CCSJ43

Apply advanced metallurgy practices to jewellery or silversmithing work

Overview

This standard covers the skills to undertake advanced metallurgy practices in jewellery or silversmithing work. You will be expected to select and prepare the materials for your work and use advanced specialist techniques including annealing, pickling, quenching, hammering and de-oxidising.

You will work autonomously following designs and will be expected to take personal responsibility for your actions, the quality and accuracy of the work and rectifying any faults. The finished work will meet the required design specification.

Performance criteria

You must be able to:

1. conduct the annealing process on a range of materials in line with industry best practice
2. perform the quenching process in line with project needs
3. complete the pickling process in line with project needs
4. apply hammering to a range of materials in line with industry best practice
5. conduct rolling of a range of materials in line with industry best practice
6. complete fluxing and de-oxidising of a range of materials in line with industry best practice
7. test porosity in line with industry best practice
8. take preventative action against porosity in line with project needs
9. select components of precious metal alloys in line with project needs
10. perform soldering of a range of materials in line with industry best practice
11. deal with the problems associated with lost wax investment casting in line with project needs
12. mitigate against the metal porosity that can result from lost wax investment casting in line with project needs
13. check the work for defects in line with the needs of the project
14. take action to rectify any defects detected in line with workplace instructions
15. complete the work to the given specification in line with workplace instructions

Knowledge and understanding

You need to know and understand:

1. terminology used by the industry
2. physical and mechanical properties of a range of metals
3. differences in the mechanical properties of precious metals compared to their alloys
4. re-crystallization after melting and annealing
5. absorption and expulsion of gasses during the melting and annealing processes
6. causes of contamination when melting and annealing metal
7. expansion and contraction of metal during the annealing and quenching process
8. theories and practice of rolling, hammering, fluxing, soldering and polishing
9. theories and practice of carrying out pickling safely
10. causes and prevention of porosity particularly in lost wax investment casting
11. consequences of not initiating corrective action when porosity is identified
12. how precious metal alloys are stamped according to assay requirements
13. consequences of incorrect identification, calculation and stamping of precious metal alloys
14. best practice in advanced metallurgy within chosen jewellery industry
15. how to check that the advanced metallurgy practices meet the needs of the specification
16. the importance of following the given specification and timescales
17. common defects and ways to rectify these

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