

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

Functional Area - Product Manufacturing

Title	Apply Industry 4.0 implementation tools, including hardware and software, to collect and utilise data across different operational areas of enterprise
Code	111574L4
Range	This unit of competency is applicable to the product manufacturing departments / production departments of companies engaged in the metal die casting, casting and extrusion industries. Practitioners should be capable to utilise appropriate technologies based on the status of metal die casting, casting, and extrusion processing equipment to enable interoperability among various systems, thereby promoting real-time monitoring
Level	4
Credit	6
Competency	Performance Requirements - Understand relevant knowledge of metal die casting, casting and extrusion equipment and their configuration digitalisation - Understand basic concepts and technologies of smart manufacturing and Industry 4.0, and be familiar with operation principles of intelligent processing equipment and systems - Understand process parameters in metal die casting, casting and extrusion production that affect product quality and efficiency (e.g., casting speed, holding pressure time, casting temperature), and identify the data to be collected - Understand methods and techniques for collecting production data in metal die casting, casting and extrusion, including sensors, barcodes, and radio frequency identification systems (RFID) - Understand methods and techniques for connecting metal die casting, casting and extrusion equipment and related configurations to a network, as well as the advantages and disadvantages of different technical solutions in the market - Understand logic of data acquisition and system integration - Understand equipment communication protocols and interface standards - Understand application of automation, machine vision, Internet of Things (IoT), big data, and other technologies in intelligent metal die casting, casting and extrusion equipment - Apply digitalisation of metal die casting, casting and extrusion equipment and related configurations - Able to be familiar with principles of automation and intelligent technologies in metal die casting, casting and extrusion equipment, including the application of PLC control systems, sensors, actuators, machine vision, IoT, and big data in intelligent metal processing equipment - Able to master data analysis and statistical methods, and to use data analysis tools and software to analyse and mine equipment data to support and advise decision-making - Able to filter and collect useful data generated in the metal die casting, casting and extrusion production process, and perform analysis - Able to understand the data interaction and collaboration mechanisms between equipment, enabling visualisation of the usage rate, production efficiency, and fault alerts of metal die casting, casting and extrusion equipment and related configurations - Able to plan and integrate existing systems in the enterprise (including MES, ERP, QMS, WMS, etc.) to achieve a single source of data

	• Able to utilise different technologies (including cloud computing, IoT, big data, etc.) to interconnect metal die casting, casting and extrusion workshop equipment and related configurations, and to provide centralised real-time monitoring status (including capacity, defect rate, equipment utilisation, etc.) according to the needs of the production department, while optimising production process parameter controls 3. Professional handling of the digitalisation of metal die casting, casting and extrusion equipment and related configurations • Able to perform digitalisation of metal die casting, casting and extrusion equipment and related configurations based on existing information, balancing and meeting various requirements, including safety, risk, capacity, quality, environmental protection, and cost
Assessment Criteria	The integrated outcome requirements of this unit of competency are: • Able to utilise different technologies (including cloud computing, IoT, big data, etc.) to provide real-time visualisation of the production status in metal die casting, casting and extrusion workshops through the digitalisation of equipment and related configurations • Able to respond to the enterprise's intelligent production needs by conducting preliminary analysis and integration of information to assist in achieving intelligent production
Remark	Individuals who possess the above knowledge and competency are also required to possess the knowledge and competency of “Understand various requirements of physical and electronic drawings, and be familiar with metal product manufacturing processes to effectively communicate with internal staff and customers regarding metal products and processes (106491L3)” Individuals who possess the above knowledge and competency are able to support the enterprise to achieve the Industry 4.0 digital maturity level of visualisation (1i)