CNC Milling

Section one
Moving from Competence to Excellence

A closer look at two key aspects of the CNC Milling World Occupational Standard.

The WorldSkills Occupational Standard (WSOS) specifies the knowledge, understanding, and specific skills that underpin international best practice in technical and vocational performance. It should reflect a shared global understanding of what the associated work role(s) or occupation(s) represent for industry and business.

Aspect:	Total number of Marks (%)
A: Programming	20
B: Machining	20

A: Programming

What does competence look like in this area?

- Able to use CAD/CAM software to create simple part programs

- Being able to produce a process plan of what the program needs to achieve

- Able to select appropriate toolpath strategies depending on the part specification

- Use 3D models supplied to create appropriate toolpaths

- Post process CAM data to create CNC part programs

What does excellence look like in this area?

- Understand how CAD/CAM software can be optimised to enable part programs to be created in the most efficient way (Hotkeys, tool libraries, view sheets etc)

- Optimise and adapt toolpath strategies and parameters to increase the efficiency of the part program

- Able to create geometry in wireframe, surfaces and solids

- Interpret 2D drawings and create 3D models in CAD/CAM

B: Machining

What does competence look like in this area

- Understand the safe working practices to be followed when operating a CNC machine
- Understand the machine's operating system to change between programming, editing, automatic and manual modes.
- Able to set a workpiece datum using a known method
- Measure cutting tool lengths and input into the machine
- Understand the importance of machine controls such as single block, feed override and spindle override
- Able to safely prove out new CNC part programs

What does excellence look like in this area?

- Align work holding to ensure accuracy
- Able to use multiple methods to set Workpiece datums
- Able to set tool length offsets using manual and automated methods, including using external preset machines
- Able to interpret inspection data and adjust workpiece datums accordingly to ensure accuracy
- Know how to adjust tool wear offset data to improve accuracy
- Know how to optimise the machining strategy to reduce vibration and improve accuracy
- Set and run parts with multiple sides machined
- Know how to check and calibrate machine spindle and tool probes to ensure accuracy.
- Able to build tool assemblies to ensure a high degree of accuracy