

Jewellery, Silversmithing and Allied Trades Professional

Occupation summary

Set within an industry steeped in centuries of tradition, the jewellery, silversmithing and allied trades supports the pursuit of excellence in their traditional craft skills whilst also embracing innovation and technology. The jeweller, silversmith or allied trades professional is a fundamental occupational role in the wider sector that contributes approximately £2 billion to the British economy.

British made jewellery and silverware products have an international and iconic reputation and the continued success of the sector will depend on maintaining a skilled, well-trained workforce.

'Jewellery, Silversmith and Allied Trades Professional' is a broad description of someone who is engaged with the production of fine and detailed items that are made from precious metals and adorned with precious stones and other materials.

Jewellery and silverware items may be in the form of silverware as a centre piece for a board room table, jewellery such as wedding and engagement rings and individually made items produced by a specialist designer.

This standard reflects the 8 key functions that make up the wider jewellery manufacturing sector. This includes:

- Silversmiths – forming shapes and forms from silverware including dishes, cups, platters
- Casting – forming moulds and working with molten precious metals to form shapes such as pendants, drops and frameworks
- Stone setting – selecting and fixing stones into a form and ensuring they are secure
- Mounting – creating parts of jewellery to which precious stones are fitted
- Engraving – using tools to create patterns in flat and complex shapes including text, images and intricate patterns
- Enamelling – working with and applying enamel to create coloured patterns, images and finishes
- Polishing and finishing – applying different processes and materials to produce a polish and shine to an item or to highlight a special finish
- CAD/CAM processes – working with designers and makers to produce model forms for manufacturing jewellery or silverware items using highly automated processes

The standard reflects a range of different job functions (allied trades) each of which is associated with key functions and activities in the overall industry. Some items produced will require input from a range of individuals employed within one or more of the allied trades, others items will be completed wholly by one individual. Individuals working within the industry will initially focus on being employed in one of the optional pathways as described within this standard.

Smaller businesses may well focus on one of the optional pathways described and work with a wider supply chain providing business to business type services. Larger businesses employ a cross section of individuals across the different optional pathways, passing each item for manufacture from one specialist to another.

An employee in this occupation may work in a small enterprise producing or manufacturing specialist jewellery or silverware items or in a wider factory setting as part of a production or manufacturing team, incorporating allied trades, producing to larger orders. They will be able to work just as effectively on their own or as part of a wider team. In both instances they will understand the impact of their role on those working around them.

Regardless of which production processes the employers' use, jewellers, silversmiths or allied trades professionals will know and understand the end-to-end process of how the items are produced and the manufacturing processes required to produce a final product.

An employee in this occupation will be responsible for working efficiently and accurately to agreed product specifications and customer requirements, using both hand and machine skills, within agreed production deadlines and to the required quality standard. In their daily work they will report to line managers, supervisors and other highly experienced colleagues from a range of other associated trades. Typical working pattern is Monday to Friday.

Typical day-to-day duties may include:

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- Obtain and understand the requirements of a design
- Working with CAD designs
- Operating equipment to produce items using CAM machinery
- The cutting of metals to given shapes and designs
- Working with hand tools and machinery to derive a range of different finishes and patterns
- Production of items in wax for casting
- Casting items in precious metals
- Working with enamels to achieve required finishes
- Selecting and setting precious stones
- Polishing and finishing items
- Examine finished jewellery and/or silverware products for quality;
- Repair and/or rework jewellery and/or silverware items;

Typical job titles

Typical job titles include:

- Jeweller
- Silversmith
- Setter
- Polisher/finisher
- Engraver
- Enameller
- Mounter
- CAD/CAM operator

The core knowledge, skills and behaviours must be completed by ALL Jewellery, Silversmiths or Allied Trade apprentices, along with ONE of the eight specialist functions.

Core: All Jewellery, Silversmithing and Allied Trades Professional apprentices must have all of the following core skills, knowledge and behaviours

Duty	Criteria	Knowledge and Understanding (Know it)	Skills (Show it)
Work in accordance with health and safety legislation	Able to work in a safe manner	<ul style="list-style-type: none"> • Relevant H & S legislation related to their role and that of the wider workplace. • Gain knowledge of systems, processes and organisational procedures to ensure compliance with H & S and other relevant legislation. 	<ul style="list-style-type: none"> • Demonstrate the application of H & S, COSHH and other policies within the workplace. • Demonstrate an understanding of workplace hazards and other areas of legislative non-compliance and how these can be addressed.
Use hand tools and equipment effectively	Can work with tools effectively	<ul style="list-style-type: none"> • The purpose and use of different hand tools and equipment. • The maintenance of hand tools and equipment. • How to purchase hand tools and equipment. 	<ul style="list-style-type: none"> • Select and utilise tools and equipment to achieve the desired finish/outcome. • Maintain the effectiveness of hand tools and rectify any defects should these arise. • Purchase or order appropriate tools and equipment.
Use powered plant and equipment effectively	Can utilise powered tools safely and effectively	<ul style="list-style-type: none"> • The purpose and use of different powered plant and equipment. • The maintenance of powered plant and equipment. • How to purchase powered plant and equipment. 	<ul style="list-style-type: none"> • Select and utilise the correct powered plant or equipment for the task to achieve the desired finish/outcome. • Maintain the effectiveness of the powered plant and/or equipment; and rectify defects and damage. • Purchase or order appropriate tools and equipment.
Work with designs and specifications	Works with designs and specifications	<ul style="list-style-type: none"> • How to read working drawings and specifications, including industry standard 	<ul style="list-style-type: none"> • Accurately translate designs into physical items from working drawings to a specification.

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	effectively and can apply them	<p>descriptions and symbols used to describe processes and finishes</p> <ul style="list-style-type: none"> • How to measure, interpret size and scale. • How to communicate design requirements to colleagues and clients. • Understanding the limitations of different design approaches. 	<ul style="list-style-type: none"> • Identify the material required to produce an item based upon a given specification. • Communicate requirements of the design to colleagues using industry standard language. • Describe the limitations of different design approaches
Work with different materials	Able to work with the materials which are used within their specialism	<ul style="list-style-type: none"> • Understand the physical properties and limitations of different materials used and their relative financial value. • Understand alternatives that may be used/substituted. • The importance of reducing waste and the methods used for managing it. 	<ul style="list-style-type: none"> • Select the correct quantity of material for the task as specified within the design and specification. • Identify alternative materials that could be substituted. • Organise and implement the production process to minimise waste. • Demonstrate a wider understanding of waste management within the workplace.
Check and assess the quality of own work	Self assesses their own work and checks for accuracy	<ul style="list-style-type: none"> • Understand the importance of working to tolerances against the original design/specification. • Understand the importance of self reflection to assist with the development of skills. 	<ul style="list-style-type: none"> • Select and utilise tools to measure tolerances and accuracy throughout the production process. • Implement actions to improve the finish/accuracy of the item.
Communicate with colleagues and customers	Communicates in a professional manner with colleagues and customers	<ul style="list-style-type: none"> • Understand the industry specific terminology used to describe materials, processes and finishes. • Understands instructions. 	<ul style="list-style-type: none"> • Communicate with colleagues in a manner that is clear, indicates understanding of the desired outcome and which promotes teamwork.
Ensures the security of work and the workplace	Ensures the security of materials and the workplace	<ul style="list-style-type: none"> • Understand the organisational procedures which ensure the security of materials, work in progress, employees and the general public. 	<ul style="list-style-type: none"> • Acts in a way that promotes their own security and that of colleagues and the organisation.

Behaviours (Live it)

- Embrace and promote the values of the organisation
- Treat team, customers and other stakeholders with courtesy and respect
- Take ownership and responsibility for their role and working area, including other team members where appropriate
- Display loyalty, integrity and accountability to the organisation
- Commit to continuous development of self and team, including improvements to systems and processes

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Specialist: Jewellery, Silversmithing and Allied Trades Professionals must select from ONE of the following specialist functions

- Silversmithing
- Casting
- Stone setting
- Mounting
- Engraving
- Enamelling
- Polishing and finishing
- CAD/CAM processes

Specialist function 1: Silversmithing			
A silversmith is responsible for working with precious and non-precious metals to produce one off and batch produced items.			
Duty	Criteria	Knowledge and Understanding (Know it)	Skills (Show it)
Develop a plan of work	Organises their work to be efficient	<ul style="list-style-type: none"> • Understand how to interpret a design for an item of silverware or a related product. • Confirm specification, tolerances and finishes required. 	<ul style="list-style-type: none"> • Select the correct amount and specification of material required to produce the design.
Work in a safe manner	Uses tools and materials safely	<ul style="list-style-type: none"> • Understand the usage of protective equipment. • Be aware of the hazards that may be encountered when implementing silversmithing activities. 	<ul style="list-style-type: none"> • Select personal protective equipment. • Use equipment utilising the workshops best practice and relevant machine guards. • Handle chemicals safely when producing a 'pickle'.
Prepare materials	Selects and prepares materials for use	<ul style="list-style-type: none"> • Calculate and agree the materials required for the task. • Produce a cutting list. • Use appropriate tools and equipment to prepare the materials for the task. 	<ul style="list-style-type: none"> • Select the appropriate marking and measuring tools. • Calculate the amount of material required based upon the cutting list. • Apply the design to the material to guide the cutting process. • Utilise suitable cutting equipment.
Shaping & forming materials	Applies different techniques to form and shape silverware	<ul style="list-style-type: none"> • Understand the different shaping and forming techniques that may be utilised. • Understand the different tools and equipment that may be used for the task. • The process and purpose of annealing metal when shaping and forming materials. • The importance of removing of oxides, etc. from the item during processing. 	<ul style="list-style-type: none"> • Demonstrate the processes required to shape a piece of silverware from a given design, including the tools and equipment that would be required. • Demonstrate annealing process to shape and form metals. • Demonstrate an understanding of the use of pickle safely and oxide prevention techniques and materials. • Maintain an effective working environment.
Join Materials	Apply methods to create secure joins in silver	<ul style="list-style-type: none"> • Understand the different processes used to join items. • How the different properties of metals impact on the method used to join them. • Understand how to support and hold work during the joining process. 	<ul style="list-style-type: none"> • Demonstrate the use of suitable joining techniques in the successful completion of the task. • Demonstrate an understanding of different types of solder and related fluxes.

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		<ul style="list-style-type: none"> The importance of removing of oxides, etc. from the item during the joining process 	<ul style="list-style-type: none"> Demonstrate an understanding around the use of jigs, binding wire, "stiches" and other fixtures used when soldering. Demonstrate an understanding of the use of safety pickle and oxide prevention techniques and materials
Finish materials	Can produce a range of surface finishes	<ul style="list-style-type: none"> The different finishes that can be applied to silverware. Preparation of surfaces prior to polishing and finishing. The use of plating and patination. How different finishes can be achieved. The principle of part polishing when assembling an item. The importance of cleaning the item prior to and after polishing. 	<ul style="list-style-type: none"> Use abrasives, papers, powders and blocks to prepare items for polishing and finishing. Demonstrate a range of polishing and finishing techniques Use lathe, and/or other suitable equipment to polish work to the required standard. Post-process work to a commercial standard.

Specialist function 2: Casting			
A caster is responsible for working with a model to reproduce it in metal			
Duty	Criteria	Knowledge and Understanding (Know it)	Skills (Show it)
Work safely	Works with casting equipment safely	<ul style="list-style-type: none"> Have the right protective equipment. Be aware of the hazards that may be encountered when implementing casting activities. 	<ul style="list-style-type: none"> Select personal protective equipment Use equipment utilising the workshops best practice and relevant machine guards, extraction. Handle investment powders and chemicals safely.
Make and cut rubber moulds for production	Can produce high quality moulds	<ul style="list-style-type: none"> Understand the various moulding making materials used by the industry and their application. The limitations of different mould making materials, The mould making and cutting process related to each material. 	<ul style="list-style-type: none"> Demonstrate a range of relevant mould making skills to the required standard. Demonstrate relevant cutting techniques. Undertake quality control checks to ensure that the mould is free from defects.
Produce wax pattern	Can produce high quality wax patterns	<ul style="list-style-type: none"> Understand the types of wax pot that may be employed, both manual and automated. The working temperature and pressure of molten wax. The removal of wax patterns from moulds avoiding damage or deformation. Understand the identification and prevention of defects that could affect the viability of the wax pattern. 	<ul style="list-style-type: none"> Inject rubber mould with wax to a consistent standard. Demonstrate the successful removal of the wax pattern from mould. Undertake quality control checks to ensure that the wax pattern is free from defects. Maintain a clean and tidy work area.
Build a tree for casting	Can compile a tree suitable for casting	<ul style="list-style-type: none"> Understand the tools required to build wax trees. The basic principles of metal flow, solidification and spruing to achieve a successful cast. Identification of correct can size and wax centre sprue. 	<ul style="list-style-type: none"> Demonstrate successful spruing and create a functional wax tree ready for investing.

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		<ul style="list-style-type: none"> How wax patterns are attached to a wax centre sprue. 	
Invest and burnout moulds	Can invest mould and burnout	<ul style="list-style-type: none"> The stages of the investment process. Understand the different types of plant used in the investment and burnout process. The importance of the burnout cycle in successful investment. The operation of the furnace. Relevant H & S and good working practices when investing. 	<ul style="list-style-type: none"> Prepare machinery for the investment process. Undertake the investment process including mixing the investment material and investing the mould within its flask, invest mould Load, program and run the furnace for casting.
Cast material	Cast jewellery items	<ul style="list-style-type: none"> Understand the various casting processes and their appropriate application to different metals. The use and purpose of cloaking gases, over-pressure and vacuum when applied to casting processes. The temperature and casting cycles that should be applied. The processes needed to ensure that casts are fully formed and reach the quality required. Identifying common defects and their rectification. 	<ul style="list-style-type: none"> Demonstrate an understanding of the process for calculating the volume of metal required to successfully fill a given flask. Prepare metal and machinery for casting and cast metal into flasks.
Wash out and de-sprue cast items	Removes item from moulds	<ul style="list-style-type: none"> Understand the purpose of quenching. The cooling times required prior to quenching. The post-processing of flasks including the removal of investment by jet washing. The techniques and tools required to remove the finished castings from the central sprue or tree. 	<ul style="list-style-type: none"> Demonstrate the quenching of flasks and the removal of investment using appropriate equipment. Remove casting from trees using appropriate equipment.

Specialist function 3: Stone Setting			
A stone setter is responsible for working with a moulder to securely embed (set) the precious gems or diamonds in a piece of jewellery.			
Duty	Criteria	Knowledge and Understanding (Know it)	Skills (Show it)
Develop a plan for work	Organises their own work	<ul style="list-style-type: none"> Understand how to interpret a design for a piece of setting and/or confirm the desired outcome from the client/colleague. Confirm specification, tolerances and finishes required. Understand how the suitability of the proposed mount can be assessed. 	<ul style="list-style-type: none"> Demonstrated an understanding of working to a specification or instruction. Consider the order in which precious gems are set into a piece to achieve the optimal outcome. Assess the suitability of a mount for setting.
Work safely	Applies working practices in a safe manner	<ul style="list-style-type: none"> Have the right protective equipment. Be aware of the hazards that may be encountered when implementing setting activities. 	<ul style="list-style-type: none"> Select personal protective equipment. Use equipment utilising the workshop's best practice and relevant machine guards. Be aware of issues related to working with heated shellac.

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Use hand and machine tools and equipment effectively	Operates hand and machine tools confidently and effectively	<ul style="list-style-type: none"> • The purpose and use of different hand and machine tools and equipment including air tools. • How equipment should be maintained • How to purchase tools and equipment. 	<ul style="list-style-type: none"> • Select and utilise tools and equipment to achieve the desired finish/outcome. • Maintain the effectiveness of hand tools and rectify any defects should these arise.
Prepare different types of stone setting	Can produce a range of stone settings	<ul style="list-style-type: none"> • Understand the different types of stone setting used in the industry. • Understand the tools and techniques required to successfully complete the task including those used for marking out, the use of burrs, drills and frazes. 	<ul style="list-style-type: none"> • Select the correct setting technique. • Prepare the item for setting by marking out and/or opening out the item to be set to accommodate the precious gems.
Create bearers and/or grains	Can create bearers and grains	<ul style="list-style-type: none"> • Understand how to create bearers and grains using the appropriate tools including scorpers and gravers. 	<ul style="list-style-type: none"> • Demonstrate a range of techniques to create bearers or grains prior to setting the piece
Secure and remove stones	Able to secure and remove stones from jewellery items	<ul style="list-style-type: none"> • Understand the correct process for setting stones using pushers, burnishers, etc. • Understand the correct process for removing stones using the appropriate equipment. 	<ul style="list-style-type: none"> • Demonstrate a range of setting processes using the correct techniques. • Demonstrate the successful removal of precious gems using the correct techniques.
Finish settings	Check and finish the setting	<ul style="list-style-type: none"> • Understand the process for finishing items once these are set. • Understand the use of burnishers to deburr items post-setting. 	<ul style="list-style-type: none"> • Complete post-processing of set items to a standard that meets the requirement of the employer.

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Specialist function 4: Mounting			
Mounters create the parts of jewellery to which gems are then added (by a gem or diamond setter). They usually work with metals, including gold, silver and platinum. The mount needs to hold the stones securely, and show it off to its best effect.			
Duty	Criteria	Knowledge and Understanding (Know it)	Skills (Show it)
Develop a plan of work	Plans work to ensure it is completed efficiently	<ul style="list-style-type: none"> Understand how to interpret a design for a piece of mounting and/or confirm the desired outcome from the client/colleague. Confirm specification, tolerances and finishes required. Understand how the suitability of the proposed mount can be assessed. 	<ul style="list-style-type: none"> Gather required information in regards to the design brief from a client or colleague Interpret technical drawings and assess methods and materials required to make the particular item Confirm specifications, tolerances and required finishes Interpret and assess the suitability of the proposed mount Estimate the material requirements with a cutting list. Select method of manufacture suitable for the given design or specification.
Work safely	Works with tools and processes in way that protect self and others	<ul style="list-style-type: none"> The application of health and safety legislation (e.g. COSHH, PPE) and company regulations for conforming to Health and Safety at Work Regulations The benefit of risk analysis to ensure the safety of self and others when using tools, equipment and materials during work processes The benefit of safe and sustainable disposal of waste materials and cleaning fluids 	<ul style="list-style-type: none"> Demonstrate safe working practices when using tools, chemicals, equipment and materials to achieve and maintain a safe working environment Identify and minimise hazards and risks in the working environment.
Measure and mark out material	Can measure design and apply to material	<ul style="list-style-type: none"> How to measure dimensions accurately. How to transfer the design to the item and mark out. 	<ul style="list-style-type: none"> Use dividers and calliper and measuring gauges for marking out. Use measuring devices to attain correct dimensions.
Work with handtools	Can confidently work with handtools	<ul style="list-style-type: none"> How saw frames, files, pliers and marking tools should be effectively handled and used. 	<ul style="list-style-type: none"> Select suitable tool for the task. Cut and file material accurately to a marked line. Bend material without marking or damaging it. File material to achieve the required shape.
Use machine based tools	Can confidently work with machine tools	<ul style="list-style-type: none"> The function, operation principles and maintenance of machine tools. E.g. drilling equipment, lasers, micro-welders and cutting equipment. Demonstrate awareness of the role that Laser fusing and machine cutting What marking out to use for each process, including bench drills and pendant motors. 	<ul style="list-style-type: none"> Select and use of appropriate tools equipment, e.g. when drilling accurately to set positions using drills, burrs, composite products, awareness of Laser fusing and machine cutting. Drill accurately to set positions. Assess the condition of mops and abrasive materials. Set up machines with correct speed settings, mops and abrasives to achieve the required finish
Work with a design	Can understand and apply a design	<ul style="list-style-type: none"> How to translate the design onto materials. 	<ul style="list-style-type: none"> Select and use appropriate measuring and marking equipment.

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		<ul style="list-style-type: none"> • How designs can be measured and marked out on materials and the different tools that can be used. • Understand working drawings and terminology used in stone mounting activities. 	<ul style="list-style-type: none"> • Transfer the design and drawing requirements to metal. • Mark out positions on material for cutting, shaping and drilling to the required specification. • Cut and shape material to the specifications set out in the design.
Work with different materials	Working with different materials Can work with a range of materials in a mounting	<ul style="list-style-type: none"> • The properties of different materials used in the production of jewellery. • The different melting points of non-ferrous metals and precious metals. • Understand the ductility and malleability of the metals used. • The required level of metal surface finishing required prior to final polishing. 	<ul style="list-style-type: none"> • Select the correct metal and fineness to produce the required item. • Task is completed without damage to the surface. • Material is used economically, producing as little waste as possible. • Achieve an acceptable surface level finish on precious metals. • Ensure that the mount is adequately prepared for setting.
Check and assess the quality of their work	Can self assess their work and check that it meets organisational requirements	<ul style="list-style-type: none"> • How to scrutinise the product for defects. • Know the common faults that may occur. • Describe the methods used to rectify common faults. 	<ul style="list-style-type: none"> • Measure the final product to identify its accuracy within specified tolerances and the overall design.

Specialist function 5: Engraving			
An engraver is responsible for working with other industry professionals to add decorative features or lettering to a precious or non-precious item.			
Duty	Criteria	Knowledge and Understanding (Know it)	Skills (Show it)
Develop a plan of work	Can organise their work efficiently	<ul style="list-style-type: none"> • How to contribute to the design process. • Know about rules and terminology used to describe patterns and finishes e.g. heraldic symbols • How lettering should be laid out 	<ul style="list-style-type: none"> • Interpret engraving of pictorial work represented by line, dot or texture. • Produce engraving from detailed specifications
Work safely	Can work with engraving tools and equipment safely	<ul style="list-style-type: none"> • Know the right protective equipment to use. • Be aware of the hazards that may be encountered when implementing engraving activities. 	<ul style="list-style-type: none"> • Select personal protective equipment • Use equipment utilising the workshops best practice and relevant machine guards • Handle chemicals, etc. safely.
Use hand tools and equipment effectively	Can confidently work with hand tools to produce required design	<ul style="list-style-type: none"> • The purpose and use of different tools and machinery used for engraving both machine based and hand tools. • The maintenance of tools and machinery • Understand the cost of tools and machinery. 	<ul style="list-style-type: none"> • Select the appropriate engraving technique to produce the required finish. • Maintain tools and equipment.
Work with gravers, scorpers and other specialist engraving tools	Can confidently work with specialist engraving tools	<ul style="list-style-type: none"> • Know the various types of letter forms and layouts for inscriptions and monograms. • Know about the key differences between repair, restoration, conservation and reconstruction. 	<ul style="list-style-type: none"> • Mark out and measure materials for engraving. • Lay out scroll work and ornamental patterns. • Produce engraved surfaces using a range of materials, designs, surface types, standard and

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		<ul style="list-style-type: none"> Understand how associated crafts (e.g. silversmithing, enamelling, metal spinning, polishing, stone mounting etc), impact on the completion of the engraved work. 	<ul style="list-style-type: none"> advanced techniques (including cutting, seal engraving, carving, piercing, inlay and overlay). Apply designs using hand or machine based processes.
Work in a professional manner	Works in a way that is professional	<ul style="list-style-type: none"> How customer requirements can be identified. How different engraving techniques and finishes can be communicated to customers. How work can be accurately priced. Where information regarding new and emerging engraving techniques can be sought. 	<ul style="list-style-type: none"> Translate customer requirements. Effectively communicate the various techniques surrounding engraving.
Repair engraved items	Can repair engraved items	<ul style="list-style-type: none"> Understand the process of repairing engraved items damaged during the engraving process. 	<ul style="list-style-type: none"> Demonstrate repair techniques including the use of burnishers, etc.

Specialist function 6: Enamelling			
A enameller is responsible for working with other industry professionals to apply decorative enamel to the surface of a range of items.			
Duty	Criteria	Knowledge and Understanding (Know it)	Skills (Show it)
Develop a plan of work	Produces a plan to work efficiently	<ul style="list-style-type: none"> The names and applications of different techniques including cloisonné, champlevé, plique-a-jour and Limoges enamel. How enamelling designs and specifications may be presented. The differing materials that may be used to produce an enamelled finish. The various methods that may be used to produce specific enamel finishes and effects. 	<ul style="list-style-type: none"> Interpret technical drawings and assess the materials and techniques required to make the particular item. Estimate material requirements with cutting list. Check the correct manufacture of the piece to be enamelled with regards to shape, thickness of metal and the solder to used. Select the appropriate enamels to achieve the required finish. Select the appropriate equipment to produce the required enamel finish.
Work safely	Can carry out enamelling processes safely	<ul style="list-style-type: none"> Have the right protective equipment. Understanding of the hazards that may be encountered when implementing enamelling activities. The impact of COSHH regulations on how work is implemented. 	<ul style="list-style-type: none"> Select personal protective equipment. Use equipment utilising the workshops best practice and relevant machine guards and ventilation systems.
Prepare surfaces ready for enamelling	Can prepare surfaces that are suited to enamelling	<ul style="list-style-type: none"> The appropriate chemicals to use to prepare the specific metal to be enamelled. 	<ul style="list-style-type: none"> Follow correct safe handling processes for use of chemicals. Clean and prepare the surface ready to enamel.
Prepare enamel for use	Can prepare enamel suited to the required task	<ul style="list-style-type: none"> The methods of preparing the enamel prior to application. How the grade of the enamel can be assessed. 	<ul style="list-style-type: none"> Grind and wash the enamel to the required grade. Dry the enamel ready for application if using dry sifting technique.

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Apply enamel to surfaces	Can apply different types of enamel	<ul style="list-style-type: none"> • How wet lay enamel should be applied. • How dust enamel should be applied. • How enamel can be reworked prior to firing. 	<ul style="list-style-type: none"> • Grind enamel in purified water for applying wet enamel onto the product as per design requirements. • Apply wet enamel onto the product as per design requirements. • Dust the enamel onto the product to the correct level ready for firing.
Fire enamel	Can fire enamel to produce required finish	<ul style="list-style-type: none"> • The different firing methods suitable for enamelling purposes including gas torch, batch, firing in electric kiln, firing in an electric conveyor furnace. 	<ul style="list-style-type: none"> • Select the appropriate method of firing the product. • Set kiln to the correct temperature for vitrifying the enamel.
Finish enamel	Can finish the enamel surface to meet the requirements of the design	<ul style="list-style-type: none"> • The finishing methods that may be applied to enamelled products. • Spotting and identifying errors in enamelling. • How defects can be corrected. 	<ul style="list-style-type: none"> • Produce the surface required including matt, shiny or satin finishes. • Finish the enamel to the required surface effect. • Correct pin holes, surface dirt and cracks.

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Specialist function 7: Polishing/Finishing			
A polisher/finisher is responsible for working with other trade professionals to create a durable and attractive finish to an item of precious or non-precious metalwork.			
Duty	Criteria	Knowledge and Understanding (Know it)	Skills (Show it)
Develop a plan for work	Organises their work efficiently	<ul style="list-style-type: none"> Understand the type and quality of finishes required including, pre-polishing, polishing, matt, relieved, oxidised and plating. The differing finishes that may be specified and how this information is communicated 	<ul style="list-style-type: none"> Interpret the most appropriate finishing methods to achieve the desired product finish.
Prepare surfaces for polishing	Prepares surfaces ready for polishing	<ul style="list-style-type: none"> How surfaces can be cleaned and prepared correctly. 	<ul style="list-style-type: none"> Produce the appropriate pre-polishing Describe the correct sequences for removing fire stain, preliminary abrasive polishing, pickling, barrelling, finishing, chemical stripping, bright polishing and finishing.
Selecting polishing media	Understands and can select suitable polishing media	<ul style="list-style-type: none"> The differing polishing materials that may be used. The appropriate hand or machine polishing processes to achieve required finishes. The properties associated with differing polishing materials. How to specify the use of specific compounds including abrasive, polishing, finishing and matting. 	<ul style="list-style-type: none"> Producing a commercially acceptable finish on completed work. Finish work using a range of equipment, compounds and chemicals. Polish and finish work made from a range of materials.
Utilise appropriate tools and machinery	Can effectively use tools and machinery	<ul style="list-style-type: none"> How to specify the use of polishing tools and equipment including mops, felt bobs, brushes and composition wheels. How to specify the use of polishing equipment including hand and machine polishing. Describe how to prepare tools. Describe the function of materials used in barrel polishing. 	<ul style="list-style-type: none"> Select the appropriate hand or machine polishing tools, equipment and machinery. Prepare and dress mops and bobs. Select and use appropriate polishing media.
Work safely when polishing and finishing	Implement their work in a safe manner	<ul style="list-style-type: none"> Have the right protective equipment. Describe the correct way to safely use and prepare polishing equipment and machinery. Be aware of the hazards that may be encountered when implementing finishing, polishing and plating activities. Handling chemicals and waste materials. 	<ul style="list-style-type: none"> Safely use and prepare polishing equipment and machinery. Follow COSHH regulations. Select and use appropriate PPE. Prepare and use chemical according to required processes.
Clean and plate surfaces	Can clean and plate materials	<ul style="list-style-type: none"> Explain how to appropriately use ultra sonic cleaner and chemical usages. Understand the use of different drying methods in the polishing processes. Describe how plating equipment should be used. Know how to measure the micron thickness of the product use when plating. 	<ul style="list-style-type: none"> Prepare and use ultra sonic cleaner and solution. Prepare and use plating equipment. Use drying methods within the polishing process.
Check quality and assess their own work	Can self assess and amend work	<ul style="list-style-type: none"> Understand the different design requirements and specification. Understand how to re-work when necessary. 	<ul style="list-style-type: none"> Check work to assess that it meets the standards and tolerance required including meeting specification, dimensionally accurate, correctly

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			formed, free from fire stain, spinning marks and other blemishes. <ul style="list-style-type: none"> • Implement appropriate re-work processes.
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Specialist function 8: CAD/CAM Processes			
A CAD Technician is responsible for working with other industry professional to produce designs, prototypes and production runs of items			
Duty	Criteria	Knowledge and Understanding (Know it)	Skills (Show it)
Interpret 2D designs	Can understand the requirements of a 2D design	<ul style="list-style-type: none"> • Understand how to read a working drawing, industry standard terminology and descriptors around finishes, etc. • Understand and consider the needs of the worker producing the final item including their ability to part-polish and assemble the item. • Understand how to communicate with the designer to ensure that the CAD design is optimal. • Understand how to interpret shape, implied form, the “feel” that a designer is seeking to achieve and be able to describe different forms of shape to facilitate this 	<ul style="list-style-type: none"> • Demonstrate an understanding of how to read technical drawings and specifications. • Work effectively with colleagues to ensure that CAD designs are fit for purpose and reflective of the design intent. • Demonstrate an understanding of how items are made that enables colleagues to produce items to a commercial standard.
Work with CAD and CAM tools safely	Can work in a safe manner	<ul style="list-style-type: none"> • Have the right protective equipment. • Be aware of the hazards that may be encountered when implementing CAD/CAM activities e.g. crush hazards. • Understand the impact that COSHH regulations have upon CAD/CAM activities 	<ul style="list-style-type: none"> • Select personal protective equipment. • Use equipment utilising the workshops best practice and relevant machine guards. • Use equipment in a way that reduces the risk of crushing.
Ensure the functionality of the design	Can produce models that can be created in metal	<ul style="list-style-type: none"> • Understand the functional aspects of the design. • The nature of materials needed to produce differing designs including weights and thicknesses, etc. • The importance of accurate measurement of existing components, e.g. stones. 	<ul style="list-style-type: none"> • Develop production drawings and specifications which take account of the manufacturing processes being used and the properties of the material selected.
Use Computer Aided Design (CAD) Software effectively	Can utilise the full functionality of the software	<ul style="list-style-type: none"> • Understand relevant industry specific software packages. • The differences between 2D, 2.5D and 3D software programmes. • The use of component libraries and other software tools that support effective design and production. • How to create forms and shapes relevant to the trade specialisation. • The different forms of output e.g. machining files, SLA, STL., etc. • How CAD files should be processed after production. 	<ul style="list-style-type: none"> • Selecting the correct software tools to achieve the required outcome. • Demonstrate the use of rendering packages for presentation purposes. • Store files and data securely
Use apply computer aided	Can support CAM processes	<ul style="list-style-type: none"> • Understand how parts produced using CAD can be made including the creation of specific files for CAM purposes. 	<ul style="list-style-type: none"> • Create appropriate files for CAM usage.

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manufacturing processes		<ul style="list-style-type: none"> Describe the range of materials that are available and suitable for CAM processing. Understand the role of support materials and supports in the CAM process. Describe the range of CAM processes that are available. Understand the limitations, strengths and weaknesses of the available CAM solutions. 	<ul style="list-style-type: none"> Ensure that CAM parts have adequate supports and that the model is orientated correctly to ensure an optimal outcome. Demonstrate the application of an appropriate CAM and CNC processes.
Can apply post-processing of CAM models	Can produce CAM models	<ul style="list-style-type: none"> Understand the post-processing of CAM models including removal of excess material and supports where appropriate. Why models produced using some CAM techniques require curing and the different methods by which this can be achieved. 	<ul style="list-style-type: none"> Demonstrate the successful curing of 3D printed resin models. Produce post-process models. Accurately remove support and build lines where appropriate in preparation for casting. Handle and package output to prevent damage.
Account for the properties of the final material	Can adapt design to account for the properties of materials	<ul style="list-style-type: none"> Understand the tools required to ensure the design is to scale and meets the requirements of the design. Understand the impact that shrinkage, warping and fitting can have on items produced using CAD/CAM processes. Understand how the design can be adjusted to take account of shrinkage and warping. 	<ul style="list-style-type: none"> Demonstrate the use of software to address issues of shrinkage, etc. Use measuring equipment to assess whether the item has been built to acceptable tolerances and to scale
Store files securely	Can store digital files securely for future use	<ul style="list-style-type: none"> Understand how data loss can be prevented. The organisational protocols for the storage and security of data and intellectual property. 	<ul style="list-style-type: none"> Demonstrate an understanding of organisational protocols around data storage, file naming and security.

Entry	Employers will set their own entry requirements in order to start on this apprenticeship
Duration	Based on the entry requirements set by the employer the typical duration for this apprenticeship is 2 and a half to 3 years
English and maths	Apprentices who have not yet achieved level 2 English and maths are required to achieve level 2 English and maths prior to completion of the apprenticeship
Progression	Progression from this apprenticeship is expected to be into a team leader role
Level	This apprenticeship standard is set at level 3
Renewal	2020 unless there is evidence of significant industry change which employers agree warrants earlier amendment