

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

Functional Area - Product Manufacturing

Title	Implement digitalisation of surface treatment processing equipment and related configurations, and provide real-time visualisation dashboards for production status in surface treatment processing workshops
Code	111576L4
Range	This unit of competency is applicable to the product manufacturing departments / production departments of companies engaged in the surface treatment industries. Practitioners should be capable to utilise appropriate technologies based on the status of surface treatment processing equipment to enable interoperability among various systems, thereby promoting real-time monitoring
Level	4
Credit	6
Competency	Performance Requirements - Understand relevant knowledge of surface treatment processing equipment and configuration digitalisation - Understand basic concepts and technologies of smart manufacturing and Industry 4.0, and be familiar with the operation principles of intelligent processing equipment and systems - Understand process parameters in surface treatment processing that affect product quality and efficiency (e.g., injection speed, pressure, material temperature, etc.), and identify the data to be collected - Understand methods and techniques for collecting production data in surface treatment processing, including sensors, barcodes, and radio frequency identification systems (RFID) - Understand methods and techniques for connecting surface treatment processing 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 surface treatment processing equipment - Apply digitalisation of surface treatment processing equipment and related configurations - Able to be familiar with principles of automation and intelligent technologies in surface treatment processing equipment, including the application of PLC control systems, sensors, actuators, machine vision, IoT, and big data in intelligent surface treatment equipment - Able to master data analysis and statistical methods, and to utilise 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 surface treatment processing production process, and perform analysis - Able to implement data interaction and collaboration between equipment, enabling visualisation of the usage rate, production efficiency, and fault alerts of surface treatment processing equipment and related configurations - Able to plan the existing systems in the enterprise (including MES, ERP, QMS, WMS, etc.), and integrate them to achieve a single data source

	• Able to utilise different technologies (including cloud computing, IoT, big data, etc.) to interconnect workshop equipment and related configurations for surface treatment processing, and to provide centralised real-time monitoring status (including capacity, defect rate, and equipment utilisation, etc.) according to the needs of the production department, while optimising production process parameter controls 3. Professional handling of the digitalisation of surface treatment processing equipment and related configurations • Able to perform digitalisation of surface treatment processing equipment and related configurations based on existing information • Able to balance and meet 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 surface treatment processing workshops through the digitalisation of equipment and related configurations • Able to respond to 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)