

Specification of Competency Standards
for the Manufacturing Technology.
Unit of Competency.

Functional Area - Product Manufacturing

Title	Perform profile grinding operations and master machining data to improve quality and management of mould components
Code	106513L3
Range	This unit of competency is applicable to the product manufacturing departments / production departments of companies engaged in the tooling industries. Practitioners should be capable to understand the principles of profile grinding, and are able to operate CNC surface grinders and optical projection grinders. They can also dressing grinding wheels for profile grinding operations to meet precision requirements for mould components
Level	3
Credit	4
Competency	Performance Requirements - Understand relevant knowledge of surface grinding processes - Understand types, structures, and specifications of fixtures used in surface grinding machines, include magnetic chucks, universal vises, and punch formers - Understand principles, purposes, and methods of wheel dressing - Understand application of dressing tools to reshape grinding wheels for profile grinding operations - Understand methods for inspecting and measuring the profile of grinding wheels, and techniques for maintaining or repairing the profile - Understand types and applications of grinding coolant - Understand characteristics of grinding wheels, include abrasive type, grit size, bond type, hardness, structure, shape, and wheel balance, as well as the meaning of their specifications - Understand speed limitations of grinding wheels and calculation methods for maximum rotational speed - Understand principles of grinding-induced internal stress and methods to prevent it - Understand principles of magnetic attraction and demagnetisation - Understand principles of thermal expansion and contraction, and their impact on grinding accuracy - Understand basic principles of optical projection - Understand the structure, function, characteristics, and precision of optical projection grinders - Understand structure and precision of CNC surface grinders - Understand parameters of CNC optical grinding, include grinding speed, feed rate, and their setting and optimisation methods - Understand common abnormal conditions and causes during profile grinding using surface grinders and optical projection grinders, as well as problem-solving methods - Understand intelligent solutions applicable to CNC surface grinders, include data acquisition, data enterprise, and preventive maintenance - Perform surface grinding operations - Able to use various fixtures to correctly secure ferrous and non-ferrous workpieces of different shapes - Able to dress the front and side surfaces of grinding wheels according to engineering drawings, include angles, arcs, and profiles

	• Able to set appropriate operating conditions under guidance, to reduce wear and minimise risk during profile grinding • Able to perform complex profile grinding after wheel dressing on surface grinders, include angular grinding, chamfer grinding, V-shaped groove grinding, thin plate grinding, dovetail groove grinding, tool grinding • Able to operate optical projection grinders to perform profile grinding operations, include punches for metal stamping dies • Able to adjust relevant parameters of optical projection grinders under guidance • Able to write CNC programs for optical projection grinders and perform the grinding operations • Able to handle abnormal conditions related to profile grinding, grinders, and grinding wheels under guidance • Able to process and organise data collected from CNC surface grinders, to evaluate profile grinding quality and equipment performance, and adjust production parameters in real-time to optimise production, according to departmental requirements • Able to retrieve production data from machine PLCs or external sensors 3. Professional handling of profile grinding • Able to follow safety guidelines for profile grinding operations, include grinding wheel handling, inspection, and maintenance, and comply with design drawings, specifications, and production efficiency requirements
Assessment Criteria	The integrated outcome requirements of this unit of competency are: • Able to perform profile grinding operations using surface grinders and CNC optical projection grinders • Able to program CNC profile grinding operations • Able to handle abnormal conditions in profile grinding under guidance
Remark	This is the updated version of UoC 106513L4 Individuals who possess the above knowledge and competency are also required to possess the knowledge and competency of “ Perform surface grinding and master various processing data to improve quality of mould components (106406L2)”