

## Produce tools for the jewellery and silversmithing industry

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### Overview

This standard covers the skills to produce tools for the jewellery and silversmithing industry using hand tools and machine techniques. You will make working drawings for production, calculate the requirements for a range of tools and produce components in different materials. You will use hand and mechanical processes to make tools.

During, and on completion of, the tool making operations individuals will be expected to check the quality and accuracy of their work using measuring equipment appropriate to the aspects being checked and the tolerances to be achieved. They need to be able to recognise any defects, determine the appropriate action to rectify them and ensure that the finished work meets the required specification.

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### Performance criteria

#### You must be able to:

1. make full working **drawings** for the production of tools in line with industry best practice
2. calculate the requirements for a range of tools and incorporate these into technical drawings in line with industry best practice
3. produce components using a range of **materials** in line with industry best practice
4. perform mechanical processes in line with project needs
5. produce components to specified **requirements** in line with project needs
6. check the work for defects in line with project needs
7. take action to rectify any defects detected in line with industry best practice
8. complete the work to the given specification in line with workplace instructions
9. maintain tools for future use in line with workplace instructions and manufacturers' guidelines

## Knowledge and understanding

### You need to know and understand:

1. safety precautions to be taken when using hand and machine tools
2. the importance of wearing protective clothing and equipment and of keeping the work area safe and tidy
3. how to start and stop the machines including emergency shutdown procedures
4. types of cutting tools to be used and the method of mounting and setting them
5. how to mount and secure the work holding devices to be used
6. how to position the cutting tools to the work piece datum
7. how to apply roughing and finishing cuts and methods of avoiding or dealing with distortion and/or material stress relief
8. effects of backlash in machine slides and how to eliminate this
9. cutting speeds and feeds to be used and the depth of cut that can be applied
10. the need for, and use of, cutting fluids and compounds
11. how to check finished work pieces for dimensional accuracy, squareness, angle and surface finish; the instruments/gauges that you are to use; and the typical accuracy that can be achieved
12. how to maintain tools and store them to ensure they are fit for future use
13. how to check that the tools meet the needs of the specification
14. best practice in tool making within chosen jewellery industry
15. the importance of following the given specification and timescales
16. common defects and how to rectify them

### Scope/range

1. Working **drawings** include:

1. CAD drawings
2. hand drawings

2. Component **materials** include:

1. ferrous
2. non-ferrous
3. non-metallic

3. Component **requirements** include:

1. turning – (dimensions +/- 0.25mm) to include diameters, plain and stepped; faces and shoulders; drilled and reamed holes; chamfers and radii; knurls
2. milling – (dimensions +/- 0.25mm) to include faces (horizontal, parallel, vertical); slots (open ended and closed)
3. grinding – (dimensions +/- 0.05mm) to include flat or cylindrical surfaces; faces or shoulders

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