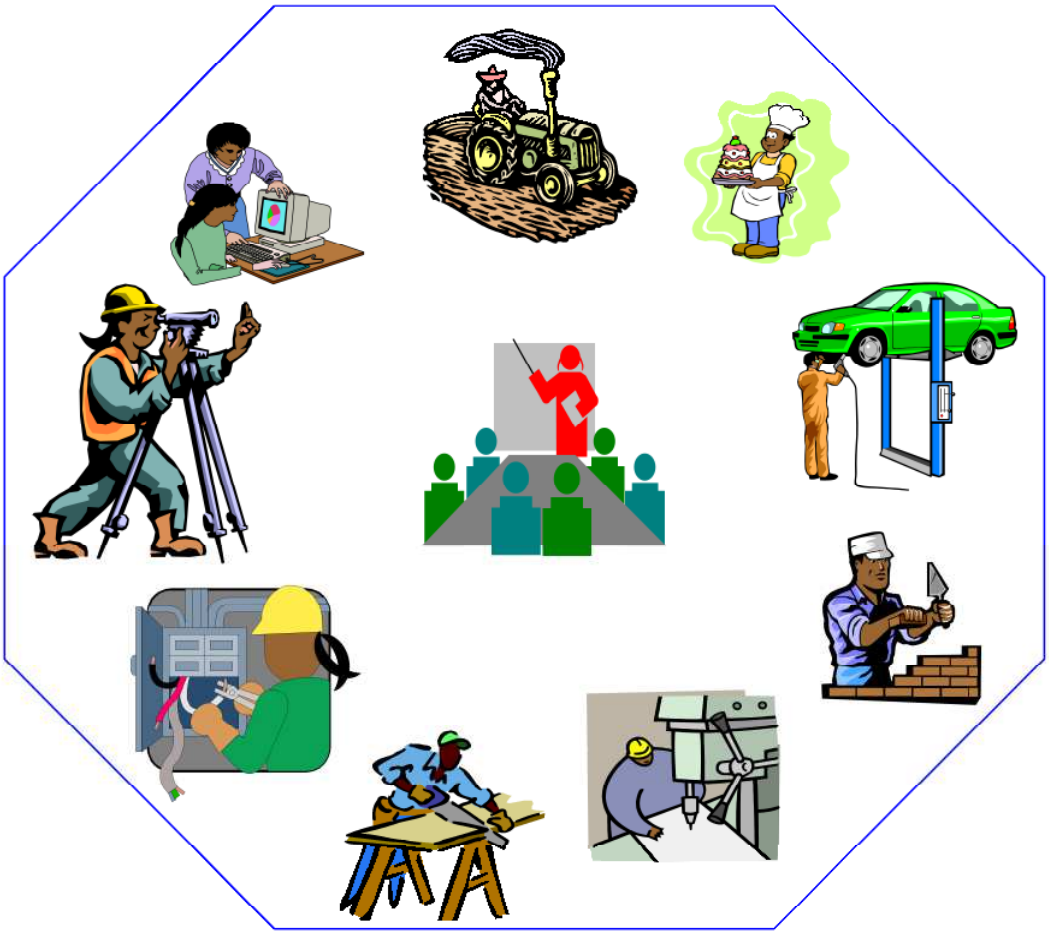
Federal Democratic Republic of Ethiopia

OCCUPATIONAL STANDARD

PRINTING AND GRAPHIC ARTS OPERATION

NTQF Level II and III



Ministry of Education

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Introduction

Ethiopia has embarked on a process of reforming its TVET-System. Within the policies and strategies of the Ethiopian Government, technology transformation – by using international standards and international best practices as the basis, and, adopting, adapting and verifying them in the Ethiopian context – is a pivotal element. TVET is given an important role with regard to technology transfer. The new paradigm in the outcome-based TVET system is the orientation at the current and anticipated future demand of the economy and the labor market.

The Ethiopia Occupational Standards (EOS) is the core element of the Ethiopian National TVET-Strategy and an important factor within the context of the National TVET-Qualification Framework (NTQF). They are national Ethiopian standards, which define the occupational requirements and expected outcome related to a specific occupation without taking TVET delivery into account.

This document details the mandatory format, sequencing, wording and layout for the Ethiopia Occupational Standard which comprised of Units of Competence.

A Unit of Competence describes a distinct work activity. It is documented in a standard format that comprises:

- Occupational title and NTQF level
- Unit title
- Unit code
- Unit descriptor
- Elements and Performance criteria
- Variables and Range statement
- Evidence guide

Together all the parts of a Unit of Competence guide the assessor in determining whether the candidate is competent.

The ensuing sections of this EOS document comprise a description of the occupation with all the key components of a Unit of Competence:

- chart with an overview of all Units of Competence for the respective level including the Unit Codes and the Unit Titles
- contents of each Unit of Competence (competence standard)
- occupational map providing the Technical and Vocational Education and Training (TVET) providers with information and important requirements to consider when designing training programs for this standards and for the individual, a career path

UNIT OF COMPETENCE CHART

Occupational Standard: Printing and Graphic Art Operation

Occupational Code: IND PGO

NTQF Level II

IND PGO2 01 0613 Access and Use computer systems	**IND PGO2 02 0613** Develop a Basic Design Concept	**IND PGO2 03 0613** Produce Graphics Using a Graphics Application
IND PGO2 04 0613 Introduction to Color Management	**IND PGO2 05 0613** Prepare Ink and Additives	**IND PGO2 06 0613** Scan Images for Reproduction
IND PGO2 07 0613 Set up Machine for Basic Adhesive, Mechanical, Guillotined Collating and Folding Product	**IND PGO2 08 0613** Produce Basic Adhesive, Adhesive, Mechanical, Guillotined Collating and Folding Product	**IND PGO2 09 0613** Select, Apply Type and Prepare Imposition Format
IND PGO2 10 0613 Perform Basic and Small Machine Maintenance	**IND PGO2 11 0613** Pack and Dispatch Products	**IND PGO2 12 0613** Electronically Combine and Assemble Data
IND PGO2 13 0613 Reconcile Process Outputs	**IND PGO2 14 0313** Under Take Root Cause Analyses	**IND PGO2 15 0613** Produce PDF Files for Online or Screen Display
IND PGO2 16 0313 Apply Cost Factors to Work Practices	**IND PGO2 17 0613** Make Photopolymer Plates (Flexographic)	**IND PGO2 18 0613** Prepare Screen and Substrate
IND PGO2 19 0613 Produce Basic Relief and Flexographic Printed Product	**IND PGO2 20 0613** Automatically Produce Basic Screen Prints	**IND PGO2 21 0613** Produce Basic Gravure Printed Product
IND PGO2 22 0613 Produce Photopolymer Plates for Pad Printing	**IND PGO2 23 0613** Produce Basic Lithographic Printed Product	**IND PGO2 24 0613** Participate in Workplace Communication
IND PGO2 25 0613 Work In Team Environment	**IND PGO2 26 0613** Develop Business Practice	**IND PGO2 27 0613** Standardize and Sustain 3S

NTQF Level III

IND PGA3 01 0613 Undertake and Plan Basic Production Processes	**IND PGA 3 02 0613** Apply Knowledge and Requirements of the Pre-Press /Press/finishing In Digital Production Sector	**IND PGA 3 03 0613** Use Color Management for Production
IND PGA3 04 0613 Apply Software Applications to Digital Printing	**IND PGA 3 05 0613** Create Pages Using a Page Layout Application	**IND PGA3 06 0613** Capture a Digital Image and Editing
IND PGA3 07 0613 Undertake Editing and Proofing of a Digital Image	**IND PGA3 08 0613** Transfer and Manage Digital Images	**IND PGA3 09 0613** Set up and Produce Basic Digital Print
IND PGA3 10 0613 Set up and Produce Complex Digital Print and Hand Bound Product	**IND PGA3 11 0613** Output Complex Images	**IND PGA3 12 0613** Produce Multiple Image Plates
IND PGA3 13 0613 Produce Complex Lithographic Printed	**IND PGA3 14 0613** Produce Complex Flexographic Printed Product	**IND PGA3 15 0613** Produce Complex Gravure Printed Product
IND PGA3 16 0613 Set up and Produce Complex Guillotined and Collating Product	**IND PGA3 17 0613** Use Electronic Monitoring Systems (Converting and Finishing)	**IND PGA3 18 0613** Produce Complex Collated, Folded, and Adhesive and Mechanical Products
IND PGA3 19 0613 Prepare Film for Complex Screen Printing	**IND PGA3 20 0613** Prepare Stencil Using Direct Electronic Imaging Method	**IND PGA3 21 0613** Operate an Automatic Screen Printing Machine
IND PGA3 22 0613 Apply Quick Change over Procedures	**IND PGA3 23 0613** Operate and Maintain Computer Resources	**IND PGA3 24 0613** Monitor Implementation of Work plan/Activities
IND PGA3 25 0613 Apply Quality Control	**IND PGA3 26 0613** Lead work place communications	**IND PGA3 27 0613** Lead small teams
IND PGA3 28 0613 Improve Business Practice	**IND PGA3 29 0613** Prevent and Eliminate MUDA	

NTQF Level II

Occupational Standard: Printing and Graphic Arts Operation Level II	
Unit Title	**Access and Use Computer Systems**
Unit Code	**IND PGO2 01 0313**
Unit Descriptor	This unit describes the performance outcomes, skills and knowledge required to access and use the Internet within the printing and graphic arts industries

Element	Performance Criteria
1. Identify and use local resources	1.1. Installed Internet ***software applications*** and their purposes are identified. 1.2. Internet software applications are used online and offline. 1.3. Extracting (decompressing) software and virus scanners are used on downloaded files. 1.4. Internet connection and protocols are identified. 1.5. Applications and files are downloaded and installed correctly. 1.6. Potential security risks are identified and avoided.
2. Identify and use remote resources	2.1. Websites are navigated to locate required information. 2.2. Files and documents are accessed using the Internet (world wide web) search engines. 2.3. The Internet is browsed to find related sites via links. 2.4. Files are retrieved from an FTP repository. 2.5. Emails are sent, downloaded, read, responded and saved to. 2.6. Files attached to incoming email are retrieved and attached files are sent. 2.7. Newsgroups ***relevant terminology*** to the industry are accessed.
3. Use a standalone computer/terminal correctly	3.1. Correct posture at the keyboard is adopted according to OHS. 3.2. Data is correctly accessed to ensure no loss of data. 3.3. Data is manipulated correctly to ensure access, retrieval and storage of data. 3.4. Keyboarding technique is safe and meets the speed requirements of the job, if necessary.
4. Perform computer/terminal functions	4.1. Data is accessed, saved and retrieved for reference and for amendment. 4.2. The appropriate program is selected for the job to be undertaken. 4.3. Mouse and/or keyboard functions are used correctly to operate the computer ***system.*** 4.4. Features of ***applications*** are used correctly to deliver a specified output.

	4.5. Data is saved in correct format and file location. 4.6. Master pages, templates and style sheets, as appropriate, are used consistently to ensure data is the same after exchange or transfer.

Variable	Range
Software applications	may include: • A wide range of programs, some current examples of which may be Eudora, Netscape.
Relevant terminology	may include: • ISDN, PPP, TCP/IP, URL, Java, JavaScript, HTML, Download, WWW, cookies, zip files and others.
systems	may include: • Computer systems used in the printing industry.
applications	may include: • Software used in the printing industry, including: typesetting, image manipulation, page layout, word processing, database, spreadsheet, production control and monitoring applications.

Evidence Guide	
Critical Aspects of Competence	Assessment requires evidence that the candidate to: • Access the Internet and retrieve data using WWW and email and newsgroups • Send emails or newsgroup posting with correctly formatted attachments • Perform a search and save the text of a web page to disk • Extract and virus-scan downloaded files • Demonstrate an ability to find and use information relevant to the task from a variety of information sources.
Underpinning Knowledge and Attitudes	Demonstrates knowledge of : • how to initiate and conclude an Internet connection • when a connection attempt fails, what could be the cause and what to do • appropriate uses of different Internet protocols and data types (WWW, email, etc.) • WWW search engines • what a URL is • using email to respond to a newsgroup post • what shareware is • maintaining (upper/lower) case : URLs, file names, passwords • "zip" are files and why are they used • difference between Java and JavaScript • ways to you use the Internet to obtain product information and technical support • time it takes to download one megabyte of data using a fast modem • privacy and security measures related to on line tasks • information you would refuse to provide when filling out a form on a web page • what cookies are

	• types of files that can carry viruses • scanning for viruses before and after extracting the files from a compressed archive • copyright ownership on the types of data you retrieve • manuals, safety and other documentation that are relevant to this task and where are they kept and information that is included in these documents
Underpinning Skills	Demonstrates skills in: • OHS in relation to operating machinery such as safely switching off machinery before cleaning is started • collecting, analysing and organising information by navigating websites to locate required information • planning and organising activities by navigating websites to locate required information • problem-solving skills by extracting files and virus scanning
Resources Implication	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.
Methods of Assessment	Competence may be assessed through: • Interview / Written Test • Observation / Demonstration with Oral Questioning
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

Occupational Standard: Printing and Graphic Arts Operation Level II	
Unit Title	**Develop a Basic Design Concept**
Unit Code	**IND PGO2 02 0613**
Unit Descriptor	This unit describes the performance outcomes, skills and knowledge required to undertake graphic design to produce roughs and finished art.

Element	Performance Criteria
1. Assess brief requirements	1.1. The printing requirements of the ***layout brief*** are determined to align pre-press processes with printing feasibility. 1.2. The brief is broken down into stages of production in order to determine a plan of procedure. 1.3. A plan of action is determined to meet the time requirements of each stage so that deadlines are identified and adhered to. 1.4. Correct design and typographic terms are used to facilitate communication according to industry standards.
2. Assemble layout	2.1. Client copy and images are assembled to conform to the brief requirements. 2.2. Library files are accessed for relevant data to conform to the brief requirements. 2.3. Appropriate equipment and materials to complete the layout are assembled to enable the brief to be undertaken efficiently. 2.4. The design area is cleaned and prepared ready for use.
3. Render a simple graphic design	3.1. The client requirements are checked to ensure a design concept matches the ***Complexity of process*** brief. 3.2. Preliminary graphic design ideas are constructed according to the brief. 3.3. A simple graphic design concept is rendered electronically to conform to the client brief. 3.4. The rendered graphic design is checked for conformance with the requirements of the brief.
4. Produce finished artwork	4.1. A layout grid is created to meet the specifications of the client brief. 4.2. Type is selected for readability style and fitted into the grid space allocated to conform to brief requirements. 4.3. Photographs and illustrations are selected, scaled and cropped appropriately to fit the grid space allocated. 4.4. Overlays/colour roughs are created to conform to brief specifications. 4.5. The components of the layout are positioned accurately using key lines to conform to the grid framework.
5. Check for suitability	5.1. The layout is checked to eliminate omissions and ***errors***.

	5.2. The layout design is checked against the requirements of the brief to conform to the critical requirements of the proposed medium. 5.3. The layout is rendered ready to present to the client.
6. Tidy materials and store data	6.1. Equipment and materials are returned to storage according to ***enterprise procedures***. 6.2. Design data and materials are saved and/or filed ready for future retrieval according to ***Quality standards*** of enterprise procedures. 6.3. The design area is cleaned according to enterprise procedures ready for re-use.

Variable	**Range**
Layout brief	may include: • Describes and specifies the work to be completed, identifies all requirements for the job.
Complexity of process	may include: • Artwork may contain simple line work or a combination of line and tone.
Errors	may include spelling, grammatical, style and placement.
Enterprise procedures	may include: • Range of enterprise procedures within defined work area.
Quality standards	Should meet client requirements and enterprise and industry standards.

Evidence Guide	
Critical Aspects of Competence	Assessment requires evidence that the candidate: • The rendered design meets the requirements of the design brief. The design conforms to commercial design standards and meets reproduction final use requirements • The underlying skill of designing a basic layout to conform to brief specifications should be transferable across the design and pre-press sectors. It is important that the substrate for reproduction is identified and that the competencies be demonstrated with a clear identification of printing processes • demonstrate an ability to find and use information relevant to the task from a variety of information sources • Prepare TWO sets of color roughs and artwork containing line and tone work according to specifications of the client brief and the listed Performance Criteria.
Underpinning Knowledge and Attitudes	Demonstrates knowledge of: • the purpose of this artwork being prepared • number and the specific colours of the job • scale that is this artwork to the finished job • the difference between reflective and transparent originals • three essential elements to consider when preparing art for printing/publication • the different requirements for TWO different printing or electronic output processes

	• using manual/computer techniques to prepare colour rough • various types of halftone dot structures and the maximum and minimum tonal ranges that could be used to reproduce this artwork • OHS concerns that are there when using cameras or computers • the colour sequence and overlap for transparent/opaque colours • preparing the finished artwork at this size or scale • choosing specific type faces • effect (influence) that the selection of different type faces have on a job • method used for registration and trim marks • artwork evaluation for density, definition and resolution, and how can this be corrected • the characteristics of properly prepared line artwork • finished art compliance with job specifications and approved colour rough • manuals, safety and other documentation that are relevant to this task and where are they kept and information that is included in these documents
Underpinning Skills	Demonstrates skills in: • OHS in relation to operating machinery such as safely switching off machinery before cleaning is started • communication of ideas and information by determining exactly what client wants from brief and subsequent discussion • collecting, analysing and organising information by balancing and matching client demands with requirements for reproduction and costs • planning and organising activities by coordinating job sequence so that as materials arrive they are processed and can be checked efficiently • teamwork when ensuring that designers, printers and clients all know what they need to do and when • mathematical ideas and techniques by calculating costs and enlargement/reduction factors • problem-solving skills by coping with discrepancies between brief and what is possible • use of technology by using appropriate software to create design and ensuring files are saved in required format
Resources Implication	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.
Methods of Assessment	Competence may be assessed through: • Interview / Written Test • Observation / Demonstration with Oral Questioning
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

Occupational Standard: Printing and Graphic Arts Operation Level II	
Unit Title	**Produce Graphics Using a Graphics Application**
Unit Code	**IND PGO2 03 0613**
Unit Descriptor	This unit describes the performance outcomes, skills and knowledge required to develop computer-generated graphics based on a client brief using a high-end application.

Element	Performance Criteria
1. Prepare the work environment	1.1. Details of the brief are reviewed to identify preference setting requirements. 1.2. Monitor is calibrated using an ICC profile to ensure closest possible colour match. 1.3. Palettes are arranged to suit job and personal preferences. 1.4. View magnification is set for ease of working with the graphics.
2. Produce objects	2.1. Ruler units are set and grid is displayed to ensure artwork meets design specifications. 2.2. Tools are used to produce ***objects*** and required attributes are entered and shapes ***manipulated***, continuing until graphic framework is finalised. 2.3. Lines and curves are adjusted and ***edited*** to fit design specifications. 2.4. Objects are painted, transposed and strokes and ***effects*** are scaled according to the design brief. 2.5. ***Colours*** are created, edited and saved to the colour palette and saturation of colour is adjusted. 2.6. Colour and ***appearance attributes*** are selected and copied as required. 2.7. Gradients fills, mesh and patterns are used to paint and blend as required by the layout and design brief.
3. Alter objects	3.1. Objects are grouped or individually selected, moved, scaled or rotated using a variety of methods. 3.2. Objects are reflected, sheared and distorted according to the design brief. 3.3. Three dimensional objects are formed and edited and gradient colour added to create depth. 3.4. The perspective of the objects is adjusted as required. 3.5. Transformations are repeated according to the design brief. 3.6. Smooth colour blends are created between objects and blends are modified as required to meet the design brief.
4. Add type as a graphic element	4.1. Required type is added to type containers and type attributes and ***formatting*** are set to reflect the design brief.

	4.2. Type is wrapped or placed along a path to complement the graphic. 4.3. Type is converted to type outlines or letterforms and shapes are modified.
5. Set appearance attributes and styles	5.1. The ***properties*** of the graphic are set and meet the design brief. 5.2. Effects are added to a graphic and edited to make the appearance more suitable according to the design brief. 5.3. Appearances required for further use are saved as styles.
6. Set up layers	6.1. Objects are organised in layers and stacking order is controlled. 6.2. Layers are locked and/or nested and grouped according to the design brief. 6.3. Styles are added or removed from layers when layer consistency is or is not required.
7. Finalise document	7.1. The appropriate format for saving the graphic is identified given the various ***elements*** in the graphic. 7.2. The resolution for effects and any filters are set based on image quality. 7.3. Document is checked to ensure correct layout file and that there are no non-printable elements. 7.4. PDF or other ***high-end application*** export options are fixed to the best settings for the final media and the file is then exported and saved.

Variable	**Range**
Objects	may include: • Predefined shapes, drawn objects, and curved segments, lines.
Manipulated	may include: • Shapes are rotated, position and sizes changed, shapes sent to back or forward, scaled and copied.
Edited	may include: • Transparency, gradients, strokes, custom colours using CMYK sliders.
Effects	may include: • Glows, textures, opacity, blur and others.
Colors	may include: • CMYK colours, Spot colours, Registration colours, PMS.
Appearance attributes	may include fills, strokes, effects, blending modes, transparency.
Formatting	may include: • Font, leading, paragraph alignment, character size, columns of type, text flow.
Properties	Are appearance attributes such as above?
Elements	may include layers, fine lines, blending, feather.
High-end application	may include Adobe Illustrator, Adobe Photoshop, CorelDraw, Freehand, In Design, Quark Express.

Evidence Guide	
Critical Aspects of Competence	Assessment requires evidence that the candidate: • developing graphics based on client brief using a high-end application • demonstrate an ability to find and use information relevant to the task from a variety of information sources • for valid and reliable assessment of this unit, evidence should be gathered over a period of time through a range of methods for assessment to indicate consistent performance • Evidence for assessment may be gathered from assessment of the unit of competency alone or through an integrated assessment activity.
Underpinning Knowledge and Attitudes	Demonstrates knowledge of : • image formats (SWF, SVG, GIF, JPEG, PNG, Bitmap and others) • correct application selection • manipulation of graphics • colour models • attributes of appearance • effects • filters • text and formatting • interpreting a brief
Underpinning Skills	Demonstrates skills in: • OHS in relation to operating machinery such as safely switching off machinery before cleaning is started • communication of ideas and information by producing graphics using a graphics application • collecting, analysing and organising information by reviewing the brief to identify preference setting arrangements • planning and organising activities by preparing the work environment before producing objects • teamwork when maintaining the production process in association with others • mathematical ideas and techniques by setting the view magnification to maximise ease of viewing • problem-solving skills by creating smooth colour blends between objects • use of technology by fixing export options to suit the final media
Resources Implication	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.
Methods of Assessment	Competence may be assessed through: • Interview / Written Test • Observation / Demonstration with Oral Questioning
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

Occupational Standard: Printing and Graphic Arts Operation Level II	
Unit Title	**Introduction to Color Management**
Unit Code	**IND PGO2 04 0613**
Unit Descriptor	This unit describes the performance outcomes, skills and knowledge required to identify and apply the fundamental theory of color in the printing industry. This includes terminology, color modes and the analysis of light and color.

Element	Performance Criteria
1. Identify the need for colour management	1.1. The varied colour representation of ***devices*** are identified and recorded. 1.2. Colour inconstancies between input, display and output devices and the final printed product are identified and rectified. 1.3. The ***components*** of a colour management system are identified and suggestions made to improve ***workplace practices***.
2. Use colour modes and libraries	2.1. Varying ***colour modes and libraries*** are used according to job specifications. 2.2. Images are converted between colour modes using a ***process*** to ensure the best reproduction according to job specifications. 2.3. Colour libraries are selected and used within software applications according to job specifications.

Variable	Range
Devices	may include: • Monitors, proofers, printers, scanners, digital cameras, digital and printing presses.
Components	may include: • standardised viewing environment • calibrated and profiled output devices, such as printers and presses • calibrated and profiled input devices, such as scanners and cameras • calibrated monitors • software applications that support colour management • Colour profiles.
Workplace practices	may include • establishment of colour managed workflow • calibration and regular recalibration of devices • Adoption of recognised colour standard, such as AS ISO 12647-2.
Color modes and libraries	may include: • RGB • CMYK • LAB and Pantone.
Process	may include: • selection of colour mode and rendering intent • Converting using profiles.

Evidence Guide	
Critical Aspects of Competence	Assessment requires evidence that the candidate: • identify the need and components of a colour management system • select and convert images to appropriate colour modes • select colour libraries that comply with specific job specifications • Locate and use information relevant to the task from a variety of information sources.
Underpinning Knowledge and Attitudes	Demonstrates knowledge of: • components of a colour management system • terminology associated with colour management • standard lighting conditions for matching colour • effects different lighting conditions have on monitors, proofing and printing • measurement of light intensity and colour temperature • difference between red, blue, green (RGB), Cyan, Magenta, Yellow, Black (CMYK) and LAB colour • different rendering intents and their application • Under Colour Removal (UCR) and Grey Component Replacement (GCR) and what effect they have on an image • different Pantone libraries and their application • OHS issues needed to be considered when managing colour for digital production
Underpinning Skills	Demonstrates skills in: • Occupational Health and Safety (OHS) in relation to using correct ergonomics when operating the computer • communicating ideas and information, having considered all the fundamentals of colour theory • collecting, analysing and organising skills in relation to the fundamentals of colour theory • planning and organising skills for identifying and clarifying colour requirements • teamwork skills for maintaining the production process in association with others • problem-solving skills for diagnosing and correcting colour problems • technical skills for using software and hardware correctly to ensure consistency of output
Resources Implication	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.
Methods of Assessment	Competence may be assessed through: • Interview / Written Test • Observation / Demonstration with Oral Questioning
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

Occupational Standard: Printing and Graphic Arts Operation Level II	
Unit Title	**Prepare Ink and Additives**
Unit Code	**IND PGO2 05 0613**
Unit Descriptor	This unit describes the performance outcomes, skills and knowledge required to prepare inks and additives in a range of printing processes.

Element	Performance Criteria
1. Select ink, coatings, adhesives and additives	1.1. Inks, dyes and additives are selected according to job specifications. 1.2. ***Quality*** and suitability of inks, dyes or additives are checked and appropriate action is taken. 1.3. Inks and dyes are selected according to suitability of substrate, adhesion, physical and chemical resistance, and light fastness, drying method and print process.
2. Prepare ink, coatings, adhesives and additives	2.1. Inks, dyes and additives are prepared according to OHS requirements, and manufacturer's/supplier's instructions with suitable precautions to minimise waste. 2.2. Correct ***Colour matching systems*** and weight/volume of ink are mixed and prepared to match the requirements of the job specifications and the printing press to be used. 2.3. Formulating the ***type of ink***, ***substrate*** and the approved colour is appropriately recorded.
3. Store and handle ink, coatings, adhesives and additives	3.1. Inks, dyes and additives are appropriately stored, handled and labelled according to manufacturer's/supplier's instructions to prevent damage and hazards to personnel. 3.2 Coatings, adhesives and additives are appropriately stored, handled and labelled according to manufacturer's/supplier's instructions to prevent damage and hazards to personnel by using different ***type of equipment***. 3.3. Coatings, adhesives and additives are stored and used in a manner that ensures use before use-by dates ***enterprise procedures***.

Variable	Range
Quality	may include: • Should meet client requirements and enterprise and industry standards.
Color matching systems	may include: • Commonly used matching procedures.
Type of ink, substrate	may include: • Range of inks and substrates commonly used in the printing industry.
Type of equipment	may include: • Range of manual and electronic measuring equipment.
Enterprise procedures	may include: • Range of enterprise procedures within defined work area.

Evidence Guide	
Critical Aspects of Competence	Assessment requires evidence that the candidate: • correctly preparing ink and additives as required by job specifications • demonstrate an ability to find and use information relevant to the task from a variety of information sources • prepare at least TWO lots of inks or additives to match a colour sample and specific end-use requirements according to workplace specifications and the listed Performance Criteria • Evidence for assessment may be gathered from assessment of the unit of competency alone or through an integrated assessment activity.
Underpinning Knowledge and Attitudes	Demonstrates knowledge of: • selecting inks and additives to match process and job requirements • suitability of the ink determined for the particular process • characteristics of the chosen ink matched to the substrate • ink adhering to the substrate • physical, chemical and light or colour fastness of the ink • preparing inks and additives • OHS concerns related to the preparation of inks and additives • correct handling procedures • correct weight/volume required • methods that are available to check and adjust ink colour and consistency • quality of the ink or additive is up to the standard required • matching colour • OHS concerns related to the matching of inks and additives • effect that lighting conditions have on colour matching • compatibility of being mixed • correct colour for inks • storage, handling and labelling of inks and additives • MSDSs for this ink system that is at hand • environmental conditions that are relevant to the storage of inks and additives • conventions that should be adhered to when labelling mixed inks • method of disposal of inks, solvent and solvent rags • information sources • manuals, safety and other documentation that are relevant to this task and where are they kept • information that is included in these documents
Underpinning Skills	Demonstrates skills in: • OHS in relation to operating machinery such as safely switching off machinery before cleaning is started • communication of ideas and information by correctly labelling inks and additives • collecting, analysing and organising information by accessing and using MSDSs and data on ink/additive formulation to ensure efficient production

	• planning and organising activities by selecting appropriate inks and additives prior to preparation • teamwork when maintaining the production process in association with other staff • mathematical ideas and techniques by calculating weights and volumes and dilution factors • problem-solving skills by identifying problems in formulation and making appropriate adjustments • use of technology by using manual and electronic measuring equipment
Resources Implication	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.
Methods of Assessment	Competence may be assessed through: • Interview / Written Test • Observation / Demonstration with Oral Questioning
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

Occupational Standard: Printing and Graphic Arts Operation Level II	
Unit Title	**Scan Images for Reproduction**
Unit Code	**IND PGO2 06 0613**
Unit Descriptor	This unit describes the performance outcomes, skills and knowledge required to scan line images.

Element	Performance Criteria
1. Prepare line image for scanning	1.1. The ***line image*** for scanning is scaled to conform to production specifications. 1.2. The quality of the line image for scanning is assessed to determine ***scanner*** settings. 1.3. The line image is cleaned and mounted ready for scanning.
2. Prepare scanner	2.1. The scanner is set correctly for the line images to be scanned. 2.2. Appropriate ***software*** is selected for scanning and processing line images. 2.3. Adjustments are made to ensure ***quality*** of scanned image.
3. Scan and check image	3.1. Appropriate software is applied to scan and process line images. 3.2. The original line image is scanned for reproduction according to the design specifications. 3.3. The quality of the scanned image is checked against the job specifications and the printing or reproduction requirements.

Variable	Range
Line image	may include: • A variety of high contrast line artwork or copy.
Scanner	may include: • flat-bed • Drum scanners with medium to high-end full colour capabilities.
Software	may include: • appropriate software relative to image input quality and output device • any proprietary industry standard software industry standard software that is bundled with high-end scanners • third party products, such as: ➢ Silver Fast ➢ Vue Scan.
Quality	may include enterprise and industry standards.

Evidence Guide	
Critical Aspects of Competence	Assessment requires evidence that the candidate: • ensure the quality of the scanned image meets specified quality standards and final media requirements • ensure the underlying skill of scanning images are transferable across the design and pre-press sectors

	• identify the substrate for reproduction and ensure that the quality of the scanned image is suitable for the identified printing processes • locate and use information relevant to the task from a variety of information sources • Use a desktop flat-bed scanner and reproduce three line originals.
Underpinning Knowledge and Attitudes	Demonstrates knowledge of: • relevant printing processes and electronic media • scanning requirements • characteristics of a line original • factors that determine line scanning resolution • controls that exist within the software for line scanning • essential hardware specifications for line scanning • software requirements for line scanning • specific software requirements to process and output the image • manuals, safety and other documentation that are relevant to this task, where they are kept and information included in these documents • OHS concerns when operating a scanner • OHS standards that relate to working for periods of time on computers
Underpinning Skills	Demonstrates skills in: • Occupational Health and Safety (OHS)skills for operating machinery, such as safely switching off machinery before cleaning is started • communication and literacy skills for expressing ideas and information and interpreting the job brief • planning, analysing and organising skills for matching reproduction requirements, resolution factors and preparing the line image for scanning • teamwork skills for maintaining the production process in association with others • numeracy skills for calculating enlargement/reduction factors and resolution • problem-solving skills for scaling the line image to conform to production specifications • technical skills for using appropriate software and hardware correctly to ensure ease of subsequent processing
Resources Implication	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.
Methods of Assessment	Competence may be assessed through: • Interview / Written Test • Observation / Demonstration with Oral Questioning
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

Occupational Standard: Printing and Graphic Arts Operation Level II	
Unit Title	**Set up Machine for Basic Adhesive, Mechanical, Guillotined Collating and Folding Product**
Unit Code	**IND PGO2 07 0613**
Unit Descriptor	This unit describes the performance outcomes, skills and knowledge required to set up a machine for basic adhesive, mechanical or thermal fastening. Some equipment may also involve cutting, trimming, folding and/or gathering (collating) which may be assessed at the same time.

Element	Performance Criteria
1. Prepare for job	1.1. Job specifications are read and interpreted from job documentation or production control system. 1.2. Set-up is carried out correctly in minimum time with minimum wastage. 1.3. Availability of all job related components is checked.
2. Set up reel system (OR Element 3)	2.1. Unwind and delivery reels are set up and adjusted according to job specifications. 2.2. Webbing procedures are carried out according to job specifications. 2.3. Web control system is set up and adjusted according to job specifications. 2.4. Reels are spliced/joined according to job specifications.
3. Set up sheet/section system (OR Element 2)	3.1. Feeder and delivery systems are set up and adjusted according to job specifications. 3.2. Sheet/section pick-up and transportation system is set up and adjusted according to job specifications. 3.3. Transfer systems are set up and adjusted according to job specifications. 3.4. ***Substrate handling type*** is removed from the process according to job specifications. 3.5. Sheet/section transfer and control system is set up and adjusted according to job specifications.
4. Set up equipment and in-line units	4.1. ***Fastening processes*** system is set up and adjusted according to job specifications ***fastening units***. 4.2. Minor ***in-line processes*** printing/converting/binding units are set up for basic processes and adjusted according to machine requirements and job specifications. 4.3. Assistance is given in set up of major in-line printing/converting/binding units (NOTE: if entire set up is completed, refer to appropriate competency standards).
5. Conduct sample run	5.1. Raw material to be used for sample is organised correctly.

	5.2. Machine is set up and operated to produce a specified sample according to OHS requirements, manufacturer's specifications and enterprise procedures. 5.3. ***Complexity*** of sample is visually inspected and/or tested or laboratory testing is organised according to enterprise procedures. 5.4. Results are interpreted to determine adjustment requirements. 5.5. Adjustment changes are carried out according to product and machine specifications.

Variable	**Range**
Substrate handling type	may include: • Wide or narrow reel or large or small sheet handling systems. • Range of substrates within the major categories of paper, pressure sensitive material, board, corrugated board, plastics and related films, or metal.
Fastening processes	may include: • adhesive fastening such as cold and hot melt gluing, taping • mechanical fastening such as riveting, string and wire stitching, and wire binding • Thermal fastening such as high frequency and head welding.
Fastening units	may include: • A range of machines with manual, semi-automated, fully automated or computerised process control.
In-line processes	may include: • minor processes that are integral to this competency can include basic in-line operations such as perforating, numbering, date coding, slitting that do not in themselves constitute another defined unit of competency. Where a major in-line process is defined as a separate competency (e.g. flat-bed cutting, folding) it should be assessed as such.
Fastening units	may include: • A range of machines with manual, semi-automated, fully automated or computerised process control.
Complexity	may include basic refers to simple hand-fed or single-head adhesive and thermal machines, single-head mechanical machines.

Evidence Guide	
Critical Aspects of Competence	Assessment requires evidence that the candidate: • Correctly set up machine for basic fastening according to job specifications and within the production timeframe • Demonstrate an ability to find and use information relevant to the task from a variety of information sources • Demonstrate all safety devices on the machine • Set up machine on TWO occasions for adhesive OR mechanical OR thermal fastening, using different weights and sizes of substrate according to manufacturer's and job specifications, enterprise procedures and the listed Performance Criteria

	• Demonstrate use of computerized control, monitoring and data entry systems if available and appropriate
Underpinning Knowledge and Attitudes	Demonstrates knowledge of - • information concerning binding requirements that would you expect to find in the job documentation or production control system • information interpretation to ensure smooth workflow throughout the factory • elements that must be considered when planning a binding sample • OHS areas that must be addressed when setting up these areas of the machine • webbing procedures commonly used in the transportation area • areas to consider when setting up the web control system • problem areas likely to be encountered when setting up the sheeter • OHS factors that must be considered when setting up the delivery systems • special delivery problems that are associated with adhesive machines • overcoming these problems • checks needed when using the delivery systems present on the various machines • ways in which the completed work can be secured for dispatch • OHS areas that must be addressed when setting up the machine • OHS safeguards that are necessary with hot melt adhesives • correct binding technique for a job • the methods of adhesive metering present on the machine • care that should be taken to ensure a neat and clean adhesive binding job • parts of the wire stitcher that would need to be adjusted to process books of different thicknesses • positioning of the wire stitches on the book • the difference between a staple and a wire stitch • determining the appropriate wire calliper for a particular job • OHS factors that must be addressed when setting up these areas of the machine • in-line units that are available for these binding processes • OHS factors that should be considered before readjusting the machine • circumstances under which the machine would need to be adjusted • quality aspects that should be considered in the completed binding job • steps that should be taken to ensure that important features of the production control system are addressed • machine manuals, safety and other documentation that are relevant to this task, where they are kept and information that is included in these documents
Underpinning Skills	Demonstrates skills in: • OHS in relation to operating machinery

	• communication skills when organising a laboratory test if required and reading and interpreting job specifications • planning and organising when conducting a sample run • teamwork by giving assistance with setting up in-line units • using technology by setting up and adjusting the fastening system according to job specifications • problem-solving by interpreting sample results to determine adjustment requirements
Resources Implication	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.
Methods of Assessment	Competence may be assessed through: • Interview / Written Test • Observation / Demonstration with Oral Questioning
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

Occupational Standard: Printing and Graphic Arts Operation Level II	
Unit Title	**Produce Basic Adhesive, Adhesive, Mechanical, Guillotined Collating and Folding Product**
Unit Code	**IND PGO2 08 0613**
Unit Descriptor	This unit describes the performance outcomes, skills and knowledge required to produce basic adhesive, mechanical or thermal fastened product. Some equipment may also involve cutting, trimming, folding and/or gathering (collating) which may be assessed at the same time.

Element	Performance Criteria
1. Maintain reel transportation system (OR Element 2)	1.1. Reel stand is monitored and adjusted to ensure efficient continuous operation. 1.2. Web control system is monitored and adjusted to ensure correct tension and accurate continuous positioning of the web for efficient operation. 1.3. ***Substrate*** is added to process according to job specifications.
2. Maintain sheet transportation system (OR Element 1)	2.1. Feeder and delivery systems are monitored and adjusted to ensure continuous and efficient feeding to machine. 2.2. Sheet pick-up and transport system is monitored and adjusted to ensure accurate and continuous sheet handling and efficient operations. 2.3. Transfer systems are monitored and adjusted to ensure correct and continuous sheet handling and efficient operation. 2.4. Substrate is added to process according to job specifications.
3. Maintain basic adhesive/mechanical/ thermal fastening process	3.1. Registration of ***fastening process*** is monitored and adjusted to ensure quality of product meets the standard of the approved sample. 3.2. Wire straightness, length, cut-off and clinching pressures are monitored and adjusted to ensure quality of product meets the standard of the approved sample OR 3.3. Adhesion is monitored and adjusted to ensure quality of product meets the standard of the approved sample OR 3.4. Power current and dwell time is monitored and adjusted to ensure quality of product meets the standard of the approved sample adjusted according to job specifications.
4. Maintain production process	4.1. Basic ***in-line processes*** printing/converting/binding/finishing processes are monitored and adjusted to ensure the quality of product meets the standard of the approved sample. 4.2. Production process is operated in association with fellow workers and according to enterprise procedures and planned daily schedule. 4.3. Production is maintained according to OHS requirements, manufacturer's specifications and enterprise procedures.

	4.4. Manual and/or automatic control is used according to job specifications. 4.5. Performance is monitored and verified using the process control system according to enterprise procedures. 4.6. Production difficulties are anticipated and preventive action is taken to prevent occurrence by timely intervention. 4.7. Process adjustments to eliminate problems are reported according to enterprise procedures. 4.8. Waste is sorted according to enterprise procedures.
5. Identify and rectify problems and faults	5.1. Problems in adhesive/mechanical/thermal fastening machine are identified and reported according to enterprise procedures. 5.2. Adjustments or corrections are carried out according to specified procedures and are consistent with operator's skill level. 5.3. Adhesive/mechanical/thermal fastening machine operation is checked to ensure correct operation. 5.4. Faulty performance of equipment is identified and reported according to enterprise procedures. 5.5. Machine faults requiring repair are identified and reported to designated person according to enterprise procedures. 5.6. Repair/adjustment is verified prior to resumption of operations.
6. Conduct shutdown of production process	6.1. Correct shutdown sequence is followed according to manufacturer's specifications and enterprise procedures. 6.2. Shutdown is conducted in association with fellow workers and in compliance with OHS requirements. 6.3. Substrate waste is removed from operating area and recycled of disposed of, where required, according to regulatory requirements and enterprise procedures.
7. Clean machine at end of run	7.1. Mechanical ***fastening unit*** is disengaged and cleaned ready for next run. 7.2. Thermal fastening unit is disengaged and cleaned ready for next run. 7.3. Glue system is washed up ready for next run and liquid waste is disposed of according to regulatory requirements and enterprise procedures. 7.4. In-line printing/converting/binding/finishing units are cleaned ready for next run. 7.5. Reel feed, transportation and delivery systems are disengaged and cleaned ready for next run. 7.6. Sheet feed, transport and delivery systems are disengaged and cleaned ready for the ***complexity*** of next run. 7.7. Production records or other documentation are accurately completed where required by enterprise procedures.

Variable	Range
Substrate	may include: • Wide or narrow reel or large or small sheet handling systems. • Range of substrates within the major categories of paper, pressure sensitive material, board, plastics and related films, or metal
Fastening process	may include: • adhesive fastening such as cold and hot melt gluing, taping • mechanical fastening such as riveting, string and wire stitching, and wire binding • Thermal fastening such as high frequency and heat welding.
In-line processes	may include: • Minor processes that are integral to this competency can include basic in-line operations such as perforating, numbering, slitting that do not in themselves constitute another defined unit of competency. Where a major in-line process is defined as a separate competency (e.g. flat-bed cutting, folding) it should be assessed as such.
Fastening units	may include: • A range of machines with manual, semi-automated, fully automated or computerised process control.
Complexity	may include basic refers to simple hand-fed or single-head adhesive and thermal machines, single-head mechanical machines.

Evidence Guide	
Critical Aspects of Competence	Assessment requires evidence that the candidate: • Produce a basic fastened product that meets job specifications, production timeframes and quality standards • Demonstrate an ability to find and use information relevant to the task from a variety of information sources • On TWO occasions produce adhesive OR mechanical OR thermal fastened products, using different weights and sizes of substrate, according to manufacturer's and job specifications, enterprise procedures and the listed Performance Criteria • Demonstrate use of computerized control, monitoring and data entry systems if available and appropriate
Underpinning Knowledge and Attitudes	Demonstrates knowledge of: • OHS factors that must be considered when operating web machine transport systems • areas of the reel stand that should be monitored to ensure trouble-free operation • OHS factors that must be considered when operating sheet-fed transportation and delivery systems • areas of the sheet-fed feeder that should be monitored to ensure trouble-free operation • areas of the delivery system that should be observed to maintain tension • areas of the delivery system that should be observed to prevent damage to the finished product

	• checks needed when substrate is removed from the machine • OHS factors that must be considered when using hot melt adhesive • safety clothing that is available for use when operating adhesive binders • OHS factors that should be considered before readjusting the machine • areas of the in-line process that should be monitored to assure the quality of the product • sectors to observe to ensure that the production process is trouble-free and continuous • when the machine needs to be adjusted • adjustment of the adhesive application on the adhesive binder • straightening the wire in the wire feed on the wire stitcher • possible reasons for the welding being unsuccessful for a high frequency welder • OHS factors that must be considered when shutting down and cleaning the machine • areas of the machine that need regular cleaning • materials that need to be cleaned from the machine • keeping the machine clear of surface rust (condensation) • quality aspects that should be considered in a completed adhesive bound job • quality aspects that should be considered in a completed high frequency welded job • quality aspects that should be considered in a completed wire stitched job • alterations needed to production to meet client requirements • machine manuals, safety and other documentation that are relevant to this task, where they are kept and information that is included in these documents
Underpinning Skills	Demonstrates skills in: • OHS in relation to operating machinery • communication skills when monitoring and verifying performance using process controls • planning and organising when following the correct shutdown sequence • teamwork when conducting shutdown with fellow workers • using technology by adjusting machinery to improve performance • identifying problems and faults and developing solutions
Resources Implication	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.
Methods of Assessment	Competence may be assessed through: • Interview / Written Test • Observation / Demonstration with Oral Questioning
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

Occupational Standard: Printing and Graphic Arts Operation Level II	
Unit Title	**Select , Apply Type and Prepare Imposition Format**
Unit Code	**IND PGO2 09 0613**
Unit Descriptor	This unit describes the performance outcomes, skills and knowledge required to undertake basic typesetting skills.

Element	Performance Criteria
1. Identify fonts	1.1. A range of fonts is identified to meet diverse client requirements and final ***output*** media. 1.2. Point sizes and leading of type are identified to meet ***quality standards*** of diverse client requirements and final output media.
2. Select, fit and produce type for a basic brief	2.1. Appropriate type is selected to meet the specifications of the ***brief.*** 2.2. Type is fitted into the copy space allocated according to the design layout. 2.3. Type is ***capture,*** set and produced using rules and boxes according to the design layout.
3. Proof read and correct type	3.1. Type is checked for accuracy, omissions and errors according to the ***complexity*** of job specifications. 3.2. Proofs are marked up with correct proof reading marks. 3.3. ***Manipulation*** type is corrected to accord with job specifications.

Variable	Range
Output	may include: • Type proof, screen display and mono chromatic PS laser image.
Quality standards	may include: • Should meet client requirements and enterprise and industry standards.
Brief	may include: • Specifications for the job that may include instructions which include samples of the product. • Interpretation of brief.
Capture	may include: • Manual typesetting; proprietary or computer equipment.
Complexity	may include: • simple briefs that do not involve problem solving or complex layouts or designs • Includes stock of varying qualities and proportions.
Manipulation	may include software and/or hardware function.

Evidence Guide	
Critical Aspects of Competence	Assessment requires evidence that the candidate: • Selecting and fitting appropriate fonts to meet the job specifications. Proofing the type for errors and correcting

	• The underlying skills of selecting and applying type should be transferable across the design and pre-press sectors. It is important that the substrate for reproduction is identified and that the competency be demonstrated with a clear identification of printing processes • demonstrate an ability to find and use information relevant to the task from a variety of information sources • Use manual or electronic equipment and suitable software to select, set, arrange and modify type in TWO different jobs according to the listed Performance Criteria.
Underpinning Knowledge and Attitudes	Demonstrates knowledge of : • different printing processes or electronic media and the affect on type selection and design • aspects of typography that influence the design of the brief • limitations with type reproduction in the printing processes • serif and sans serif categories • type atmosphere • elements of a dynamic arrangement • text and margin proof reader marks • grammar, punctuation and the apostrophe • manuals, safety and other documentation that are relevant to this task and where are they kept and information that is included in these documents
Underpinning Skills	Demonstrates skills in: • OHS in relation to operating machinery such as safely switching off machinery before cleaning is started • communication of ideas and information by interpreting job brief to ensure that the job is done appropriately • collecting, analysing and organising information by matching characteristics of fonts, sizes and layouts with requirements of the job brief • planning and organising activities by selecting and fitting appropriate type • teamwork when maintaining the production process in association with others • mathematical ideas and techniques by calculating fit and point sizes • problem-solving skills by fitting type in the allocated copy space • use of technology by selecting and applying type using software applications
Resources Implication	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.
Methods of Assessment	Competence may be assessed through: • Interview / Written Test • Observation / Demonstration with Oral Questioning
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

Occupational Standard: Printing and Graphic Arts Operation Level II	
Unit Title	**Perform Basic and Small Machine Maintenance**
Unit Code	**IND PGO2 10 0613**
Unit Descriptor	This unit describes the performance outcomes, skills and knowledge required to undertake basic routine maintenance of small machines and equipment.

Element	Performance Criteria
1. Check and replace machine consumables	1.1. ***Machine consumables*** are checked and replaced if worn or damaged. 1.2. Any consumables used are documented for reordering purposes.
2. Carry out regular of routine miner maintenance	2.1. ***Units or machine sections*** are cleaned, checked and lubricated according to manufacturer's recommendations and enterprise standard operating procedures. 2.2. Feeders and conveyers are cleaned, checked and lubricated according to manufacturer's recommendations and enterprise standard operating procedures. 2.3. Safety devices, gears and bearings are checked, lubricated and maintained according to manufacturer's recommendations and enterprise standard operating procedures for ***Supervision machines***. 2.4. Basic ***maintenance*** **procedures** is carried out according to OHS requirements.
3. Complete maintenance	3.1. Any wear and tear to the machinery is documented and/or referred to appropriate person for action. 3.2. Used consumables are disposed of correctly according to enterprise procedures and OHS requirements

Variable	Range
Machine consumables	may include: • Stacker wheels, belts, suckers, gripper arms, water brush, OMR readers, barcode readers, ink cartridges, knives, blades.
Units or machine sections	may include: • Range of semi-automatic and automatic folding, collating and inserting units, cutters, dryers, in-line or off-line operation.
Maintenance procedures	may include: • Should meet manufacturer's specifications and requirements.
Supervision	may include: • The work is carried out under minimal supervision, exercising initiative and judgement with discretion. Occasional supervision of the work of other personnel may be required.
Machines	may include: • the operation may apply to small machines such as inline cutters, inline mail machines

Evidence Guide	
Critical Aspects of Competence	Assessment requires evidence that the candidate: • Correctly and safely carrying out routine maintenance on small machines or equipment with minimum down time. • Demonstrate an ability to find and use information relevant to the task from a variety of information sources. • Carry out routine maintenance on any TWO pieces of equipment or systems, satisfying job, workplace and statutory requirements according to the listed Performance Criteria. • Evidence for assessment may be gathered from assessment of the unit of competency alone or through an integrated assessment activity.
Underpinning Knowledge and Attitudes	Demonstrates knowledge of: • reel handling system • OHS requirements when maintaining and cleaning the reel handling system • common causes of failure or breakdown • precautions that must be observed when working with compressed air • damage caused to electronic sensors during cleaning • checks that were performed on this area of the machine • particular chemical used for cleaning purposes • sheet or object handling systems • OHS requirements when maintaining and cleaning the sheet or object handling system • common causes of failure or breakdown • problems with inefficient cleaning • parts of this area of the machine that require cleaning • effect of excessive lubricant in this area of the machine • need for regular maintenance of this area of the machine. • printing units • OHS requirements when maintaining and cleaning the printing units • common causes of failure or breakdown • a problem that arises due to continual inefficient wash-up of roller surfaces • necessity to clean the bearers on all cylinders in the printing unit • problems that could result from cylinder bodies not being cleaned correctly • safety devices that were checked in the printing unit • action if a safety device is found to be inoperative • checks that must be carried out when replacing rollers in the inking system • ancillary units • OHS requirements when maintaining and cleaning ancillary units • common causes of failure or breakdown • checks that were performed on ancillary units • precautions that should be observed when cleaning ancillary units

	• cutting units • OHS requirements when maintaining and cleaning the cutting units • common causes of failure or breakdown • checks that are carried out on cutting devices and knives • storing of cutting knives after being replaced • problems that would arise if the machine bed was not maintained • problems that would arise if blades or knives were not maintained • folding/collating units • OHS requirements when maintaining and cleaning the folding/ collating units • common causes of failure or breakdown • components that were checked with this equipment
Underpinning Skills	Demonstrates skills in: • OHS in relation to operating machinery such as safely switching off machinery before cleaning is started • communication of ideas and information by referring any wear and tear to the machinery to the appropriate person for action • collecting, analysing and organising information by documenting any consumables used for reordering purposes • planning and organising activities by disposing of used consumables correctly according to enterprise procedures and OHS requirements • teamwork when maintaining the production process in association with others • mathematical ideas and techniques by recording quantities or amounts of consumables used • problem-solving skills by carrying out any basic maintenance according to OHS requirements • use of technology by using tools and equipment to perform small machine maintenance
Resources Implication	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.
Methods of Assessment	Competence may be assessed through: • Interview / Written Test • Observation / Demonstration with Oral Questioning
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

Occupational Standard: Printing and Graphic Arts Operation Level II	
Unit Title	**Pack and Dispatch Product**
Unit Code	**IND PGO2 11 0613**
Unit Descriptor	This unit describes the performance outcomes, skills and knowledge required to pack and dispatch basic printed products.

Element	Performance Criteria
1. Assess final product	1.1. Finished job is collected/received and checked against job specifications according to ***enterprise procedures***. 1.2. Defects, irregularities and discrepancies are identified and action taken according to enterprise procedures.
2. Prepare stock for dispatch	2.1. Suitable area for wrapping ***packaging techniques*** is selected and prepared. 2.2. Wrapping and packaging materials are prepared according to enterprise procedures. 2.3. ***Product type*** is wrapped and packaged in pre-determined parcel sizes according to enterprise procedures, job specifications, storage and delivery specifications. 2.4. Product is packaged in predetermined form as appropriate to product size, type, destination, delivery route and method of transportation; and according to workplace instructions, transportation/ shipping regulations and OHS requirements. 2.5. Packaged goods are checked, weighed and labelled according to delivery instructions, transportation/ shipping regulations and enterprise procedures.
3. Dispatch product	3.1. Packaged product is stacked on/in appropriate storage/shipping containers prior to ***dispatch methods***. 3.2. Product is dispatched via appropriate delivery mode according to enterprise procedures, job specifications and OHS requirements. 3.3. Product shipping/dispatch details are recorded according to enterprise procedures. 3.4. Documentation associated with tasks, where relevant, is accurately completed according to enterprise procedures.

Variable	Range
Enterprise procedures	may include: • Range of enterprise procedures within defined work area.
Packaging techniques	may include: • Various methods and equipment used in wrapping and packing of printed and printing related products.
Product type	may include range of products within the major categories of paper, pressure sensitive material, board, corrugated board, plastics and related films, or metal; printing plates, cylinders, disks.

Dispatch methods	may include packaging requirements for the various methods of transportation of products.

Evidence Guide	
Critical Aspects of Competence	Assessment requires evidence that the candidate: • correctly packing and dispatching printed products and accurately completing documentation • demonstrate an ability to find and use information relevant to the task from a variety of information sources • prepare, pack and dispatch TWO lots of printed or printing related product following correct procedures, job and workplace specifications and the listed Performance Criteria • Evidence for assessment may be gathered from assessment of the unit of competency alone or through an integrated assessment activity.
Underpinning Knowledge and Attitudes	Demonstrates knowledge of: • preparing stock for dispatch • items that will be required in the process of dispatching • checks that are performed prior to packaging the product • identifying a defective print or item • defect rectification • wrapping and packing materials and methods • OHS regulations on packaged goods • type of packaging to be used • transport or destination's bearing on the wrapping and packing method • number of units to be wrapped in each parcel • details that need to be recorded on dispatching labels and why • dispatching product • shipping details to be obtained • weight limitations that are there on dispatched products • priorities that are used for dispatching the product • appropriate delivery mode • completing documentation of dispatched product
Underpinning Skills	Demonstrates skills in: • OHS in relation to operating machinery such as safely switching off machinery before cleaning is started • communication of ideas and information by labelling packaged goods according to delivery instructions • collecting, analysing and organising information by accessing information about packing requirements for various products with regard to protecting product and meeting transport needs and fulfilling these requirements • planning and organising activities by preparing stock prior to dispatch • teamwork when liaising with printers, transport suppliers and customers to ensure product arrives undamaged and on time • mathematical ideas and techniques by calculating weights and dividing jobs into separate packages to meet transport needs

	• problem-solving skills by checking finished job and taking remedial action • use of technology by weighing stock and packaging
Resources Implication	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.
Methods of Assessment	Competence may be assessed through: • Interview / Written Test • Observation / Demonstration with Oral Questioning
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

Occupational Standard: Printing and Graphic Arts Operation Level II	
Unit Title	**Electronically Combine and Assemble Data**
Unit Code	**IND PGO2 12 0613**
Unit Descriptor	This unit describes the performance outcomes, skills and knowledge required to electronically combine and assemble data.

Element	Performance Criteria
1. Plan and prepare the work	1.1. Computer functions are undertaken to access the required data from electronic files. 1.2. Required data is checked to ensure correct format for software application and ***output***. 1.3. The system is checked for the required fonts to fulfil job specifications and ***input***. 1.4. The storage capacity of the system is checked for sufficiency.
2. Combine data	2.1. Pages are composed according to job specifications. 2.2. Elements are placed in the page according to job specifications. 2.3. Trapping is ***capture*** and applied according to job specifications. 2.4. The image output is prepared and appropriate colour profiles are applied according to media output.
3. Create multiple images	3.1. Basic step and repeat the ***complexity*** of layout is prepared according to job specifications. 3.2. The appropriate software for step and repeat is accessed according to job specifications. 3.3. ***Quality*** Images are stepped according to job specifications.

Variable	Range
Output	may include image setter, laser printer, CTP, digital print.
Input	may include Specific elements of type and/or screened images to be supplied either as hard copy or electronic files or along with layout or detailed job brief.
Capture	may include scanning device and/or electronic file storage.
Complexity	may include fairly simple layouts with text and colour images.
Quality	should meet client requirements and enterprise and industry standards.

Evidence Guide	
Critical Aspects of Competence	Assessment requires evidence that the candidate: • the page layout and overall design meet the job specifications, reproduction requirements and final end use • The underlying skill of combining and assembling should be transferable across the design and pre-press sectors. It is important that the substrate for reproduction is identified and that the competencies be demonstrated with a clear identification of printing processes

	• demonstrate an ability to find and use information relevant to the task from a variety of information sources • Use a desktop platform (or high-end system) with appropriate layout, design and drafting software to combine and assemble TWO jobs following the job brief and according to the listed Performance Criteria.
Underpinning Knowledge and Attitudes	Demonstrates knowledge of: • Creating a page layout according to job specifications? • function of electronic trapping of image elements as applied to image assembly • trapping and job specification • step and repeat layout to suit a job specification • main criteria for evaluating the final output • requirements of a contract proof as compared to an in-house check proof • manuals, safety and other documentation that are relevant to this task and where are they kept and information that is included in these documents
Underpinning Skills	Demonstrates skills in: • OHS in relation to operating machinery such as safely switching off machinery before cleaning is started • communication of ideas and information by interpreting implicit and explicit requirements of the job brief • collecting, analysing and organising information by accessing data on software capabilities and production requirements and matching them with the job brief • planning and organising activities by planning the sequence of operations to facilitate smooth processing of the job • teamwork when maintaining the production process in association with others • mathematical ideas and techniques by calculating enlargement/reduction factors, fit, spatial relationships between elements and colour profiles • problem-solving skills by adjusting fit and using colour correction so that output meets requirements of the brief • use of technology by using software correctly to ensure ease of subsequent processing
Resources Implication	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.
Methods of Assessment	Competence may be assessed through: • Interview / Written Test • Observation / Demonstration with Oral Questioning
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

Occupational Standard: Printing and Graphic Arts Operation Level II	
Unit Title	**Reconcile Process Outputs**
Unit Code	**IND PGO2 13 0613**
Unit Descriptor	This unit describes the performance outcomes, skills and knowledge required to reconcile process requirements with process outputs.

Element	Performance Criteria
1. Confirm throughputs	1.1. Field values are verified as corresponding to values identified in job sheet. 1.2. Where required, mail class is verified as the same as the job sheet. 1.3. Collated data is correct and in sequence. 1.4. Collated data is correctly ***matched*** to addressee. 1.5. Address information is verified as accurate. 1.6. Barcode information confirms correct sequence of addressees to collated information. 1.7. Any discrepancies are reported to supervisor.
2. Reconcile output	2.1. The total number of throughputs is equal to the job specifications. 2.2. The destination delivery unit rate matches the job specification. 2.3. An information matching trail is documented. 2.4. ***Process output*** of any discrepancies is reported to supervisor.

Variable	Range
Matched	may include: • the process of keeping together a unique insert to the addressee that goes with at least one other unique insert in the same package, or a unique insert to the addressee that goes with the address information located on the outside of the package.
Process output	Can include mail, credit cards, smart cards or other items requiring close tracking.

Evidence Guide	
Critical Aspects of Competence	Assessment requires evidence that the candidate: • reconciling process requirements with process outputs • correctly reconcile process requirements with process outputs, document the information and report any discrepancies • evidence for assessment may be gathered from assessment of the unit of competency alone or through an integrated assessment activity
Underpinning Knowledge and Attitudes	Demonstrates knowledge of: • basic literacy skills to follow work instructions and read job specifications • basic numeracy skills to reconcile process outputs • OHS in relation to working in a safe environment

Underpinning Skills	Demonstrates skills in: • OHS in relation to operating machinery such as safely switching off machinery before cleaning is started • communication of ideas and information by reporting any discrepancies to a supervisor • collecting, analysing and organising information by verifying field values as corresponding to values identified in job sheet • planning and organising activities by confirming throughputs before reconciling outputs • teamwork when maintaining the production process in association with others • mathematical ideas and techniques by confirming when the total number of throughputs is equal to the job specifications • problem-solving skills by reporting any discrepancies to a supervisor • use of technology by using barcode equipment to confirm throughputs or reconcile outputs
Resources Implication	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.
Methods of Assessment	Competence may be assessed through: • Interview / Written Test • Observation / Demonstration with Oral Questioning
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

Occupational Standard: Printing and Graphic Art Operation Level II	
Unit Title	**Undertake Root Cause Analysis**
Unit Code	**IND PGO2 14 0613**
Unit Descriptor	This unit covers the knowledge and skills needed to undertake root cause analysis (RCA) by any person. This will often be done by people working in a team. This unit also covers the competencies needed by operators to contribute to an advanced maintenance strategy using RCA coupled with diagrams and charts.

Element	Performance Criteria
1. Recognise problems	1.1. Equipment/plant characteristics indicative of a problem is identified. 1.2. Process conditions/product characteristics indicative of a problem is identified. 1.3. Appropriate techniques/charts are used to define the problem.
2. Implement quick fix	2.1. A quick fix is recommended/implemented within the scope of competency and authority. 2.2. Technology or processes relevant to the problem is used to implement quick fix **and *overall Equipment Efficiency (OEE)*.**
3. Determine root cause	3.1. A range of possible ***root cause*** is identified. 3.2. Information is gathered to eliminate/confirm causes by using ***appropriate techniques***. 3.3. A cause and effect diagram is constructed from available data. 3.4. Assistance is sought as required. 3.5. Root cause is identified.
4. Develop permanent solution	4.1. A range of methods of eliminating the root cause/ breaking the ***cause tree*** is identified. 4.2. The most appropriate solution is selected. 4.3. Liaise with relevant people. 4.4. Solution is recommended or implemented within the limits of competency and authority. 4.5. Impact of solution is monitored and further recommendations are made as required.

Variable	Range
Overall Equipment Efficiency (OEE)	• Overall Equipment Efficiency (OEE) is the combination of the main factors causing loss of productive capacity from equipment/plant and is: • *OEE = availability x performance x quality rate* • where: ➢ availability takes into account losses due to breakdown, set up and adjustments

	➢ performance takes into account losses due to minor stoppages, reduced speed and idling ➢ Quality rate takes into account t losses due to rejects, re-works and start up waste.
Root cause	• There are many possible causes of any problem. Eliminating some will have no impact, others will ameliorate the problem. However, elimination of the root cause will eliminate the problem. There should only be one root cause for any problem and so the analysis should continue until this one cause is found. Elimination of the root cause permanently eliminates the problem.
Appropriate techniques	/charts may include the following: • control charts • Pareto charts • run charts • flow charts • cause and effect diagrams • tree diagrams • 4W analysis.
Cause tree	• The series of causes is referred to as the cause tree. Not all root causes are accessible and able to be eliminated. Breaking the cause tree is such a way that the problem cannot recur is an acceptable alternative. • Not all situations can wait for the root cause analysis and eventual elimination of the root cause as there are serious current impacts. The quick fix will control these immediate impacts, but does not eliminate the root cause.

Evidence Guide	
Critical Aspects of Competence	Assessment requires evidence that the candidate: • principles of the process sufficient to undertake a RCA and propose solutions • use of relevant analysis tools (e.g. cause/effect diagrams, Pareto charts, 4W) • problem solving • communication
Underpinning Knowledge and Attitudes	Demonstrates knowledge of: • root cause analysis methodology • indicators of a problem • principles of the process sufficient to undertake a RCA and propose solutions • use of relevant analysis tools (e.g. cause/effect diagrams, Pareto charts, 4W)
Underpinning Skills	Demonstrates skills in: • analysis • problem solving • communication • documenting

Resources Implication	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.
Methods of Assessment	Competence may be assessed through: • Interview / Written Test • Observation / Demonstration with Oral Questioning
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

Occupational Standard: Printing and Graphic Arts Operation Level II	
Unit Title	**Produce PDF Files for Online or Screen Display**
Unit Code	**IND PGO2 15 0613**
Unit Descriptor	This unit describes the performance outcomes, skills and knowledge required to produce both passive and interactive PDF files for online or screen display.

Element	Performance Criteria
1. Prepare file	1.1 Use of ***document*** is identified according to specifications of the brief. 1.2 Purpose and audience are established and cultural, equity or gender requirements determined from the brief or client. 1.3 Changes required in media size and format is chosen from predefined settings. 1.4 Relevant fonts for online readability are selected, text is formatted, chunked and article threads added as required for online ease of reading. 1.5 Navigation plan or display timing is developed and required ***elements*** or areas allocated on document. 1.6 Document is checked to ensure correct layout ***file*** and there are no non-printable elements. 1.7 Unnecessary elements and blank pages are deleted, if not required. 1.8 Document is proofed for color, positioning, bleed allowance, grammar and text.
2. Edit file	2.1 Text corrections are made using the text touch-up tool as required. 2.2 Images are edited using the touch-up object tool as required. 2.3 Page orientation is changed, pages inserted and deleted as required. 2.4 Bookmarks are added and named or edited with magnification added as required.
3. Create PDF	3.1 The ***final media*** of the file is identified and correct distiller preset job options and color management settings are chosen. 3.2 Document is opened and exported to PDF or postscript file for conversion in Distiller. 3.3 PDF file is exported to correct folder, opened and checked against requirements of the brief.
4. Perform navigation	4.1 Menus are created for major themes with buttons and graphics consistently placed and easily identifiable to the user. 4.2 Internal and external links with actions are added according to the requirements of the brief. 4.3 Navigation is made consistent and traceable to ensure maximum usability and user confidence.

	4.4 Users are given more than one navigational option for moving through the document.
5. Perform file management	5.1 Fonts and graphics are embedded where possible for greater portability. 5.2 All additional files are saved in the correct folder and in appropriate format. 5.3 All unused element or pages are removed to reduce size.
6. Display settings	6.1 ***Screen display*** preferences are set as required to suit brief. 6.2 Magnification is set for consistency of display. 6.3 Page transitions are applied as desired to suit brief. 6.4 ***Actions*** and preferences for multimedia elements are applied to suit final media.
7. Finalize the document	7.1 Final file is saved to correct folder and opened to check for correct screen display and magnification. 7.2 All links, bookmarks and actions are tested for correct operation. 7.3 Navigation is assessed for intuitive usability. 7.4 Document is tested in a range of environments and platforms for consistency and predictable display. 7.5 File naming conventions are logical and comparable for cross-platform use.

Variable	**Range**
Documents	may include: • stand-alone document • software e-book reading device • Online documents.
Elements	may include: • file management • images • Tables and other non-text items.
File	may include: • Tagged Image File Format (TIFF) • Encapsulated Postscript (EPS) • Joint Photographic Expert Group (JPEG) • Rich Text Format (RTF) • Portable Network Graphics (PNG).
Final media	may include: • e-books • websites • hard copy • Online documents.

Screen display	may include: • passive • Interactive.
Actions	may include: • movies • sound clips • Menu commands.

Evidence Guide	
Critical Aspects of Competence	Assessment requires evidence that the candidate: • produce both passive and interactive online and screen display PDF files • Locate and use information relevant to the task from a variety of information sources.
Underpinning Knowledge and Attitudes	Demonstrates knowledge of: • file type and use • page sizes and formats for online print • use of different fonts on online document • reformatting text in an online document • OHS standards that relate to working for long periods on computers • Various document types.
Underpinning Skills	Demonstrates skills in: • Occupational Health and Safety (OHS) skills for operating machinery, such as safely switching off machinery before cleaning is started • communication and literacy skills for expressing ideas and information, reformatting text and adding article threads as required for final media • planning, organising and analytical skills for setting preferences, document summaries and search index options according to the requirements of the brief • teamwork skills for maintaining the production process in association with others • numeracy skills for settings paper size and format • problem-solving skills for rotating, deleting and inserting pages as required by the brief • Technical skills for computer operation and producing interactive PDF files.
Resources Implication	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.
Methods of Assessment	Competence may be assessed through: • Interview / Written Test • Observation / Demonstration with Oral Questioning
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

Occupational Standard: Printing and Graphic Arts Operation Level II	
Unit Title	**Apply Cost Factors to Work Practices**
Unit Code	**IND PGO2 16 0313**
Unit Descriptor	This unit covers the knowledge and skills needed for an individual to identify cost components and to be able to determine in general terms the cost impacts of alternative actions.

Element	Performance Criteria
1. Identify in own work area major cost components of product or process	1.1. ***Cost components*** in the product or ***process*** are identified in own work area. 1.2. The impact of current or alternative actions on costs is recognised.
2. Identify constraints to cost efficiency	2.1. Required production/process rate and major costs are identified. 2.2. Costs factors are identified under the control of the individual or team. 2.3. Costs factors are identified to impact on ***overall cost*** of production/process. 2.4. Cost factors that are a constraint to cost efficiency are identified in own work area.
3. Apply cost efficient work practices	3.1. The implications of possible actions/changes are expressed to improve cost efficiency in simple financial terms. 3.2. Non-financial implications of proposed changes are identified in discussion with relevant people. 3.3. Actions which minimise overall costs are selected. 3.4. Monitor actions are maintained to ensure cost efficiency in own work area.

Variable	Range
Cost components	• Cost components include fixed and variable costs such as power/energy, materials, plant and equipment, production or process time including impact on salary and wages, office expenses such as telephone and government taxes and charges.
Process	• Process may include a production, maintenance, logistics or office process in a manufacturing environment.
Overall cost	• Overall cost may include the assessment of negative and positive financial implications. It also includes negative long term issues, such as Occupational Health and Safety (OHS), environmental and regulatory issues.

Evidence Guide	
Critical Aspects of Competence	Assessment requires evidence that the candidate: • to identify costs factors • difference between overhead, labor and consumables

	• major cost contributors to product (e.g. energy • basic numeracy
Underpinning Knowledge and Attitudes	Demonstrates knowledge of - • cost components of products made • costs concepts such as expense and income • major cost contributors to product (e.g. energy) • the difference between internally and externally controlled costs • difference between overhead, labor and consumables
Underpinning Skills	Demonstrates skills in: • basic numeracy • problem solving • communication
Resources Implication	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.
Methods of Assessment	Competence may be assessed through: • Interview / Written Test • Observation / Demonstration with Oral Questioning
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

Occupational Standard: Printing and Graphic Arts Operation Level II	
Unit Title	**Make Photopolymer Plates (Flexographic)**
Unit Code	**IND PGO2 17 0613**
Unit Descriptor	This unit describes the performance outcomes, skills and knowledge required to make flexographic plates from film inputs.

Element	Performance Criteria
1. Select the plate	1.1. Job specifications are interpreted to ensure appropriate ***types of plate*** selection. 1.2. The correct plate is selected according to the printing requirements and job specifications.
2. Pre-plan the process	2.1. Film negatives are checked for conformance with job specifications. 2.2. Extra exposure masking is planned by examining the film. 2.3. Appropriate exposure masks are cut. 2.4. The appropriate amount of plate material is calculated to ensure economical use.
3. Expose the plate	3.1. Exposure is determined by using step wedges and depth gauge to establish the correct front and back exposure time. 3.2. The plate is exposed according to job specifications. 3.3. The exposure unit and vacuum frame are maintained according to manufacturer's specifications.
4. Develop the plate	4.1. The chemistry balance is maintained according to manufacturer's specifications. 4.2. The washout unit is maintained according to manufacturer's specifications. 4.3. The plate is washed out to pre-determined depth that has been pre-set by front and back exposures.
5. Finish the plate	5.1. The plate is dried in a drying oven at a temperature and time according to manufacturer's specifications. 5.2. The back of the plate is cleaned. 5.3. The plate is post-exposed according to manufacturer's specifications. 5.4. The plate is light finished according to manufacturer's specifications. 5.5. OHS procedures are observed to ensure a safe working environment when making plates.
6. Establish and maintain a chemical register	6.1. A chemical register is established to identify and describe the purpose of each chemical and to ensure finished plates meet set specifications. 6.2. All chemicals used in the workplace are identified and registered correctly according to safe working practices within ***quality standards***.

Variable	Range
Types of plates	may include flexographic plates: includes plates using water washout.
Quality standards	Should meet client requirements and enterprise and industry standards.

Evidence Guide	
Critical Aspects of Competence	Assessment requires evidence that the candidate: • the plate has been correctly finished to meet the job brief and according to manufacturer's specifications • The underlying skills of plate making should be transferable across the design and pre-press sectors. It is important that the substrate for reproduction is identified and that the quality of the plate be suitable for the identified printing processes • demonstrate an ability to find and use information relevant to the task from a variety of information sources • Produce TWO flexographic plates, with different characteristics, according to the listed Performance Criteria.
Underpinning Knowledge and Attitudes	Demonstrates knowledge of: • effect flexographic ink has on your selection of plate material • effect the "shoulder" has on the printing process • overcoming "orange peel effect" • effects of chemicals used in detaching • methods that can be used to counteract image elongation • manuals, safety and other documentation that are relevant to this task and where are they kept and information that is included in these documents
Underpinning Skills	Demonstrates skills in: • OHS skills in relation to operating machinery such as safely switching off machinery before cleaning is started • communication skills required to convey ideas and information by interpreting the job brief • skills needed to collect, analyse and organise information by matching the job brief with production requirements • planning and organising skills • teamwork skills required for maintaining the production process in association with others • numeracy skills required to calculate exposures and positioning of film • problem-solving skills by needed to recognise and correct faults in plates • skills required to use technology and equipment correctly to ensure ease of subsequent processing
Resources Implication	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.
Methods of Assessment	Competence may be assessed through: • Interview / Written Test • Observation / Demonstration with Oral Questioning
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

Occupational Standard: Printing and Graphic Arts Operation Level II	
Unit Title	**Prepare Screen and Substrate**
Unit Code	**IND PGO2 18 0613**
Unit Descriptor	This unit describes the performance outcomes, skills and knowledge required to prepare screens.

Element	Performance Criteria
1. Select the frame	1.1. ***Frame type*** is selected according to job specifications. 1.2. ***Quality standard***, type and finish of frame are specified.
2. Prepare the frame	2.1. Frame surface is appropriately prepared free of imperfections to receive the mesh. 2.2. Tools and equipment used in frame preparation are suitable to achieve the standard indicated in job specifications.
3. Select the mesh	3.1. Required ***mesh type*** is selected according to job specifications. 3.2. Imperfections and flaws are identified and appropriate remedial action is taken. 3.3. Mesh is measured and cut from bulk supply to meet screen specifications with minimum wastage.
4. Stretch and fix mesh	4.1. Mesh is positioned in tensioning equipment at the correct angle according to job specifications. 4.2. ***Tension measurement*** is set and applied according to job specifications. 4.3. Tension is checked according to manufacturer's/supplier's specifications. 4.4. Mesh is pre-stretched prior to ***fixing method*** and mesh is fixed to frame according to frame construction requirements. 4.5. Chemicals are mixed for application according to manufacturer's specifications. 4.6. Screen is removed from apparatus after appropriate curing.
5. Convert mesh	5.1. Chemicals are selected for the conversion of the mesh according to manufacturer's/supplier's specifications. 5.2. Chemicals are applied to effect conversion according to manufacturer's/supplier's specifications and to OHS requirements.
6. Store screen	6.1. Screens are identified and labelled. 6.2. Screens are stored in a safe, clean and dry environment in subdued light.

Variable	Range
Frame type	may include: • Frame types commonly used within the industry relative to industry sectors.
Quality standards	may include: • Should meet client requirements and enterprise and industry standards.
Type of mesh	may include: • Screen mesh thread counts, thread thickness, colours and weaves commonly used in the industry sectors.
Tension measurement	may include: • Different tension measurement techniques commonly used in the industry sector.
Fixing method	may include: • Fixing methods commonly used in the industry sector.

Evidence Guide	
Critical Aspects of Competence	Assessment requires evidence that the candidate to: • correctly prepare screens for screen printing according to job specifications • demonstrate an ability to find and use information relevant to the task from a variety of information sources • select TWO different frames types, either fixed or micro chase, stretch and fix mesh as appropriate and prepare screen for stencil application, according to manufacturer's and job specifications, enterprise procedures and the listed Performance Criteria • gather assessment of the unit of competency alone or through an integrated assessment activity
Underpinning Knowledge and Attitudes	Demonstrates knowledge of : • OHS standards • personal protective equipment required when preparing frame surface, screen adhesive and chemical conversion and using equipment for the surface preparation • selecting and preparing the frame • purpose a frame is used • tools that you use for preparing the frame surface • observations in order to achieve a good surface for mesh adhesion • choosing and stretching the mesh • mesh types • frame size and mesh cutting • flaws or imperfections that may be found in screen mesh • measuring tension and fixing the mesh • position that is the mesh placed before tensioning • methods of pre-stretching the mesh prior to securing it • tension measurement • various methods of fixing mesh to frame • pre-tensioning techniques used

	• converting and storing the screen • methods of converting the screen mesh chemically • method of converting the screen mesh mechanically • method that you use to identify the mesh on this screen • ideal conditions for storing screens • manuals, safety and other documentation that are relevant to this task and where they are kept and information that is included in these documents
Underpinning Skills	Demonstrates skills in: • OHS in relation to operating machinery such as safely switching off machinery before cleaning is started • communication of ideas and information by labelling screens • collecting, analysing and organising information by checking mesh tension for conformance to job specifications • planning and organising activities by preparing the frame prior to using the mesh • teamwork when maintaining the production process in association with fellow workers • mathematical ideas and techniques by measuring and cutting mesh from bulk supplies • problem-solving skills by identifying flaws in the mesh and taking appropriate remedial action • use of technology by using the tools required to fix the mesh
Resources Implication	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.
Methods of Assessment	Competence may be assessed through: • Interview / Written Test • Observation / Demonstration with Oral Questioning
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

Occupational Standard: Printing and Graphic Arts Operation Level II	
Unit Title	**Produce Basic Relief and Flexographic Printed Product**
Unit Code	**IND PGO2 19 0613**
Unit Descriptor	This unit describes the performance outcomes, skills and knowledge required to produce a basic flexographic relief printed product.

Element	Performance Criteria
1. Maintain routine operation of reel system (OR Element)	1.1. Job requirements are read and interpreted from job documentation or production control system. 1.2. Set up is carried out correctly in minimum time with minimum wastage. 1.3. Prior inspections are completed and signed off.
2. Maintain routine operation of sheet system (OR Element)	2.1. Plate height and relief are measured. 2.2. Plates are trimmed and prepared according to mounting system requirements. 2.3. Mounting adhesive is selected to achieve correct PCD (Pitch Circle Diameter) of specified plate cylinders and gears.
3. Maintain basic flexographic printing process	3.1. Plate cylinders/seamless sleeves are selected, cleaned and prepared and correct gears are mounted. 3.2. Sleeves and correct gears on mandrels are selected, cleaned, prepared and mounted to meet ***routine*** job specifications. 3.3. TIR (Total Indicated Run out) is checked to be within specified tolerances on plate cylinders. 3.4. Selected mounting adhesive is applied to plate cylinders.
4. Maintain operation of sheet system	4.1. Feeder and delivery sections are monitored and adjusted to ensure continuous and efficient feeding to machine. 4.2. Sheet pick-up and transport system is monitored and adjusted to ensure accurate and continuous sheet handling and efficient operation. 4.3. Transfer system is monitored and adjusted to ensure correct and continuous sheet handling and efficient operation. 4.4. Substrate is added to and removed from the process according to job instructions. 4.5. Set-off/marking prevention system is monitored and adjusted to ensure the quality of the printed product meets the standard of the approved proof.
5. Maintain basic routine relief printing process	5.1. Relief form or plate cylinder condition is monitored and adjusted to ensure the quality of the printed product meets the standard of the approved proof. 5.2. Relief impression surface condition is monitored and adjusted to ensure the quality of the printed product meets the standard of the approved proof.

	5.3. Relief inking system is monitored and adjusted to ensure the quality of the printed product meets the standard of the approved proof.
6. Maintain routine production process	6.1. Plates are prepared and mounted on cylinders using pin mount or microdot systems or sleeves according to chart number/print direction OR 6.2. Plate mounting sheet is prepared to meet routine job specifications And 6.3. Plates are mounted to position on plate mounting sheet or camera targets And 6.4. Plate mounting sheet is installed and tensioned onto plate cylinder to specified chart number/print direction. 6.5. Plates are proofed and each plate cylinder is checked for register of ***colour matching systems***. 6.6. Flexographic plate ***designs*** are trimmed and taped down according to printing press requirements.
7. Identify and rectify faults	7.1. Problem in flexographic ***machine*** operation is identified and reported according to enterprise procedures. 7.2. Adjustments or corrections are carried out according to specified procedures and consistent with operator's skill level. 7.3. Flexographic machine operation is checked to ensure correct operation. 7.4. Machine faults requiring repair are identified and reported to designated person according to enterprise procedures.
8. Conduct shutdown of production process	8.1. Correct shutdown sequence is followed according to manufacturer's specifications and enterprise procedures. 8.2. Shutdown is conducted in association with fellow workers and in compliance with OHS requirements. 8.3. Reels and cores are removed from press if web-fed. 8.4. Unused ***inks/coatings*** is drained back to containers and correctly labelled and stored according to manufacturer's/supplier's specifications and enterprise procedures. 8.5. Solid and liquid waste is removed from operating area and recycled or disposed of, where required, according to regulatory requirements and enterprise procedures. 8.6. All products are removed from operating area.
9. Clean and wash up printing machine at end of print run	9.1. Cylinders or sleeves, plate and roller surfaces are cleaned ready for next run. 9.2. Inking rollers and doctor blades or chamber blade systems are cleaned with correct solvents according to OHS guidelines. 9.3. Ink pumps, tanks and hoses are cleaned correctly.

	9.4. Impression rollers/central impression and press rollers are cleaned. 9.5. ***In-line process*** of printing/converting/binding/finishing units are cleaned ready for next run. 9.6. Reel or sheet-feed transportation and delivery systems are disengaged and cleaned ready for next run. 9.7. ***Substrate types*** are lubricated and protected according to duration of shutdown. 9.8. Production records or other documentation are accurately completed where required by enterprise procedures.

Variable	**Range**
Routine	may include: • Routine within this context relates to the set up and production of print runs. The set-up of equipment and production is straightforward and does not involve a significant amount of deviation from using standard equipment settings. In this sense, routine does not refer to a job that an individual might repeat on a regular basis.
Machines	may include: • A range of stack, in-line and central impression flexographic printing machines with manual, semi-automated, fully automated or computerised process control.
Color matching systems	may include: • Use of visual colour assessment and densitometry to match basic standard colours under controlled lighting conditions.
Design	may include: • 4 colours, simple graphics and text. Minor variation in registration and position.
Inks/coatings	may include: • Range of standard inks commonly used in 4-colour printing.
In-line processes	may include: • minor processes that are integral to this competency can include basic in-line operations such as perforating, numbering, date coding, slitting that do not in themselves constitute another defined unit of competency. Where a major in-line process is defined as a separate competency (e.g. flat-bed cutting, folding) it should be assessed as such.
Substrate types	may include: • Range of substrates within the major categories of paper, pressure sensitive material, board, corrugated board, plastics and related films, or metal. • Wide or narrow reel or large or small sheet handling systems.

Evidence Guide	
Critical Aspects of Competence	Assessment requires evidence that the candidate: • Operate either a reel or sheet-fed flexographic press ensuring an efficient production flow that maintains product quality standards. Any

	production problems are rectified with minimum downtime. The machine is correctly shut down and cleaned according to OHS guidelines • demonstrate use of computerised control, monitoring and data entry systems if available and appropriate • demonstrate an ability to find and use information relevant to the task from a variety of information sources • produce TWO basic flexographic printing jobs (if possible including at least ONE in-line process) according to job specifications, enterprise procedures and the Performance Criteria • evidence for assessment may be gathered from assessment of the unit of competency alone or through an integrated assessment activity
Underpinning Knowledge and Attitudes	Demonstrates knowledge of: • reel transportation and delivery • OHS concerns that are there when loading and handling heavy reels • determining the printing side of the substrate • effect on the print of excessive tension on the unwinding reel • correct splicing of the web • sheet transportation and delivery • OHS factors that need to be considered when operating the sheet transportation and delivery systems • fanning the sheets before loading into the press • setting and check to be made to the double sheet detector during the print run • implications if the web is not spliced correctly • components that can be adjusted to ensure correct delivery • effect that excessive suction could have on the slow-down wheels • flexographic printing operations • frequency the quality of the product should be assessed • action that can taken if the print was filling in when printing • the effect dirt would have under the doctor blade on the print • doctor blade oscillation • action that can taken if the ink in the duct is foaming • signs of wear in the image area of the plate • in-line processes • OHS concerns for the in-line component of the press • frequency the in-line components of the job should be examined • quality control and problem solving • monitoring to ensure quality • precautions that should be taken to ensure that the rewound product is of consistent acceptable quality • identifying printed material that is not of an acceptable standard • marking of product that is deemed unacceptable by the operator • consultation if there was a problem with the print that was not able to be fixed by the operator

	• location of information concerning the correct operation of the machine • shut down and wash up the press • dangers that exist from solvents and solutions used to clean the inking system, plate and the press • methods that are used to ensure proper storage of the plates following printing • parts of the machine that should be thoroughly cleaned following the print run • components that are to be inspected for wear following the print run • records that are important for following or repeat prints • machine manuals and safety documentation that are relevant to this task and where they are kept and information that is included in these documents
Underpinning Skills	Demonstrates skills in: • OHS in relation to operating machinery such as safely switching off machinery before cleaning is started • communication of ideas and information by providing feedback to internal and external clients about printing, in-line processes and job specifications • collecting, analysing and organising information by collating details of job and machine specifications and printing processes to ensure efficient production • planning and organising activities by coordinating sequences for printing and wash-up • teamwork when communicating with work team members and workers involved in prior and subsequent processes to ensure efficient production • mathematical ideas and techniques by calculating consumables requirements • problem-solving skills by identifying print problems and correcting during print run • use of technology by using monitoring systems, understanding their output and feeding into production management systems
Resources Implication	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.
Methods of Assessment	Competence may be assessed through: • Interview / Written Test • Observation / Demonstration with Oral Questioning
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

Occupational Standard: Printing and Graphic Arts Operation Level II	
Unit Title	**Automatically Produce Basic Screen Prints**
Unit Code	**IND PGO2 20 0613**
Unit Descriptor	This unit describes the performance outcomes, skills and knowledge required to produce one- or two-color automatic screen prints.

Element	Performance Criteria
1. Load substrate	1.1. Substrate is checked for conformance to job specifications with any irregularities reported and/or rectified. 1.2. Substrate position and stencil registration are adjusted according to job specifications.
2. Apply ink to screen	2.1. Ink is applied to the screen in the quantity required for the screen size. 2.2. Equipment is kept clean and spillage is minimised. 2.3. Ink is checked for conformance to job specifications. 2.4. Feeder is set and adjusted to suit substrate.
3. Produce proof print	3.1. Proof print is run off and checked for colour, strength, registration, adhesion, clarity, gloss level, ***drying***/***curing unites***, artwork detail and other technical aspects according to job specifications. 3.2. Adjustments are made as required. 3.3. Appropriate approval to commence production is sought prior to commencement. 3.4. Belt speed and energy required are set to achieve desired properties and then printing speeds are adjusted to suit.
4. Run job and monitor print quality	4.1. Printing speed production is adjusted to maximise ***quality standards*** and output. 4.2. Print quality and sheet feeder are continuously evaluated and adjusted as required. 4.3. Effects of ink alterations during run are monitored and appropriate action taken according to manufacturer's/supplier's and job specifications. 4.4. Workplace documentation on job is completed as required. 4.5. Curing and drying are constantly monitored and adjusted according to manufacturer's/supplier's and job specifications.
5. Carry out routine user maintenance	5.1. Equipment is cleaned according to manufacturer's/supplier's specifications. 5.2. Fault conditions are identified, reported and/or rectified according to ***enterprise procedures***.
6. Handle production output	6.1. Output is checked for thorough drying/curing before handling.

	6.2. Job status and progress are checked for conformance to job specifications and any necessary action is taken.
7. Shut down machine	7.1. Excess ink, screens, squeegees and flood coaters are removed and cleaned according to OHS requirements and manufacturer's/supplier's specifications. 7.2. Waste materials are disposed of according to manufacturer's/supplier's specifications, regulatory requirements and enterprise procedures. 7.3. ***Type of machine***, equipment and surrounding areas are cleaned according to manufacturer's/supplier's specifications and enterprise procedures.

Variable	**Range**
Drying**/**curing units	may include: • Drying systems commonly used and relative to the industry sector.
Quality standards	Should meet client requirements and enterprise and industry standards.
Enterprise procedures	may include: • Tasks must be performed according to enterprise procedures.
Type of machine	may include: • Semi-automatic and computerised screen printing machines relative to the industry sector.

Evidence Guide	
Critical Aspects of Competence	Assessment requires evidence that the candidate to: • produce a complex print of more than two colours containing line and tone using a semi-automatic machine according to job specifications • demonstrate use of computerised control, monitoring and data entry systems if available and appropriate • demonstrate an ability to find and use information relevant to the task from a variety of information sources • produce a complex print of more than two colours containing line and tone using a semi-automatic machine according to manufacturer's and job specifications, enterprise procedures and the listed Performance Criteria • for valid and reliable assessment of this unit, evidence should be gathered over a period of time through a range of methods for assessment to indicate consistent performance • evidence for assessment may be gathered from assessment of the unit of competency alone or through an integrated assessment activity
Underpinning Knowledge and Attitudes	Demonstrates knowledge of: • adjustments that are necessary to the machine prior to setting up • maintenance that is required on the machine and feeder prior to the commencement of printing • substrate is to be used on this job

	• procedure that you use for checking the screen sequence of colours, ink, substrate and squeegee/flood coater prior to printing • the system for setting the feed board and loading substrate • the need to prepare substrate or item when loading the feeder • adjustment of the stock feed system for this machine • the correct positioning, registering and locking the screen in position • need to adjust the off contact/peel-off requirements of the screen • the OHS requirements when working with infra red/UV curing units • the relationship between ink deposit, squeegee speed and belt speed/temperature of the drying/curing unit • the routine maintenance you undertake on this drying/curing unit • OHS concerns that are there when using an automatic machine • the effect of humidity on the substrate • the correct viscosity of the ink prior to printing • the rectification of the change in the viscosity of the ink during a production run • evaluation and maintenance of the print quality during the run • the ideal printing rate for this substrate on this machine • production output handling to prevent offsetting of the ink • the effect that the ink conditions have on output capacity • the need to determine the exact count and to record production details on the job sheet • the health hazards associated with ink/solvents • the correct procedure for removing the ink without damaging the screen • the correct method of cleaning squeegees/flood coaters, machine and surrounding area • maintenance that is required on this machine after printing • machine manuals, safety and other documentation that are relevant to this task and where they are kept • information that is included in these documents
Underpinning Skills	Demonstrates skills in: • OHS in relation to operating machinery such as safely switching off machinery before cleaning is started • communication of ideas and information by gaining approval to commence a production run • collecting, analysing and organising information by checking job status and progress according to job specifications • planning and organising activities by following machine shutdown procedures • teamwork when completing workplace documentation • mathematical ideas and techniques by adjusting print speed to maximise quality • problem-solving skills by monitoring and responding to the effect of ink alterations • use of technology by operating automatic and computerized screen printing machines

Resources Implication	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.
Methods of Assessment	Competence may be assessed through: • Interview / Written Test • Observation / Demonstration with Oral Questioning
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

Occupational Standard: Printing and Graphic Arts Operation Level II	
Unit Title	**Produce Basic Gravure Printed Product**
Unit Code	**IND PGO2 21 0613**
Unit Descriptor	This unit describes the performance outcomes, skills and knowledge required to produce routine gravure printed product.

Element	Performance Criteria
1. Maintain routine operation of reel system	1.1. Reel stand and rewind section are is monitored and adjusted to ensure efficient continuous operation and to maintain correct tension and to ensure no marks, blemishes or damage to finished product. 1.2. Web control system is monitored and adjusted to ensure correct tension and accurate continuous positioning of the web for efficient operation. 1.3. ***Substrate handling*** is added to remove from process according to job instructions. 1.4. Sheeting section is monitored and adjusted to ensure quality and efficient product delivery. 1.5. Set-off/marking prevention system is monitored and adjusted to ensure quality of printed product without set-off or marking meets the standard of approved proof.
2. Maintain basic gravure printing process	2.1. Gravure cylinder condition is monitored and adjusted to ensure the quality of printed product meets the standard of the approved proof. 2.2. Gravure impression roller condition is monitored and maintained to ensure the quality of printed product meets the standard of ***colour matching systems*** and approved proof. 2.3. Gravure inking system and doctor blade are monitored and adjusted to ensure quality of printed product meets the standard of approved proof. 2.4. Drying systems are monitored and adjusted to ensure quality of printed product meets the standard of approved proof. 2.5. Basic ***in-line processes*** printing/converting/binding/finishing process are monitored and adjusted to ensure quality of product meets the standard of the approved proof.
3. Maintain routine production process	3.1. Production process is operated in association with fellow workers and according to company specifications and planned daily schedule. 3.2. Production is maintained within OHS requirements and company and manufacturer's specifications by Appling ***routine*** adjustment. 3.3. Manual and/or automatic control is used as per specification. 3.4. Performance is monitored and verified using the process control system according to enterprise procedures.

	3.5. ***Ink/coatings*** performance, colour, register and position of print ***Design*** are monitored and adjusted throughout production run. 3.6. Production difficulties are anticipated and preventive action is taken to prevent occurrence by timely intervention. 3.7. Process adjustments to eliminate problems are reported according to enterprise procedures. 3.8. Waste is sorted according to enterprise procedures.
4. Identify and rectify faults	4.1. Problem in gravure ***machine*** operation is identified and reported according to enterprise procedures. 4.2. Adjustments or corrections are carried out according to specified procedures and consistent with operator's skill level. 4.3. Gravure machine operation is checked to ensure correct operation. 4.4. Faulty performance of equipment is identified and reported according to enterprise procedures.
5. Conduct shutdown of production process	5.1. Correct shutdown sequence is followed according to manufacturer's specifications and enterprise procedures. 5.2. Shutdown is conducted in association with fellow workers and in compliance with OHS requirements. 5.3. Unused ink is correctly labelled and stored according to manufacturer/supplier specifications and enterprise procedures. 5.4. Solid and liquid waste is removed from operating area and recycled or disposed of, where required, according to regulatory requirements and enterprise procedures. 5.5. All product is removed from operating area. 5.6. Machine faults requiring repair are identified and reported to designated person according to enterprise procedures. 5.7. Repair/adjustment is verified prior to resumption of operations.
6. Clean and wash up printing machine at end of print run	6.1. Cylinders and roller surfaces are cleaned ready for next run. 6.2. Inking system is washed up ready for next run, and liquid waste is disposed of according to company and regulatory requirements. 6.3. In-line printing/converting/binding/finishing units are cleaned ready for next run. 6.4. Reel feed, transportation and delivery systems are disengaged and cleaned ready for next run. 6.5. Production records or other documentation are accurately completed where required by enterprise procedures.

Variable	**Range**
Substrate handling	may include: • Wide or narrow reel handling systems

	• Range of substrates within the major categories of paper, board, plastics and related films, or metal.
Color matching systems	may include: • Use of visual colour assessment and densitometry to match basic standard colours under controlled lighting conditions.
In-line processes	may include: • minor processes that are integral to this competency can include basic in-line operations such as perforating, numbering, date coding, slitting that do not in themselves constitute another defined unit of competency. Where a major in-line process is defined as a separate competency (e.g. flat-bed cutting, folding) it should be assessed as such.
Routine	may include: • Routine within this context relates to the set up and production of print runs. The set up of equipment and production is straightforward and does not involve a significant amount of deviation from using standard equipment settings. In this sense, routine does not refer to a job that an individual might repeat on a regular basis.
Inks/coatings	may include: • Range of standard inks commonly used in 1-2 colour printing.
Design	may include: • 1-2 colours, simple graphics or text, minor variations in registration and position.
Machines	may include: • A range of in-line gravure printing machines with manual, semi-automated, fully automated or computerised process control.

Evidence Guide	
Critical Aspects of Competence	Assessment requires evidence that the candidate: • Operate a gravure press ensuring an efficient routine production flow that maintains product quality standards. Any production problems are rectified with minimum downtime. The machine is correctly shut down and cleaned according to OHS guidelines • demonstrate use of computerised control, monitoring and data entry systems if available and appropriate • demonstrate an ability to find and use information relevant to the task from a variety of information sources • produce TWO basic gravure printing jobs (if possible including at least ONE in-line process) according to job specifications, enterprise procedures and the Performance Criteria • Evidence for assessment may be gathered from assessment of the unit of competency alone or through an integrated assessment activity.
Underpinning Knowledge and Attitudes	Demonstrates knowledge of : • reel transportation and delivery • OHS concerns that are there when loading and handling heavy reels • determining the printing side of the substrate • effect on the print of excessive tension on the unwinding reel

	• correct splicing of the web • gravure printing operations • frequency the quality of the product should be assessed • action that can taken if the print was filling in when printing • effect that dirt under the doctor blade would have on the print and the cylinder • doctor blade oscillation • addressing a nick in the doctor blade • action that can be taken if the ink in the duct is foaming • signs of wear in the image area of the plate • level the ink level should be maintained • in-line processes • OHS concerns for the in-line component of the press • frequency in-line components of the job should be examined • quality control and problem solving • precautions that should be taken to ensure that the rewound product is of consistent acceptable quality • identifying printed material that is not of an acceptable standard • monitoring to ensure quality • the marking of product that is deemed unacceptable by the operator • consultation if there was a problem with the print that was not able to be fixed by the operator • location of information concerning the correct operation of the machine • shut down and wash up the press • dangers that exist from solvents and solutions used to clean the inking system, plate and the press • methods that are used to ensure proper storage of the plates following printing • parts of the machine that should be thoroughly cleaned following the print run • components that are to be inspected for wear following the print run • records that are important for following or repeat prints • machine manuals, safety and other documentation that are relevant to this task and where they are kept and information that is included in these documents
Underpinning Skills	Demonstrates skills in: • OHS in relation to operating machinery such as safely switching off machinery before cleaning is started • communication of ideas and information by providing feedback to internal and external clients about printing and in-line processes and job specifications • collecting, analysing and organising information by collating details of job and machine specifications and printing processes to ensure efficient production • planning and organising activities by coordinating sequences for printing and wash-up

	• teamwork when communicating with work team members and workers involved in prior and subsequent processes to ensure efficient production • mathematical ideas and techniques by calculating consumables requirements • problem-solving skills by identifying print problems and correcting during print run • use of technology by using monitoring systems, understanding their output and feeding into production management systems
Resources Implication	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.
Methods of Assessment	Competence may be assessed through: • Interview / Written Test • Observation / Demonstration with Oral Questioning
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

Occupational Standard: Printing and Graphic Arts Operation Level II	
Unit Title	**Produce Photopolymer Plates for Pad Printing**
Unit Code	**IND PGO2 22 0613**
Unit Descriptor	This unit describes the performance outcomes, skills and knowledge required to make plates (clichés) from film inputs for pad printing.

Element	Performance Criteria
1. Select the plate	1.1. Job specifications are interpreted to ensure appropriate ***types of plates*** selection. 1.2. The correct plate is selected according to the printing requirements and job specifications.
2. Pre-plan the process	2.1. Film positives are flattened to prevent air entrapment. 2.2. Any Exposure unit is energised for one cycle to warm up the UV elements where necessary. 2.3. The appropriate screen film positive is selected and checked according to the printing requirements.
3. Expose the plate	3.1. Exposure is determined by using a ***quality standards*** control step wedge to establish the correct exposure time. 3.2. The plate is exposed to standard/established exposure time. 3.3. The plate is exposed with screen film positive according to job specifications. 3.4. The exposure unit and vacuum frame are maintained according to manufacturer's specifications.
4. Develop the plate	4.1. The chemistry balance is maintained according to manufacturer's specifications. 4.2. The washout tools are maintained according to manufacturer's specifications. 4.3. The plate is washed out for pre-determined time that has been established by manufacturer and in-house tests.
5. Finish the plate	5.1. The plate is blown dry by compressed air. 5.2. The plate is dried in a drying oven at a temperature and time according to manufacturer's specifications. 5.3. The plate is post-exposed according to manufacturer's specifications. 5.4. OHS procedures are observed to ensure a safe working environment when making plates.
6. Establish and maintain a chemical register	6.1. A chemical register is established to identify and describe the purpose of each chemical and to ensure finished plates meet set specifications. 6.2. All chemicals used in the work place are identified and registered correctly according to safe working practices.

Variable	Range
Types of plates	may include plates using both water and chemical washout.

Quality standards	Should meet client requirements and enterprise and industry standards.

Evidence Guide	
Critical Aspects of Competence	Assessment requires evidence that the candidate: • the plate has been correctly prepared to meet the job brief and according to manufacturer's specifications • The underlying skills of plate making should be transferable across the design and pre-press sectors. It is important that the substrate for reproduction is identified and that the quality of the plate be suitable for the identified printing processes • demonstrate an ability to find and use information relevant to the task from a variety of information sources • Produce TWO photopolymer plates with different characteristics according to the listed Performance Criteria.
Underpinning Knowledge and Attitudes	Demonstrates knowledge of - • effect of print life requirement on your selection of plate material • effect the screen dot has on the printing process • OHS requirements that are there for photopolymer plate chemicals • overcoming undercutting of screens • methods that can be used to counteract air entrapments between film and plate • manuals, safety and other documentation that are relevant to this task and where are they kept and information that is included in these documents
Underpinning Skills	Demonstrates skills in: • OHS in relation to operating machinery such as safely switching off machinery before cleaning is started • communication of ideas and information by interpreting the job brief • collecting, analysing and organising information by matching the job brief with production requirements • planning and organising activities by interpreting the job specifications when preparing for the job • teamwork when maintaining the production process in association with others • mathematical ideas and techniques by calculating exposures and positioning of film • problem-solving skills by recognising faults in plates and correcting • use of technology by using equipment correctly to ensure ease of subsequent processing
Resources Implication	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.
Methods of Assessment	Competence may be assessed through: • Interview / Written Test • Observation / Demonstration with Oral Questioning
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

Occupational Standard: Printing and Graphic Arts Operation Level II	
Unit Title	**Produce Basic Lithographic Printed Product**
Unit Code	**IND PGO2 23 0613**
Unit Descriptor	This unit describes the performance outcomes, skills and knowledge required to produce basic lithographic printing, including small offset product.

Element	Performance Criteria
1. Maintain routine operation of reel system (OR Element)	1.1. Reel stand and rewind section is is monitored and adjusted to maintain correct tension and to ensure no marks or blemishes to finished product and to ensure efficient continuous operation. 1.2. Web control system is monitored and adjusted to ensure correct tension and accurate continuous positioning of the web for efficient operation. 1.3. ***Substrate*** is added to and removed from process according to job instructions. 1.4. Sheeting section is monitored and adjusted to ensure quality and efficient product delivery.
2. Maintain routine operation of sheet system (OR Element)	2.1. Feeder and delivery sections are monitored and adjusted to ensure continuous and efficient feeding to ***machine***. 2.2. Sheet pick-up and transport system is monitored and adjusted to ensure accurate and continuous sheet handling and efficient operation. 2.3. Transfer systems are monitored and adjusted to ensure ***Routine*** and continuous sheet handling and efficient operation. 2.4. Substrate is added to and removed from process according to job instructions.
3. Maintain basic routine lithographic printing process	3.1. Lithographic plate and plate cylinder condition is monitored and adjusted to ensure the quality of printed product meets the standard of the approved proof. 3.2. Lithographic blanket and blanket cylinder condition is monitored and adjusted to ensure the quality of printed product meets the standard of approved proof. 3.3. Lithographic impression cylinder condition is monitored and adjusted to ensure quality of printed product meets the standard of approved proof. 3.4. Lithographic inking or ***colour matching*** condition is checked and maintained to ensure quality of printed product meets the standard of approved proof. 3.5. Lithographic dampening system condition is monitored and adjusted maintained to ensure ***design*** quality of printed product meets the standard of approved proof.

4. Maintain routine production process	4.1. Production process is operated in association with fellow workers and according to company specifications and planned daily schedule. 4.2. Production is maintained within OHS requirements and company and manufacturer's specifications. 4.3. Manual and/or automatic control is used as per specification. 4.4. Performance is monitored and verified according to enterprise procedures. 4.5. In performance, colour, register and position of print are monitored and adjusted maintained throughout production run. 4.6. Faulty performance of equipment is identified and reported according to enterprise procedures. 4.7. Waste is sorted according to enterprise procedures.
5. Rectify minor lithographic machine faults	5.1. Adjustments or corrections are carried out according to specified procedures and consistent with operator's skill level. 5.2. Problems with lithographic machine operation is identified and reported according to enterprise procedures. 5.3. Lithographic machine operation is checked to ensure correct operation.
6. Conduct shutdown of production process	6.1. Correct shutdown sequence is followed according to manufacturer's specifications and enterprise procedures. 6.2. Shutdown is conducted in association with fellow workers and in compliance with OHS requirements. 6.3. Unused ***ink*** /***coatings*** is correctly labelled and stored according to manufacturer/supplier specifications and enterprise procedures. 6.4. Solid and liquid waste is removed from operating area and recycled or disposed of, where required, according to regulatory requirements and enterprise procedures. 6.5. All product is removed from operating area. 6.6. Machine faults requiring repair are identified and reported to designated person according to enterprise procedures. 6.7. Repair/adjustment is verified prior to resumption of operations.
7. Clean and wash up printing machine at end of print run	7.1. Cylinders, plate and roller surfaces are cleaned ready for next run. 7.2. Inking system and dampening system are washed up ready for next run, and liquid waste is disposed of according to company and regulatory requirements. 7.3. ***In-line*** printing/converting/binding/finishing units are cleaned ready for next run. 7.4. Reef Reel-fed, transportation and delivery systems are disengaged and cleaned ready for next run.

	7.5. Sheet feed, transport and delivery system are disengaged and cleaned ready for next run. 7.6. Production records or other documentation are accurately completed where required by enterprise procedures.

Variable	Range
Substrate	may include: • Wide or narrow reel or large or small sheet handling systems. • range of substrates within the major categories of paper, pressure sensitive material, board, plastics and related films, or metal
Machines	may include: • A range of single sheet, stream and reel-fed machines with manual, semi-automated, fully automated or computerised process control.
Routine	may include: • Routine within this context relates to the set up and production of print runs. The set-up of equipment and production is straightforward and does not involve a significant amount of deviation from using standard equipment settings. In this sense, routine does not refer to a job that an individual might repeat on a regular basis.
Color matching	may include: • Use of visual colour assessment and matching under controlled lighting conditions.
Design	may include: • Simple graphics and text. Minor variation in registration and position.
Inks/coatings	may include range of standard inks commonly used in printing.
In-line processes	may include: • minor processes that are integral to this competency can include basic in-line operations such as perforating, numbering, date coding, slitting that do not in themselves constitute another defined unit of competency. Where a major in-line process is defined as a separate competency (e.g. flat-bed cutting, folding) it should be assessed as such.

Evidence Guide	
Critical Aspects of Competence	Assessment requires evidence that the candidate: • Routine within this context relates to the set up and production of print runs. The set-up of equipment and production is straightforward and does not involve a significant amount of deviation from using standard equipment settings. In this sense, routine does not refer to a job that an individual might repeat on a regular basis • demonstrate use of computerised control, monitoring and data entry systems if available and appropriate • demonstrate an ability to find and use information relevant to the task from a variety of information sources • produce TWO basic lithographic printing jobs (if possible including at least ONE in-line process) according to job specifications, enterprise procedures and the Performance Criteria

	• Evidence for assessment may be gathered from assessment of the unit of competency alone or through an integrated assessment activity.
Underpinning Knowledge and Attitudes	Demonstrates knowledge of: • reel or sheet transportation and delivery • OHS concerns when loading and handling heavy reels • sheets are fanned before loading into the press • double sheet detector be set and checked during the print run • effect on the print of excessive tension on the rewinding reel • implications if web is not spliced correctly • components that can be adjusted to ensure correct delivery • effect excessive suction on the slow-down wheels has • lithographic printing operations • non-image area of the print was scumming when printing • causes of emulsification while printing on a lithographic printing press • signs of wear in the image area of the plate • level the ink level should be maintained at • in-line processes • OHS concerns for the in-line components of the press • frequency the in-line components of the job should be examined • quality control and problem solving • precautions that should be taken to ensure that the rewound product is of consistent acceptable quality • identification of material that is not of an acceptable standard • frequency at which the quality of the product be assessed • product that is deemed unacceptable by the operator is marked • finding information concerning the correct operation of the machine • shutdown and wash-up of the press • dangers that exist from solvents and solutions used to clean the inking system, plates, cylinders and the press • effect could excessive gum has on the plate image • parts of the machine need to be thoroughly cleaned following the print run • components that are to be inspected for wear following the print run • records that are important for following or repeat prints • machine manuals, safety and other documentation that are relevant to this task and where are they kept and information that is included in these documents
Underpinning Skills	Demonstrates skills in: • OHS in relation to operating machinery such as safely switching off machinery before cleaning is started • communication of ideas and information by providing feedback to internal and external clients about printing, in-line processes and job specifications • collecting, analysing and organising information by collating details of job and machine specifications and printing processes to ensure efficient production

	• planning and organising activities by coordinating sequences for printing and wash-up • teamwork when communicating with work team members and workers involved in prior and subsequent processes to ensure efficient production • mathematical ideas and techniques by calculating consumables requirements • problem-solving skills by identifying print problems and correcting during print run • use of technology by using monitoring systems, understanding their output and feeding into production management systems
Resources Implication	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.
Methods of Assessment	Competence may be assessed through: • Interview / Written Test • Observation / Demonstration with Oral Questioning
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

Occupational Standard: Printing and Graphic Arts Operation Level II	
Unit Title	**Participate in Workplace Communication**
Unit Code	**IND PGO2 24 0613**
Unit Descriptor	This unit covers the knowledge, skills and attitudes required to gather, interpret and convey information in response to workplace requirements.

Elements	Performance Criteria
1. Obtain and convey workplace information	1.1 Specific and relevant information is accessed from ***appropriate sources***. 1.2 Effective questioning, active listening and speaking skills are used to gather and convey information. 1.3 Appropriate ***medium*** is used to transfer information and ideas. 1.4 Appropriate non- verbal communication is used. 1.5 Appropriate lines of communication with supervisors and colleagues are identified and followed. 1.6 Defined workplace procedures for the location and ***storage*** of information are used. 1.7 Personal interaction is carried out clearly and concisely.
2. Participate in workplace meetings and discussions	2.1 Team meetings are attended on time. 2.2 Own opinions are clearly expressed and those of others are listened to without interruption. 2.3 Meeting inputs are consistent with the meeting purpose and established ***protocols***. 2.4 ***Workplace interactions*** are conducted in a courteous manner. 2.5 Questions about simple routine workplace procedures and matters concerning working conditions of employment are asked and responded to. 2.6 Meetings outcomes are interpreted and implemented.
3. Complete relevant work related documents	3.1 Range of ***forms*** relating to conditions of employment is completed accurately and legibly. 3.2 Workplace data is recorded on standard workplace forms and documents. 3.3 Basic mathematical processes are used for routine calculations. 3.4 Errors in recording information on forms/ documents are identified and properly acted upon. 3.5 Reporting requirements to supervisor are completed according to organizational guidelines.

Variable	Range
Appropriate sources	• Team members • Suppliers • Trade personnel • Local government • Industry bodies
Medium	• Memorandum • Circular • Notice • Information discussion • Follow-up or verbal instructions • Face to face communication
Storage	• Manual filing system • Computer-based filing system
Protocols	• Observing meeting • Compliance with meeting decisions • Obeying meeting instructions
Workplace interactions	• Face to face • Telephone • Electronic and two way radio • Written including electronic, memos, instruction and forms, non-verbal including gestures, signals, signs and diagrams
Forms	• Personnel forms, telephone message forms, safety reports

Evidence Guide	
Critical Aspects of Competency	Assessment requires evidence that the candidate: • Prepare written communication following standard format of the organization • Access information using communication equipment • Make use of relevant terms as an aid to transfer information effectively • Convey information effectively adopting the formal or informal communication
Underpinning Knowledge and Attitudes	Demonstrate knowledge of: • Effective communication • Different modes of communication • Written communication • Organizational policies • Communication procedures and systems • Technology relevant to the enterprise and the individual's work responsibilities
Underpinning Skills	Demonstrate skills to: • Follow simple spoken language • Perform routine workplace duties following simple written notices • Participate in workplace meetings and discussions • Complete work related documents • Estimate, calculate and record routine workplace measures

	• Basic mathematical processes of addition, subtraction, division and multiplication • Ability to relate to people of social range in the workplace • Gather and provide information in response to workplace Requirements
Resource Implications	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.
Methods of Assessment	Competence may be assessed through: • Interview / Written Test • Observation / Demonstration with Oral Questioning
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

Occupational Standard: Printing and Graphic Arts Operation Level II	
Unit Title	**Work in Team Environment**
Unit Code	**IND PGO2 25 0613**
Unit Descriptor	This unit covers the skills, knowledge and attitudes to identify role and responsibility as a member of a team.

Elements	Performance Criteria
1. Describe team role and scope	1.1 The ***role and objective of the team*** are identified from available ***sources of information***. 1.2 Team parameters, reporting relationships and responsibilities are identified from team discussions and appropriate external sources.
2. Identify own role and responsibility within team	2.1 Individual role and responsibilities within the team environment are identified. 2.2 Roles and responsibility of other team members are identified and recognized. 2.3 Reporting relationships within team and external to team are identified.
3. Work as a team member	3.1 Effective and appropriate forms of communications used and interactions undertaken with team members who contribute to known team activities and objectives. 3.2 Effective and appropriate contributions are made to complement team activities and objectives, based on individual skills and competencies and ***workplace context.*** 3.3 Protocols are observed in reporting using standard operating procedures. 3.4 Contribute to the development of team work plans based on an understanding of team's role and objectives and individual competencies of the members.

Variable	Range
Role and objective of team	• Work activities in a team environment with enterprise or specific sector • Limited discretion, initiative and judgment maybe demonstrated on the job, either individually or in a team environment
Sources of information	• Standard operating and/or other workplace procedures • Job procedures • Machine/equipment manufacturer's specifications and instructions • Organizational or external personnel • Client/supplier instructions • Quality standards • OHS and environmental standards
Workplace context	• Work procedures and practices

	• Conditions of work environments • Legislation and industrial agreements • Standard work practice including the storage, safe handling and disposal of chemicals • Safety, environmental, housekeeping and quality guidelines

Evidence Guide	
Critical Aspects of Competence	Assessment requires evidence that the candidate to: • Operate in a team to complete workplace activity • Work effectively with others • Convey information in written or oral form • Select and use appropriate workplace language • Follow designated work plan for the job • Report outcomes
Underpinning Knowledge and Attitude	Demonstrate knowledge of: • Communication process • Team structure • Team roles • Group planning and decision making
Underpinning Skills	Demonstrate skills to: • Communicate appropriately, consistent with the culture of the workplace
Resource Implications	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.
Methods of Assessment	Competence may be assessed through: • Interview / Written Test • Observation / Demonstration with Oral Questioning
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

Occupational Standard: Printing and Graphic Arts Operation Level II	
Unit Title	**Develop Business Practice**
Unit Code	**IND PGO2 26 0613**
Unit Descriptor	This unit specifies the outcomes required to establish a business operation from a planned concept. It includes researching the feasibility of establishing a business operation, planning the setting up of the business, implementing the plan and reviewing operations once commenced.

Elements	Performance Criteria
1. Identify business opportunity	1.1 ***Business opportunities*** are investigated and identified. 1.2 Feasibility study is undertaken to determine likely ***business viability***. 1.3 Market research on product or service is undertaken. 1.4 Assistance with feasibility study of ***specialist and relevant parties*** is sought as required. 1.5 Impact of emerging or changing technology including e-commerce, on business operations is evaluated. 1.6 Practicability of business opportunity is assessed in line with perceived risks, returns sought and resources available. 1.7 Business plan is completed for operation.
2. Identify personal business skills	2.1 Financial and business skills available are identified and taken into account when business opportunities are researched. 2.2 ***Personal skills/attributes*** are assessed and matched against those perceived as necessary for a particular business opportunity. 2.3 ***Business risks*** are identified and assessed according to resources available and personal preferences.
3. Plan for establishment of business operation	3.1 Business structure and operations are determined and documented. 3.2 Procedures are developed and documented to guide operations. 3.3 Financial backing is secured for business operation. 3.4 Business legal and regulatory requirements are identified and complied. 3.5 ***Human and physical resources*** required to commence business operation are determined. 3.6 Recruitment strategies are developed and implemented.
4. Implement establishment plan	4.1 Marketing of business operation is undertaken. 4.2 Physical and human resources are obtained to implement business operation. 4.3 ***Operational unit*** is established to support and coordinate business operation.

	4.4 Monitoring process is developed and implemented for managing operation. 4.5 ***Legal documents*** are carefully maintained and relevant records are kept and updated to ensure validity and accessibility. 4.6 Contractual procurement rights for goods and services including ***contracts with relevant people****,* negotiated and secured as required in accordance with the business plan. 4.7 Options for leasing/ownership of business premises identified and contractual arrangements are completed in accordance with the business plan.
5. Review implementation process	5.1 Review process for implementation of business operation is developed and implemented. 5.2 Improvements in business operation and associated management process are identified. 5.3 Identified improvements are implemented and monitored for effectiveness.

Variable	**Range**
Business opportunities maybe influenced by:	• expected financial viability • skills of operator • amount and types of finance available • returns expected or required by owners • likely return on investment • finance required • lifestyle issues
Business viability may include:	• opportunities available • market competition • timing/ cyclical considerations • skills available • resources available • location and/ or premises available • risk related to a particular business opportunity, especially • in regard to Occupational Health and Safety and • environmental considerations
Specialist and relevant parties	• Chamber of commerce • Financial planners and financial institution representatives, business planning specialists and marketing specialists • accountants • lawyers and providers of legal advice • government agencies • industry/trade associations • online gateways and business brokers/business consultants
Personal skills/attributes	• technical and/ or specialist skills • business knowledge and skills • entrepreneurship and willingness to take risks

Business risks may be affected by and may include but are not restricted to:	• occupational health and safety and environmental • considerations • relevant legislative requirements • security of investment • market competition • security of premises/ location • supply and demand • resources available
Human and physical resources may include:	• software and hardware • office premises • communications equipment • specialist services through outsourcing, contracting and • consultancy • staff and vehicles
Operational unit refers to:	• office location staffed with required personnel and equipped to service and support business • home-based site or other location such as leased or owned property
Legal documents may include:	• partnership agreements, constitution documents, statutory books for companies (Register of Members, Register of Directors and Minute Books), Certificate of Incorporation, Franchise Agreements and financial documentation, appropriate software for financial records • recordkeeping including personnel, financial, taxation, OHS and environmental
Contracts with relevant people may include:	• owners, suppliers, employees, landlords, agents, distributors, customers or any person with whom the business has, or seeks to have, a performance-based relationship

Evidence Guide	
Critical Aspects of Competence	A person must be able to provide evidence: • that a business operation has been planned and implemented from initial research into feasibility of the business and completion of the plan, through to implementing the plan and commencing operations • the ability to evaluate the results of research and assess the likely viability and practicability of a business opportunity, taking into account the current business/market climate and resources available
Underpinning Knowledge and Attitudes	Demonstrate knowledge of: • Federal and regional government legislative requirements affecting business operations, especially in regard to OHS, Equal Employment Opportunity (EEO), industrial relations and anti-discrimination • Technical or specialist skills relevant to the business operation • Financing options • Business systems and operations • Relevant marketing, management, sales and financial concepts • Methods for researching business opportunities • Principles of risk management relevant to the business • Methods of identifying relevant specialist services to complement the business

	• Forms and administrative systems • Services available and charges • Planning and control systems (sales, • Advertising and promotion, distribution and logistics • Financial recording systems • Legal rights and responsibilities • Record keeping duties • Operational factors relating to the business (provision of professional services, products)
Underpinning Skills	Demonstrate skills of: • Literacy skills to interpret legal requirements, company policies and procedures and immediate, day-to-day demands • Marketing skills • Business planning skills • Entrepreneurial skills • Problem-solving skills • OHS skills • Time management skills • Belief in services and products offered by the business • Communication skills including questioning, clarifying, reporting, and giving and receiving constructive feedback • Technical and analytical skills to interpret business documents, reports and financial statements and projections • Ability to relate to people from a range of social, cultural and ethnic backgrounds and physical and mental abilities • Problem solving skills to develop contingency plans • Using computers and software packages to record and manage data and to produce reports • Literacy skills to enable interpretation of business information, numeracy skills for data analysis to aid research • Research skills to identify a business opportunity and to conduct a feasibility study • Analytical skills to assess personal attributes and to identify business risks • Observation skills for identifying appropriate people, resources and to monitor work
Resource Implications	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.
Methods of Assessment	Competence may be assessed through: • Interview / Written Test • Observation / Demonstration with Oral Questioning
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

Occupational Standard: Printing and Graphic Arts Operation Level II	
Unit Title	**Standardize and Sustain 3S**
Unit Code	**IND PGO2 27 0613**
Unit Descriptor	This unit of competence covers the knowledge, skills and attitudes required by worker to standardize and sustain 3S to his/her workplace. It covers responsibility for the day- to-day operations of the workplace and ensuring that continuous improvements of Kaizen elements are initiated and institutionalized.

Elements	Performance Criteria
1. Prepare for work.	1.1 Work instructions are used to determine job requirements, including method, material and equipment. 1.2 Job specifications are read and interpreted following working manual. 1.3 ***OHS requirements***, including dust and fume collection, breathing apparatus and eye and ear personal protection needs are observed throughout the work. 1.4 ***Safety equipment and tools*** are identified and checked for safe and effective operation. 1.5 ***Tools and equipment*** are prepared and used to implement 3S.
2. Standardize 3S.	2.1 Plan is prepared and used to standardize 3S activities. 2.2 ***Tools and techniques*** to standardize 3S are prepared and implemented based on ***relevant procedures***. 2.3 Checklists are followed for standardize activities and ***reported*** to ***relevant personnel***. 2.4 The workplace is kept to the specified standard. 2.5 Problems are avoided by standardizing activities.
3. Sustain 3S.	3.1 Plan is prepared and followed to standardize 3S activities. 3.2 ***Tools and techniques*** to sustain 3S are discussed, prepared and implemented based on relevant procedures. 3.3 Workplace is inspected regularly for compliance to specified standard and sustainability of 3S techniques. 3.4 Workplace is cleaned up after completion of job and before commencing next job or end of shift. 3.5 Situations are identified where compliance to standards is unlikely and actions specified in procedures are taken. 3.6 Improvements are recommended to lift the level of compliance in the workplace. 3.7 Checklists are followed to sustain activities and reported to relevant personnel. 3.8 Problems are avoided by sustaining activities.

Variable	Range
OHS requirements	May include but not limited to: • Are to be in accordance with legislation/ regulations/codes of practice and enterprise safety policies and procedures. This may include protective clothing and equipment, use of tooling and equipment, workplace environment and safety, handling of material, use of fire fighting equipment, enterprise first aid, hazard control and hazardous materials and substances. • Personal protective equipment is to include that prescribed under legislation/regulations/codes of practice and workplace policies and practices. • Safe operating procedures are to include, but are not limited to the conduct of operational risk assessment and treatments associated with workplace organization. • Emergency procedures related to this unit are to include but may not be limited to emergency shutdown and stopping of equipment, extinguishing fires, enterprise first aid requirements and site evacuation.
Safety equipment and tools	May include but not limited to: • dust masks / goggles • glove • working cloth • first aid • safety shoes
Tools and equipment	May include but not limited to: • paint • hook • sticker • signboard • nails • shelves • chip wood • sponge • broom • pencil • shadow board/ tools board
Tools and techniques	May include but not limited to: • 5S Job Cycle Charts • Visual 5S • The Five Minute 5S • Standardization level checklist • 5S checklist • The five Whys and one How approach(5W1H) • Suspension • Incorporation • Use Elimination

Relevant procedures	May include but not limited to: • Assign 3S responsibilities • Integrate 3S duties into regular work duties • Check on 3S maintenance level • OHS measures such as signage, symbols / coding and labeling of workplace and equipment • Creating conditions to sustain your plans • Roles in implementation
Reporting	May include but not limited to: • verbal responses • data entry into enterprise database • brief written reports using enterprise report formats
Relevant personnel	May include but not limited to: • supervisors, managers and quality managers • administrative, laboratory and production personnel • internal/external contractors, customers and suppliers
Tools and techniques	May include but not limited to: • 5S slogans • 5S posters • 5S photo exhibits and storyboards • 5S newsletter • 5S maps • 5S pocket manuals • 5S department/benchmarking tours • 5S months • 5S audit • Awarding system • Big cleaning day • Patrolling system may include: ➢ Top management Patrol ➢ 5S Committee members and Promotion office Patrol ➢ Mutual patrol ➢ Self-patrol ➢ Checklist patrol ➢ Camera patrol

Evidence Guide	
Critical Aspects of Competence	Demonstrates skills and knowledge to: • Discuss the relationship between Kaizen elements. • Standardize and sustain 3S activities by applying appropriate tools and techniques.
Underpinning Knowledge and Attitudes	Demonstrates knowledge of: • Elements of Kaizen • Ways to improve Kaizen elements • Benefits of improving kaizen elements • Relationship between Kaizen elements • The fourth pillar of 5S

	• Benefits of standardizing and sustaining 3S • Procedures for standardizing and sustaining 3S activities • Tools and techniques to sustain 3S • Relevant Occupational Health and Safety (OHS) and environment requirements • Plan and report • Method of communication
Underpinning Skills	Demonstrates skills of: • improving Kaizen elements by applying 5S • standardizing and sustaining procedures and techniques to avoid problems • technical drawing • procedures to standardizing 3S activities • analyzing and preparing shop layout of the workplace • standardizing and sustaining checklists • preparing and implementing tools and techniques to sustain 3S • working with others • reading and interpreting documents • observing situations • solving problems by applying 5S • communication skills • preparing labels, slogans, etc. • gathering evidence by using different means • using Kaizen board properly in accordance the procedure • reporting activities and results using report formats
Resources Implication	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.
Methods of Assessment	Competence may be assessed through: • Interview / Written Test • Observation / Demonstration with Oral Questioning
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

NTQF Level III

Occupational Standard: Printing and Graphic Arts Operation Level III	
Unit Title	**Undertake and Plan Basic Production Processes**
Unit Code	**IND PGA3 01 0613**
Unit Descriptor	This unit describes the performance outcomes, skills and knowledge required to develop and plan new or to modify existing, operational or production processes.

Element	Performance Criteria
1. Identify production requirements	1.1. Overall production schedule is examined to identify production requirements. 1.2. Material requirements are identified according to production requirements. 1.3. Current ***processes*** are identified in consultation with other staff.
2. Review customer order specifications	2.1. Customer order specifications are obtained and examined. 2.2. Supporting production data is examined. 2.3. The production process to be used is determined based on information supplied in production plan.
3. Determine process operations	3.1. Existing process operations are reviewed in consultation with management. 3.2. Existing problems are clarified with team and customers. 3.3. Work operations required are identified in consultation with team. 3.4. Suitable machinery or equipment is identified in consultation with team. 3.5. Cost and duration are estimated against production estimates. 3.6. Recommendations on possible solutions are made and documented.
4. Determine production sequence	4.1. Steps required for the process are identified. 4.2. Material and equipment requirement lists are prepared and documented. 4.3. Quality assurance steps and specifications are identified. 4.4. Process steps are documented and clearly represented.
5. Monitor production	5.1. Production is monitored. 5.2. Any necessary changes in scheduling, and the reasons for this, are reported according to ***enterprise procedures***.

Variable	Range
processes	Applies to the development of new processes or the modification of existing processes based on known and documented changes to process technology or product including the machinery. Applies to a part of the overall production process.

Enterprise procedures	may include: • Carried out according to established organisational practices and processes and following instructions as to approach. Plan is developed according to accepted organisation practice and procedures • work for the process element is planned over the specified time frame taking into account resources required and available • Process plan establishes detailed steps required and milestones against which progress can be checked.

Evidence Guide	
Critical Aspects of Competence	Assessment requires evidence that the candidate: • effective planning or modification of production processes • demonstrate an ability to find and use information relevant to the task from a variety of information sources • produce a portfolio that includes paperwork showing planning of operational processes in any ONE of pre-press, printing, screen printing, converting, binding and finishing, corrugating or laminating, according to the listed Performance Criteria • Evidence for assessment may be gathered from assessment of the unit of competency alone or through an integrated assessment activity.
Underpinning Knowledge and Attitudes	Demonstrates knowledge of: • necessity to implement change • changes to existing production areas that will have to be made • integrating the operation into existing organisational processes • materials that are required in addition to existing ones • alternatives to the chosen process • process choice • review that was conducted to assess the process to suit customer requirements • need for new customers to be sought • seeking customers • production plan information that will aid in determining the process • impact that will the process have on existing operations • integrating training into existing process operations • process to eliminate existing production problems • utilising existing machinery or equipment • space that will the equipment occupy in the production area • special provisions that will be necessary to accommodate the equipment • expected production life of this equipment • technology that could see this equipment outdated • production factors that were established from tests and trials • estimating cost savings • estimated total cost savings per annum • positive conclusions that can be drawn from the tests and trials • negative conclusions that can be drawn from the tests and trials

	• authority to approve the operational process • identified steps for the process • process that have any effect on existing quality assurance steps • new materials that will need to be supplied • importance of documenting the steps of the process
Underpinning Skills	Demonstrates skills in: • OHS in relation to operating machinery such as safely switching off machinery before cleaning is started • communication of ideas and information by liaising with production workers and customers to identify needs and limitations • collecting, analysing and organising information by accessing data about machine capabilities, production processes and customer needs and using them in the planning process • planning and organising activities by modelling and trialling different process operations • teamwork when working with staff to review existing process operations • mathematical ideas and techniques by completing a cost benefit analysis of the production process and making projections for different options • problem-solving skills by considering options for modifying operational processes and choosing the most efficient • use of technology by using planning and project management software
Resources Implication	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.
Methods of Assessment	Competence may be assessed through: • Interview / Written Test • Observation / Demonstration with Oral Questioning
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

Occupational Standard: Printing and Graphic Arts Operation Level III	
Unit Title	**Apply Knowledge and Requirements of the Pre-Press /Press/Finishing in Digital Production Sector**
Unit Code	**IND PGA3 02 0613**
Unit Descriptor	This unit describes the performance outcomes, skills and knowledge required to work in or deal with information technology systems in the digital printing industry. It facilitates technical communication and the ability to work as a team member.

Element	Performance Criteria
1. Apply knowledge of printing industry	1.1. Printing industry terminology and vocabulary are used correctly and accurately. 1.2. New technology and new work processes are monitored and implemented when required. 1.3. Trends within the printing industry are monitored on an ongoing basis to inform personal work practices.
2. Apply knowledge of Government Acts and regulations	2.1. Basic principles and obligations for copyright, Occupational Health and Safety (OHS), environmental protection, access and equity and industrial awards are researched and evaluated. 2.2. Basic principles and obligations for copyright, OHS, environmental protection, access and equity and industrial awards are followed and applied in the workplace.
3. Apply knowledge of digital production processes	3.1. The principles behind basic layout production, image manipulation, digital output and workflow are identified and applied where possible in the workplace. 3.2. Proofing processes and principles are applied to meet client needs 3.3. Raster Image Processor (RIP) and front-end processer functions are applied to meet job specifications 3.4. Knowledge of CTP (computer to plate) is applied. 3.4. The effective use of software applications for producing digital products is evaluated.
4. Apply knowledge of digital printing processes	4.1. Basic principles of toner, inkjet or liquid toner-based, are evaluated to inform decisions made for different jobs. 4.2. The types of jobs and products for each process are considered to ensure appropriate choices are made to meet client needs. 4.3. The capabilities and limitations of each process are reviewed for different jobs.
5. Apply knowledge of substrates and consumables	5.1. The range of ***substrates*** used for each printing process are researched and evaluated for different jobs. 5.2. Different weights and callipers of substrates and how they affect digital production operations are researched and evaluated for different jobs.

	5.3. Paper grain and how it affects digital production and finishing operations are researched for different jobs. 5.4. Different properties of digital consumables, and how they affect digital production operations are researched for different jobs.
6. Apply knowledge of colour theory	6.1. ***Colour theory*** is used to inform digital production and/or design decisions. 6.2. Colour matching systems are used to inform digital production and/or design decisions. 6.3. Procedures that ensure effective colour management are implemented.
7. Apply knowledge of printing, converting and finishing processes	7.1. Basic characteristics of ***printing converting and finishing*** processes are identified and considered for different jobs. 7.2. The types of processes are evaluated and used to inform decisions made for different jobs.
8. Demonstrate knowledge of production management systems	8.1. The types of information that need to be exchanged between different stages of production to facilitate production efficiency are identified and used to inform development decisions. 8.2. ***Information technology systems*** that can be used to exchange information between and within companies are identified and used. 8.3. Efficient production management information systems are established and applied to inform development decisions.

Variable	**Range**
Substrates	may include print media and paper: • coated • uncoated • card • canvas • Vinyl and plastic.
Color theory	may include: • additive and subtractive • colour modes, such as: ➢ Red, Green, Blue (RGB) ➢ Cyan, Magenta, Yellow, Black (CMYK) ➢ LAB • colour rules, such as: • analogous • complementary • Triad.
printing Converting and finishing	may include: • Printing • Guillotining • flat-bed and rotary cutting

	• collating • folding • adhesives • Mechanical and thermal fastening.
Information technology systems	may include: • computer networks • databases • Internet.

Evidence Guide	
Critical Aspects of Competence	Assessment requires evidence that the candidate to: • demonstrate knowledge of digital production and related production processes so that job procedures, requirements and modifications have been implemented to job specifications • Establish and apply efficient production management information systems and accurately explain these systems to the production manager or client.
Underpinning Knowledge and Attitudes	Demonstrates knowledge of: • colour theory • converting and finishing processes • digital production processes • Government Acts and regulations • production management systems • substrates and consumables
Underpinning Skills	Demonstrates skills in: • OHS skills for using correct ergonomics when operating the computer • communication skills for transferring ideas and information by accurately using correct printing industry terminology and vocabulary • analysing and organising skills used when applying basic principles of efficient production management • teamwork skills for maintaining the production process in association with others • numeracy skills for determining weights and callipers of substrates • problem-solving skills for checking and adjusting procedures • technical skills for using relevant hardware and software to produce a layout
Resources Implication	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.
Methods of Assessment	Competence may be assessed through: • Interview / Written Test • Observation / Demonstration with Oral Questioning
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

Occupational Standard: Printing and Graphic Arts Operation Level III	
Unit Title	**Use Color Management for Production**
Unit Code	**IND PGA3 03 0613**
Unit Descriptor	This unit describes the performance outcomes, skills and knowledge required to obtain an acceptable match across color devices. It includes the correct use of color profiles and calibration of monitors and output devices.

Element	Performance Criteria
1. Indentify colour requirements	1.1. Printing conditions are determined to identify colour management requirements. 1.2. Printer's requirements are established to guide the provision and use of colour profiles.
2. Calibrate digital devices	2.1. All ***digital devices*** in the workflow are calibrated to produce accurate colour reproduction. 2.2. Device profiles created during calibration are correctly used and stored. 2.3. Digital devices are checked regularly to ensure they are still within calibration. 2.4. Profiles or equipment parameters are adjusted to bring devices back into calibration, when required. 2.5. Records are stored to ensure calibration occurs regularly.
3. Use colour profiles	3.1. Source and destination profiles are identified within the workflow. 3.2. Profiles are used to ensure that colour on monitors, proofs and final product match as closely as possible. 3.3. Images are converted to correct profile if incorrect profile is embedded. 3.4. The correct rendering intent is used to ensure accurate conversion of colour.
4. Configure software within the workflow	4.1. ***Software applications*** in the workflow with colour management features are determined. 4.2. Software applications with colour management features are configured to meet output condition. 4.3. A range of colour management presets are configured, saved and correctly used for various output conditions.
5. Maintain colour management workflow	5.1. The colour management system is checked regularly to ensure consistent colour match. 5.2. ***Monitors*** are calibrated regularly to ensure accurate reproduction of colour. 5.3. Digital devices are re-calibrated regularly or when ***conditions*** change from initial calibration.

Variable	Range
Digital devices	may include: • monitors • proofers • printers • scanners • digital cameras • Digital presses. • CTP (Computer To Press)
Software applications	may include: • colour management software, e.g. Colo sync • page layout software, e.g. In Design and/or QuarkXPress • image editing software, e.g. Photoshop and/or Illustrator • Raster image processors (RIPs), e.g. Apogee, Spire and Fiery.
Monitors	may include range of monitors used in the pre-press sector, including: • Cathode Ray Tube (CRT) • Liquid Crystal Display (LCD).
Conditions	may include: • change of stock • ink cartridge • Lighting.

Evidence Guide	
Critical Aspects of Competence	Assessment requires evidence that the candidate: • manage colour in pre-press operations to ensure that proofs, monitors and final products match • locate and use information relevant to the task from a variety of information sources • check monitors and software to ensure that they have different loaded profiles that match jobs • apply colour management system maintenance procedures • Produce three jobs with final product printed on various stocks and matching digital proofs on simulated stock.
Underpinning Knowledge and Attitudes	Demonstrates knowledge of: • OHS issues related to managing colour for digital production • densitometry and spectrophotometric measurement • International Colour Consortium (ICC) profiles and their use • device independent colour and profile connection spaces • colour space conversions and rendering intents • effects ICC profiles have on output • factors that influence selection of highlight and shadow aim points • grey balance requirements in relation to colour correction • process of determining grey balance requirements • ink/toner light errors - 'ideal' versus 'actual' inks/toners • viewing light conditions and metamerism • factors determining the requirement for colour correction

	• how different stocks affect colour • effects different inks have on colour reproduction for proofing and final production • how dot gain effects colour • type of press and what printing process are being used for final output • solutions to common problems for colour management • effects of using the wrong profile on output • sources of information about color management
Underpinning Skills	Demonstrates skills in: • Occupational Health and Safety (OHS) skills for using correct ergonomics when operating the computer • communication skills for expressing ideas and information by printing a test file on proofer • collecting, analysing and organising skills for determining printing conditions in order to identify colour management requirements • planning and organising skills for clarifying colour requirements before generating a proof • teamwork skills for maintaining the production process in association with others • numeracy skills in relation to densitometry, spectrophotometer and colour profiles • problem-solving skills used when diagnosing and correcting colour problems • self-management and learning skills to evaluate and enhance personal effectiveness • technical skills for utilizing software and hardware correctly to ensure consistency of output
Resources Implication	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.
Methods of Assessment	Competence may be assessed through: • Interview / Written Test • Observation / Demonstration with Oral Questioning
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

Occupational Standard: Printing and Graphic Arts Operation Level III	
Unit Title	**Apply Software Applications to Digital Printing**
Unit Code	**IND PGA3 04 0613**
Unit Descriptor	This unit describes the performance outcomes, skills and knowledge required to correctly select and use a variety of high-end software applications to efficiently produce a standard job.

Element	Performance Criteria
1. Select and assess software	1.1. Printing requirements of the layout brief are determined to align with digital production processes and printing feasibility. 1.2. Range of ***software applications*** is selected according to job specifications. 1.3. Appropriate software applications are used to complete components of the job according to manufacturer's specifications and enterprise standards.
2. Arrange elements on page	2.1. Client copy and images are assembled to confirm to the design brief. 2.2. Text is prepared and required fonts and font size is applied. 2.3. ***Basic elements*** and images are created and arranged on the page to confirm to the design brief. 2.4. Image resolution and colour mode are determined according to job specifications, help function is accessed, if required, and solution to queries found. 2.5. ***Document set-up*** is completed to conform to the design brief and job specifications.
3. Check quality	3.1. Text is reviewed for possible errors and omissions, and errors are discussed with client or supervisor. 3.2. Arrangement of the basic elements are arranged to adhere with design principles. 3.3. Hard copy proof is printed and rechecked for errors, omissions and overall design of the layout. 3.4. Necessary changes are made and reviewed and re-proofed as required. 3.5. The job is saved according to ***enterprise procedures***.
4. Use RIP to output job/CTP	4.1. The layout is imported into a ***Raster Image Processor (RIP) or front-end processor*** according to workplace procedures. 4.2 The image is imported in to a CTP (Computer To Press) according to the work procedure. 4.3. The layout is printed according to job specifications and enterprise standards.

Variable	Range
Software applications	may include: • Adobe In design • Illustrator • Photoshop • QuarkXPress • Corel • RIPs and front-end processors • New software applications and new versions of existing products entering the market regularly.
Basic elements	may include: • simple filled or unfilled boxes • frames • Rules (lines) or bullets used as accents or to divide a page into sections.
Document set-up	may include: • Layout • margins • page size • page orientation • number of pages • Arrangement of pages.
Enterprise procedures	may include various filing methods and techniques including: • network drives • DVDs and archiving systems.
Raster Image Processor (RIP) or front-end processor	may include computerised monitoring and data entry device used to enter: • machine settings • job specification settings • Monitor machine status and perform machine productivity enhancements.

Evidence Guide	
Critical Aspects of Competence	Assessment requires evidence that the candidate: • use a variety of software applications to first produce a layout, then a printed product according to job specifications • find and use information relevant to the task from a variety of information sources • Use at least two software applications to prepare and print two different sets of layouts according to enterprise standards.
Underpinning Knowledge and Attitudes	Demonstrates knowledge of: • different printing processes used in digital production • colour modes and how they affect output • how image resolution is governed by output resolution and/or viewing distance • various software applications and their usages in relation to digital production

	• how the job specifications determine typeface selection • effect typefaces have on readability • design principles, such as hierarchy, emphasis, contrast, alignment, repetition and flow • how to select an manipulate type within a layout application • image manipulation techniques including basic colour correction • how to create basic vector shapes with an application • different colour modes and there uses • pre flighting procedures • the various ways to import a job into a RIP • location of manuals, safety and other documentation that are relevant to high-end software applications for digital production
Underpinning Skills	Demonstrates skills in: • Occupational Health and Safety (OHS) skills for using correct ergonomics when operating the computer • communication skills for gaining client agreement on design layout • collecting, analysing and organising skills for storing and retrieving all required electronic files • planning and organising skills for outputting a proof and gaining approval by the client • teamwork skills for maintaining the production process in association with others • numeracy skills for expressing ideas and techniques by determining image resolution • problem-solving skills for checking and fixing errors when refighting • technical skills for selecting relevant hardware and software to produce a layout
Resources Implication	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.
Methods of Assessment	Competence may be assessed through: • Interview / Written Test • Observation / Demonstration with Oral Questioning
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

Occupational Standard: Printing and Graphic Arts Operation Level III	
Unit Title	**Create Pages Using a Page Layout Application**
Unit Code	**IND PGA3 05 0613**
Unit Descriptor	This unit describes the performance outcomes, skills and knowledge required to compose pages based on a client design brief using a high-end application.

Element	Performance Criteria
1. Confirm client design brief	1.1. Details of the client design brief are reviewed and clarified with client or supervisor. 1.2. The type of document is determined and production requirements are assessed. 1.3. Client copy and images are assembled to conform to the design brief. 1.4. ***Library files*** are accessed for relevant data to confirm to the design brief.
2. Set up document	2.1. A master page for multiple pages and with multiple columns is set up. 2.2. Required text is prepared and formatted and appropriate fonts and size are selected. 2.3. Master pages, templates and style sheets, as appropriate, are used consistently to ensure data is the same after exchange or transfer. 2.4. Text boxes and columns are correctly linked for text flow and chapter heading hierarchies are selected. 2.5. Colour palettes are set up according to the design brief. 2.6. ***Document set up*** is completed to conform to requirements of the ***final media*** and design brief.
3. Arrange elements on page	3.1. Imported text or data from other applications is correctly formatted and any cross-application formatting issues are resolved. 3.2. ***Elements*** are created and arranged on page to confirm to the design brief. 3.3. Graphics and other elements are imported from other applications and correctly formatted and arranged. 3.4. Elements are arranged in layers according to the design brief.
4. Finalise artwork	4.1. Pages and combined elements are composed correctly to suit specified sheet size. 4.2. Numerical sequence and lay down of the product or mock-up is correctly identified to meet binding and finishing requirements. 4.3. A bleed allowance is incorporated in margins and borders.
5. Check quality	5.1. Text and image are reviewed for possible errors and omissions and errors are discussed with the client or supervisor.

	5.2. Overall balance of the layout and correct colour blends and gradients are maintained in the arrangement of the elements. 5.3. Completed file is sent to be ripped. 5.4. A proof is created and rechecked for errors, omissions and the overall balance of the layout. 5.5. Necessary changes are made, reviewed on screen and reroofed as required. 5.6. The job is saved according to ***enterprise procedures***. 5.7. A digital proof or PDF is created to present to client.

Variable	**Range**
Library files	may include: • Bullets, borders, buttons, images, clip art.
Document set up	may include: • Margins, page size, page orientation, multiple pages, multiple columns, arrangement of pages.
Final media	may include: • printed material, Internet, CD Rom.
Elements	may include: • Graphics, frames, menus or dialogue boxes, indexes.
Enterprise procedures	may include: • Enterprise procedures for saving a document can include the preferred format, naming preferences and the location the file is saved to.

Evidence Guide	
Critical Aspects of Competence	Assessment requires evidence that the candidate: • composing a page incorporating elements and features that meets the client's design brief and is print ready • demonstrate an ability to find and use information relevant to the task from a variety of information sources • prepare THREE different sets of page layouts according to the listed Performance Criteria • for valid and reliable assessment of this unit, evidence should be gathered over a period of time through a range of methods for assessment to indicate consistent performance • Evidence for assessment may be gathered from assessment of the unit of competency alone or through an integrated assessment activity.
Underpinning Knowledge and Attitudes	Demonstrates knowledge of: • trapping during the design phase • colour qualities and behaviour for trapping • different qualities of TIFF and EPS and the use • distinguishing unmarked colours • principles of additive and subtractive colour mixing

	• considerations given to the printing process during the design phase • kinds of problems that can occur if the printing process isn't considered during the design stage • media size consideration during imposition • planning for multiple colours and graphics during imposition • computer type verses print type • the importance of type to the overall design • factors that you need to consider to ensure overall readability • importance of design and layout arranging artwork • typography use in design • purposeful design • market segmentation • understanding the target audience • factors that you need to consider when targeting equity groups • creating and saving templates • creating style guides and sheets
Underpinning Skills	Demonstrates skills in: • OHS in relation to operating machinery such as safely switching off machinery before cleaning is started • communication of ideas and information by clarifying information with the client or supervisor • collecting, analysing and organising information by selecting library files for relevant data to conform to the design brief • planning and organising activities by developing the numerical sequence and lay down of the product • teamwork when maintaining the production process in association with others • mathematical ideas and techniques by identifying the numerical sequence and lay down of the product • problem-solving skills by imposing pages and combined elements to correctly suit specified sheet size • use of technology by using hardware and software applications
Resources Implication	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.
Methods of Assessment	Competence may be assessed through: • Interview / Written Test • Observation / Demonstration with Oral Questioning
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

Occupational Standard: Printing and Graphic Arts Operation Level III	
Unit Title	**Capture a Digital Image and Edit**
Unit Code	**IND PGA3 06 0613**
Unit Descriptor	This unit describes the performance outcomes, skills and knowledge required to use digital camera technology for the production of color separated images.

Element	Performance Criteria
1. Assess digital camera qualities	1.1. Camera software compatibility with hardware ***system*** is assessed and the appropriate software is selected for the job. 1.2. Pixel resolution of the camera is matched to the required quality and resolution of outcome. 1.3. The RAM capacity of the camera is checked to be appropriate to the number of images required to be captured. 1.4. Shutter speed, focal lengths and camera feature modes (e.g. flash, scroll age, icon menu, close-up, wide angle and telephoto capacity) are assessed suitable for the quality and use of photographic images required. 1.5. Lithium batteries are handled and stored according to OHS requirements.
2. Set up for image capture	2.1. Camera is set up for image composition according to job specifications. 2.2. ***Lighting*** is arranged according to job specifications. 2.3. Light intensity is set for the correct exposure.
3. Preview image	3.1. Tone curves are adjusted according to job specifications. 3.2. The neutral balance of the image is arranged and adjusted. 3.3. Adjustments to image composition and exposure are made.
4. Photograph and upload a digital image	4.1. The digital camera is loaded and operated according to manufacturer's specifications appropriate to the quality of image to be photographed. 4.2. The computer card interface/disk is uploaded onto the relevant computer and the image saved on hard disk. 4.3. Photographic image files are created and stored on the computer according to software procedures. 4.4. Photographic images are enhanced, cropped and altered electronically to deliver the required image. 4.5. Photographic images are checked for fitness of purpose and conformance to the job brief. 4.6. Photographic images are assessed fit for the relevant delivery mode (e.g. print, CD-ROM) and delivered appropriately.

Variable	Range
systems	may include: • digital cameras used in the pre-press sector and associated sectors with which a pre-press organisation may be required to work
Lighting	may include direct (main) fill in lighting/fill reflector

Evidence Guide	
Critical Aspects of Competence	Assessment requires evidence that the candidate: • Photographed image meets the quality and look/ feel requirements of the brief. The digital camera functions are used to capture the required image • underlying skills of capturing a digital image using a digital camera should be transferable across the associated sectors of the printing industry • demonstrate an ability to find and use information relevant to the task from a variety of information sources • assess the capacity of, and operate, a digital camera to upload and process THREE digital images using industry hardware and software to deliver a designated quality of image outcome • Evidence for assessment may be gathered from assessment of the unit of competency alone or through an integrated assessment activity.
Underpinning Knowledge and Attitudes	Demonstrates knowledge of: • digital camera use • pixel resolution and how this affects the resolution of the image • relevance of the RAM capacity of a digital camera • importance of shutter speeds and focal lengths • safety requirements for handling and storing lithium batteries • uploading and processing digital images using a computer • uploaded data to a computer from the computer card interface/disk • process for filing and creating photographic image files on the computer • enhancing, crop and altering photographic images electronically • considerations that need to be made to assess a digital photograph suitable for a newspaper, glossy brochure and CD-ROM • manuals, safety and other documentation that are relevant to this task and where are they kept and information that is included in these documents
Underpinning Skills	Demonstrates skills in: • OHS in relation to operating machinery such as safely switching off machinery before cleaning is started • communication of ideas and information by consulting with supervisors over the processing of digital images • collecting, analysing and organising information by assessing the suitability of shutter speed, focal lengths and camera feature modes (e.g. flash, scroll age, icon menu, close-up, wide angle and telephoto capacity) for the photographic image required

	• planning and organising activities by planning and coordinating digital image capture sessions • teamwork when maintaining the production process in association with others • mathematical ideas and techniques by choosing the correct shutter speed and focal length to capture digital images • problem-solving skills applied by identifying and correcting problems of image quality • use of technology applied by using digital camera technology
Resources Implication	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.
Methods of Assessment	Competence may be assessed through: • Interview / Written Test • Observation / Demonstration with Oral Questioning
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

Occupational Standard: Printing and Graphic Arts Operation Level III	
Unit Title	**Undertake Editing and Proofing of a Digital Image**
Unit Code	**IND PGA3 07 0613**
Unit Descriptor	This unit describes the performance outcomes, skills and knowledge required to edit and manipulate an image ***captured*** digitally and to prepare for export to electronic image assembly and also undertake digital proofing

Element	Performance Criteria
1. Assess digital image	1.1. ***Capture*** digital image is opened and resolution parameters assessed against job specifications. 1.2. Image is converted from RGB to CMYK colour space. 1.3. Image characteristics are evaluated for colour and tone requirements.
2. Edit digital image	2.1. Suitable software is engaged to enable print image profiling and/or ***manipulation*** to suit print requirement. 2.2. Image is retouched to confirm to job specifications. 2.3. Local colour correction is employed to confirm with job specifications. 2.4. Tone correction is undertaken to confirm with job specifications. 2.6. Image storage requirements are identified and employed. 2.7. Image is saved ready for export.
3. Calibrate proofing device	3. 1. The calibration of the machine is checked for conformance to job specifications. 3. 2. Appropriate ICC profiles are applied to meet colour requirements. 3. 3. Paper for ***output*** is matched to profile.
4. Produce proofs from digital data	4.1 The image is retrieved from the database using industry software. 4.2 Data file is checked for structural compatibility with capability of RIP. 4.3 Special colours are sent to the RIP where appropriate. 4.4 Proof is produced according to job specifications and workflow procedures. 4.5 Proof is evaluated against job specifications using a densitometer, and checked against changes and original working data. 4.6 ***Quality standards*** proof is prepared for client submission. 4.7 Proof is used as a contract proof only if RIP is the same for both proof and film and if client accepts it as such.

Variable	Range
Capture	may include: • Variety of digital colour output devices.
manipulation	may include: • Appropriate image edit/manipulation software.
Output	may include: • Digital image storage capability and appropriate image digital proofing capability.
Quality standards	may include: • Should meet client requirements and enterprise and industry standards.

Evidence Guide	
Critical Aspects of Competence	Assessment requires evidence that the candidate: • Photographed image meets the quality and look/feel requirements of the brief. The digital camera functions are used to capture the required image • understanding of image editing should be transferable across associated sectors of the printing industry • Evidence for assessment may be gathered from assessment of the unit of competency alone or through an integrated assessment activity.
Underpinning Knowledge and Attitudes	Demonstrates knowledge of: • performing image editing • circumstances that may require editing or manipulation • why image profiling is required when preparing for printing • why image storage is capability relevant • selection of a JPEG or TIFF file format • factors that may influence the grey balance and color in the final result • method of producing the colour image • variations that may occur when utilising different imaging methods • outputting the image and production of a colour proof, i.e. the transfer of files and the use of specific assembly software • constraints on file structure that can the RIP impose • an ICC profile • differences that can different RIPs have on output • use of a densitometer for proof evaluation • calibration software for the output device • colour evaluation charts • criteria for evaluating a colour proof • differences that can there be between preliminary proofs and a contract proof • manuals, safety and other documentation that are relevant to this task and where are they kept and information that is included in these documents • other sources of information that are available

Underpinning Skills	Demonstrates skills in: • OHS in relation to operating machinery such as safely switching off machinery before cleaning is started • communication of ideas and information by communicating ideas and feedback from internal and external clients • collecting, analysing and organising information by collecting and discussing information between client and work team members • planning and organising activities by discussing and integrating digital image editing with other work team members as part of the workflow • teamwork when sharing knowledge and information • mathematical ideas and techniques by applying mathematical formula to determination of image resolution requirements • problem-solving skills by identifying problems in quality and workflow and determining and implementing solutions • use of technology by understanding technology applied in a coordinated manner
Resources Implication	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.
Methods of Assessment	Competence may be assessed through: • Interview / Written Test • Observation / Demonstration with Oral Questioning
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

Occupational Standard: Printing and Graphic Arts Operation Level III	
Unit Title	**Transfer and Manage Digital Images**
Unit Code	**IND PGA 08 0613**
Unit Descriptor	This unit describes the performance outcomes, skills and knowledge required to manipulate, delete and transfer digital files.

Element	Performance Criteria
1. Save digital files	1.1. Files are named using enterprise format. 1.2. File is checked for use of ***appropriate formats*** required for enterprise processing. 1.3. ***Version control*** is used to ensure the most recent file can be accessed.
2. Transfer digital files	2.1. Files to be transferred (sent or received) are selected and the correct method of transfer is chosen. 2.2. Locations where the files are to be saved or downloaded are accurately located and navigated. 2.3. Files are transferred to required location for processing. 2.4. Transferred (sent or received) files are checked to ensure correct transfer has occurred. 2.5. Files are documented, moved, renamed, copied, archived and deleted as necessary according to enterprise standards.
3. Retrieve and manage digital files	3.1. Required files are retrieved and opened from digital file system. 3.2. Computer search functions are used to locate and retrieve files. 3.3. File is sent to ***required location***.
4. Archive digital files	4.1. ***Archive system*** is created according to enterprise protocol. 4.2. Consistent, regular backup strategies are undertaken to allow for retrieval of files if there is a data loss event. 4.3. Files are retrieved from archive system.

Variable	Range
Appropriate formats	may include: • collect for output, package or similar functions in proprietary software • Encapsulated Postscript (EPS) • PDF • postscript or other file format standards as required by enterprise • XML.
Version control	may include: • recording date • time and version numbers for each major amendment distribute • recording distribution destinations of versions

	• distribution methods recording amendments to each version proof using: ➢ digital signatures ➢ File permissions.
Required location	may include: • email • networked storage • transfer via internet • uploading to or downloading from: ➢ a destination website ➢ Portable storage device - optical, magnetic or flash.
Archive system	may include: • networked storage • uploading to, or downloading from: ➢ a destination website ➢ portable storage device - optical, magnetic or flash ➢ Other devices used in automated and/or scheduled archiving and backup.

Evidence Guide	
Critical Aspects of Competence	Assessment requires evidence that the candidate: • manipulating, deleting and transferring digital files by using enterprise determined protocols • ability to locate and use information relevant to the task from a variety of information sources
Underpinning Knowledge and Attitudes	Demonstrates knowledge of: • enterprise file format standards • storage media: ➢ optical ➢ flash ➢ magnetic • file transfer protocols: ➢ USB ➢ Fire wire ➢ Asymmetric Digital Subscriber Line (ADSL) wireless ➢ email attachment ➢ Ethernet • file compression methods and effect on file type required for enterprise processing • file formats and sizes, and their effect on RAM requirements, storage, processing and transfer protocols • OHS standards that relate to working for periods of time on computers
Underpinning Skills	Demonstrates skills in: • Occupational Health and Safety (OHS) skills for operating machinery, such as safely switching off machinery before cleaning is started • communication and literacy skills for expressing ideas and completing required enterprise documentation

	• planning, analytical and organising skills for selecting files to be transferred, choosing correct mode and file naming protocols for transferred files • teamwork skills for maintaining the production process in association with others • numeracy skill to calculate file size, transfer rates, archival and storage requirements and reviewing the settings • problem-solving skills for locating, downloading, renaming, moving, copying, archiving and deleting files • technical skills for transferring digital files
Resources Implication	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.
Methods of Assessment	Competence may be assessed through: • Interview / Written Test • Observation / Demonstration with Oral Questioning
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

Occupational Standard: Printing and Graphic Arts Operation Level III	
Unit Title	**Set up and Produce Basic Digital Print**
Unit Code	**IND PGA3 09 0613**
Unit Descriptor	This unit describes the performance outcomes, skills and knowledge required to set up for and produce basic digitally printed product. This unit incorporates the use of Raster Image Processor (RIP) technology when outputting to digital devices including wide format.

Element	Performance Criteria
1. Check components and functions of a digital print system	1.1. All areas of user replaceable ***consumables*** are checked and replacements made. 1.2. ***Substrate*** feeding mechanisms and transport units are checked and cleared of any miss feeds. 1.3. Correct set-up for data and electrical power is completed. 1.4. Shutdown and restart procedures are performed according to manufacturer's specifications. 1.5. Print driver and/or job download software are correctly installed and set-up on workstation computer and/or digital front-end processor.
2. Maintain digital printing system to maximise productivity and quality	2.1. Routine maintenance tasks are performed according to ***manufacturer's specifications***. 2.2. Substrate transport and ***inking systems*** are cleaned to ensure optimum productivity and quality. 2.3. Temperature and humidity conditions are checked to ensure even flow of substrate. 2.4. Substrate registration mechanisms are checked to ensure alignment of printed images. 2.5. Ink density ***calibration*** is performed on a digital print system to meet job specifications. 2.6. Basic maintenance solutions to minimise ink residue, substrate misfeed, paper particle dust, uncalibrated systems and ink coverage are implemented.
3. Maintain and perform optimum substrate handling procedures	3.1. A paper handling and storage system for a digital print environment are developed that maintains substrate integrity and digital image quality. 3.2. ***Machine*** status is checked, print counters and consumable levels are reviewed and time estimated for reordering, servicing and reporting purpose.
4. Confirm job specifications	4.1. Print job specifications are read and interpreted from job documentation or production control system. 4.2. Availability of all job components is checked according to ***enterprise procedures***.

	4.3. Finishing requirements of job are checked and internal workflow and/or outsource arrangements are coordinated according to enterprise procedures. 4.4. Run time of job is calculated and completion time is estimated, allowing consideration for other production demands.
5. Set up reel system	5.1. Unwind reel is adjusted according to job specifications. 5.2. Rewind reel is set up and adjusted according to job specifications. 5.3. Minor ***in-line processes*** are set up and adjusted according to job specifications.
6. Set up sheet transportation system on sheet-fed machine	6.1. Substrate is loaded into correct feeding mechanism and all substrate properties are correctly specified in the user control interface. 6.2. Adjustments to the delivery unit are identified and made using the user control interface according to job specifications. 6.3. On-line finishing unit is adjusted using the user control interface according to job specifications.
7. Use RIP or front-end processor to set up job	7.1. Electronic data files are located and retrieved according to job specifications. 7.2. ***RIP or front-end processor*** parameters are set according to job specifications. 7.3. Preview or pre-flight check of electronic data files is performed to verify correct job set-up according to job specifications. 7.4. Basic troubleshooting methods are applied to identify and rectify unverified data files, file errors and job requirement inconsistencies according to manufacturer's specifications.
8. Submit data files to a digital print machine	8.1. Job priority is determined according to job specifications and production schedules. 8.2. Data file is submitted to print and image quality and machine productivity checks are performed.
9. Produce digital proof and run digital print job	9.1. A proof run is conducted to confirm proof conforms to job specifications and/or for client approval if required. 9.2. Entire print run is conducted according to job specifications ensuring that machine productivity and quality are monitored and rectified throughout the duration of the print job.
10. Coordinate and/or perform document finishing and client delivery	10.1. Steps required for document finishing are identified if not performed on in-line finishing units on a reel or sheet-fed system according to job specifications. 10.2. Finished print work is packaged in a manner to prevent damage and to confirm to delivery requirements according to job specifications,

Variable	Range
Consumables	may include: • ink • toner • developer • waste toner • cleaning web • fuser • Various substrates.
Substrates	may include range of print media and paper, such as: • coated • uncoated • card • canvas • Vinyl and plastic.
Manufacturer's specifications	may include: • Technical, administrator and user specifications documented by a manufacturer for a range of printing machines.
Inking systems	may include commonly used inking systems in colour printing, such as: • toner • inkjet and liquid toner-based.
Calibration	may include: • Mechanical and/or electronic and/or visual controls used to identify and correct ink coverage and density inconsistencies in a range of printing equipment.
Machine	may include non-impact printing machines, including: • inkjet • laser • Wide format with computerised monitoring and/or control.
Enterprise procedures	may include: • rules • standards • OHS guidelines • Communication protocols and behaviour codes of a range of workplace environments.
In-line processes	may include: • stapling • punching • perforating • cutting • Numbering or date coding.
RIP or front-end processor	may include computerised monitoring and data entry device used to enter: • machine settings • job specification settings • monitor machine status • Perform machine productivity enhancements.

Evidence Guide	
Critical Aspects of Competence	Assessment requires evidence that the candidate to: • set up a reel, sheet-fed or wide format digital printer • access data and conduct a digital proof run • adjust settings and ensure production speeds are attained • use a RIP or front-end processor • find and use information relevant to the task from a variety of information sources • demonstrate all safety devices on machine • perform preventive maintenance according to manufacturer's specifications • Set up and print four basic digital printing jobs according to manufacturer's specifications and enterprise procedures.
Underpinning Knowledge and Attitudes	Demonstrates knowledge of - • workplace job ticket procedures • pre-printing set-up checks and procedures • file transfer actions, problems and solutions • OHS issues relating to ink/toner • determining the selection of specific ink/toner for varied printed products • how to ensure the quality of ink/toner • what to do if the required substrate was unavailable • maximum weight of a substrate that can be printed on a specific machine • minimum weight of a substrate that can be printed on a specific machine • possible faults of printing on lightweight paper • availability of pre-prepared substrates for specific machine • maximum delivery quantity for specific machine • possible problems regarding incorrect feeding and delivery • data formats that can be used in digital print • the benefits of using electronic data rather than scanning hard copy • ways to submit a PDF file to the digital printer • OHS procedures relating to setting up in-line processes • in-line options that are available on specific machine • on-line finishing options that are available on specific machine • setting up in-line/on-line processes • circumstances when a job would be modified before printing • the steps involved for a client approval of the print • proof check procedures • processes involved for gaining final approval of a basic job • various types of binding • procedures followed if the binding method required by the client was not available at the workplace • alternative options if the document size was too thick to staple • importance of packing finished print work

	• location of machine manuals, safety and other documentation relevant to the set up and production of digitally printed products
Underpinning Skills	Demonstrates skills in: • Occupational Health and Safety (OHS) skills for operating machinery, such as safely switching off machinery before cleaning is started • communication skills for interpreting job tickets and requirements • collecting, analysing and organising skills for collecting and assessing data about coating process and machine specifications and characteristics and how these interact • planning and organising skills for identifying and providing information about time and materials requirements for set-up, production and finishing to ensure efficient operation • teamwork skills for maintaining the production process in association with other workers • numeracy skills for calculating substrate properties and production speeds to determine run length • problem-solving skills for recognising proofing faults and determining adjustments to correct them • technical skills for using computerized technology to access and adjust data files
Resources Implication	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.
Methods of Assessment	Competence may be assessed through: • Interview / Written Test • Observation / Demonstration with Oral Questioning
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

Occupational Standard: Printing and Graphic Arts Operation Level III	
Unit Title	**Set up and Produce Complex Digital Print**
Unit Code	**IND PGA3 10 0613**
Unit Descriptor	This unit describes the performance outcomes, skills and knowledge required to set up for and produce complex digitally printed product. This unit incorporates the use of Raster Image Processor (RIP) technology when outputting to digital devices including wide format.

Element	Performance Criteria
1. Liaise with clients	1.1. A ***productivity analysis*** on a digital print system is performed to determine guidelines for most productive print method for a range of print applications. 1.2. Print services, quality expectations and print costing are communicated to clients according to enterprise procedures. 1.3. Productivity advantages and disadvantages of different digital print options are presented to clients according to enterprise procedures. 1.4. Advice is provided to clients on appropriate substrates and document finishing methods for digital print jobs according to client budget and job specifications.
2. Confirm job specifications	2.1. Print job specifications are read and correctly interpreted from job documentation or production control system. 2.2. Availability of all job components is checked according to enterprise procedures. 2.3. ***Finishing*** requirements of job are confirmed and coordination with internal workflow and/or outsource arrangements is maintained. 2.4. Run time of job is determined and completion time is correctly estimated demonstrating consideration of other production demands.
3. Set up and maintain a digital print system	3.1. ***Substrate*** is loaded to correct reel or sheet feeding mechanism and all substrate properties are correctly specified in the user control interface. 3.2. Delivery unit is set up on a machine and adjustments made to minor in-line processes on reel-fed machine or on-line finishing settings on sheet-fed machine. 3.3. Preventive maintenance is performed on a digital printing system to ensure optimum quality and productivity are achieved. 3.4. Common factors affecting print quality and productivity of a digital printing machine are identified and solutions implemented to minimise and/or eliminate these.
4. Use the complex features of RIP or front-end processor	4.1. ***Colour*** adjustments are made to ensure optimum image quality and/or to match sample. 4.2. Output profiles are selected according to job specifications.

	4.3. An imposition method is selected to make best use of stock. 4.4. Screen ruling is adjusted to ensure optimal output of job. 4.5. Overprints and trapping are adjusted to achieve optimum output. 4.6. Finishing options are set up according to job specifications.
5. Perform and/or coordinate document proofing	5.1. The type of ***proofing*** method is determined according to job specifications. 5.2. A digital proof run is conducted for client approval and conformance of proof to job specifications is confirmed. 5.3. Internal or external pre-press proofing systems operators are consulted to conduct the proof run and provide job requirement information according to enterprise procedures. 5.4. Communication between the client and proofing provider is demonstrated to ensure proof meets job specifications.
6. Run digital print job and/or coordinate press print run	6.1. Production schedules, job specifications and enterprise procedures are observed and liaison occurs with internal and/or external production operators to determine start and duration time for the print run. 6.2. Completion time for the print run is estimated and communicated to the client and co-workers according to job specifications and enterprise procedures. 6.3. An entire digital print run is conducted according to job specifications ensuring that machine productivity and quality are monitored and rectified throughout the duration of the print job.

Variable	**Range**
Productivity analysis	may include: • production speeds for a range of print volumes and substrate types • quality standards • cost of labour • materials • Maintenance and servicing.
Finishing	may include: • stapling • folding • punching • perforating • cutting • numbering • Date coding.
Substrate	may include range of print media and paper, such as: • coated • uncoated • card

	• canvas • vinyl • Plastic.
Color	may include: • Cyan, Magenta, Yellow, Black (CMYK) • Pantone simulation.
Proofing	may include: • soft (on screen) • Hard proof.

Evidence Guide	
Critical Aspects of Competence	Assessment requires evidence that the candidate to: • communicate a range of digital and traditional printing solutions • coordinate a print run that uses a combination of digital and traditional printing solutions • conduct a digital proof run, adjust settings and ensure production speeds are attained on a digital printer • perform preventive maintenance tasks on digital printer to maintain machine productivity • use advanced RIP or front-end processor features • find and use information relevant to the task from a variety of information sources • perform preventive maintenance tasks on a digital printer according to manufacturer's specifications • Set up and print four complex color digital printing jobs according to manufacturer's specifications and enterprise procedures.
Underpinning Knowledge and Attitudes	Demonstrates knowledge of: • factors that influence making a decision about using a particular printing solution (run length, substrate type and application) • cost difference between a specified job printed on a digital system and a specified traditional system, e.g. digital vs. lithographic • quality difference between a specified job printed on a digital system and a specified traditional system, e.g. digital vs. lithographic • difference in turnaround time of a specified job printed on a digital system and a specified traditional system, e.g. digital vs. lithographic • print method that would be the most appropriate option for the specified print job • measures that can be taken to ensure clients have correct procedures for providing electronic files • main differences between digital printing and traditional printing methods • recommendations that can be made to clients who have created an electronic file in an incompatible software application • suggestions that could be made to clients who require a high-volume print run but need a portion of the print job immediately • steps needed to be followed for client approval of a proof • circumstances a job would be modified before printing • steps involved for client approval of the print

	• proof check procedures • processes involved for gaining final approval of a basic job • adjusting colour, toner/ink coverage or density to solve problems • need for using correct output profiles • screen ruling shapes and sizes • various types of binding • advantages and disadvantages of various binding methods • procedures followed if the binding method required by the client is not available at the workplace • alternative options if the document size was too thick to staple • importance of packing finished print work
Underpinning Skills	Demonstrates skills in: • Occupational Health and Safety (OHS) in relation to operating machinery, such as safely switching off machinery before cleaning is started • communicating ideas and information by interpreting client requirements to recommend most productive method of printing • collecting, analysing and organising information by collecting and assessing data on printing processes to determine time and cost savings to a client • planning and organising activities by suggesting production sequences to maximise efficiency • teamwork skills when cooperating with external production providers and giving consideration to their production scheduling requirements • mathematical ideas and techniques by calculating run length time of two different print solutions to determine most productive method • problem-solving skills by recognising electronic file errors to determine a file conversion procedure • use of technology by using RIP or font-end processor to submit files for printing
Resources Implication	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.
Methods of Assessment	Competence may be assessed through: • Interview / Written Test • Observation / Demonstration with Oral Questioning
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

Occupational Standard: Printing and Graphic Arts Operation Level III	
Unit Title	**Output Complex Images**
Unit Code	**IND PGA3 11 0613**
Unit Descriptor	This unit describes the performance outcomes, skills and knowledge required to output complex images.

Element	Performance Criteria
1. Set up and maintain the output device	1.1. Devices are set up to manufacturer's specifications and enterprise ***standards***. 1.2. ***Output*** medium is calibrated by conducting exposure tests using appropriate software and hardware. 1.3. Calibration is evaluated and necessary adjustments are made to output device.
2. Adjust and manipulate images/files	2.1. Electronic files are evaluated as to suitability for output. 2.2. Appropriate output resolution is set. 2.3. Appropriate screen angle and dot type are set according to job specifications. 2.4. Appropriate colour profiles are applied where necessary. 2.5. Availability of high resolution images is assessed for OPI process. 2.6. Appropriate fonts are available. 2.7. All support files are included with the job.
3. Output the image	3.1. The file is prepared for output to imaging device. 3.2. Job queuing is managed to ensure efficient production. 3.3. Images are outputted to the appropriate medium. 3.4. Output is processed according to job specifications.
4. Evaluate the result	4.1. Output is checked for correct dot size, screen angles and film density. 4.2. Image elements are checked according to original job specifications. 4.3. Technical problems are solved and appropriate corrections are made. 4.4. Job is prepared for the next stage of production.

Variable	Range
Standards	Should meet client requirements and enterprise and industry standards.
Output	may include: • Image setters.
Complexity	may include: • Complex refers to intricate and detailed design (line and tones) and may include difficult vignettes, tone separations, colour reproductions.

Evidence Guide	
Critical Aspects of Competence	Assessment requires evidence that the candidate: • final image must meet job specifications and appropriate colour profiles are applied as required • demonstrate an ability to find and use information relevant to the task from a variety of information sources • output TWO complex images
Underpinning Knowledge and Attitudes	Demonstrates knowledge of: • effect the selection of printing process has on the output settings for final films • methods/procedures that are available for calibrating an output device • consequences of incorrect calibration • corrective action when a file does not transfer correctly • main points to be checked before sending a job to the RIP • relationship to screen ruling and the selection of image resolution • conditions that would cause a variation from conventional screen angles • checks when preparing a job for OPI • consequences for image quality if OPI files are not placed in their correct folders • function of the low resolution file in the OPI process • main factors that influence the processing speed of a job when being RIP pad • increasing the RIP ping speed of a job • setting changes that must be made to the output device when outputting a stochastic screen • factors that influence the selection of the micron rating of the screen • main types of file formats and the effects the selection of a format has on the processing of a job • manuals, safety and other documentation that are relevant to this task and where are they kept and information that is included in these documents
Underpinning Skills	• OHS in relation to operating machinery such as safely switching off machinery before cleaning is started • communication of ideas and information by interpreting implicit and explicit requirements of the job brief • collecting, analysing and organising information by matching information on production requirements and formats with the job brief • planning and organising activities by planning the sequence of operations to facilitate smooth processing of the job • teamwork when maintaining the production process in association with others • mathematical ideas and techniques by calculating screens and dots and colour profiles • problem-solving skills by using different types of output (dot shape, screens) to best satisfy requirements of the job brief • use of technology by using equipment correctly to ensure ease of subsequent processing

Resources Implication	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.
Methods of Assessment	Competence may be assessed through: • Interview / Written Test • Observation / Demonstration with Oral Questioning
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

Occupational Standard: Printing and Graphic Arts Operation Level III	
Unit Title	**Produce Multiple Image Plates**
Unit Code	**IND PGA3 12 0613**
Unit Descriptor	This unit describes the performance outcomes, skills and knowledge required to make plates for any printing process with repeated images from film inputs.

Elements	**Performance Criteria**
1. Produce step and repeat layout	1.1. Client information is gathered to enable step and repeat layout. 1.2. A layout is produced according to client information. 1.3. ***Input*** data is stored ***manipulation/edit*** for future retrieval using industry software package. 1.4. A register of stock levels is maintained and advice about the depletion of stock is recorded according to ***quality standards*** of enterprise procedures.
2. Set up step and repeat machine	2.1. The film is mounted squarely to ***capture*** and produce an accurate image. 2.2. Accurate masks are cut for image protection/bleeds. 2.3. Mounting foils are positioned in a chase to ensure a quality ***output***. 2.4. The film or plate is punched, loaded, exposed and processed according to job specifications.

Variable	**Range**
Input	May include: • A variety of images to be assembled in multiples repeated in a single layout.
Manipulation/edit	May include: • Appropriate software and/or masking methods.
Quality standards	May include: • Should meet client requirements and enterprise and industry standards.
Capture	May include: • A variety of devices electronically or manually operated.
Output	May include: • Dedicated step and repeat machine either manual or electronically driven.

Evidence Guide	
Critical Aspects of Competence	Assessment must confirm appropriate knowledge and skills to: • the film or plate is punched, loaded, exposed and processed according to job specifications

	• The underlying skills of step and repeat should be transferable across different pre-press systems and printing processes. It is important that the substrate for reproduction is identified and that the quality of the photographic image be suitable for the identified printing processes • demonstrate an ability to find and use information relevant to the task from a variety of information sources • prepare and set up at least TWO step and repeat layouts for production of multiple repeated images according to the listed Performance Criteria
Underpinning Knowledge and Attitudes	Demonstrate knowledge of: • relationship between the image of the original and the final substrate • calculation required to produce the final layout • correct operation of the step and repeat machine • steps that are necessary to ensure safe operation • calculations using x and y coordinates that are needed to be completed to produce the layout rough • OHS concerns that are there when processing printing plates • prepare and use a mask to suit the job • procedures that are employed to ensure correct registration and accuracy/repeatability of exposure • manuals, safety and other documentation that are relevant to this task and where are they kept • information that is included in these documents
Underpinning Skills	Demonstrate skills to: • OHS in relation to operating machinery such as safely switching off machinery before cleaning is started • communication of ideas and information by obtaining client information • collecting, analysing and organising information by matching the job brief with production requirements • planning and organising activities by planning the sequence of operations to ensure efficient processing • teamwork when maintaining the production process in association with others • mathematical ideas and techniques by calculating exposures, chemical formulations and positioning of film • problem-solving skills by identifying plate faults and correcting • use of technology by using equipment is correctly to ensure ease of subsequent processing
Resource Implications	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.
Methods of Assessment	Competence may be assessed through: • Interview / Written Test • Observation / Demonstration with Oral Questioning
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

Occupational Standard: Printing and Graphic Arts Operation Level III	
Unit Title	**Produce Complex Lithographic Printed**
Unit Code	**IND PGA3 13 0613**
Unit Descriptor	This unit describes the performance outcomes, skills and knowledge required to produce complex lithographic printed product.

Element	Performance Criteria
1. Maintain non-routine operation of reel system (OR Element)-	1.1. Reel stand and rewind sections are monitored and adjusted to maintain correct tension and to ensure no marks, blemished or damage to finished product and to ensure efficient continuous operation. 1.2. Web control system is monitored and adjusted to ensure correct tension and accurate continuous positioning of the web for efficient operation. 1.3. ***Substrate*** is added to and removed from the process according to job instructions. 1.4. Sheeting section is monitored and adjusted to ensure quality and efficient product delivery. 1.5. Set-off/marking prevention system is monitored and adjusted to ensure quality of printed product without set-off or marking meets the standard of approved proof.
2. Maintain non-routine operation of sheet system (OR Element)	2.1. Feeder and delivery sections are monitored and adjusted to ensure continuous and efficient feeding to ***machine***. 2.2. Sheet pick-up and transport system is monitored and adjusted to ensure accurate and continuous sheet handling and efficient operation. 2.3. Transfer systems are monitored and adjusted to ensure correct and continuous sheet handling and efficient operation. 2.4. Substrate is added to and removed from the process according to job instructions. 2.5. Set-off/marking prevention system is monitored and adjusted to ensure quality of printed product without set-off or marking meets the standard of approved proof.
3. Maintain complex lithographic printing process	3.1. ***Non-routine*** lithographic plate and plate cylinder condition are monitored and adjusted to ensure the quality of printed product meets the standard of the sample sheet. 3.2. Non-routine lithographic blanket and blanket cylinder condition are monitored and adjusted to ensure the quality of printed product meets the standard of sample sheet. 3.3. Non-routine lithographic impression cylinder condition is monitored and adjusted to ensure quality of printed product meets the standard of sample sheet.

	3.4. Non-routine lithographic inking system is checked and maintained to ensure quality of printed product meets the standard of sample sheet. 3.5. Non-routine lithographic dampening system condition is monitored and adjusted to ensure quality of printed product meets the standard of sample sheet. 3.6. Set off/marking prevention and drying system is monitored and adjusted to ensure quality of printed product meets the standard of sample sheet. 3.7. Drying systems are monitored and adjusted to ensure quality of printed product meets the standard of approved proof.
4. Maintain production process	4.1. Production process is operated in association with fellow workers and according to company specifications and planned daily schedule. 4.2. Production is maintained within OHS requirements and company and manufacturer's specifications. 4.3. Manual and/or automatic control is used as per specification. 4.4. Performance is monitored and verified using the process control system according to enterprise procedures. 4.5. ***Inks*** performance, ***colour matching***, register and position of print are monitored and adjusted throughout production run. 4.6. Production difficulties are anticipated and preventive action is taken to prevent occurrence by timely intervention. 4.7. Process adjustments are reported to eliminate problems according to enterprise procedures. 4.8. Faulty performance of equipment is identified and reported according to enterprise procedures. 4.9. Waste is sorted according to enterprise procedures.
5. Identify and investigate lithographic machine operating problem	5.1. Problem in lithographic machine operation is investigated. 5.2. Problem in lithographic machine is identified and reported according to enterprise procedures.
6. Rectify minor lithographic machine faults	6.1. Adjustments or corrections are carried out according to specified procedures and consistent with operator's skill level. 6.2. Lithographic machine operation is checked to ensure correct operation.
7. Conduct shutdown of production process	7.1. Correct shutdown sequence is followed according to manufacturer's specifications and enterprise procedures. 7.2. Shutdown is conducted in association with fellow workers and in compliance with OHS requirements.

	7.3. Unused ink is correctly labelled and stored according to manufacturer/supplier specifications and enterprise procedures. 7.4. Solid and liquid waste is removed from operating area and recycled or disposed of, where required, according to regulatory requirements and enterprise procedures. 7.5. All product is removed from operating area. 7.6. Machine faults requiring repair are identified and reported to designated person according to enterprise procedures. 7.7. Repair/adjustment is verified prior to resumption of operations.
8. Clean and wash up printing machine at end of print run	8.1. Cylinders, plate and roller surfaces are cleaned ready for next run. 8.2. Inking system and dampening system are washed up ready for next run, and liquid waste is disposed of according to company and regulatory requirements. 8.3. ***In-line*** printing/converting/binding/finishing units are cleaned ready for next run. 8.4. Reel feed, transportation and delivery systems are disengaged and cleaned ready for next run. 8.5. Sheet feed, transport and delivery systems are disengaged and cleaned ready for next run.
9. Complete records	9.1. Production records or other documentation are accurately completed where required by enterprise procedures.

Variable	**Range**
Substrate	may include: • Wide and narrow reel and large and small sheet. • Range of substrates within the major categories of paper, pressure sensitive material, board, plastics and related films, or metal
Machine	may include range of single sheet, stream-fed or reel-fed printing machines with manual, semi-automated, fully automated or computerised process control. Includes machines with digitally imaged plates.
Non-routine	may include non-routine within this context relates to the set up and production of print runs. The set up of equipment and production involves a significant amount of deviation from using standard equipment settings. It also involves significant problem solving and the development of new criteria and procedures for performing current practices. It does not refer to a job that an individual does only occasionally.
Inks	may include Wide range of inks commonly used in printing.
Color matching	Use of densitometers and spectrophotometer.
In-line processes	may include minor processes that are integral to this competency can include basic in-line operations such as perforating, numbering, date coding, slitting that do not in themselves constitute another defined unit of competency. Where a major in-line process is defined as a separate competency (e.g. flat-bed cutting, folding) it should be assessed as such.

Evidence Guide	
Critical Aspects of Competence	Assessment requires evidence that the candidate: • Operate a lithographic press ensuring an efficient non-routine production flow that maintains product quality standards. Any production problems are anticipated and rectified with minimum downtime. The machine is correctly shut down and cleaned according to OHS guidelines • Demonstrate use of computerised control, monitoring and data entry systems if available and appropriate • Demonstrate an ability to find and use information relevant to the task from a variety of information sources • Monitor production output and make necessary adjustments to maintain print quality on a lithographic machine whilst producing a complex print on TWO occasions (if possible using different types and sizes of substrates and if possible including at least TWO in-line processes) according to job specifications, enterprise procedures and the Performance Criteria • Evidence for assessment may be gathered from assessment of the unit of competency alone or through an integrated assessment activity
Underpinning Knowledge and Attitudes	Demonstrates knowledge of - • reel transportation and web control • OHS concerns when operating the reel transportation system • reel wander • causes of web break at the unwind unit • difference between a "flying paster" and "zero speed" type reel-stand • print fault that would result from the reel being run out of centre • faults in the unwind section that could cause a web break • sheet transportation and transfer • OHS concerns that are there when operating the sheet transportation system • result of worn suckers at the feeder suction head • type of two sheet detection on this machine • movement that the sheet should have when being registered by the side lay • causes of miss-register of the sheet at the feeder • visible signs of the sheet being registered in the feeder • gripper malfunction affecting sheet control and transfer • adjustment of sheet transfer mechanisms • causes of the feeder stack becoming uneven • result of the feeder stack not being loaded level • how unevenness of the feeder stack can be rectified • reel delivery for rewinding and sheeting • OHS risks associated with rewinding and sheeting • what safety feature is in the delivery system if the web jams up • why the sheet cut-off would wander • effect of poorly adjusted nip rollers when rewinding and sheeting

	• further operations that are required for printed reels upon removal from the printing machine • how the printed job should be stored after removal from the printing machine • why it is necessary to label each printed reel • sheet delivery • effect machine speed will have on sheet delivery • advantage of spraying moving sheets with anti-set off powder in the delivery • items in the delivery that could cause marking of the printed image • remedial steps that may be necessary to eliminate marking of the printed image • function of a sheet decurler fitted to the delivery of some machines • faults that could result from incorrectly set grippers in the transfer section of a machine • how the printed job should be stored after removal from the printing machine • printing unit • result if the plate develops a crack at the grip edge during a print run • effect of a sticky blanket surface
Underpinning Skills	Demonstrates skills in: • OHS in relation to operating machinery such as safely switching off machinery before cleaning is started • communication of ideas and information by interpreting the job brief and providing advice to clients about options and limitations • collecting, analysing and organising information by collecting and analysing data about printing process, machine specifications and performance to calculate appropriate adjustments for the job • planning and organising activities by providing information about time and materials requirements for production scheduling • teamwork when maintaining the production process in association with others • mathematical ideas and techniques by calculating substrate requirements, plate position and pressures • problem-solving skills by recognising proofing faults and calculating adjustments necessary to meet job specifications • use of technology by using monitoring equipment and computerized production records
Resources Implication	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.
Methods of Assessment	Competence may be assessed through: • Interview / Written Test • Observation / Demonstration with Oral Questioning
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

Occupational Standard: Printing and Graphic Arts Operation Level III	
Unit Title	**Produce Complex Flexographic Printed Product**
Unit Code	**IND PGA3 14 0613**
Unit Descriptor	This unit describes the performance outcomes, skills and knowledge required to produce non-routine flexographic printed product.

Element	Performance Criteria
1. Maintain non-routine operation of reel transportation system	1.1. Reel stand is monitored and adjusted to ensure efficient continuous operation. 1.2. Web control system is monitored and adjusted to ensure correct tension and accurate continuous positioning of the web for efficient operation. 1.3. ***Substrate handling*** is added to process according to job instructions.
2. Maintain non-routine operation of reel delivery system on web-fed machine	2.1. Reel rewind section is monitored and adjusted to maintain correct tension and to ensure no marks, blemishes or damage to finished product. 2.2. Substrate is removed from process according to ***non-routine*** job instructions. 2.3. Sheeting section is monitored and adjusted to ensure quality and efficient product delivery. 2.4. Set-off/marking prevention system is monitored and adjusted to ensure quality of printed product without set-off or marking meets the standard of approved proof.
3. Maintain complex flexographic printing process	3.1. Flexographic plate and plate cylinder or sleeve condition is monitored and adjusted to ensure the quality of printed product meets the standard of the approved proof. 3.2. Flexographic impression roller condition is monitored to ensure the quality of printed product meets the standard of approved proof. 3.3. Flexographic inking system and doctor blade condition are monitored and adjusted to ensure quality of printed product meets the standard of approved proof. 3.4. Drying systems are monitored and adjusted to ensure quality of printed product meets the standard of approved proof. 3.5. ***In-line*** printing/converting/binding/finishing processes are monitored and adjusted to ensure quality of product meets the standard of the approved proof.
4. Maintain non-routine production process	4.1. Production process is operated in association with fellow workers and according to company specifications and planned daily schedule. 4.2. Production is maintained within OHS requirements and company and manufacturer's specifications.

	4.3. Manual and/or automatic control is used as per specification. 4.4. ***Inks***/***coatings*** performance, ***colour matching***, register and position of print are monitored and adjusted throughout production run. 4.5. Production difficulties are anticipated and preventive action is taken to prevent occurrence by timely intervention. 4.7. Process adjustments are reported to eliminate problems according to enterprise procedures. 4.8. Faulty performance of equipment is identified and reported according to enterprise procedures. 4.9. Waste is sorted according to enterprise procedures.
5. Identify and rectify faults	5.1. Problem in flexographic ***machine*** is identified and reported according to enterprise procedures. 5.2. Adjustments or corrections are carried out according to specified procedures and consistent with operator's skill level. 5.3. Flexographic machine operation is checked to ensure correct operation. 5.4. Machine faults requiring repair are identified and reported to designated person according to enterprise procedures.
6. Conduct shutdown of production process	6.1. Correct shutdown sequence is followed according to manufacturer's specifications and enterprise procedures. 6.2. Shutdown is conducted in association with fellow workers and in compliance with OHS requirements. 6.3. Reels and cores are removed from press. 6.4. Unused ink is drained back to containers and correctly labelled and stored according to manufacturer/supplier specifications and enterprise procedures. 6.5. Solid and liquid waste is removed from operating area and recycled or disposed of, where required, according to regulatory requirements and enterprise procedures. 6.6. All products are removed from operating area.
7. Clean and wash up printing machine at end of print run	7.1. Cylinders or sleeves, plate and roller surfaces are cleaned ready for next run. 7.2. Inking rollers and doctor blades or chamber blade systems are cleaned with correct solvents according to OHS guidelines. 7.3. Ink pumps, tanks and hoses are cleaned correctly. 7.4. Impression rollers/central impression and press rollers are cleaned. 7.5. In-line printing/converting/binding/finishing units are cleaned ready for next run. 7.6. Reel feed, transportation and delivery systems are disengaged and cleaned ready for next run.

	7.7. Press is lubricated and protected according to duration of shutdown. 7.8. Production records or other documentation are accurately completed where required by enterprise procedures.

Variable	Range
Substrate handling	may include: • Wide and narrow reel delivery systems. • Range of substrates within the major categories of paper, pressure sensitive material, board, corrugated board, plastics and related films, or metal.
Non-routine	may include: • Non-routine within this context relates to the set up and production of print runs. The set up of equipment and production involves a significant amount of deviation from using standard equipment settings. It also involves significant problem solving and the development of new criteria and procedures for performing current practices. It does not refer to a job that an individual does only occasionally.
In-line processes	may include: • minor processes that are integral to this competency can include basic in-line operations such as perforating, numbering, date coding, slitting that do not in themselves constitute another defined unit of competency. Where a major in-line process is defined as a separate competency (e.g. flat-bed cutting, folding) it should be assessed as such.
Inks/coatings	may include: • Range of inks commonly used in 4 or more colour printing, including standard and special colours.
Color matching	may include: • Use of viscosity controls, densitometers and spectrophotometer.
Machine	may include: • Range of stack, in-line and central impression flexographic printing machines with manual, semi-automated, fully automated or computerised process control.

Evidence Guide	
Critical Aspects of Competence	Assessment requires evidence that the candidate: • Operate a reel-fed flexographic press ensuring an efficient 3 or more colour production flow that maintains product quality standards. Any production problems are anticipated and rectified with minimum downtime. The machine is correctly shut down and cleaned according to OHS guidelines • demonstrate use of computerised control, monitoring and data entry systems if available and appropriate • demonstrate an ability to find and use information relevant to the task from a variety of information sources • monitor production output and make necessary adjustments to maintain print quality on a flexographic machine whilst producing a

	complex print on TWO occasions (if possible using different substrates and if possible including at least TWO in-line processes) according to job specifications, enterprise procedures and the Performance Criteria • Evidence for assessment may be gathered from assessment of the unit of competency alone or through an integrated assessment activity.
Underpinning Knowledge and Attitudes	Demonstrates knowledge of - • reel transportation and web control • causes of the reel to wander • cause the web to break at the unwind unit • difference between a "flying paster" and "zero speed" type reel-stand • print fault that would result from the reel being run out of centre • possible faults in the unwind section that could cause a web break • reel delivery for rewinding and sheeting • OHS risks associated with rewinding and sheeting • hat safety feature in the delivery system if the web jams up • why the sheet cut-off would wander • effect of poorly adjusted nip rollers when rewinding and sheeting • printing and drying units • result if the plate lifts on the leading edge during a print run • build-up of ink on the impression cylinder affecting the printed product • causes of the ink foaming in the ink tray • effect of too much reducer in the ink • actions that reduce wear of the doctor blade • necessary that all solvents be removed from the final ink film • the link between driers and set off and marking • causes of UV ink to dry • causes substrate to distorting • effect in the chillers if the drying temperature was too low • effect of incorrect drying temperature on the finished product • advisable not to eat or drink near the machine when using UV inks • necessary to frequently examine the in-line components of the job • how the consistency of the punching unit IS checked • result of excessive pressure on the slitters • maintaining production process • safety features within the organisation aid in maintaining effective production • who would be held legally responsible for the removal of machine guards and/or disconnection of micro switches • effect of inadequate communication within the work team on a flexographic printing machine • ramifications if machine guards are removed and/or micro switches are disconnected on a machine • other measurements besides optimum solid ink density can be measured to assess print quality accurate method of checking register during a production run

	• necessary to take immediate action when production problems are anticipated • actions to be taken to eliminate further processing of unacceptable printed product • the result to the substrate if the relative humidity is increased in the press room
Underpinning Skills	Demonstrates skills in: • OHS in relation to operating machinery such as safely switching off machinery before cleaning is started • communication of ideas and information by interpreting the job brief and providing advice to clients about options and limitations • collecting, analysing and organising information by collecting and analysing data about printing process, machine specifications and performance to calculate appropriate adjustments for the job • planning and organising activities by providing information about time and materials requirements for production scheduling • teamwork when maintaining the production process in association with others • mathematical ideas and techniques by calculating substrate requirements, plate position and pressures • problem-solving skills by recognising proofing faults and calculating adjustments necessary to meet job specifications • use of technology by using monitoring equipment and making adjustments
Resources Implication	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.
Methods of Assessment	Competence may be assessed through: • Interview / Written Test • Observation / Demonstration with Oral Questioning
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

Occupational Standard: Printing and Graphic Arts Operation Level III	
Unit Title	**Produce Complex Gravure Printed Product**
Unit Code	**IND PGA3 15 0613**
Unit Descriptor	This unit describes the performance outcomes, skills and knowledge required to produce non-routine gravure printed product.

Element	Performance Criteria
1. Maintain non-routine operation of reel transportation system	1.1. Reel stand is monitored and adjusted to ensure efficient continuous operation. 1.2. Web control system is monitored and adjusted to ensure correct tension and accurate continuous positioning of the web for efficient operation. 1.3. ***Substrate handling*** is added to process according to job instructions.
2. Maintain non-routine operation of reel delivery system	2.1. Reel rewind section is monitored and adjusted to maintain correct tension and to ensure no marks, blemishes or damage to finished product. 2.2. Substrate is removed from process according to job instructions. 2.3. Sheeting section is monitored and adjusted to ensure quality and efficient product delivery. 2.4. Set-off/marking prevention system is monitored and adjusted to ensure quality of printed product without set-off or marking meets the standard of approved proof.
3. Maintain complex gravure printing process	3.1. Gravure cylinder condition is monitored and adjusted to ensure the quality of printed product meets the standard of the sample sheet. 3.2. Gravure impression roller condition is monitored and maintained to ensure the quality of printed product meets the standard of sample sheet. 3.3. Gravure inking system and doctor blade are monitored and adjusted to ensure quality of printed product meets the standard of sample sheet. 3.4. Drying systems are monitored and adjusted to ensure quality of printed product meets the standard of approved proof.
4. Maintain operation of in-line processes	4.1. ***In-line processes*** printing/converting/binding/finishing processes are monitored. 4.2. In-line printing/converting/binding/finishing process are adjusted to ensure quality of product meets the standard of the approved proof.
5. Maintain non-routine production process	5.1. Production process is operated in association with fellow workers and according to company specifications and planned daily schedule. 5.2. Production is maintained within OHS requirements and company and manufacturer's specifications.

	5.3. Manual and/or automatic control is used as per specification. 5.4. Performance is monitored and verified using the process control system according to enterprise procedures. 5.5. ***Ink***/***coatings*** performance, ***colour matching***, register and position of print are monitored and adjusted throughout production run. 5.6. Production difficulties are anticipated and preventive action is taken to prevent occurrence by timely intervention. 5.7. Process adjustments are reported to eliminate problems according to enterprise procedures. 5.8. Waste is sorted according to enterprise procedures.
6. Identify and rectify faults	6.1. Problem in gravure ***machine*** is identified and reported according to enterprise procedures. 6.2. Adjustments or corrections are carried out according to specified procedures and consistent with operator's skill level. 6.3. Gravure machine operation is checked to ensure correct operation. 6.4. ***Non-routine*** faulty performance of equipment is identified and reported according to enterprise procedures.
7. Conduct shutdown of production process	7.1. Correct shutdown sequence is followed according to manufacturer's specifications and enterprise procedures. 7.2. Shutdown is conducted in association with fellow workers and in compliance with OHS requirements. 7.3. Unused ink is correctly labelled and stored according to manufacturer/supplier specifications and enterprise procedures. 7.4. Solid and liquid waste is removed from operating area and recycled or disposed of, where required, according to regulatory requirements and enterprise procedures. 7.5. All products are removed from operating area. 7.6. Machine faults requiring repair are identified and reported to designated person according to enterprise procedures. 7.7. Repair/adjustment is verified prior to resumption of operations.
8. Clean and wash up printing machine at end of print run	8.1. Cylinders, plate and roller surfaces are cleaned ready for next run. 8.2. Inking system is washed up ready for next run, and liquid waste is disposed of according to company and regulatory requirements. 8.3. In-line printing/converting/binding/finishing units are cleaned ready for next run. 8.4. Reel feed, transportation and delivery systems are disengaged and cleaned ready for next run. 8.5. Sheet feed, transport and delivery systems are disengaged and cleaned ready for next run.

	8.6. Production records or other documentation are accurately completed where required by enterprise procedures.

Variable	Range
Substrate handling	may include: • Wide and narrow reel handling systems. • Range of substrates within the major categories of paper, pressure sensitive materials, board, plastics and related films, or metal
In-line processes	may include: • minor processes that are integral to this competency can include basic in-line operations such as perforating, numbering, date coding, slitting that do not in themselves constitute another defined unit of competency. Where a major in-line process is defined as a separate competency (e.g. flat-bed cutting, folding) it should be assessed as such.
Inks/coatings	may include: • Range of inks commonly used in 3 or more colour printing, including standard and special colours.
Color matching	may include: • Use of viscosity controls, densitometers and spectrophotometer.
Machine	may include: • Range of stack, in-line and central impression printing machines with manual, semi-automated, fully automated or computerised process control.
Non-routine	may include non-routine within this context relates to the set up and production of print runs. The set-up of equipment and production involves a significant amount of deviation from using standard equipment settings. It also involves significant problem solving and the development of new criteria and procedures for performing current practices. It does not refer to a job that an individual does only occasionally.

Evidence Guide	
Critical Aspects of Competence	Assessment requires evidence that the candidate: • Operate a gravure press ensuring an efficient non-routine production flow that maintains product quality standards. Any production problems are rectified with minimum downtime. The machine is correctly shut down and cleaned according to OHS guidelines • demonstrate use of computerised control, monitoring and data entry systems if available and appropriate • demonstrate an ability to find and use information relevant to the task from a variety of information sources • monitor production output and make necessary adjustments to maintain print quality on a gravure machine whilst producing a complex print on TWO occasions (if possible using different substrates and if possible including at least TWO in-line processes) according to job specifications, enterprise procedures and the Performance Criteria

	• Evidence for assessment may be gathered from assessment of the unit of competency alone or through an integrated assessment activity.
Underpinning Knowledge and Attitudes	Demonstrates knowledge of - • what could cause the reel to wander • what could cause the web to break at the unwind unit • what is the difference between a "flying paster" and "zero speed" type reel-stand • what print fault would result from the reel being run out of centre • what possible faults in the unwind section could cause a web break • what are the OHS risks associated with rewinding and sheeting • what safety feature is in the delivery system if the web jams up • why would the sheet cut-off wander • what is the effect of poorly adjusted nip rollers when rewinding and sheeting • how could a build-up of ink on the impression cylinder affect the printed product • what could cause the ink to foam in the ink tray • what is the effect of too much reducer in the ink • what action reduces wear of the doctor blade • why is it necessary that all solvents be removed from the final ink film • what is the link between driers and set off and marking • what could cause the substrate to distort • what would be the effect in the chillers if the drying temperature was too low • what is the effect of incorrect drying temperature on the finished product • why is it necessary to frequently examine the in-line components of the job • how is the consistency of the punching unit checked • what would be the result of excessive pressure on the slitters • what is the benefit of identification numbers on jobs with multiple similar images • how is the ratio of print to in-line speed controlled • what is the effect of inadequate communication within the work team on a gravure printing machine • what safety features within the organisation aid in maintaining effective production • what are the ramifications if machine guards are removed and/or micro switches are disconnected on a machine • who would be held legally responsible for the removal of machine guards and/or disconnection of micro switches • what is the most accurate method of checking register during a production run • why is it necessary to take immediate action when production problems are anticipated

Underpinning Skills	Demonstrates skills in: • OHS in relation to operating machinery such as safely switching off machinery before cleaning is started • communication of ideas and information by interpreting the job brief and providing advice to clients about options and limitations • collecting, analysing and organising information by collecting and analysing data about printing process, machine specifications and performance to calculate appropriate adjustments for the job • planning and organising activities by providing information about time and materials requirements for production scheduling • teamwork when maintaining the production process in association with others • mathematical ideas and techniques by calculating substrate requirements, plate position and pressures • problem-solving skills by recognising proofing faults and calculating adjustments necessary to meet job specifications • use of technology by using monitoring equipment and making adjustments
Resources Implication	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.
Methods of Assessment	Competence may be assessed through: • Interview / Written Test • Observation / Demonstration with Oral Questioning
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

Occupational Standard: Printing and Graphic Arts Operation Level III	
Unit Title	**Set up and Produce Complex Guillotined and Collating Product**
Unit Code	**IND PGA3 16 0613**
Unit Descriptor	This unit describes the performance outcomes, skills and knowledge required to complete complex guillotining (including knife changing) involving programmable guillotines and/or complex cutting sequences.

Element	Performance Criteria
1. Prepare job	1.1. Job specifications are read and interpreted from job documentation or production control system. 1.2. Set-up is planned and carried out correctly in minimum time with minimum wastage. 1.3. Availability of all job related components is checked. 1.4. Grip and lay edges of sheet are identified.
2. Install and replace cutting knives into machine	2.1. Appropriate knives are selected and safely secured to machine. 2.2. Dull knives are removed and bolted securely to protective board. 2.3. Cutting sticks are replaced when necessary.
3. Set up machine for guillotining	3.1. Guillotine is set up and adjusted according to job specifications. 3.2. Clamping pressures are set up and adjusted according to job specifications.
4. Conduct sample cut	4.1. Material to be used for sample is organised correctly. 4.2. Machine is set up and operated to produce a specified sample according to OHS requirements, manufacturer's specifications and enterprise procedures. 4.3. Sample is visually inspected and/or tested or laboratory testing is organised according to enterprise procedures. 4.4. Results are interpreted to determine adjustment requirements. 4.5. Adjustment changes are carried out according to product and machine specifications.
5. Maintain guillotining process	5.1. Knife and cutting stick condition is monitored and adjusted to ensure the quality of product meets the standard of the approved sample. 5.2. ***Cutting process*** pressures are monitored and adjusted to ensure the quality of product meets the standard of the approved sample. 5.3. Registration of knives is monitored and adjusted to ensure quality of product meets the standard of the approved sample.
6. Maintain operation of production process	6.1. Production process is operated in association with fellow workers and according to enterprise procedures and planned daily schedule. 6.2. Production is maintained according to OHS requirements, manufacturer's specifications and enterprise procedures.

	6.3. Manual and/or automatic control is used according to job specifications. 6.4. Performance is monitored and verified using the process control system according to enterprise procedures. 6.5. Production difficulties are anticipated and preventive action is taken to prevent occurrence by timely intervention. 6.6. Process adjustments are reported to eliminate problems according to enterprise procedures. 6.7. Faulty performance of equipment is identified and reported according to enterprise procedures. 6.8. Waste is sorted according to enterprise procedures.
7. Identify and rectify problems and faults	7.1. Problems in guillotining machine operation are identified and reported according to enterprise procedures. 7.2. Adjustments or corrections are carried out according to specified procedures and are consistent with operator's skill level. 7.3. Guillotining machine operation is checked to ensure correct operation.
8. Conduct shutdown of production process	8.1. Correct shutdown sequence is followed according to manufacturer's specifications and enterprise procedures. 8.2. Shutdown is conducted in association with fellow workers and in compliance with OHS requirements. 8.3. ***Substrate types*** waste is removed from operating area and recycled or disposed of, where required, according to regulatory requirements and enterprise procedures. 8.4. Machine faults requiring repair are identified and reported to designated person according to enterprise procedures. 8.5. Repair/adjustment is verified prior to resumption of operations.
9. Clean guillotining machine at end of run	9.1. Knife and machine bed are cleaned ready for next run. 9.2. ***Cutting units'*** machine is disengaged and cleaned ready for next run. 9.3. Production records or other documentation are accurately completed where required by enterprise procedures.

Variable	**Range**
Cutting process	may include: • Single knife, programmable guillotines, complex cutting sequence.
Substrate types	may include: • Range of substrates within the major categories of paper, pressure sensitive material, board, plastics and related films, or metal. • Large or small sheet handling systems
Cutting units	may include: • Range of semi-automated, automated or computerised guillotines.

Evidence Guide	
Critical Aspects of Competence	Assessment requires evidence that the candidate: • correctly set up and produce complex guillotined product according to job specifications and within the production timeframe • demonstrate an ability to find and use information relevant to the task from a variety of information sources • demonstrate all safety devices on the machine • set up (including knife change) and produce THREE complex guillotined products (THREE different substrates eg paper, strawboard, plastic, book cloth, and both large and small sheets) using a semi-automated or automated electronic guillotine, and setting a complex cutting program according to manufacturer's and job specifications, enterprise procedures and the listed Performance Criteria • demonstrate use of computerized control, monitoring and data entry systems if available and appropriate
Underpinning Knowledge and Attitudes	Demonstrates knowledge of: • information concerning cutting would that you expect to find in the job documentation or production control system • interpretation of this information to ensure smooth workflow throughout the factory • SIX trade terms that may be used in the documentation for complex cutting or guillotine knife change operations • elements that must be considered when planning a cutting sequence • OHS factors that must be considered when handling knife blades during the knife change operation • recommended knife angles for general cutting • use of a double bevel on a guillotine knife • factors that indicate that a new blade is needed • result of a dull blade is used continuously • difference between sharp knife from a dull knife • information that must be sent with dull knife when replaced • necessary time to replace a cutting stick • forces that are acting on a guillotine knife • OHS factors that must be considered when setting up and operating the guillotine • factors that should be considered when setting up a guillotine for a complex cutting job • choosing the correct clamping pressure for a given job • result of the clamp pressure not being appropriate for the stock • clamp pressure adjustment • clamp pressure that is recommended for NCR paper • clamp pressure that is recommended for 80gsm offset paper • clamp pressure that is recommended for 2400um strawboard • expectation if the knife angle is less than 19 degrees • expectation if the knife angle is more than 24 degrees

	• need for a knife with a double angle • knife angles on a double bevelled knife • largest and smallest size sheets that can be processed on this machine • procedures that can be used to complete undersize requirements • recognising a "work and turn" job • recognising a “work and twist" job • recognising a "work and tumble" job • recognising a “work and back" job • problems that can occur when activating the automatic knife • types of job not suitable for automatic cutting • important operation that is required to trim multi-section books or magazines with bulky spines • OHS factors that must be considered when checking and adjusting the machine • the machine adjustment parameters • checks that should be made after readjustment • settings that may need to be altered after checks have been made • items of the cutting result that should be checked against the sample • steps that are taken if the cutting result does not coincide with the sample • areas of the machine that should be continuously monitored • identifying a lay and gripper edge if not marked (FIVE methods) • OHS factors that must be considered when maintaining the production process • production factors that must be considered when maintaining the production process • production difficulties that can possibly affect the smooth production flow • reporting procedures that are to be followed if the machine should malfunction • treatment / disposal of waste from the guillotine area • ways to mark lay and gripper edges on sheets • result of the lay and grip edges are not recognised • need to build-up the clamp of a guillotine • "packing-up" the clamp of a guillotine • important operation that is required to trim multi-section books or magazines with bulky spines • reasons why the guillotine knife will not operate when the machine is turned on • reasons why a book block may be cut out-of-square • reasons for the program not working after it has been entered into the machine • parts of the guillotine that should be checked if, after a cut, the top sheets are longer than the bottom sheets • Parts of the guillotine that should be checked if, after a cut, the top sheets are shorter than the bottom sheets?

	• result of no replacing the cutting stick regularly • Part of the guillotine that should be checked if, after a cut, the top sheets are out-of-square? • Part of the guillotine that should be checked if, after a cut, the top sheets are creasing along the cut line? • checks necessary when the clamp plate is remove • need for machine lubrication • information about correct types and methods of lubrication • OHS factors that must be considered when shutting down and/or cleaning the machine • special operations that are essential when shutting down the machine • maintenance procedures that should be used to keep the machine in good condition and order • methods that are employed to rid the machine of waste • cleaning agents that are used on the guillotine
Underpinning Skills	Demonstrates skills in: • OHS in relation to operating machinery such as safely switching off machinery before cleaning is started • communication skills by liaising with clients as required to maintain or adjust production, and reading and interpreting job specifications • planning and organising by correctly shutting down and cleaning the machine at the end of a run • teamwork when maintaining the production process in association with fellow workers • using technology by setting up and adjusting clamping pressures according to job specifications • problem solving by selecting appropriate knives and securely fixing them to the machine
Resources Implication	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.
Methods of Assessment	Competence may be assessed through: • Interview / Written Test • Observation / Demonstration with Oral Questioning
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

Occupational Standard: Printing and Graphic Arts Operation Level III	
Unit Title	**Use Electronic Monitoring Systems (Converting and Finishing)**
Unit Code	**IND PGA3 17 0613**
Unit Descriptor	This unit describes the performance outcomes, skills and knowledge required to use electronic monitoring systems for glue lines used in the container and carton sector of the industry and for gatherers and folders used in the binding and finishing sector.

Element	Performance Criteria
1. Set up electronic monitoring system	1.1. Parameters are set according to job type and specifications and enterprise procedures. 1.2. ***Monitor*** is positioned according to job type and specifications. 1.3. Ejection system is positioned according to job type and specifications, where relevant. 1.4. Marking system is positioned according to job type and specifications, where relevant. 1.5. "Learn" function is started to identify sheets and signatures, where relevant.
2. Run job and monitor production	2.1. Glue line registration and glue application is monitored to ensure product confirms to job specifications. 2.2. ***Machine*** is adjusted if the number of rejects exceeds specified limits. 2.3. Reasons for stoppages are identified and corrected. 2.4. Initial set up parameters are monitored and reviewed to ensure smooth production of ***quality*** product.
3. Review production data	3.1. Production rejects are monitored and causes are identified. 3.2. Overall data is reviewed at the end of the product run. 3.3. Information on production documentation is recorded as required.

Variable	Range
Monitor	may include: • Electronic glue line Monitoring Systems (EMS) and monitoring systems for gatherers and folders that identify incorrect sheets or signatures. Systems may eject or mark faulty product (mainly in carton sector) or shut down production (mainly in binding and finishing).
Machine	may include: • Folder/gluers, gatherers and other relevant converting and finishing machines.
Quality	may include: • Should meet client requirements and enterprise and industry standards.

Evidence Guide	
Critical Aspects of Competence	Assessment requires evidence that the candidate to: • correctly use electronic monitoring systems for glue lines, gatherers and folders according to job specifications and within the production timeframe • set up electronic monitoring systems for TWO different jobs, preferably of different sizes and substrates, according to manufacturer's and job specifications, enterprise procedures and the listed Performance Criteria • Demonstrate an ability to retrieve information from the electronic system.
Underpinning Knowledge and Attitudes	Demonstrates knowledge of: • OHS factors that need to be considered when setting up and operating electronic monitoring systems • importance of the distance between cartons on the machine t for production and for the operation of the electronic monitoring system • checking the ejector (or marker) for correct operation • different carton types and substrates and the affect on the amount and position of glue required • glue is requirements for different carton types • result of too much or too little glue • result of an incorrectly positioned glue line • process for fixing too much and too little glue • process for adjusting the position of the glue line with respect to the length of the glue flap • other machine faults that are registered on the EMS • other parts of the folding/gluing system that will cause monitoring system to reject product • ways of ensuring that the EMS is ejecting/marking only faulty cartons • parts of the machine that need to be adjusted if reject cartons are not correctly identified and culled • faults that are likely to trigger the signature or sheet monitoring system • cause of common faults and how can they be avoided and corrected • quality principles behind the use of electronic monitoring • work procedures that can be implemented to minimise faults • production records that need to be kept or written up • information that should be included in this reporting procedure • steps that should be taken to ensure that important features of the production control system are followed • machine manuals, safety and other documentation that are relevant to this task and where they are kept and information that is included in these documents • other sources of information that are available
Underpinning Skills	Demonstrates skills in: • OHS in relation to setting up and operating electronic monitoring systems

	• communication skills when recording information on production documents • planning and organising when positioning the monitor according to job type • teamwork when maintaining the production process in association with other staff • using technology when setting up the electronic monitoring system • problem solving when identifying reasons for rejects during production
Resources Implication	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.
Methods of Assessment	Competence may be assessed through: • Interview / Written Test • Observation / Demonstration with Oral Questioning
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

Occupational Standard: Printing and Graphic Arts Operation Level III	
Unit Title	**Produce Complex Collated, Folded, Adhesive and Mechanical Products**
Unit Code	**IND PGA3 18 0613**
Unit Descriptor	This unit describes the performance outcomes, skills and knowledge required to produce complex adhesive, mechanical or sewn fastened product. Some equipment may also involve cutting, trimming, folding and/or gathering (collating) which may be assessed at the same time.

Element	Performance Criteria
1. Maintain operation of sheet/section transportation system	1.1. Feeder is monitored and adjusted to ensure continuous and efficient feeding to machine. 1.2. Sheet/section pick-up and transport system is monitored and adjusted to ensure accurate and continuous sheet handling and efficient operation. 1.3. Sheet/section transfer systems are monitored and adjusted to ensure correct and continuous sheet handling and efficient operation. 1.4. ***Substrate*** is added to the process according to job specifications.
2. Maintain operation of sheet/section delivery system	2.1. Delivery system is monitored and adjusted to ensure quality and efficient product delivery. 2.2. Wire straightness, length, cut-off and clinching pressures are monitored and adjusted to ensure quality of product meets the standard of the approved sample. 2.3. Adhesion is monitored and adjusted to ensure quality of product meets the standard of the approved sample. 2.4. Thread tension and stitch quality are monitored and adjusted to ensure quality of product meets standard of the approved sample.
3. Maintain production process	3.1. ***In-line*** /***off-line*** printing/converting/binding/finishing processes are monitored and adjusted to ensure the quality of product meets the standard of the approved sample. 3.2. Production process is operated in association with fellow workers and according to enterprise procedures and planned daily schedule. 3.3. Production is maintained according to OHS requirements, manufacturer's specifications and enterprise procedures. 3.4. Manual and/or automatic control is used according to job specifications. 3.5. Performance is monitored and verified using the process control system according to enterprise procedures. 3.6. Production difficulties are anticipated and preventive action is taken to prevent occurrence by timely intervention. 3.7. Waste is sorted according to enterprise procedures.

4. Identify and rectify problems and faults	4.1. Problems in sewing fastening units machine are identified and reported according to enterprise procedures. 4.2. Adjustments or corrections are carried out according to specified procedures and are consistent with operator's skill level. 4.3. Sewing fastening machine operation is checked to ensure correct operation. 4.4. Process adjustments to eliminate problems are reported according to enterprise procedures. 4.5. Faulty performance of equipment is identified and reported according to enterprise procedures.
5. Conduct shutdown of production process	5.1. Correct shutdown sequence is followed according to manufacturer's specifications and enterprise procedures. 5.2. Shutdown is conducted in association with fellow workers and in compliance with OHS requirements. 5.3. Substrate waste is removed from operating area and recycled or disposed of, where required, according to regulatory requirements and enterprise procedures. 5.4. Machine faults requiring repair are identified and reported to designated person according to enterprise procedures. 5.5. Repair/adjustment is verified prior to resumption of operations.
6. Clean adhesive/ mechanical/sewing fastening machine at end of run	6.1. Sewing unit is disengaged and cleaned ready for next run. 6.2. Mechanical ***fastening unit*** is disengaged and cleaned ready for next run. 6.3. Glue system is washed up ready for next run and liquid waste is disposed of according to regulatory requirements and enterprise procedures. 6.4. ***Complexity*** In-line printing/converting/binding/finishing units are cleaned ready for next run. 6.5. Sheet feed, transport and delivery systems are disengaged and cleaned ready for next run. 6.6. Production records or other documentation are accurately completed where required by enterprise procedures.

Variable	**Range**
Substrate	may include: • Large or small sheet/section handling systems. • Range of substrates within the major categories of paper, pressure sensitive material, board, plastics and related films, or metal
In-line/off-line processes	may include minor processes that are integral to this competency can include basic in-line/off-line operations such as perforating, numbering, slitting that do not in themselves constitute another defined unit of competency. Where a major in-line/off-line process is defined as a

	separate competency (e.g. flat-bed cutting, folding, gathering) it should be assessed as such.
Fastening processes	may include: • adhesive fastening such as cold and hot melt gluing, taping of substrates of varied form, weight or shape, e.g. hard case making, casing in, spine lining • mechanical fastening such as wire stitching, loop stitching of substrates of varied form, weight or shape • Section sewing.
Fastening units	may include a range of machines with manual, semi-automated, fully automated or computerised process control.
Complexity	may include complex refers to use of automatic adhesive and thermal machines, multiple head mechanical machines, section sewers.

Evidence Guide	
Critical Aspects of Competence	Assessment requires evidence that the candidate to: • produce a complex fastened product that meets job specifications, production timeframes and quality standards • demonstrate an ability to find and use information relevant to the task from a variety of information sources • Competency must be demonstrated in any ONE of adhesive, mechanical or section sewing. For each process produce TWO complex jobs using different sizes and weights of substrate according to manufacturer's and job specifications, enterprise procedures and the listed Performance Criteria • demonstrate use of computerized control, monitoring and data entry systems if available and appropriate
Underpinning Knowledge and Attitudes	• OHS factors that must be considered when operating sheet-fed transportation and delivery systems • areas of the sheet-fed feeder that should be monitored to ensure trouble-free operation • parts of the sheet pick-up system that are to be adjusted to ensure accurate and continuous sheet feeding • areas of the delivery system that should be observed to maintain tension • areas of the delivery system that should be observed to prevent damage to the finished product • checks to be made when substrate is removed from the machine • OHS factors that must be considered when maintaining or adjusting the operation of the machine • OHS factors that must be considered when using hot melt adhesive • safety clothing that is available for use when operating adhesive binders • speed of production • sectors to observe to guarantee that the production process is trouble-free and continuous • areas of the in-line process that should be monitored to assure the quality of the product

	• circumstances that require the machine to be adjusted • circumstances that require the machine to be slowed down • circumstances for machine speed be increased • adjustment of the adhesive application on an adhesive binder • achieving more spine milling on an adhesive binder • adjustment of the wire length on a wire stitcher how • straightening the wire in the wire feed on a wire stitcher • increasing / decreasing the dwell time on a high frequency welder • increasing / decreasing the current on a high frequency welder • OHS factors that must be considered when cleaning hot melt from the machine • checks to be made when shutting down a given machine • FOUR important reasons for a thorough shutdown of operations • areas of the machine that needs regular cleaning • materials that need to be cleaned from the machine • recommended cleaning agents • keeping the machine clear of surface rust (condensation) • production records that need to be kept or written up • information that should be included in this reporting procedure • quality aspects that should be considered in a completed adhesive bound job • quality aspects that should be considered in a completed high frequency welded job • quality aspects that should be considered in a completed wire stitched job • steps that should be taken to ensure that important features of the production
Underpinning Skills	Demonstrates skills in: • OHS in relation to operating machinery such as safely switching off machinery before cleaning is started • communication skills when monitoring and verifying performance using process control systems • planning and organising when conducting a sample run • teamwork when following the correct shutdown sequence • using technology when adjusting machinery to improve performance • problem solving when identifying problems and faults and developing solutions • problem solving when interpreting sample results to determine adjustment requirements
Resources Implication	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.
Methods of Assessment	Competence may be assessed through: • Interview / Written Test • Observation / Demonstration with Oral Questioning
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

Occupational Standard: Printing and Graphic Arts Operation Level III	
Unit Title	**Prepare Film for Complex Screen Printing**
Unit Code	**IND PGA3 19 0613**
Unit Descriptor	This unit describes the performance outcomes, skills and knowledge required to prepare film for screen printing ready for screen manufacture.

Element	Performance Criteria
1. Identify job requirements	1.1. ***Image specifications*** are checked according to job specifications and enterprise procedures. 1.2. Orientation is checked for conformance to job specifications and adjusted if required. 1.3. Resolution/dpi is determined for template creation.
2. Prepare and operate equipment	2.1. ***Scanner***/computer is selected, turned on and scanner glass cleaned. 2.2. Scanner software is selected/opened and correct settings made according to job requirements. 2.3. Previews are made, image is selected, finished scan completed and image adjusted as required. 2.4. Image format is determined and saved to a storage device.
3. Select Imaging software	3.1. Software is selected, scan is opened and separations are produced on individual layers according to job specifications. 3.2. Colours are excluded as required on separation layers. 3.3. Stroke is applied for bleed according to printing equipment. 3.4. Separation layers are coloured for specific Raster Image Processor (RIP) software. 3.5. Image format is determined according to RIP software requirements. 3.6. Supplied finished artwork/separation is checked for output capability.
4. Select and operate an appropriate output device producing film separations to an industry standard and ready for screen manufacture	4.1. Image setter/dye printer is selected, turned on and checked, and heads cleaned prior to outputting images. 4.2. RIP software is selected and opened, and software settings checked and set according to output specifications. 4.3. Nesting is checked to ensure non-wastage of film. 4.4. Image is output and evaluated to ensure it confirms to job specifications and measuring, including checking with a reflection densitometer valve. 4.5. Film is handled according to manufacturer's specifications. 4.6. Output device is closed down according to manufacturer's recommendations.

5. Access the requirements of particular production exercise in order to meet the process and job specification	5.1. Requirements of the printing process and job specification are assessed. 5.2. The quality of job ***elements***, including resolution/dpi is specified according to client requirements. 5.3. Films, dye cartridges, their qualities and process requirements are determined. 5.4. Stock levels are checked and maintained according to job specifications. 5.5. Copy is checked and assessed according to job specifications.
6. Prepare and operate equipment able to produce film separations	6.1. Scanner/computer is selected and artwork/copy is placed squarely in the scanner. 6.2. Scanner software is selected/opened and correct settings are made according to job requirements. 6.3. Previews are made, images selected, finished scan completed and image adjusted as required. 6.4. Image format is determined and saved to a storage device.
7. Select and use appropriate imaging software	7.1. Software is selected, scan opened and, using layers and software tools as required, separations are provided on individual layers according to job specifications. 7.2. Colours are excluded as required on separation layers. 7.3. Separate layers are coloured for specific RIP software requirements. 7.4. Image/layers or separations are manually nested, if required, in accordance with film output device size. 7.5. Image format is determined according to RIP software requirements and saved to storage device. 7.6. Supplied finished artwork/separations is checked for output suitability.

Variable	**Range**
Image specifications	may include: • screen rulings • dot percentages • Image thickness/film assessment.
Scanner	may include: • flat-bed • Drum scanners with medium to high-end full colour capabilities.
Elements	may include: • text • headings • rules • Components and shapes.

Evidence Guide	
Critical Aspects of Competence	Assessment requires evidence that the candidate: • produce films according to job specification and client standards • prepare film for two different jobs involving a variety of image effects, according to manufacturer's and job specifications and enterprise procedures
Underpinning Knowledge and Attitudes	Demonstrates knowledge of: • job requirements: • image specifications • orientation • resolutions/dpi • substrate and use of product • finished size and image location • location of printer marks, registration crosses and colour identification • image detail, screen ruling related to substrate • ink type and equipment available • preparation and operation of equipment: • scanner settings • image brightness/contrast • file format • type of software • image/scan and quality adjustment • output device: • checks and maintenance to be performed on an image setter/dye printer • RIP software settings to be checked prior to ripping • output film • measuring the halftone value on the film separation • techniques for handling film before and after separations • image setter/dye printer ability to provide quality separations • RIP software settings • image format • output suitability of artwork • output device • nesting of film separations • techniques for handling film according to manufacturer's specifications
Underpinning Skills	Demonstrates skills in: • Occupational Health and Safety (OHS) skills for operating machinery, such as safely switching off machinery before cleaning is started • communication skills for expressing ideas and information and interpreting the brief and job specifications • planning, collecting, analysing and organising skills for drawing correct design area to include elements according to job specifications • numeracy skills for calculating the required magnification before operating the equipment

	• teamwork skills for maintaining the production process in association with others • problem-solving skills for implementing required quality controls to ensure job specifications are met • technical skills for using the equipment necessary to prepare film for screen printing
Resources Implication	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.
Methods of Assessment	Competence may be assessed through: • Interview / Written Test • Observation / Demonstration with Oral Questioning
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

Occupational Standard: Printing and Graphic Arts Operation Level III	
Unit Title	**Prepare Stencil Using Direct Electronic Imaging Method**
Unit Code	**IND PGA3 20 0613**
Unit Descriptor	This unit describes the performance outcomes, skills and knowledge required to prepare direct electronically imaged stencils.

Element	Performance Criteria
1. Prepare the work area	1.1. Work area is made clean and functional prior to the commencement of work. 1.2. All equipment is inspected to ensure it is functional and where necessary, appropriate remedial action is taken prior to the commencement of work. 1.3. Chemicals are prepared, if necessary, according to OHS requirements and manufacturer's/supplier's specifications. 1.4. Appropriate ***coating techniques*** trough (or troughs for automatic coaters) is selected ensuring they are free of nicks and burrs.
2. Prepare the screen	2.1. Screen is selected according to job specifications. 2.2. Chemicals are applied and removed according to OHS requirements and manufacturer's/supplier's specifications.
3. Select direct emulsion	3.1. Emulsion is selected according to requirements for ink type, print resolution, substrate, mesh type and machine type with minimisation of waste. 3.2. Emulsion is checked for expiry date and appropriate action taken. 3.3. Emulsion is prepared according to OHS requirements, and manufacturer's/supplier's specifications. 3.4. Emulsion is used and dried according to manufacturer's/supplier's specifications.
4. Process material	4.1. Coated screen is placed in direct imaging equipment according to manufacturer's/supplier's specifications. 4.2. Direct imaging equipment is set up according to manufacturer's/supplier's and job specifications. 4.3. Direct imaging equipment is operated according to OHS requirements, and manufacturer's/supplier's specifications. 4.4. Exposed screen is removed and washed out according to OHS requirements and manufacturer's/supplier's specifications. 4.5. Processed ***type of stencil materials*** /screen is inspected for processing flaws.
5. Dry stencil	5.1. Processed stencil is dried according to manufacturer's/supplier's specifications. 5.2. Backing sheet is carefully removed and stencil checked for full adhesion.

6. Block out screen	6.1. Non-image areas of prepared screen are blocked out with filler suitable for ink type and according to job specifications. 6.2. Stencil is inspected for flaws, scum and/orientation. 6.3. Pinholes are spotted out with suitable filler and taped according to ink type and job specifications.
7. Store screen	7.1. Prepared screen is labelled according to ***enterprise specifications*** 7.2. Prepared screen is stored in a clean, dry environment according to manufacturer's/supplier's specifications.

Variable	**Range**
Coating techniques	may include appropriate coating techniques for various emulsions, mesh types and edge definition requirements.
Type of stencil materials	may include direct emulsion commonly used in direct projection relative to the industry sector.
Enterprise procedures	may include tasks must be performed according to enterprise procedures.

Evidence Guide	
Critical Aspects of Competence	Assessment requires evidence that the candidate: • correctly prepare direct electronically imaged stencils according to job specifications • demonstrate an ability to find and use information relevant to the task from a variety of information sources • prepare TWO different screens using direct electronic imaging techniques according to manufacturer's and job specifications
Underpinning Knowledge and Attitudes	Demonstrates knowledge of: • influence that mesh count has on final printed product • need to have a correctly tensioned screen • screen tension that is required on screens of various mesh count or grades • degreasing/cleaning techniques that are employed prior to coating the screen • information that is contained in MSDSs for the emulsion • pollution and environmental issues that need to be considered when working with emulsions • maintenance that is required on the direct projection camera • need to work in a safelight area when using the direct projection method • kinds of high sensitivity emulsion that are available and state their characteristics, lifespans and areas of use • preparation method for the emulsion you are using • influence that the length of run and ink being used have on the coating technique • number of coats of emulsion and the best method of coating the screen • best position (horizontal or vertical) for drying the screen

	• effect of heat on the emulsion during the drying process • OHS concerns that are there when exposing the screen • operating features of the direct projection camera • best position on the frame and the registration requirements • scanning speed and the exposure time • inputting information into the computer, manipulation of the image and output information • effect of temperature, pressure and period of washing on the emulsion • determining when washing out is complete • ideal position of the screen for drying to prevent scum and streaking • post-curing effect on the stencil • information that is obtained from the MSDSs for this particular block out • ink to be used and the type of stencil that have a bearing on the type of block out • What preventive measures can be taken to minimise pinholes? • need to tape the edge of the frame • means by which is this screen able to be identified at a later date • manuals, safety and other documentation that are relevant to this task and where they are kept and information that is included in these documents
Underpinning Skills	Demonstrates skills in: • OHS in relation to operating machinery such as safely switching off machinery before cleaning is started • communication of ideas and information by labelling prepared screens • collecting, analysing and organising information by drying and using emulsion according to supplier's instructions • planning and organising activities by drying the stencil prior to blocking out the screen • teamwork when maintaining the production process in association with others • mathematical ideas and techniques by correctly preparing chemicals • problem-solving skills by inspecting the stencil for flaws, scum and/orientation • use of technology by using relevant equipment to prepare direct electronically imaged stencils
Resources Implication	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.
Methods of Assessment	Competence may be assessed through: • Interview / Written Test • Observation / Demonstration with Oral Questioning
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

Occupational Standard: Printing and Graphic Arts Operation Level III	
Unit Title	**Operate an Automatic Screen Printing Machine**
Unit Code	**IND PGA3 21 0613**
Unit Descriptor	This unit describes the performance outcomes, skills and knowledge required to produce a print on a range of common substrates, using automatic equipment and screening techniques.

Element	Performance Criteria
1. Identify job requirements	1.1. ***Substrate*** is checked for conformance to ***job specifications*** with any irregularities reported and/or rectified. 1.2. Ink is checked for conformance to job specifications. 1.3. Artwork is checked for conformance to job specifications.
2. Prepare machine to print	2.1. Correct film/emulsion exposure is set and correctly completed according to job specifications. 2.2. Substrate position and screen alignment are set according to job specifications. 2.3. Ink is applied to the screen in the quantity required for the screen size. 2.4. ***Equipment*** is kept clean and spoilage is minimised.
3. Produce proof print	3.1. A proof print is run off and checked for colour, strength, registration, adhesion, clarity, gloss level, ***drying***/***curing unit***, artwork detail and other technical aspects according to ***job specifications***. 3.2. Adjustments are made according to product and machine specifications. 3.3. Belt speed and temperature required are set to achieve desired curing or drying properties. 3.4. ***Appropriate approval*** to commence production is sought prior to commencement.
4. Run job and monitor print quality	4.1. Printing speed production is adjusted to maximise quality and output. 4.2. Print quality is continuously evaluated and adjusted as required. 4.3. Effects of ink alterations during run are monitored and appropriate action taken according to manufacturer's/supplier's and job specifications. 4.4. ***Workplace documentation*** on job is completed as required. 4.5. Curing and drying are constantly monitored and adjusted according to manufacturer's/supplier's and job specifications.
5. Carry out routine user maintenance	5.1. Equipment is cleaned according to enterprise procedures. 5.2. Lights are replaced as necessary and alerts/alarms are tested. 5.3. Fault conditions are identified and reported according to enterprise

	procedures.
6. Stack production output	6.1. Output is checked for thorough drying/curing before stacking. 6.2. Job is labelled and recorded according to enterprise procedures. 6.3. Job status and progress are checked for conformance to job specifications and any necessary action is taken.
7. Conduct shutdown of the production process	7.1. Material is transferred to correct destination in a safe manner. 7.2. Excess ink, screens, squeegees and flood coaters are removed and cleaned according to OHS requirements and manufacturer's/supplier's specifications. 7.3. Waste materials are disposed of according to manufacturer's/supplier's specifications, regulatory requirements and enterprise procedures. 7.4. Equipment and surrounding areas are cleaned according to manufacturer's/supplier's specifications and enterprise procedures. 7.5. Tools and equipment are stored and maintained according to manufacturer's specifications to ensure ease of access and operator safety. 7.6. The correct procedure for dealing with spilt chemicals is demonstrated according to OHS requirements.

Variable	**Range**
Substrate	may include: • t-shirts, tote bags, binders, hats, boxes, CD-ROMs, DVDs.
Job specifications	may include: • Job sheets, work tickets or processing orders.
Equipment	may include: • Up to six colours, with exposure unit, curing unit, screen alignment system and conveyor drying system.
Drying**/**curing unit	may include manual/semi m automatic drying systems commonly used in specific industry sections.
Appropriate approval	may include enterprise or client approval from supervising personnel.
Workplace documentation	may include: • Enterprise procedural documents.

Evidence Guide	
Critical Aspects of Competence	Assessment requires evidence that the candidate: • set up screen printing machinery and produce a print on a range of common substrates using automatic equipment according to job specifications • complete TWO different jobs on an automatic machine according to manufacturer's and job specifications, enterprise procedures and the listed Performance Criteria • evidence for assessment may be gathered from assessment of the unit of competency alone or through an integrated assessment activity

Underpinning Knowledge and Attitudes	Demonstrates knowledge of - • process of recording and reporting any substrate irregularities • checks for ink compatibility • criteria used to check the stencil compatibility • limitations that you have when setting the substrate position • precautions that need to be undertaken when applying ink to the screen • products and materials that are used to keep the equipment clean • OHS concerns that are there when producing an automated print run • quality control devices that are used to check the print standards • variables/tolerances that you need to be aware of when checking the print to the proof • relationship between ink film thickness and ink density • maximum and minimum ink densities permissible • properties that determine belt speed • properties that determine heat unit setting for curing • responsibility for the final approval before commencing the production run • quality inspection that occurs during printing • frequency of inspections for quality • ink monitoring during the print run • purpose of workplace documentations • OHS concerns that are there in relationship to monitoring drying/curing systems • maintenance that should be carried out on this machine • expected result of not reporting faulty equipment • result of stacking while the ink film is still wet • advantages of labelling prior to removal • Result of not taking action if problems occur with the progress of the job? • advantages that result from proper labelling and storage of excess inks and materials • OHS practices that must be adhered to when reclaiming screens • result of not keeping screens and squeegees clean • result of not following correct procedures when disposing of liquid waste • result of not keeping equipment and surrounding areas clean • storage of screens so as to minimise damage • location of documentation dealing with spilt chemicals
Underpinning Skills	Demonstrates skills in: • OHS in relation to operating machinery such as safely switching off machinery before cleaning is started • communication of ideas and information by seeking appropriate approval to commence production • collecting, analysing and organising information by checking technical aspects of the proof print

	• planning and organising activities by organising materials and equipment in the correct order for the print run • teamwork when maintaining the production process in association with others • mathematical ideas and techniques by making adjustments according to product and machine specifications • problem-solving skills by monitoring and responding to the effect of ink alterations • use of technology by operating automatic screen printing machines
Resources Implication	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.
Methods of Assessment	Competence may be assessed through: • Interview / Written Test • Observation / Demonstration with Oral Questioning
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

Occupational Standard: Printing and Graphic Arts Operation Level III	
Unit Title	**Apply Quick Changeover Procedures**
Unit Code	**IND PGA3 22 0613**
Unit Descriptor	This unit describes the performance outcomes, skills and knowledge required to carry out quick operational changeovers.

Element	Performance Criteria
1. Prepare for changeover	1.1. Timing of ***changeover*** is determined according to production schedule. 1.2. All required tools/parts/materials are obtained for changeover. 1.3. Process and tools/parts/materials are organised ready for changeover. 1.4. Liaison with relevant people is conducted for quick changeover.
2. Make quick changeover	2.1. Quick changeover is planned according to quick changeover principles. 2.2. Changeover is completed according to enterprise ***procedures***. 2.3. Output is checked to meet specifications. 2.4. Any steps which cause a problem are noted and changes recommended to problematic steps.
3. Improve OHS	3.1. Hazards in all steps/actions are identified. 3.2. Risks from each hazard are determined. 3.3. Actions which may be performed in a more ergonomic manner are identified. 3.4. Changes are recommended to improve OHS.

Variable	Range
Changeover	may include: • An exchange of dies/tools (traditional) or a change between batches, or it may be any quantum equipment/process change to produce a different product e.g. plate changeover, stock change producing only the one product or simultaneous range of products. This is not applicable to a maintenance/PVI shutdown as experienced by continuous process manufacturers.
Procedures	may include: • procedures includes all work instructions, standard operating procedures, formulas/recipes, batch sheets, temporary instructions and similar instructions provided for the smooth running of the plant. They may be written, oral, computer-based or in some other form.

Evidence Guide	
Critical Aspects of Competence	Assessment requires evidence that the candidate: • routine positive participation in quick changeover procedures • Assessment will need to occur in an organization using quick changeover or a suitable simulation in say a workshop.
Underpinning Knowledge and Attitudes	Demonstrates knowledge of - • principles of quick changeover • relevant procedures • purposes/requirements of changeover • methods of recommending changes • quality requirements for products • minimization of changeover scrap
Underpinning Skills	Demonstrates skills in: • OHS in relation to operating machinery such as safely switching off machinery before cleaning is started • communication of ideas and information by liaising with relevant staff to facilitate changeover • collecting, analysing and organising information by determining when changeover will be required according to production schedule • planning and organising activities by planning a quick changeover according to quick changeover principles • teamwork when working with others to affect a quick changeover • mathematical ideas and techniques by checking output to ensure that it meets specifications • problem-solving skills by identifying actions which may be performed in a more ergonomic manner • use of technology by using required tools/parts/materials for changeover
Resources Implication	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.
Methods of Assessment	Competence may be assessed through: • Interview / Written Test • Observation / Demonstration with Oral Questioning
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

Occupational Standard: Printing and Graphic Arts Operation Level III	
Unit Title	**Operate and Maintain Computer Resources**
Unit Code	**IND PGA3 23 0613**
Unit Descriptor	This unit describes the performance outcomes, skills and knowledge required to undertake basic computing skills including routine personal computer maintenance, upgrades, restorations, data storage, conversion and transmission.

Element	Performance Criteria
1. Perform routine system maintenance	1.1. Required equipment is checked to be in working order and available for use. 1.2. Peripherals are fitted, maintained, cleaned and adjusted as required. 1.3. Personal computer furniture and fittings are adjusted according to OHS practices and protection of equipment. 1.4. Routine system maintenance and security processes are performed. 1.5. Correct functioning of automated processes is monitored. 1.6. Monitors are adjusted only when being calibrated and are otherwise left alone. 1.7. All abnormalities and system malfunctions are reported. 1.8. Off-line maintenance records are kept up to date.
2. Perform backups and restorations on a personal computer	2.1. File system backups are performed regularly according to established workplace practices. 2.2. Backup media are labelled, stored and rotated according to established workplace practices. 2.3. Files are restored from backup as required. 2.4. Data is recovered from damaged and corrupted files using small office tools. 2.5. Adequate written records of backups are kept.
3. Store and supply consumables	3.1. Consumables are stored and disposed of with regard to OHS, care of equipment and system security. 3.2. Stock levels and user needs are monitored to ensure required consumables are available.
4. Upgrade and configure a personal computer	4.1. Software and peripherals are installed, upgraded and configured according to enterprise policy. 4.2. New software, upgrades and adjustments are tested to ensure adequate performance. 4.3. Associated a personal computer furniture and fittings are adjusted to meet workplace standards for OHS and care of equipment. 4.4. Written records of ***installations***, upgrades and configurations are maintained.

5. Access documentation, records and updates	5.1. Documentation, including hardware and software manuals and equipment inventory and service records, is stored and accessed appropriately. 5.2. Supplementary product information, updates and technical reference material are accessed using the Internet, journals and other sources.
6. Access and deliver data	6.1. Removable storage devices are connected, disconnected and configured as required. 6.2. Data is accessed from different types of file ***systems***. 6.3. Data is stored and converted to suit a variety of operating systems, environments and applications. 6.4. ***Data is transmitted*** effectively by the method most appropriate to the task.

Variable	**Range**
installations	may include: • Peripherals and software with pre-configured installation routines.
systems	may include: • Multi-user and or network computer systems used in the printing industry including publishing, consultancy, advertising or packaging.
Data is transmitted	may include: • Methods may include ISDN, removable devices, the Internet.

Evidence Guide	
Critical Aspects of Competence	Assessment requires evidence that the candidate to: • Correctly operating and maintaining computer resources. The underlying skill of system maintenance should be transferable across the design and pre-press sectors • demonstrate an ability to find and use information relevant to the task from a variety of information sources • produce log books and written records showing system maintenance and configuration history over a period of THREE months, including all reported abnormalities and how they were addressed, stock records • perform a routine system backup and restore a nominated file from an earlier backup • convert a document from one common file format to another and make available for access on a different platform (e.g. Macintosh application to MS-Windows application via suitably encoded Internet email attachment) • research and report the availability of upgrades and support for TWO pieces of hardware and TWO pieces of software currently in use • Evidence for assessment may be gathered from assessment of the unit of competency alone or through an integrated assessment activity.

Underpinning Knowledge and Attitudes	Demonstrates knowledge of: • OHS requirements for terminal operators • positioning the keyboard, mouse and screen to avoid fatigue • foot rest provision • computing technology • relationships between baud rate, bits per second and bandwidth • MIPPS • function of the video card • check performed before commencement of a software installation or upgrade • security and storage of data • Risks that might exist for the system, the enterprise and the user if the user precedes to installs their own software to use during their lunch break. Assuming the software is scanned for viruses • strengths and weaknesses of backup and restoration procedures currently used • reasons hand-written records are kept • alerts to, and response to possible security breach or virus attack • environmental factors that could cause loss of data from removable media • file preparation, conversion and encoding including cross-platform considerations • retaining converted file fonts • differences in file naming conventions between IBM-PC, Macintosh and Unix • three encoding methods for Internet email transmission of files and state which platform each is used for • four common graphics file formats • choosing formats • correct use of network and telecommunications technologies • Macintosh communication with another computer without using AppleTalk • types of cabling and network cards that are installed and what is their effect on data transmission speed • transmitting data at 38400bps using a V34 modem • initiating a search for product information on the Internet • most efficient way to exchange files with clients or other companies • specific hardware, peripherals and consumables for the pre-press area • SCSI device and how the system refer to SCSI devices • configuration of a typical high performance pre-press computer • form of computer language that is used to drive an image setter • types of removable media commonly used in the pre-press area • pieces of hardware that require periodical cleaning • pre-press software • limiting factor with most DTP pre-press software • UNIX use in the pre-press production process

	• appropriate software required to: ➢ scan for a virus ➢ produce a logo ➢ manipulate an image ➢ set up a printer network ➢ create a page of text • manuals, safety and other documentation that are relevant to this task and where are they kept and information that is included in these documents • other sources of information that are available
Underpinning Skills	Demonstrates skills in: • OHS in relation to operating machinery such as safely switching off machinery before cleaning is started • communication of ideas and information by providing clear information about protocols and procedures to other system users • collecting, analysing and organising information by accessing user manuals and on-line resources and organising them for easy use • teamwork when liaising with other system users to ensure maintenance program causes minimum disruption to production • mathematical ideas and techniques by calculating file sizes and memory requirements • problem-solving skills by troubleshooting application problems and system faults • use of technology by using computer systems
Resources Implication	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.
Methods of Assessment	Competence may be assessed through: • Interview / Written Test • Observation / Demonstration with Oral Questioning
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

Occupational Standard: Printing and Graphic Arts Operation Level III	
Unit Title	**Monitor Implementation of Work Plan/Activities**
Unit Code	**IND PGA3 24 0613**
Unit Descriptor	This unit covers competence required to oversee and monitor the quality of work operations within an enterprise. This unit may be carried out by team leaders or supervisors.

Elements	Performance Criteria
1. Monitor and improve workplace operations	1.1 Efficiency and service levels are monitored on an ongoing basis. 1.2 Operations in the workplace support overall enterprise goals and quality assurance initiatives. 1.3 Quality ***problems*** and issues are promptly identified and adjustments are made accordingly. 1.4 Procedures and systems are changed in consultation with colleagues to improve efficiency and effectiveness. 1.5 Colleagues are consulted about ways to improve efficiency and service levels.
2. Plan and organise workflow	2.1 Current workload of colleagues is accurately assessed. 2.2 Work is scheduled in a manner which enhances efficiency and customer service quality. 2.3 Work is delegated to appropriate people in accordance with principles of delegation. 2.4 Workflow is assessed against agreed objectives and timelines and colleagues are assisted in prioritisation of workload. 2.5 Input is provided to appropriate management regarding staffing needs.
3. Maintain workplace records	3.1 ***Workplace records*** are accurately completed and submitted within required timeframes. 3.2 Where appropriate completion of records is delegated and monitored prior to submission.
4. Solve problems and make decisions	4.1 Workplace problems are promptly identified and considered from an operational and customer service perspective. 4.2 Short term action is initiated to resolve the immediate problem where appropriate. 4.3 Problems are analysed for any long term impact and potential solutions are assessed and actioned in consultation with relevant colleagues. 4.4 Where problem is raised by a team member, they are encouraged to participate in solving the problem. 4.5 Follow up action is taken to monitor the effectiveness of solutions in the workplace.

Variables	Range
Problems	May include but not limited to: • difficult customer service situations • equipment breakdown/technical failure • delays and time difficulties • competence
Workplace records	May include but is not limited to: • staff records and regular performance reports

Evidence Guide	
Critical Aspects of Competence	Assessment must confirm appropriate knowledge and skills to: • ability to effectively monitor and respond to a range of common operational and service issues in the workplace • understanding of the role of staff involved in workplace monitoring • knowledge of quality assurance, principles of workflow planning, delegation and problem solving
Underpinning Knowledge and Attitudes	Demonstrate knowledge of: • roles and responsibilities in monitoring work operations • overview of leadership and management responsibilities • principles of work planning and principles of delegation • typical work organization methods appropriate to the sector • quality assurance principles and time management • problem solving and decision making processes • industrial and/or legislative issues which affect short term work organization as appropriate to industry sector
Underpinning Skills	Demonstrate skills to: • monitoring and improving workplace operations • planning and organizing workflow • maintaining workplace records
Resource Implications	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.
Methods of Assessment	Competence may be assessed through: • Interview / Written Test • Observation / Demonstration with Oral Questioning
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

Occupational Standard: Printing and Graphic Arts Operation Level III	
Unit Title	**Apply Quality Control**
Unit Code	**IND PGA3 25 0613**
Unit Descriptor	This unit covers the knowledge, attitudes and skills required in applying quality control in the workplace.

Elements	Performance Criteria
1. Implement quality standards	1.1 Agreed quality standard and procedures are acquired and confirmed. 1.2 Standard procedures are introduced to organizational staff/personnel. 1.3 Quality standard and procedures documents are provided to employees in accordance with the organization policy. 1.4 Standard procedures are revised / updated when necessary.
2. Assess quality of service delivered	2.1 Services delivered are ***quality checked*** against organization ***quality standards*** and specifications. 2.2 Service delivered are evaluated using the appropriate evaluation ***quality parameters*** and in accordance with organization standards. 2.3 Causes of any identified faults are identified and corrective actions are taken in accordance with organization policies and procedures.
3. Record information	3.1 Basic information on the quality performance is recorded in accordance with organization procedures. 3.2 Records of work quality are maintained according to the requirements of the organization.
4. Study causes of quality deviations	4.1 Causes of deviations from final outputs or services are investigated and reported in accordance with organization procedures. 4.2 Suitable preventive action is recommended based on organization quality standards and identified causes of deviation from specified quality standards of final service or output.
5. Complete documentation	5.1 Information on quality and other indicators of service performance is recorded. 5.2 All service processes and outcomes are recorded.

Variable	Range
Quality check	• Check against design / specifications • Visual inspection and Physical inspection
Quality standards	• Materials • Components • Process and Procedures
Quality parameters	• Standard Design / Specifications • Material Specification

Evidence Guide	
Critical Aspects of Competence	Assessment requires evidence that the candidate to: • Check completed work continuously against organization standard • Identify and isolate faulty or poor service • Check service delivered against organization standards • Identify and apply corrective actions on the causes of identified faults or error • Record basic information regarding quality performance • Investigate causes of deviations of services against standard • Recommend suitable preventive actions
Underpinning Knowledge	Demonstrates knowledge of: • Relevant quality standards, policies and procedures • Characteristics of services • Safety environment aspects of service processes • Evaluation techniques and quality checking procedures • Workplace procedures and reporting procedures
Underpinning Skills	Demonstrates skills to: • interpret work instructions, specifications and standards appropriate to the required work or service • carry out relevant performance evaluation • maintain accurate work records • meet work specifications and requirements • communicate effectively within defined workplace procedures
Resource Implications	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.
Methods of Assessment	Competence may be assessed through: • Interview / Written Test • Observation / Demonstration with Oral Questioning
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

Occupational Standard: Printing and Graphic Arts Operation Level III	
Unit Title	**Lead Workplace Communication**
Unit Code	**IND PGA3 26 0613**
Unit Descriptor	This unit covers the knowledge, attitudes and skills needed to lead in the dissemination and discussion of information and issues in the workplace.

Elements	Performance Criteria
1. Communicate information about workplace processes	1.1 Appropriate ***communication method*** is selected. 1.2 Multiple operations involving several topics areas are communicated accordingly. 1.3 Questions are used to gain extra information. 1.4 Correct sources of information are identified. 1.5 Information is selected and organized correctly. 1.6 Verbal and written reporting is undertaken when required 1.7 Communication skills are maintained in all situations.
2. Lead workplace discussion	2.1 Response to workplace issues is sought. 2.2 Response to workplace issues are provided immediately. 2.3 Constructive contributions are made to workplace discussions on such issues as production, quality and safety. 2.4 Goals/objectives and action plan undertaken in the workplace are communicated.
3. Identify and communicate issues arising in the workplace	3.1 Issues and problems are identified as they arise. 3.2 Information regarding problems and issues are organized coherently to ensure clear and effective communication. 3.3 Dialogue is initiated with appropriate staff/personnel. 3.4 Communication problems and issues are raised as they arise.

Variable	Range
Methods of communication	• Non-verbal gestures • Verbal • Face to face • Two-way radio • Speaking to groups • Using telephone • Written • Using Internet • Cell phone

Evidence Guide	
Critical Aspects of Competence	Demonstrates skills and knowledge to: • Deal with a range of communication/information at one time • Make constructive contributions in workplace issues • Seek workplace issues effectively • Respond to workplace issues promptly • Present information clearly and effectively written form • Use appropriate sources of information • Ask appropriate questions • Provide accurate information
Underpinning Knowledge and Attitudes	Demonstrates knowledge of: • Organization requirements for written and electronic communication methods • Effective verbal communication methods
Underpinning Skills	Demonstrates skills to: • Organize information • Understand and convey intended meaning • Participate in variety of workplace discussions • Comply with organization requirements for the use of written and electronic communication methods
Resources Implication	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.
Methods of Assessment	Competence may be assessed through: • Interview / Written Test • Observation / Demonstration with Oral Questioning
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

Occupational Standard: Printing and Graphic Arts Operation Level III	
Unit Title	**Lead Small Teams**
Unit Code	**IND PGA3 27 0613**
Unit Descriptor	This unit covers the skills, knowledge and attitudes required to determine individual and team development needs and facilitate the development of the work group.

Elements	Performance Criteria
1. Provide team leadership	1.1 ***Learning and development needs*** are systematically identified and implemented in line with ***organizational requirements***. 1.2 Learning plan to meet individual and group training and developmental needs is collaboratively developed and implemented. 1.3 Individuals are encouraged to self-evaluate performance and identify areas for improvement. 1.4 ***Feedback on performance*** of team members is collected from relevant sources and compared with established team learning process.
2. Foster individual and organizational growth	2.1 Learning and development program goals and objectives are identified to match the specific knowledge and skills requirements of Competence standards. 2.2 ***Learning delivery methods*** are appropriate to the learning goals, the learning style of participants and availability of equipment and resources. 2.3 Workplace learning opportunities and coaching/ mentoring assistance are provided to facilitate individual and team achievement of competencies. 2.4 Resources and timelines required for learning activities are identified and approved in accordance with organizational requirements.
3. Monitor and evaluate workplace learning	3.1 Feedback from individuals or teams is used to identify and implement improvements in future learning arrangements. 3.2 Outcomes and performance of individuals/teams are assessed and recorded to determine the effectiveness of development programs and the extent of additional support. 3.3 Modifications to learning plans are negotiated to improve the efficiency and effectiveness of learning. 3.4 Records and reports of competence are maintained within organizational requirement.

4. Develop team commitment and cooperation	4.1 Open communication processes to obtain and share information is used by team. 4.2 Decisions are reached by the team in accordance with its agreed roles and responsibilities. 4.3 Mutual concern and camaraderie are developed in the team.
5. Facilitate accomplishment of organizational goals	5.1 Team members actively participated in team activities and communication processes. 5.2 Teams' members developed individual and joint responsibility for their actions. 5.3 Collaborative efforts are sustained to attain organizational goals.

Variable	**Range**
Learning and development needs	• Coaching, mentoring and/or supervision • Formal/informal learning program • Internal/external training provision • Work experience/exchange/opportunities • Personal study • Career planning/development • Performance appraisals • Workplace skills assessment • Recognition of prior learning
Organizational requirements	• Quality assurance and/or procedures manuals • Goals, objectives, plans, systems and processes • Legal and organizational policy/guidelines and requirements • Safety policies, procedures and programs • Confidentiality and security requirements • Business and performance plans • Ethical standards • Quality and continuous improvement processes and standards
Feedback on performance	• Formal/informal performance appraisals • Obtaining feedback from supervisors and colleagues • Obtaining feedback from clients • Personal and reflective behavior strategies • Routine and organizational methods for monitoring service delivery
Learning delivery methods	• On the job coaching or mentoring • Problem solving • Presentation/demonstration • Formal course participation • Work experience and Involvement in professional networks • Conference/seminar attendance and induction

Evidence Guide	
Critical Aspects of Competence	Assessment requires evidence that the candidate to: • identify and implement learning opportunities for others • give and receive feedback constructively

	• facilitate participation of individuals in the work of the team • negotiate learning plans to improve the effectiveness of learning • prepare learning plans to match skill needs • access and designate learning opportunities
Underpinning Knowledge and Attitude	Demonstrates knowledge of: • coaching and mentoring principles • how to work effectively with team members who have diverse work styles, aspirations, cultures and perspective • how to facilitate team development and improvement • methods and techniques for eliciting and interpreting feedback • methods for identifying and prioritizing personal development opportunities and options • career paths and competence standards in the industry
Underpinning Skills	Demonstrates skills to: • ability to read and understand a variety of texts, prepare general information and documents according to target audience; spell with accuracy; use grammar and punctuation effective relationships and conflict management • communication skills including receiving feedback and reporting, maintaining effective relationships and conflict management • planning skills to organize required resources and equipment to meet learning needs • coaching and mentoring skills to provide support to colleagues • reporting skills to organize information; assess information for relevance and accuracy; identify and elaborate on learning outcomes • facilitation skills to conduct small group training sessions • ability to relate to people from a range of social, cultural, physical and mental backgrounds
Resources Implication	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.
Methods of Assessment	Competence may be assessed through: • Interview / Written Test • Observation / Demonstration with Oral Questioning
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

Occupational Standard: Printing and Graphic Arts Operation Level III	
Unit Title	**Improve Business Practice**
Unit Code	**IND PGA3 28 0613**
Unit Descriptor	This unit covers the skills, knowledge and attitudes required in promoting, improving and growing business operations.

Elements	Performance Criteria
1. Diagnose the business	1.1 ***Data required*** for diagnosis is determined and acquired. 1.2 ***Competitive advantage*** of the business is determined from the data. 1.3 ***SWOT analysis*** of the data is undertaken.
2. Benchmark the business	2.1 Sources of relevant benchmarking data are identified. 2.2 ***Key indicators*** for benchmarking are selected in consultation with key stakeholders. 2.3 Like indicators of own practice are compared with benchmark indicators. 2.4 Areas for improvement are identified.
3. Develop plans to improve business performance	3.1 A consolidated list of required improvements is developed. 3.2 Cost-benefit ratios for required improvements are determined. 3.3 Work flow changes resulting from proposed improvements are determined. 3.4 Proposed improvements are ranked according to agreed criteria. 3.5 An action plan is developed and agreed to implement the top ranked improvements. 3.6 ***Organizational structures*** are checked to ensure they are suitable.
4. Develop marketing and promotional plans	4.1 The practice vision statement is reviewed. 4.2 Practice ***objectives*** are developed/reviewed. 4.3 Target markets are identified/refined. 4.4 ***Market research data*** is obtained. 4.5 ***Competitor analysis*** is obtained. 4.6 ***Market position*** is developed/reviewed. 4.7 ***Practice brand*** is developed. 4.8 ***Benefits*** of practice/practice products/services are identified. 4.9 ***Promotion tools*** are selected/developed.
5. Develop business growth plans	5.1 Plans are developed to increase ***yield per existing client***. 5.2 Plans are developed to add new clients. 5.3 Proposed plans are ranked according to agreed criteria.

	5.4 An action plan is developed and agreed to implement the top ranked plans. 5.5 Practice work practices are reviewed to ensure they support growth plans.
6. Implement and monitor plans	6.1 Implementation plan is developed in consultation with all relevant stakeholders. 6.2 Indicators of success of the plan are agreed. 6.3 Implementation is monitored against agreed indicators. 6.4 Implementation is adjusted as required.

Variable	**Range**
Data required includes:	• organization capability • appropriate business structure • level of client service which can be provided • internal policies, procedures and practices • staff levels, capabilities and structure • market, market definition • market changes/market segmentation • market consolidation/fragmentation • revenue • level of commercial activity • expected revenue levels, short and long term • revenue growth rate • break even data • pricing policy • revenue assumptions • business environment • economic conditions • social factors • demographic factors • technological impacts • political/legislative/regulative impacts • competitors, competitor pricing and response to pricing • competitor marketing/branding • competitor products
Competitive advantage includes:	• services/products • fees • location • timeframe
SWOT analysis includes:	• internal strengths such as staff capability, recognized • quality • internal weaknesses such as poor morale, • under-capitalization, poor technology • external opportunities such as changing market and

	• economic conditions • external threats such as industry fee structures, strategic • alliances, competitor marketing
Key indicators may include:	• salary cost and staffing • personnel productivity (particularly of principals) • profitability • fee structure • client base • size staff/principal • overhead/overhead control
Organizational structures include:	• Legal structure (partnership, Limited Liability Company, etc.) • organizational structure/hierarchy • reward schemes
Objectives should be 'SMART' , that:	• S: Specific • M: Measurable • A: Achievable • R: Realistic • T: Time defined
Market research data includes:	• data about existing clients • data about possible new clients • data from internal sources • data from external sources such as: ➢ trade associations/journals ➢ Yellow Pages small business surveys ➢ libraries ➢ Internet ➢ Chamber of Commerce ➢ client surveys ➢ industry reports ➢ secondary market research • primary market research such as: ➢ telephone surveys ➢ personal interviews and mail surveys
Competitor analysis	• competitor offerings • competitor promotion strategies and activities • competitor profile in the market place
Market position should include data on:	• product • the good or service provided • product mix • the core product - what is bought • the tangible product - what is perceived • the augmented product - total package of consumer • features/benefits • product differentiation from competitive products • new/changed products • Price and pricing strategies (cost plus, supply/demand, ability to pay, etc.)

	• Pricing objectives (profit, market penetration, etc.) • cost components • market position • distribution strategies • marketing channels • promotion • promotional strategies • target audience • communication and promotion budget
Practice brand may include:	• practice image • practice logo/letter head/signage • phone answering protocol • facility decor • slogans • templates for communication/invoicing • style guide • writing style • AIDA (Attention, Interest, Desire and Action)
Benefits	may include: • features and benefits as perceived by the client
Promotion tools	include: • networking and referrals • seminars • advertising • press releases • publicity and sponsorship • brochures • newsletters (print and/or electronic) • websites • direct mail • telemarketing/cold calling
Yield per existing client may be increased by:	• raising charge out rates/fees • packaging fees • reduce discounts • sell more services to existing clients

Evidence Guide	
Critical Aspects of Competence	The candidate must be able to demonstrate: • ability to identify the key indicators of business performance • ability to identify the key market data for the business • knowledge of a wide range of available information sources • ability to acquire information not readily available within a business • ability to analyze data and determine areas of improvement • ability to negotiate required improvements to ensure implementation • ability to evaluate systems against practice requirements and form recommendations and/or make recommendations • ability to assess the accuracy and relevance of information

Underpinning Knowledge and Attitudes	Demonstrates knowledge of: • data analysis • communication skills • computer skills to manipulate data and present information • negotiation skills • problem solving • planning skills • marketing principles • ability to acquire and interpret relevant data • current product and marketing mix • use of market intelligence • development and implementation strategies of promotion and growth plans
Underpinning Skills	Demonstrates skill in: • data analysis and manipulation • ability to acquire and interpret required data, current practice systems and structures and sources of relevant benchmarking data • applying methods of selecting relevant key benchmarking indicators • communication skills • working and consulting with others when developing plans for the business • planning skills, negotiation skills and problem solving • using computers to manipulate, present and distribute information
Resources Implication	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.
Methods of Assessment	Competence may be assessed through: • Interview / Written Test • Observation / Demonstration with Oral Questioning
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

Occupational Standard: Printing and Graphic Arts Operation Level III	
Unit Title	**Prevent and Eliminate MUDA**
Unit Code	**IND PGA3 29 0613**
Unit Descriptor	This unit of competence covers the knowledge, skills and attitude required by a worker to prevent and eliminate MUDA/wastes in his/her their workplace. It covers responsibility for the day-to-day operation of the work and ensures Kaizen elements are continuously improved and institutionalized.

Elements	Performance Criteria
1. Prepare for work.	1.1 Work instructions are used to determine job requirements, including method, material and equipment. 1.2 Job specifications are read and interpreted following working manual. 1.3 ***OHS requirements***, including dust and fume collection, breathing apparatus and eye and ear personal protection needs are observed throughout the work. 1.4 Appropriate material is selected for work. 1.5 ***Safety equipment and tools*** are identified and checked for safe and effective operation.
2. Identify MUDA.	2.1 Plan of MUDA identification is prepared and implemented. 2.2 Causes and effects of MUDA are discussed. 2.3 ***Tools and techniques*** are used to draw and analyze current situation of the work place. 2.4 Wastes/MUDA are identified and measured based on ***relevant procedures***. 2.5 Identified and measured wastes are reported to relevant personnel.
3. Eliminate wastes/MUDA.	3. 1. Plan of MUDA elimination is prepared and implemented. 3. 2. Necessary attitude and ***the ten basic principles for improvement*** are adopted to eliminate waste/MUDA. 3. 3. Tools and techniques are used to eliminate wastes/MUDA based on the procedures and OHS. 3. 4. Wastes/MUDA are reduced and eliminated in accordance with OHS and organizational requirements. 3. 5. Improvements gained by elimination of waste/MUDA are reported to relevant bodies.
4. Prevent occurrence of wastes/MUDA.	4.1 Plan of MUDA prevention is prepared and implemented. 4.2 Standards required for machines, operations, defining normal and abnormal conditions, clerical procedures and procurement are discussed and prepared.

	4.3 Occurrences of wastes/MUDA are prevented by using ***visual and auditory control methods***. 4.4 Waste-free workplace is created using ***5W and 1H***sheet. 4.5 The completion of required operation is done in accordance with standard procedures and practices. 4.6 The updating of standard procedures and practices is facilitated. 4.7 The capability of the work team that aligns with the requirements of the procedure is ensured.

Variable	**Range**
OHS requirements	May include but not limited to: • Are to be in accordance with legislation/ regulations/codes of practice and enterprise safety policies and procedures. This may include protective clothing and equipment, use of tooling and equipment, workplace environment and safety, handling of material, use of fire fighting equipment, enterprise first aid, hazard control and hazardous materials and substances. • Personal protective equipment is to include that prescribed under legislation/regulations/codes of practice and workplace policies and practices. • Safe operating procedures are to include, but are not limited to the conduct of operational risk assessment and treatments associated with workplace organization. • Emergency procedures related to this unit are to include but may not be limited to emergency shutdown and stopping of equipment, extinguishing fires, enterprise first aid requirements and site evacuation.
Safety equipment and tools	May include but not limited to: • dust masks / goggles • glove • working cloth • first aid • safety shoes
Tools and techniques	May include but not limited to: • Plant Layout • Process flow • Other Analysis tools • Do time study by work element • Measure Travel distance • Take a photo of workplace • Measure Total steps • Make list of items/products, who produces them and who uses them & those in warehouses, storages etc. • Focal points to Check and find out existing problems • 5S • Layout improvement

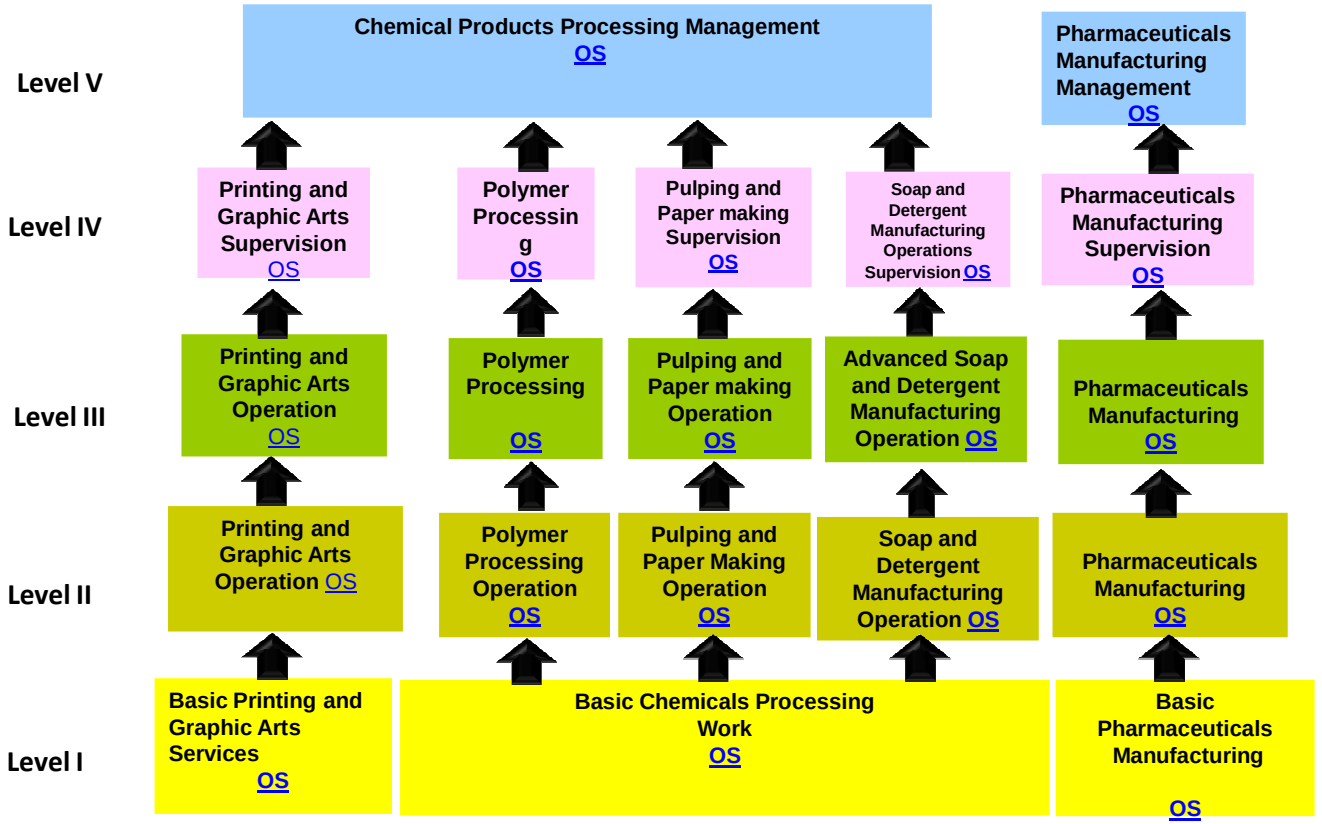
	• Brainstorming • Andon • U-line • In-lining • Unification • Multi-process handling & Multi-skilled operators • A.B. control (Two point control) • Cell production line • TPM (Total Productive Maintenance)
Relevant procedures	May include but not limited to: • Make waste visible • Be conscious of the waste • Be accountable for the waste and measure the waste.
The ten basic principles for improvement	May include but not limited to: • Throw out all of your fixed ideas about how to do things. • Think of how the new method will work- not how it won. • Don't accept excuses. Totally deny the status quo. • Don't seek perfection. A 5o percent implementation rate is fine as long as it's done on the spot. • Correct mistakes the moment they are found. • Don't spend a lot of money on improvements. • Problems give you a chance to use your brain. • Ask "why?" at least five times until you find the ultimate cause. • Ten people's ideas are better than one person's. • Improvement knows no limits.
Visual and auditory control methods	May include but not limited to: • Red Tagging • Sign boards • Outlining • Andons • Kanban, etc.
5W and 1H	May include but not limited to: • Who • What • Where • When • Why and How

Evidence Guide	
Critical Aspects of Competence	Demonstrates skills and knowledge to: • discuss why wastes occur in the workplace • discuss causes and effects of wastes/MUDA in the workplace • analyze the current situation of the workplace by using appropriate tools and techniques • identify, measure, eliminate and prevent occurrence of wastes by using appropriate tools and techniques • use 5W and 1H sheet to prevent

Underpinning Knowledge and Attitudes	Demonstrates knowledge of: • Targets of customers and manufacturer/service provider • Traditional and kaizen thinking of price setting • Kaizen thinking in relation to targets of manufacturer/service provider and customer • value • The three categories of operations • the 3“MU” • waste/MUDA • wastes occur in the workplace • The 7 types of MUDA • The Benefits of identifying and eliminating waste • Causes and effects of 7 MUDA • Procedures to identify MUDA • Necessary attitude and the ten basic principles for improvement • Procedures to eliminate MUDA • Prevention of wastes • Methods of waste prevention • Definition and purpose of standardization • Standards required for machines, operations, defining normal and abnormal conditions, clerical procedures and procurement • Methods of visual and auditory control • TPM concept and its pillars. • Relevant Occupational Health and Safety (OHS) and environment requirements • Plan and report • Method of communication
Underpinning Skills	Demonstrates skills to: • draw & analyze current situation of the work place • use measurement apparatus (stop watch, tape, etc.) • calculate volume and area • use and follow checklists to identify, measure and eliminate wastes/MUDA • identify and measure wastes/MUDA in accordance with OHS and procedures • use tools and techniques to eliminate wastes/MUDA in accordance with OHS procedure • apply 5W and 1H sheet • update and use standard procedures for completion of required operation • work with others • read and interpret documents • observe situations • solve problems • communicate • gather evidence by using different means • report activities and results using report formats

Resources Implication	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.
Methods of Assessment	Competence may be assessed through: • Interview / Written Test • Observation / Demonstration with Oral Questioning
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

Sector: Industry
Chemical Products Manufacturing



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This occupational standard was developed on May 2013 at Ethiopian Management Institute (EMI), Debre Zeyit.

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