worldskills

Technical Description

Jewellery

WorldSkills International, by a resolution of the Competitions Committee and in accordance with the Constitution, the Standing Orders, and the Competition Rules, has adopted the following minimum requirements for this skill for the WorldSkills Competition.

The Technical Description consists of the following:

1 Introduction

1.1 Name and description of the skill competition

1.1.1 The name of the skill competition is

Jewellery

1.1.2 Description of the associated work role(s) or occupation(s)

The skill of jewellery manufacturing consists of the making of fashion accessories using precious metal. A jewellery manufacturer can make exclusive individual pieces for use, pieces ready to be set with precious gemstones or prototypes for reproduction in numbers through lost-wax casting. A jeweller may also be required to replicate a piece directly, use jewellery making skills to refashion or repair an existing piece. A jewellery manufacturer will usually work from detailed drawings created through direct consultation with a client or by a jewellery designer. These designs can be developed by the jeweller through the use of hand sketching or in collaboration with the CAD drawer/Designer. They will, therefore, need to be able to correctly interpret these drawings to create a jewellery piece as envisioned by themselves, a client, or a designer. Excellent communication skills and sufficiently in-depth knowledge in many areas of jewellery production and design are critical when understanding what the client or designer wants to achieve.

A jeweller can do all the work on the product, but collaboration with other jewellers is possible. This allows for the sharing of manufacturing operations to better manage time and efficiency. It is essential that a jeweller understands production processes, even if they do not perform these themselves. An example of this would be outsourcing to a third party to complete a specific task or sharing a workspace with other jewellery makers or technicians with other specialist industry skills.

Dealing with precious metals, a jeweller needs to be precise, work economically and avoid wastage of materials. The work is intricately detailed and requires a high level of skill, focus, and concentration. They must have a working knowledge of metal characteristics and how to prepare metal alloys should the need arise.

Once the jeweller has finished a piece, it may progress to further phases of the manufacturing process requiring jewellery industry skills other than jewellery making e.g., gem-setting and casting. For this reason, a jeweller must have some knowledge and understanding of other jewellery industry skills. They must have an appreciation of gemstones, their characteristics, cuts, uses and impact on the finished piece. Similarly, they must be aware of the different phases of reproduction through casting and as mentioned above, a familiarity with CAD.

Jewellers work with highly valuable materials, therefore must act with complete honesty and integrity. They must be fully aware of security and the regulations relating to the purchase, production and sale of precious metals, gemstones, and finished pieces. Whether working as part of a production team, or in the capacity of a sole manufacturer, a jeweller must have a thorough understanding of production costs, to enable them to arrive at an acceptable selling price, while maintaining profitability.

Lastly, there is now a consumer ethical awareness that drives decision making when commissioning or purchasing jewellery. A jeweller should be aware of and understand the social and ethical consequences when acquiring precious materials from around the world. They must, at all times endeavour to uphold these ethics in relation to sourcing precious metals and gemstones e.g. conflict diamonds, worker exploitation, environmental damage, etc.

1.1.3 Number of Competitors per team

Jewellery is a single Competitor skill competition.

1.1.4 Age limit of Competitors

The Competitors must not be older than 22 years in the year of the Competition.

1.2 The relevance and significance of this document

This document contains information about the standards required to compete in this skill competition, and the assessment principles, methods, and procedures that govern the competition.

Every Expert and Competitor must know and understand this Technical Description.

In the event of any conflict within the different languages of the Technical Descriptions, the English version takes precedence.

1.3 Associated documents

Since this Technical Description contains only skill-specific information it must be used in association with the following:

- WSI – Code of Ethics and Conduct
- WSI – Competition Rules
- WSI – WorldSkills Occupational Standards framework
- WSI – WorldSkills Assessment Strategy
- WSI online resources as indicated in this document
- WorldSkills Health, Safety, and Environment Policy and Regulations
- WorldSkills Standards and Assessment Guide (skill-specific)

2 The WorldSkills Occupational Standards (WSOS)

2.1 General notes on the WSOS

The WSOS specifies the knowledge, understanding, skills, and capabilities that underpin international best practice in technical and vocational performance. These are both specific to an occupational role and also transversal. Together they should reflect a shared global understanding of what the associated work role(s) or occupation(s) represent for industry and business (www.worldskills.org/WSOS).

The skill competition is intended to reflect international best practice as described by the WSOS, to the extent that it can. The Standard is therefore a guide to the required training and preparation for the skill competition.

In the skill competition the assessment of knowledge and understanding will take place through the assessment of performance. There will only be separate tests of knowledge and understanding where there is an overwhelming reason for these.

The Standard is divided into distinct sections with headings and reference numbers added.

Each section is assigned a percentage of the total marks to indicate its relative importance within the Standards. This is often referred to as the “weighting”. The sum of all the percentage marks is 100. The weightings determine the distribution of marks within the Marking Scheme.

Through the Test Project, the Marking Scheme will assess only those skills and capabilities that are set out in the WorldSkills Occupational Standards. They will reflect the Standards as comprehensively as possible within the constraints of the skill competition.

The Marking Scheme will follow the allocation of marks within the Standards to the extent practically possible. A variation of up to five percent is allowed, if this does not distort the weightings assigned by the Standards.

2.2 WorldSkills Occupational Standards

Section		Relative importance (%)
1	**Work organization and management**	**20**
	The individual needs to know and understand: • The requirements and implications of jewellery production on the environment and related sustainability issues • Workplace hazards and risks associated with own work role • Sources of advice relating to the objectives, requirements, and specifications • Timeframe for activity completion • Quality requirements of the product or service • Techniques and reasons for prioritizing of each step in a plan • Modifications that can be made to the plan to respond to unforeseen developments • Risk control measures	

Section		Relative importance (%)
	• Reporting requirements for accidents, incidents, and other non-conformances with WHS procedures • Information analysis techniques appropriate to tasks and position • Methods of categorizing and organizing information including correct sequencing of information • Methods of recording and communicating information • Types of information relevant to the workplace and required tasks • Processes or tools for effective decision making • How to deliver and receive constructive criticism to better work in a collaborative manner • Procedures for checking and maintaining individual specialist tools and shared workshop tools and machines • Safe operation and maintenance of shared workshop machines and individual tools • Procedures for the secure storage of jewellery and materials • Risks attached to the use of natural and propane gas, oxygen, electricity acid, and chemical products • Out-sourcing practices to external contractors for the purposes of electro-plating and the electro-plating process, gemstone mounting and the gemstone mounting process • Processes for manufacturing both single and mass unit production, e.g., 1 piece, 10 pieces, 100 pieces	
	The individual shall be able to: • Follow environmental policies, identify potential breaches of environmental regulations, and suggest improvements within the limit of own authority • Manage the environmental hazards/risks, resource use and inefficiencies associated with own workplace, at an appropriate level • Take account of the relevant environmental and resource efficiency systems and procedures for own work area • Plan a work activity using appropriate planning tools such as technical drawings, sample pieces and sketches or rendered images from 3D digital models, whilst following established procedures, including work health and safety (WHS) requirements • Check the plan to ensure accuracy and conformance and modify the plan components, as necessary, to overcome any unforeseen difficulties or developments • Identify hazards and implementing appropriate risk control measures and procedures • Select, use and maintain relevant personal protective equipment (PPE), • Evaluate the effectiveness of risk controls measures • Follow work instructions, standard operating procedures (SOPs) and safe work practices • Access and record relevant information from a range of sources	

Section		Relative importance (%)
	• Recognize and use workplace appropriate terminology • Read, interpret and follow information in workplace documentation • Check and clarify information • Organize, categorize, and sequence information • Communicate using appropriate methods and procedures for a variety of situations • Create efficient work practices to minimize waste • Interpret technical terminology and symbols • Work with a high degree of accuracy and precision on fine and delicate pieces • Operate machinery and tools in a manner that avoids risk to him/herself or others within the workshop • Gather relevant information, seek input from team members, and engage in effective dialogue to make informed decisions • Effectively communicate, provide, and receive feedback	
2	**Design jewellery components**	**20**
	The individual needs to know and understand: • Specialist techniques both historical and regional • Features and characteristics of products and services offered • Product and service availability and processes • Range of customer requirements for product/service and alternatives available • Reasons for informing the customer promptly of the ability/inability to meet the customer requirements • Strategies for managing customer issues • Record keeping requirements of customer service interactions and transactions • Iterative processes to enable effective development of client designs • Potential problems or limitations that may affects or limit a client's design • Effective communication techniques to better understand client needs • Trends, innovations, and breakthroughs in relevant design fields • Methods to establish rapport with customers aimed at providing a positive customer experience • Design resources and where to locate them • Research techniques and available resources • Existing designs, ethical and competitive considerations • Applicable industry standards or regulations • Design principles including form, function, harmony, line definition (interpretive/actual) • Drawing media and their purposes/applications including paper, ink/pencil/stencils/erasers, etc. • Rules and methods of displaying ideas and concepts through basic sketches and drawings	

Section		Relative importance (%)
	• Available manufacturing technologies and their suitability for jewellery manufacture • The interrelationship of technical and design drawings • 2D and 3D drawing techniques • Elements and principles of design of basic and complex jewellery components, • Terminology and symbols used in technical drawings produced from CAD software • Jewellery construction techniques • The use of techniques associated with applying texturing to precious metal surfaces for creative effect • How to extract mass and area properties using 3D design software • Information on specifications, design documentation, illustrations, design drawings and other applicable source documents • Industry requirements and availability of industry expertise • Safe work practices	

Section		Relative importance (%)
	The individual shall be able to: • Apply product knowledge to address customer requirements • Propose alternative products and/or services to satisfy customer requirements and taking action to implement these • Identify and interpret specifications • Select equipment appropriate to the illustrating method and requirements and prepare or modify drawings • Approve final illustration as per design information and process in accordance with procedures • Identify purpose and needs, including design restraints, budget considerations, item end-use, proportions and desired features, available materials • Develop research/ideas to a sufficient level to determine customer expectations and/or design outcomes • Clearly communicate the degree to which the customer requirements can be met • Communicate concepts in terms suitable to relevant customer or other contacts e.g. engineer, master pattern maker • Document and maintain design processes, features, and design development notes relevant to the iterative process • Use callouts as visual cues to quickly and efficiently communicate design intent and thought process • Produce basic form drawings/sketches that accurately reflect the design concept; this can extend to shadow, and highlight techniques for emphasis to display jewellery design concepts and rendering illustrations • Seek input from others who have relevant expertise or diverse perspectives, • Engage in discussions, participate in forums, or consult with colleagues, mentors, or subject matter experts • Identify and solve problems that may affect design form or functionality	

Section		Relative importance (%)
3	**Manufacture of precious metal alloys**	**5**
	The individual needs to know and understand: • The content of precious metal alloys and the impact that additives have on the precious metal in terms of colour, pliability, and durability • How alloys react to various processes used by the jewellery maker • The properties of precious metal alloys and their solders • Laws and regulations relating to precious metal content for sale and export • Assaying processes and procedures for the country of operation, purchase, and sale of jewellery products • Assaying marks delineating precious metal quality • Forms in which precious metals are sold, such as sheet/wire/ granules etc.	
	The individual shall be able to: • Recognize authenticity and quality signs for precious metals • Source precious metals of the correct price and quality for jewellery manufacture • Calculate the proportions and quantities of fine precious metals and base metals required for any predetermined amount of any recognized precious metal alloy • Cast precious metal alloy ingots and bars of any predetermined weight, with a minimum of residual impurities, ready to be milled or rolled in preparation for the manufacture of jewellery components	
4	**Preparation of precious metal alloys for the manufacture of jewellery components**	**10**
	The individual needs to know and understand: • Properties and applications of various recognized precious metal alloys • Procedures for the transformation of precious metal alloy ingots in preparation for the manufacture of jewellery components • Applications and uses for different recognized precious metals	
	The individual shall be able to: • Manufacture precious metal sheet or square wire, and reduce to any pre-determined thickness using manual or electrically powered rolling mills • Manufacture and reduce the thickness of square or round wire in precious metal alloys to any pre-determined dimensions using drawing banks • Manufacture round wire from square wire, and reduce to any pre-determined diameter using a drawing bank	

Section		Relative importance (%)
	• Use basic mathematical formulas the calculate metal weights and reach desired dimensions	
5	**Manufacture of both simple and complex jewellery components**	**30**
	The individual needs to know and understand: • Legislation and regulations regarding the purchase, production, and sale of precious metals, gemstones, and finished pieces • Various jewellery components and their uses • Techniques and methods for forming and constructing components and methods for finishing components • A sufficient understanding of gemstone setting to ensure the successful seating and setting of a gemstone by a professional gem setter • The correct and safe use of solders and soldering torches, and hard soldering techniques • Other techniques used in the joining of one or more components to create a completed piece without the use of heat or solder	
	The individual shall be able to: • Manufacture Chenier/tubes and reduce to any predetermined diameters using a drawing bank • Transform precious metal alloy sheet, wire or Chenier/tube into simple jewellery components employing bending, shaping, and forming to conform to any shape pre-determined by technical drawing or sample component • Drill precious metals accurately to conform to any shape pre-determined by technical drawings or sample component • Transform simple jewellery components employing abrasive techniques such as milling, grinding, filing, ajour-sawing etc. to conform to any shape pre-determined by technical drawings or sample components • Hammer, emboss, shape or dome precious metal sheets of appropriate thickness into low relief, to conform to any shapes pre-determined by technical drawings or sample components using appropriate doming tools • Manufacture settings for precious gemstones to conform to shapes or designs pre-determined by technical drawings or sample components • Manufacture functioning mechanisms for jewellery such as hinges, clasps, articulations, pressure snaps riveting and screw threads as determined by technical drawings or sample components, or of their own design • Ensure that manufactured functioning components can withstand constant use without sacrificing any mechanical properties • Assemble basic jewellery components and complex jewellery components into completed jewellery pieces by means of precious	

Section		Relative importance (%)
	metal solder joins to conform to any designs pre-determined by technical drawing or sample components • Repair damaged or worn pieces of jewellery so that the restored pieces will be indistinguishable from their original aspect at the time of manufacture	
6	**Surface finish**	**15**
	The individual needs to know and understand: • Skill specific finishing and polishing methods and techniques • The effect of different types and grades of polishing media on the surface finish • Procedures, tools, and techniques to gain the optimum surface finish, • Common surface imperfections and defects and appropriate methods for their repair • International grades of sandpaper used in surface finishing • Precious metal lemel control and collection processes to reduce waste and encourage reuse • Best practice for refining to ensure maximum returns of scrap precious metals to ensure sustainable practices are upheld in the workplace	
	The individual shall be able to: • Remove marks, scratches, and surface imperfections throughout all stages of manufacture of simple and complex jewellery components and completed jewellery pieces before the application of final surface finishes • Finish surfaces at stages throughout the manufacturing process • Apply non-reflective 800ASA sandpaper (or equivalent) appropriate for critical evaluation and/or passing on to any subsequent phases of production requiring other jewellery' industry skills, such as casting, gem-setting, engraving, and polishing • Work in an organized and efficient manner to minimize loss of precious metals • Return all surplus metal and lemel/scrap to assess loss prior to recycling	
	Total	**100**

3 The Assessment Strategy and Specification

3.1 General guidance

Assessment is governed by the WorldSkills Assessment Strategy. The Strategy establishes the principles and techniques to which WorldSkills assessment and marking must conform.

Expert assessment practice lies at the heart of the WorldSkills Competition. For this reason, it is the subject of continuing professional development and scrutiny. The growth of expertise in assessment will inform the future use and direction of the main assessment instruments used by the WorldSkills Competition: the Marking Scheme, Test Project, and Competition Information System (CIS).

Assessment at the WorldSkills Competition falls into two broad types: Measurement and Judgement. For both types of assessment, the use of explicit benchmarks against which to assess each Aspect is essential to guarantee quality.

The Marking Scheme must follow the weightings within the Standards. The Test Project is the assessment vehicle for the skill competition, and therefore also follows the Standards. The CIS enables the timely and accurate recording of marks; its capacity for scrutiny, support, and feedback is continuously expanding.

The Marking Scheme, in outline, will lead the process of Test Project design. After this, the Marking Scheme and Test Project will be designed, developed, and verified through an iterative process, to ensure that both together optimize their relationship with the Standards and the Assessment Strategy. They will be agreed by the Experts and submitted to WSI for approval together, to demonstrate their quality and conformity with the Standards.

Prior to submission for approval to WSI, the Marking Scheme and Test Project will liaise with the WSI Skill Advisors for quality assurance and to benefit from the capabilities of the CIS.

4 The Marking Scheme

4.1 General guidance

This section describes the role and place of the Marking Scheme, how the Experts will assess Competitors' work as demonstrated through the Test Project, and the procedures and requirements for marking.

The Marking Scheme is the pivotal instrument of the WorldSkills Competition, in that it ties assessment to the standard that represents each skill competition, which itself represents a global occupation. It is designed to allocate marks for each assessed aspect of performance in accordance with the weightings in the Standards.

By reflecting the weightings in the Standards, the Marking Scheme establishes the parameters for the design of the Test Project. Depending on the nature of the skill competition and its assessment needs, it may initially be appropriate to develop the Marking Scheme in more detail as a guide for Test Project design. Alternatively, initial Test Project design can be based on the outline Marking Scheme. From this point onwards the Marking Scheme and Test Project should be developed together.

Section 2.1 above indicates the extent to which the Marking Scheme and Test Project may diverge from the weightings given in the Standards, if there is no practicable alternative.

For integrity and fairness, the Marking Scheme and Test Project are increasingly designed and developed by one or more Independent Test Project Designer(s) with relevant expertise. In these instances, the Marking Scheme and Test Project are unseen by Experts until immediately before the start of the skill competition, or competition module. Where the detailed and final Marking Scheme and Test Project are designed by Experts, they must be approved by the whole Expert group prior to submission for independent validation and quality assurance. Please see the Competition Rules for further details.

Experts and Independent Test Project Designers are required to submit their Marking Schemes and Test Projects for review, verification, and validation well in advance of completion. They are also expected to work with their Skill Advisor, reviewers, and verifiers, throughout the design and development process, for quality assurance and in order to take full advantage of the CIS's features.

In all cases a draft Marking Scheme must be entered into the CIS at least eight weeks prior to the Competition. Skill Advisors actively facilitate this process.

4.2 Assessment Criteria

The main headings of the Marking Scheme are the Assessment Criteria. These headings are derived before, or in conjunction with, the Test Project. In some skill competitions the Assessment Criteria may be similar to the section headings in the Standards; in others they may be different. There will normally be between five and nine Assessment Criteria. Whether or not the headings match, the Marking Scheme as a whole must reflect the weightings in the Standards.

Assessment Criteria are created by the person or people developing the Marking Scheme, who are free to define the Criteria that they consider most suited to the assessment and marking of the Test Project. Each Assessment Criterion is defined by a letter (A-I). **The Assessment Criteria, the allocation of marks, and the assessment methods, should not be set out within this Technical Description. This is because the Criteria, allocation of marks, and assessment**

methods all depend on the nature of the Marking Scheme and Test Project, which is decided after this Technical Description is published.

The Mark Summary Form generated by the CIS will comprise a list of the Assessment Criteria and Sub Criteria.

The marks allocated to each Criterion will be calculated by the CIS. These will be the cumulative sum of marks given to each Aspect within that Assessment Criterion.

4.3 Sub Criteria

Each Assessment Criterion is divided into one or more Sub Criteria. Each Sub Criterion becomes the heading for a WorldSkills marking form. Each marking form (Sub Criterion) contains Aspects to be assessed and marked by Measurement or Judgement, or both Measurement and Judgement.

Each marking form (Sub Criterion) specifies both the day on which it will be marked, and the identity of the marking team.

4.4 Aspects

Each Aspect defines, in detail, a single item to be assessed and marked, together with the marks, and detailed descriptors or instructions as a guide to marking. Each Aspect is assessed either by Measurement or by Judgement.

The marking form lists, in detail, every Aspect to be marked together with the mark allocated to it. The sum of the marks allocated to each Aspect must fall within the range of marks specified for that section of the Standards. This will be displayed in the Mark Allocation Table of the CIS, in the following format, when the Marking Scheme is reviewed from C-8 weeks. (Section 4.1 refers.)

		CRITERIA								TOTAL MARKS PER SECTION	WSSS MARKS PER SECTION	VARIANCE
STANDARDS SPECIFICATION SECTION		A	B	C	D	E	F	G	H			
	1	5.00								5.00	5.00	0.00
	2		2.00					7.50		9.50	10.00	0.50
	3								11.00	11.00	10.00	1.00
	4			5.00						5.00	5.00	0.00
	5				10.00	10.00	10.00			30.00	30.00	0.00
	6		8.00	5.00				2.50	9.00	24.50	25.00	0.50
	7			10.00				5.00		15.00	15.00	0.00
TOTAL MARKS		5.00	10.00	20.00	10.00	10.00	10.00	15.00	20.00	100.00	100.00	2.00

4.5 Assessment and marking

There is to be one marking team for each Sub Criterion, whether it is assessed and marked by Judgement, Measurement, or both. The same marking team must assess and mark all Competitors. Where this is impracticable (for example where an action must be done by every Competitor simultaneously, and must be observed doing so), a second tier of assessment and marking will be put in place, with the approval of the Competitions Committee Management Team. The marking teams must be organized to ensure that there is no compatriot marking in any circumstances. (Section 4.6 refers.)

4.6 Assessment and marking using Judgement

Judgement uses a scale of 0-3. To apply the scale with rigour and consistency, Judgement must be conducted using:

- benchmarks (criteria) for detailed guidance for each Aspect (in words, images, artefacts, or separate guidance notes). This is documented in the Standards and Assessment Guide.
- the 0-3 scale to indicate:
  - 0: performance below industry standard
  - 1: performance meets industry standard
  - 2: performance meets and, in specific respects, exceeds industry standard
  - 3: performance wholly exceeds industry standard and is judged as excellent

Three Experts will judge each Aspect, normally simultaneously, and record their scores. A fourth Expert coordinates and supervises the scoring, and checks their validity. They also act as a judge when required to prevent compatriot marking.

4.7 Assessment and marking using Measurement

Normally three Experts will be used to assess each Aspect, with a fourth Expert supervising. In some circumstances the team may organize itself as two pairs, for dual marking. Unless otherwise stated, only the maximum mark or zero will be awarded. Where they are used, the benchmarks for awarding partial marks will be clearly defined within the Aspect. To avoid errors in calculation or transmission, the CIS provides a large number of automated calculation options, the use of which is mandated.

4.8 The use of Measurement and Judgement

Decisions regarding the choice of criteria and assessment methods will be made during the design of the competition through the Marking Scheme and Test Project.

4.9 Skill assessment strategy and procedures

WorldSkills is committed to continuous improvement including reviewing past limitations and building on good practice. The following skill assessment strategy and procedures for this skill competition take this into account and explain how the marking process will be managed.

Criterion A

For similarity to drawing, the Experts will assess the degree to which the Competitor's work reflects the general shapes and proportions described in the Test Project drawing(s). Where a design contains functions, the Experts will assess the degree to which any mechanisms or clasps in the Competitor's work operates correctly. Shapes and proportions that are assessed in Criterion B are not to be evaluated in Criterion A.

Criterion B

The Experts will assess, shape's, angles, intersections, and internal surface finish of technical elements involving the removal of metal in the Competitor's work.

Criterion C

The Experts will assess the degree to which Competitors unite, by using solder joints, components implicitly or expressly defined as touching in the Test Project drawing(s), and creative design sketch. Experts should consider the use of solder with consideration to too much or too little solder visible when uniting joints and pinholes visible.

Criterion D

The Experts will assess how well each Competitor has produced a uniform, unpolished surface that is equivalent to an ASA 800 abrasive finish. All surfaces are free of marks, scratches, or surface discolouration. Surface discolouration is assessed using measurement Y/N. Surfaces that are assessed in Criterion B are not to be evaluated in Criterion D. A sample of the desired surface finish is selected by Experts and then displayed within the competition area for Competitor reference.

Criterion E

The Experts will assess whether the measurements of the Competitor's work reflect clearly marked dimensions on the Test Project drawing, within defined tolerances. Experts will determine whether the mass of the Competitor's work reflects clearly marked weights on the Test Project drawing. All dimensional marking to be inputted using calculations and incremental percentage tolerances as agreed upon by the Experts and outlined in section 4.10 Skill Assessment Procedures.

Criterion F

The Experts will assess whether the correct number of components and technical elements specified in the Test Project drawing(s) are present and connected to the others using at least one solder or mechanical joint, as defined in the technical project. On the final day Experts will also assess Competitors economic use of material by weighing all 18ct yellow gold metal, lemel/fillings etc returned against metal provided. All marking to be inputted using calculations and incremental percentage tolerances as agreed upon by the Experts and outlined in section 4.10 Skill Assessment Procedures.

Criterion G

The Experts will assess how well the Competitor has interpreted the Design Brief, taking into consideration:

- Iterative Design Process- How well the design shows a clear train of thought through words and pictures from initial ideas to final drawing to clearly demonstrate a design direction
- Design Elements – How well the piece includes all the physical attributes of the design constraints as outlined in the brief, including use of technical skills and difficulty, to execute the design
- Cohesiveness - How well does the creative element compliment the entire design.

Procedural specifications:

- The Experts that attend the Competition are divided into marking groups to deal with each section of the marking criteria;
- Experts will maintain supervision of the Competitors during the Competition, but must not look at Competitors' work, or have any knowledge of progress except from the compatriot Competitor during those times permitted by Competition Rules, until the module is marked;
- At the end of each day of the Competition, the incomplete test pieces shall be collected, by the Workshop Manager, in opaque boxes, sealed and signed, marked with the Competitor's workstation number and country code, and locked in a safe or strong cabinet. The key or combination to the safe or strong cabinet should be kept by the Workshop Manager, Workshop Manager Assistant or the Skill Competition Manager;
- At the end of each day of the Competition, photographs may be taken of all Competitors' metal, by the Workshop Manager or the Skill Competition Manager to assure that no parts may be replaced or added. These photographs shall be kept in a safe or strong cabinet;
- At the end of each Competition module the test pieces for marking shall be sealed in opaque envelopes, inscribed with the Competitor's name, workstation number and country code, until assessment or returned to the Competitor for use in a subsequent module.

Dimensions

The agreed percentage increments for dimensions:

Lower limit dimension	Upper limit dimension	Percentage increment
0.00 mm	4.99 mm	1.0%
5.00 mm	19.99 mm	0.5%
20.00 mm	34.99 mm	0.3%
35.00 mm	All dimension above	0.2%

Mass

The agreed percentage increments for mass:

Lower limit weight	Upper limit weight	Percentage increment
0.00 g	6.99 g	2.0%
7.00 g	9.99 g	1.5%
10.00 g	All weights above	1.0%

Economic use of material - Example of mark deductions (to be determined by Expert consultation prior to CPW)

Lower limit return	Upper limit return	Percentage increment
97.5%	100%	Full marks
96.5%	97.4%	Half marks
95.5%	96.4%	Zero marks

5 The Test Project

5.1 General notes

Sections 3 and 4 govern the development of the Test Project. These notes are supplementary.

Whether it is a single entity, or a series of stand-alone or connected modules, the Test Project will enable the assessment of the applied knowledge, skills, and behaviours set out in each section of the WSOS.

The purpose of the Test Project is to provide full, balanced, and authentic opportunities for assessment and marking across the Standards, in conjunction with the Marking Scheme. The relationship between the Test Project, Marking Scheme, and Standards will be a key indicator of quality, as will be its relationship with actual work performance.

The Test Project will not cover areas outside the Standards or affect the balance of marks within the Standards other than in the circumstances indicated by Section 2. This Technical Description will note any issues that affect the Test Project's capacity to support the full range of assessment relative to the Standards. Section 2.1 refers.

The Test Project will enable knowledge and understanding to be assessed solely through their applications within practical work. The Test Project will not assess knowledge of WorldSkills rules and regulations.

Most Test Projects and Marking Schemes are now designed and developed independently of the Experts. They are designed and developed either by the Skill Competition Manager, or an Independent Test Project Designer, normally from C-12 months. They are subject to independent review, verification, and validation. (Section 4.1 refers.)

The information provided below will be subject to what is known at the time of completing this Technical Description, and the requirement for confidentiality.

Please refer to the current version of the Competition Rules for further details.

5.2 Format/structure of the Test Project

The Test Project is a single Test Project assessed in stages.

5.3 Test Project design requirements

Test Projects should reflect the purposes, structures, processes, and outcomes of the occupational role they are based on. They should aim to be a small-scale version of that role. Before focusing on practicalities, SMTs should show how the Test Project design will provide full, balanced, and authentic opportunities for assessment and marking across the Standards, as set out in Section 5.1.

The Test Project must have a wide variety of jewellery technical elements including:

- Ajour/back holes;
- Gallery and/or back/edge wire;
- Settings made by soldering jewellery components;
- Assembly of complex jewellery components;
- Doming/forming or relief work;
- A creative element that forms part of one day's module, that is outlined by a design brief supplied to the Competitor during familiarization.

The drawing must be available in at least JPG or PDF. For drawing projections refer to ISO 128, either first or third angle projection. Projections shall be on one sheet of A4 paper, scale 1:1, or one per module. Cross-sections and three-dimensional representations may also be included.

Once the Test Project has been designed, it can be requested that the materials from this list can be milled to suit the requirements of the project, time, and logistical requirements permitting.

In each module a minimum of two and a maximum of three proposed marking dimensions, must be clearly identified on the drawing for marking purposes. Each marking dimension must allow for a minimum of three contact points.

A full scale, hand-made prototype of the Test Project and accompanying images must be brought to the competition for Experts to view after the Test Project has been presented.

Project/Modules will be developed to accommodate timetables designed for a Test Project of 22 working hours.

5.4 Test Project coordination and development

The Test Project MUST be submitted using the templates provided by WorldSkills International (www.worldskills.org/expertcentre). Use the Word template for text documents and DWG template for drawings.

5.4.1 Test Project coordination (preparation for Competition)

Coordination of the Test Project/modules will be undertaken by the Skill Competition Manager.

5.4.2 Who develops the Test Project/modules

The Test Project/modules are developed by an Independent Test Project Designer (ITPD) in collaboration with the Skill Competition Manager.

5.4.3 When is the Test Project developed

The Test Project/modules are developed according to the following timeline:

Time	Action
Ten (10) months prior to the Competition	The ITPD is identified and a Confidentiality Agreement between WSI and the ITPD is organized.
Two (2) months prior to the Competition	A general Statement of Work is circulated on the WorldSkills website for translation.
One (1) month prior to the Competition	The Test Project documents are sent to the WorldSkills International Skills Competitions Administration Manager.
At the Competition on C-2	The Design Brief is given to Experts and Interpreters towards the end of familiarization for translation. Immediately after translation the Design Brief is made available to the Competitors on the WorldSkills website.
At the Competition on C1	Test Project/modules are presented to the Competitors.

5.5 Test Project initial review and verification

The purpose of a Test Project is to create a challenge for Competitors which authentically represents working life for an outstanding practitioner in an identified occupation. By doing this, the Test Project will apply the Marking Scheme and fully represent the WSOS. In this way it is unique in its context, purpose, activities, and expectations.

To support Test Project design and development, a rigorous quality assurance and design process is in place (Competition Rules sections 10.6-10.7 refer.) Once approved by WorldSkills, the Independent Test Project Designer (ITPD) is expected to identify one or more independent expert(s), and trusted individuals initially to review the Independent Test Project Designer's ideas and plans, and subsequently to verify the Test Project, prior to validation.

A Skill Advisor will ensure and coordinate this arrangement, to guarantee the timeliness and thoroughness of both initial review, and verification, based on the risk analysis that underpins Section 10.7 of the Competition Rules.

5.6 Test Project validation

The Skill Competition Manager coordinates the validation of the Test Project/modules and will ensure that it can be completed within the material, equipment, knowledge, and time constraints of Competitors.

5.7 Test Project circulation

The Test Project/modules are not circulated prior to the Competition. The Test Project/modules are presented to Experts and to Competitors on C1.

A general Statement of Work is circulated two (2) months prior to the Competition via the WorldSkills website. No technical or detailed information on the Test Project/modules is shared.

The Design Brief is given to Experts and Interpreters towards the end of familiarization for translation and in the evening of C-2 it is accessible for all Competitors via the WorldSkills website.

5.8 Test Project change

Due to the Test Project being developed by an Independent Test Project Designer (ITPD), there is no change required to be made to the Test Project/modules at the Competition. Exceptions are amendments to technical errors in the Test Project documents and according to infrastructure limitations.

5.9 Material or manufacturer specifications

Specific material and/or manufacturer specifications required to allow the Competitor to complete the Test Project will be supplied by the Competition Organizer and are available from www.worldskills.org/infrastructure located in the Expert Centre. However, note that in some cases details of specific materials and/or manufacturer specifications may remain secret and will not be released prior to the Competition. These items may include those for fault finding modules or modules not circulated.

6 Skill management and communication

6.1 Discussion Forum

Prior to the Competition, all discussion, communication, collaboration, and decision making regarding the skill competition must take place on the WorldSkills skill-specific Discussion Forum. (http://forums.worldskills.org). Skill related decisions and communication are only valid if they take place on the WorldSkills Discussion Forum. The Chief Expert (or an Expert Lead appointed by the Skill Management Team) will be the moderator for this Discussion Forum. Refer to the Competition Rules for the timeline of communication and competition development requirements.

6.2 Competitor information

All information for registered Competitors is available from the Competitor Centre (www.worldskills.org/competitorcentre).

This information includes:

- Competition Rules
- Technical Descriptions
- Mark Summary Form (where applicable)
- Test Projects (where applicable)
- Infrastructure List
- WorldSkills Health, Safety, and Environment Policy and Regulations
- Other Competition-related information

6.3 Test Projects and Marking Schemes

Circulated Test Projects will be available from www.worldskills.org/testprojects and the Competitor Centre (www.worldskills.org/competitorcentre).

6.4 Day-to-day management

The day-to-day management of the skill competition during the Competition is defined in the Skill Management Plan that is created by the Skill Management Team. The Skill Management Team comprises the Skill Competition Manager, Chief Expert, and the Expert Leads. The Skill Management Plan is progressively developed in the six (6) months prior to the Competition and finalized at the Competition. The Skill Management Plan can be viewed in the Expert Centre (www.worldskills.org/expertcentre).

6.5 General best practice procedures

General best practice procedures clearly delineate the difference between what is a best practice procedure and skill-specific rules (section 9). General best practice procedures are those where Experts and Competitors CANNOT be held accountable as a breach to the Competition Rules or skill-specific rules which would have a penalty applied as part of the Issue and Dispute Resolution procedure including the Code of Ethics and Conduct Penalty System. In some cases, general best practice procedures for Competitors may be reflected in the Marking Scheme.

Topic/task	Best practice procedure
Assessment	• Marking Teams will be determined by the Skill Competition Manager and Chief Expert. • Marking Teams will be assigned Marking Criterion on the morning of C1. Marking Teams will mark the same Criterion on each day of assessment. • Not all Experts will be required to assess during the Competition. Those Experts that are not assessing may be assigned other responsibilities as seen fit by the Skill Competition Manager and Chief Expert. • Experts that are not required to assess must remain within the skill competition area while assessment is taking place. Non assessing Experts are encouraged to observe the process but must not interfere with the Assessment in any way.
Sustainability	• All precious metal filings must be gathered in the bench drawer or lap-skin and collected at the end of each Competition Day. • All lighting and power must be turned off at the power point outside of competition time. • All gas and oxygen cylinders must be turned to the off position outside of competition time.
Equipment failure	• In the event of failure of equipment supplied by the Competition Organizer, time lost during repair or substitution will be added on to the official competition time. • In the event of failure of equipment brought by the Competitor, time lost during repair or substitution will not be added on to the official competition time. Refer to section 8 Materials and equipment of this document.
Translation of documents	• Two (2) months prior to Competition, the **Test Project Statement of Work** document will be uploaded to the WorldSkills International website. Members are permitted to download and translate this document. Please ensure that your Competitor arrives on the morning of C-2 with this document, translated if necessary. • Design Brief translation will take place on C-2 as outlined in the Skill Management Plan. Interpreters and Experts can use this time to translate the document before it is handed out to the Competitors. • Interpreters are permitted to use personal laptops and electronic translation devices for translation. Once translated, each Member's document will be stored on a WSI drive for immediate printing within the skill competition area.
Test Project release	• The Test Project will be released to both Competitors and Experts in the morning of C1. Competitors will have one hour of Test Project familiarization prior to Competition Commencement. • The process for Design Brief distribution on C-2 will be as follows: ◦ 45 minutes prior to the completion of familiarization, the design brief and mood boards will be handed out to Competitors.

Topic/task	Best practice procedure
	◦ At the end of the designated familiarization, all paperwork pertaining to the Design Brief and mood boards will remain in the skill competition area as stated within section 9 skill-specific rules. ◦ 15 minutes prior to the end of the designated familiarization time, there will be a short question and answer period. This question-and-answer period will be for the clarification of instructions within the Design Brief only. No creative direction will be offered other than contained within the Design Brief. ◦ Immediately after the familiarization period has ended, a copy of the Design Brief and the corresponding mood boards will be made available through the WorldSkills International website.
Documentation	• All paperwork presented to Experts and Competitors must remain in the workshop until Competition Completion on C4.

7 Skill-specific safety requirements

7.1 Personal Protective Equipment

Refer to WorldSkills Health, Safety, and Environment Policy and Regulations for Host country or region regulations.

Task	Safety glasses with side protection	Welding mask	Dust mask	Welding gloves	Sturdy shoes with closed toe and heel	Fire resistant protective clothes	Long hair tied back	Wo apr
General PPE for safe areas					√			
General PPE for workshop areas					√	√	√	√
Drilling with hand-drilling	√						√	√
Forge use		√	√	√			√	√
Milling with hand-milling	√						√	√
Removing products with hand-drill such as abrasive paper/ abrasive disc/ abrasive wheels	√		√				√	√
Hammering and Forming	√							√

8 Materials and equipment

8.1 Infrastructure List

The Infrastructure List details all equipment, materials, and facilities provided by the Competition Organizer.

The Infrastructure List is available at www.worldskills.org/infrastructure.

The Infrastructure List specifies the items and quantities requested by the Skill Management Team for the next Competition. The Competition Organizer will progressively update the Infrastructure List specifying the actual quantity, type, brand, and model of the items. Note that in some cases details of specific materials and/or manufacturer specifications may remain secret and will not be released prior to the Competition. These items may include those for fault finding modules or modules not circulated.

At each Competition, the Skill Management Team must review and update the Infrastructure List in preparation for the next Competition. The Skill Competition Manager must advise the Director of Skills Competitions of any increases in space and/or equipment.

At each Competition, the Technical Observer must audit the Infrastructure List that was used at that Competition for the upcoming WorldSkills Competition.

The Infrastructure List does not include items that Competitors and/or Experts are required to bring and items that Competitors are not allowed to bring – they are specified below.

8.2 Competitors toolbox

Competitors may bring one toolbox with the total external volume not exceeding 0.075 m³.

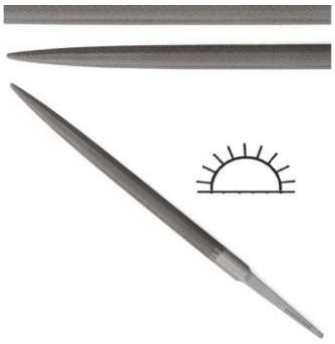
(Volume = Length x Height x Width, or V = L x H x W)

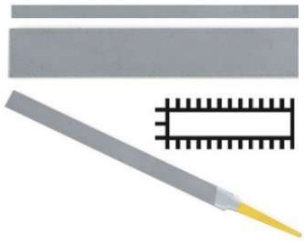
Volume measurement does not include a packing crate, other protective packing material, palette for transportation, wheels, etc.

8.3 Materials, equipment, and tools supplied by Competitors

The following items are allowed to be carried in the toolbox:

Item	quantity	Picture
Saw Frames Various Styles	2	

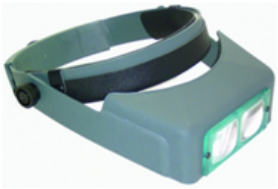
Item	quantity	Picture
Needle File Various cuts/Shapes	30	
Escapement Needle File Various cuts/shapes	30	
Half Round Ring File Various cuts	4	

Item	quantity	Picture
Crossing File Various cuts	4	
Bench File Various cuts	4	
Dividers	2	
File Handles	8	
Scriber	2	
Centre Punch – automatic or static	2	

Item	quantity	Picture
		
Scissor for metal	2	
Tweezers Stainless Steel Anti-magnetic Various Styles	8	
Tweezers - X-Lock	6	
Titanium Rod for Soldering	2	
Stand for pliers	1	

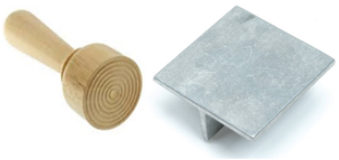
Item	quantity	Picture
		
Parallel plier	4	
Cutter - End cut flush or Side cut	2	
Jewellers Plier Various Jaw Shapes	15	
Pin Vice Various Styles	5	
	15	

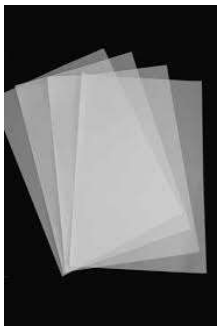
Item	quantity	Picture
Modified punches Beaders /Shanks		
Gravers with handle Various Styles	6	
Burnisher Various Styles	6	
Clamp – Double end, Broad wedge, etc Various Styles	3	
Bench Hammers Various Styles	4	
Nylon /Plastic/Rubber Mallet Various Styles	2	

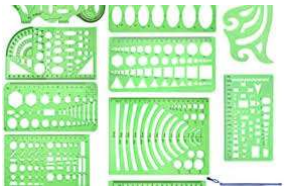
Item	quantity	Picture
Mallet Wood/Raw Hide	2	
Magnification	1	
Glue	2	
Steel Ruler	2	
Magnet	1	
Emery Stick Sticks or boards must not already contain abrasive paper or abrasive cloth/plastics	10	

Item	quantity	Picture
Specialty Burr 2.38 mm shank	50	
Flux brushes	4	
Bench Brush	2	
Metal Scoop	2	
Modelling Clay	1	
Soft Timber 100 mm x100 mm x 30 mm	2	
Scraper Various Styles	4	

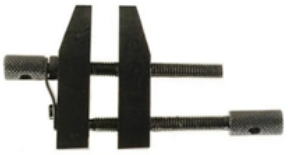
Item	quantity	Picture
		 
Soft Jaw Pliers Various shapes	5	
Benders Various Styles	2	
Gapping File Various cuts	15	
Needle File Holder Various	5	
Customised Pliers Pliers that have been modified	5	

Item	quantity	Picture
Glass Brush	2	
Metal Flattening Tools	2	
Chenier Cutter	1	
Engineer Jig	2	
Shellac/Thermo-Loc Holder	2	
3rd Hand	2	

Item	quantity	Picture
Saw Blade Holders	1	
Ruler for Drafting	1	
Leather off cuts 300 x 300mm	1	
Tracing Paper	10	
Tape Single and double sided	2	

Item	quantity	Picture
Pens, Drafting or Writing Various	6	
Sharpener	1	
Eraser	1	
Drawing Templates	8	
Wire Mesh	2	
Bees Wax	1	
Drawing Set	1	

Item	quantity	Picture
		
Engineers Square	2	
Scalpel	1	
Diamond/Sharpening Stone or similar	2	
Brush Various Styles	2	
Centre Finder	1	
Parallel Clamps	2	

Item	quantity	Picture
		
Hand Vise Various Styles	4	
Mandrels for Jump ring Making	1 set	
Bezel punch	10	
Bezel Mandrel Round and Oval	1	
Edenta diamond wheel Coarse/Medium/Fine	1	
Rotary Solder Stand Without solder board	1	

Please note that images and descriptions of the equipment listed above are a guide of the type/ version/brand of a tool, that is permitted to be brought by Competitors. Equipment that is supplied by the Competition Organizer (listed in the IL) must be used by all Competitors. Competitors cannot

bring their own tools with the same functionality as they will not be allowed in the workshop. Refer to Competition Rules.

All tools brought to the Competition must fit within the pre-defined toolbox size as listed in section 8.2 Competitors toolbox.

8.4 Materials, equipment, and tools supplied by Experts

Experts are required to supply their own Personal Protective Equipment as specified in section 7 skill-specific safety requirements.

Experts are responsible that Interpreters bring their PPE.

8.5 Materials and equipment prohibited in the skill area

Competitors and Experts are prohibited to bring any materials or equipment not listed in section 8.3 and section 8.4.

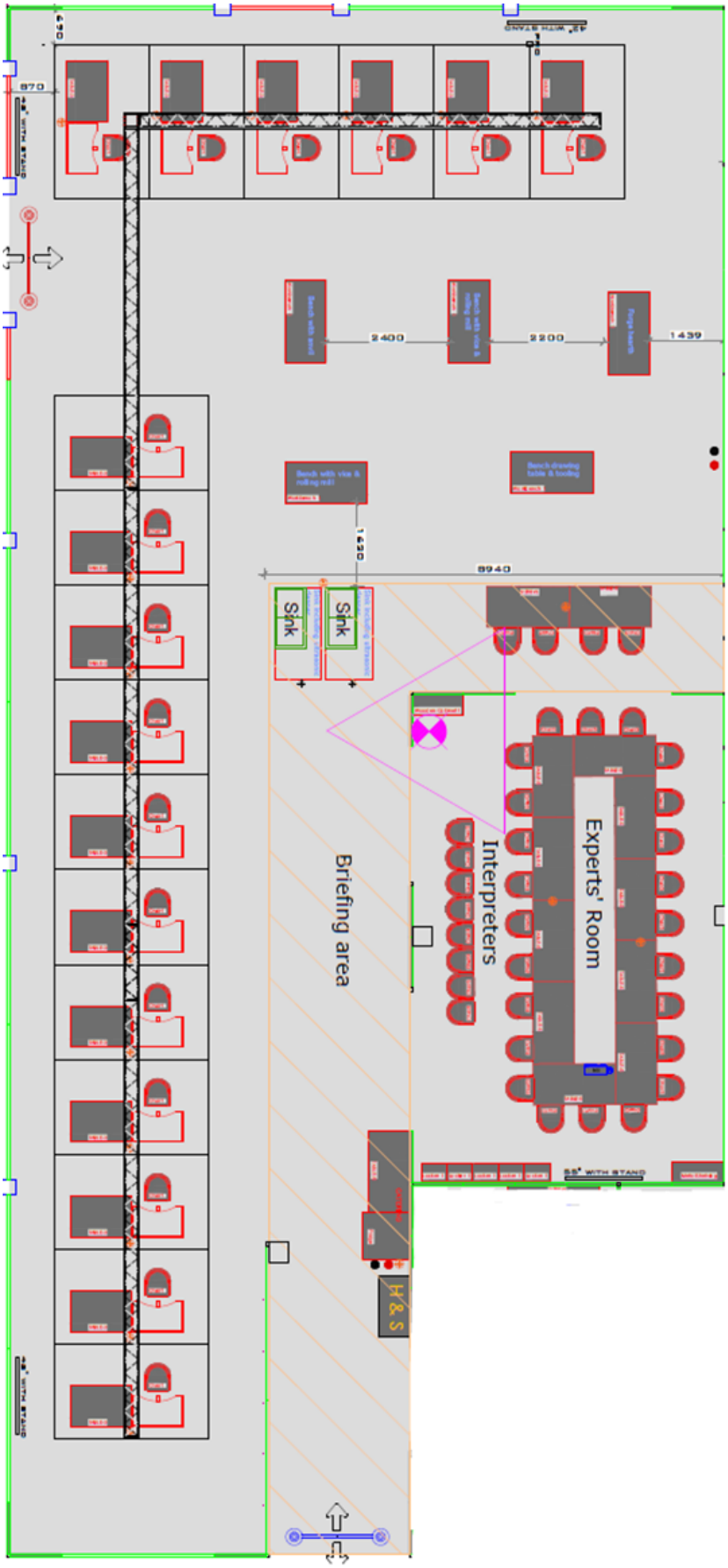
- Tools that perform the same function, or perform the same task, as equipment supplied by the Competition Organizer are prohibited;
- Tools and templates that have been pre-formed for the Test Project;
- Metal used in the Test Project other than that supplied by the Host Country for the competition.

Any yellow or white gold or silver that can be used to augment the metal supplied for the competition. This includes any precious metal jewellery worn by the Competitors. They must remove this jewellery and place in their locker prior to entering the workshop area.

8.6 Proposed workshop and workstation layouts

Workshop layouts from previous competitions are available at www.worldskills.org/sitelayout.

Example workshop layout



Jewellery Benches must be a minimum size of :

Length: 1200 mm

Width: 600 mm

Height: 1000 mm

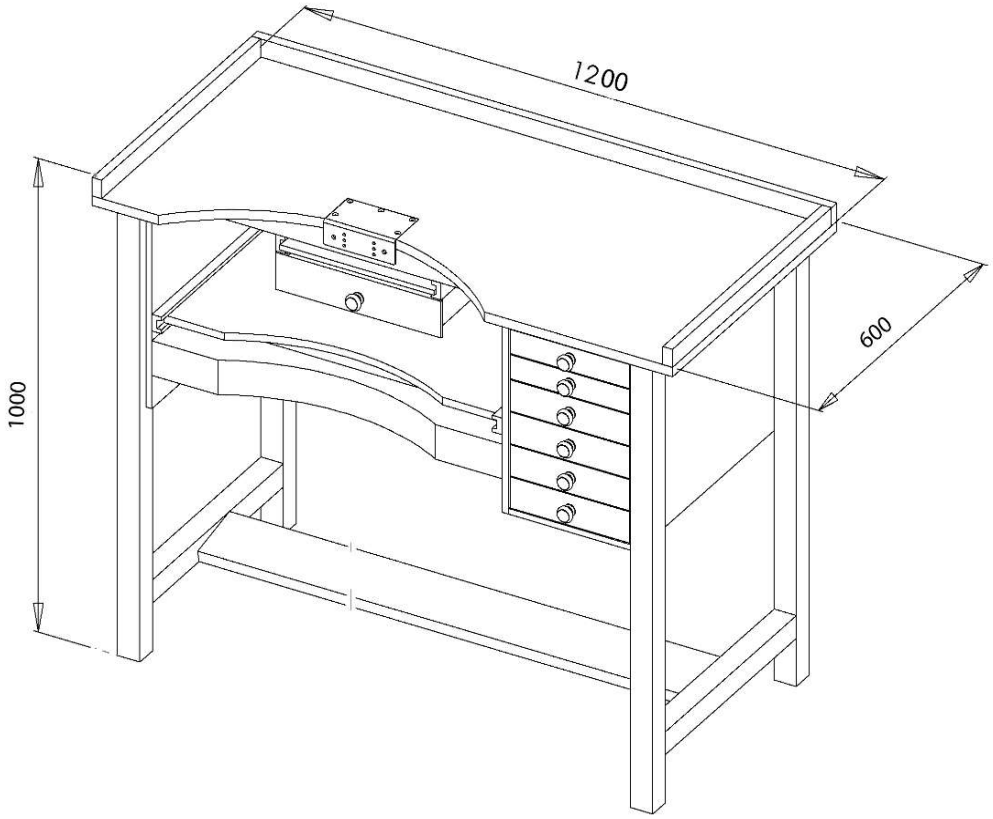


Image is for dimensional reference purposes only.

9 Skill-specific rules

9.1 General notes

Skill-specific rules cannot contradict or take priority over the Competition Rules. They do provide specific details and clarity in areas that may vary from skill competition to skill competition. This includes but is not limited to personal IT equipment, data storage devices, Internet access, procedures and workflow, and documentation management and distribution. Breaches of these rules will be solved according to the Issue and Dispute Resolution procedure including the Code of Ethics and Conduct Penalty System.

9.2 Skill-specific rules

Topic/task	Skill-specific rules
Use of technology – USB, memory sticks	• It is prohibited to use digital information storage devices on any computer on which the final Test Project is stored.
Use of technology – personal laptops, tablets, and mobile phones	No digital information processing devices of any kind may be taken to the workstations from C-2 until the end of C4 including: • Computers; • Tablets; • Mobile phones; • Personal stereo equipment.
Use of technology – personal photo and video taking devices	The following uses of photographic devices are forbidden: • Taking photographs of any Test Project documentation, until after the Test Project has been released; • Taking photographic devices into the workstations between setting-up and packing-up; • Taking detailed photographs of Competitor's work from outside the workshop; • Viewing detailed photographs of Competitor's work from outside the workshop taken by others. Refer to section 4.9 Skill assessment strategy and procedures.
Tools/infrastructure	• Unused tools/infrastructure found/handed in at/before the initial toolbox check will be confiscated until after the competition. This also applies for any additional tools added to a Competitor workstation after the initial toolbox check.
Templates, aids, etc.	Competitors must not bring the following into the workshop (Refer to section 8.5 Material and equipment prohibited in the skill area: • Tools/templates pre-formed for the Test Project – manufacturing of any such tools/templates must be manufactured during competition time and is strictly prohibited before Competition Commencement on C1.

Topic/task	Skill-specific rules
Drawings, recording information	• Except for the competition timetable, all documentation that is taken to (or produced at) the workshop, must remain in the workshop. • As soon as any portion of the Design Brief is released it is prohibited for Competitors and all Experts including the Chief Expert, to bring any paperwork or documentation into the workshop area. • All Competitor documents, including notes and sketches must remain at the Competitors workstation, and within the competition area. • All Experts documents, including notes and sketches, must remain within the Experts area. This also applies to the Chief Expert. • Experts and Interpreters may not directly exchange documents with Competitors within the workshop (translations of documents for Competitors must be copied by the SMT before being passed on)
Assessment	• Experts will maintain supervision of the Competitors during the competition, but must not look at Competitors' work, or have any knowledge of progress, except from those times permitted by Competition Rules, until the module is marked. • The following rules must therefore be observed during competition time: ◦ Experts and Interpreters must not enter the safety area between setting-up and packing-up, except during daily toolbox checks; ◦ Must not have direct contact with their compatriot Competitor during competition time except during those times permitted by Competition Rules; ◦ Must not leave the workshop for breaks if their compatriot Competitor is also outside except during those times permitted by the Competition Rules. • During competition time, Competitors: ◦ Who require assistance should speak to the Chief Expert (with or without Interpreter) at a predetermined "neutral" location on the edge of the safety area. ◦ Must not have direct contact with their compatriot Expert/ Interpreter (including breaks) except during those times permitted by Competition Rules. ◦ Must not leave the workshop for breaks if their compatriot Expert/Interpreter is also outside except during those times permitted by the Competition Rules. ◦ Any exceptions to above, or alternative solutions must be approved by the Chief Expert.
Test Project	• No digital or paper copy (see above) of the Test Project is to be given to Competitors, other than the official Test Project documents provided at the beginning of C1.

10 Visitor and media engagement

10.1 Engagement methods

Following is a list of possible ways to maximize visitor and media engagement:

- Try-a-Skill (benches with tools for visitors to try basic Jewellery techniques);
- “Competitor Cam” – a fixed camera on each Competitor’s workstation with a central viewing monitor;
- Test Project descriptions;
- Enhanced understanding of Competitor activity;
- Competitor profiles – interests, training and education, e.g. duration of training;
- Career opportunities – may differ for each Member Country;
- Precious metal art history – an educational brochure detailing the history of jewellery manufacture and how this aligns with current industry practice, specifically, techniques that the Competitors are currently using;
- Audio visual display explaining the project and category information for the general public.

11 Sustainability

11.1 Sustainable practices

This skill competition will focus on the sustainable practices below:

- Recycling;
- Use of “green” materials;
- Use of completed Test Projects after Competition;
- Energy efficient lighting;
- Pre-determined material list;
- Pre-determined toolbox sizes.

12 References for industry consultation

12.1 General notes

WorldSkills is committed to ensuring that the WorldSkills Occupational Standards fully reflect the dynamism of internationally recognized best practice in industry and business. To do this WorldSkills approaches a number of organizations across the world that can offer feedback on the draft Description of the Associated Role and WorldSkills Occupational Standards on a two-yearly cycle.

In parallel to this, WSI consults three international occupational classifications and databases:

- ISCO-08: (http://www.ilo.org/public/english/bureau/stat/isco/isco08/)
- ESCO: (https://ec.europa.eu/esco/portal/home)
- O*NET OnLine (www.onetonline.org/)

12.2 References

This WSOS (Section 2) appears most closely to relate to the occupation of Jeweller (which is rather higher):
https://www.onetonline.org/link/summary/51-9071.01

and the occupation of Jeweller here, which may be a closer fit:
ttp://data.europa.eu/esco/occupation/618a854a-4ecd-4535-84e6-350e1fe0aa0f .

Adjacent occupations may also be explored through these links.

ILO 7313

The following table indicates which organizations were approached and provided valuable feedback for the Description of the Associated Role and WorldSkills Occupational Standards in place for WorldSkills Lyon 2024.

Organization	Contact name
Andrew Chappell Ltd	Andrew Chappell, Owner
Chopard	Thierry Perrochon, Director of High Jewellery Creation Department
Sarah and Sebastian	Robert Sebastian Grynkofki, Co-founder and Managing Director
The Goldsmith Centre	Robin Kyte, Education and Training Consultant
Vummidi Bangaru Jewellers	Anupam Karmakar, Creative Head

13 Appendix

13.1 Appendix information

Not applicable.