

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

Functional Area - Process Design and Development

Title	Develop and formulate intelligent processing and testing procedures, methods, and equipment for metal die casting, casting and extrusion products, and upgrade them to machine networking and data-driven operation
Code	111564L5
Range	This unit of competency is applicable to the process design and development departments / engineering departments of companies engaged in the metal die casting, casting and extrusion industries. Practitioners should be capable to review existing metal die casting, extrusion, and foundry product processing flows, develop suitable automated equipment, and upgrade to machine networking
Level	5
Credit	6
Competency	Performance Requirements - Understand relevant knowledge of various automated processing methods and equipment, and upgrade to relevant knowledge of machine networking and information technology - Understand basic concepts and technologies of smart manufacturing and Industry 4.0 and be familiar with the operating principles of intelligent processing equipment and systems - Understand application of technologies such as automation, machine vision, IoT, and big data in the fields of metal die casting, extrusion, and casting - Understand hardware requirements for upgrading from information silos to machine networking - Be familiar with properties, processing technology, and forming methods of metal die casting, casting and extrusion materials; understand the design and production process of metal die casting, casting and extrusion products - Understand types, specifications, and applications of commonly used sensors, programmable logic controllers (PLCs), and systems - Understand types, specifications, and applications of various peripheral equipment for automated processing and handling of die-casting, extrusion, and casting of metal products, including transfer robots, multi-axis robots, and conveyor belts, and understand the methods for data acquisition from these automated machines - Understand types, specifications, functions, and applications of automated testing equipment for various metal die-casting, extrusion, and casting products, including stacked parts detectors, high-speed optical camera measuring instruments, and integrated measuring instruments, and understand data acquisition methods - Develop and formulate automated processing procedures, methods, and equipment, and upgrade to machine networking - Able to base on new metal die casting, casting and extrusion products R&D design schemes, to determine the production process flow of new metal die casting, casting and extrusion products - Able to evaluate the effectiveness of automation, intelligentisation, and machine networking in metal die casting, casting and extrusion product development and improve continuously - Able to design new manufacturing processes and tooling for metal die casting, casting and extrusion products; ensure defect-free processes and equipment; and minimise the probability of failure

	• Able to monitor the trial production and testing processes of new metal die-casting, extrusion, and casting products to ensure product quality, and ensure the development of automated, intelligent processes and machine networking does not lead to product defects • Able to understand the application of automation and robotics in metal die casting, casting and extrusion processes; able to evaluate and select suitable automated equipment, intelligent equipment, and robotic systems to achieve intelligent and automated production lines • Able to interconnect different automated production lines within factories, combining and integrating existing data sources with workshop sensors to provide comprehensive information and achieve visualisation • Able to draw layout diagrams and process flow charts for machine networking and specify technical specifications 3. Professional handling of developing and formulating automated processes and equipment for various metal die casting, casting and extrusion products, and upgrade them to machine networking • Able to possess theoretical knowledge and practical experience related to metal die casting, casting and extrusion processes • Able to apply advanced and specialised technologies such as automation, machine vision, IoT, and big data in the intelligent die casting, casting and extrusion processing, and achieve high degree of production line informatisation • Able to arrange and configure production lines and equipment, and upgrade to machine networking
Assessment Criteria	The integrated outcome requirements of this unit of competency are: • Able to develop and formulate automated processing procedures, methods, and required equipment for die casting, casting and extrusion of metal products, and upgrade them to machine networking • Able to develop and formulate layout diagrams and process flow charts for machine networking and specify technical specifications
Remark	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 (0i) and CPPS