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

Functional Area - Product Manufacturing

Title	Intermediate computer numerical control (CNC) precision milling
Code	106509L4
Range	This unit of competency is applicable to the production department of the corporation of tooling manufacturing industry. Practitioners should be capable to understand intermediate computer numerical control (CNC) precision milling and cutting and operate CNC milling machines and carry out intermediate precision milling
Level	4
Credit	6 （For Reference Only）
Competency	Performance Requirements 1. Understand the techniques and technologies of intermediate computer numerical control (CNC) precision milling and cutting • Understand the computer-aided manufacturing software of milling (CAM), including the 3D model programming and the application of output and input interface system • Understand the methods of intermediate programming of CNC milling machines, including 2.5D and 3D contour arc and other fixed program, recycling program and subroutine milling programming • Understand the influence of all CNC milling parameters on the milling effect and finished goods • Understand the characteristics and using methods of all kinds of Tool Setter • Understand the characteristics and connecting methods of Direct Numerical Control • Understand the setting and optimization methods of parameters, such as the Cutting Speed and Feed Rate, and the tool path programming tips of high speed milling • Understand the using methods of all kinds of fixtures and safety precautions of CNC milling, such as collets • Understand the types and applications of intermediate standard fixtures • Understand the functions of all kinds of cutting fluid, applications of 3D and high speed milling and the treatment methods of metal scrap • Understand the relationship between the different processing parameters and tool life • Understand the calibration and precision correction of CNC milling machines 2. Carry out intermediate computer numerical control (CNC) precision milling and cutting • According to the requirements of finished goods, operate CNC milling manufacturing software (such as 3D CAM) to compile 2.5D and 3D software program • Apply all kinds of measuring instruments to Initially measure the finished goods • According to engineering design requirements, set the appropriate parameters, such as cutting speed, cutting depth and feed rate • Design and manufacture specific fixture in accordance with different requirements • Calculate the appropriate processing parameters, including intermediate and cutting speed, so as to optimise the milling efficiency • Carry out Direct Numerical Control (DNC) in appropriate timing • Set and use the automatic tool path correction of Tool Setter • Manage the tool of CNC milling machine, set and amend the information of tool life • Use special fixtures to fix the sheet workpiece and complex shape of workpiece, and carry out calibration • According to engineering design requirements, carry out CNC milling including Face Milling, Side Milling, Angular Milling, Step Milling, Groove Milling, Dovetail Milling, T-shaped Groove Milling, 2.5D and 3D Form Milling • Carry out precision Boring, Reaming and High-speed Machining processing

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	• Measure the positioning precision, analyse the causes of processing error, and enter the appropriate compensation value to enhance the precision 3. Professional handling of intermediate computer numerical control (CNC) precision milling and cutting • Follow safety guidelines of CNC precision milling and cutting (such as handle metal scrap produced in the milling process) and related Code, and in accordance with design drawings, specifications and production efficiency requirements, carry out CNC precision milling and cutting
Assessment Criteria	The integrated outcome requirements of this unit of competency are: • Capable to compile complex 2.5D and 3D and high-speed CNC milling machine milling program, and carry out the complex finished goods and high-speed CNC milling processing • Capable to carry out precision milling processing of complex parts and finished goods, and coordinate with the appropriate parameters to extend the tool life • Capable to test the positioning precision, make use of appropriate compensation value to enhance the precision
Remark	Person who has the above knowledge and ability should also obtain the knowledge and ability of Fuondation computer numerical control/ (CNC) milling and cutting (106402L3) at the same time.