TRANSPORTATION AND LOGISTICS

Car Painting

Technical Description

 TD36 v8.0 WSC2021

worldskills

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:

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Stefan Praschl
Board member – Competitions

Michael Fung
Board member – Competitions

1 Introduction

1.1 Name and description of the skill competition

1.1.1 The name of the skill competition is

Car Painting

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

Car painters (refinishers) are responsible for reinstating the pre-accident paint finish to cars after the structure and/or the panels have been repaired or replaced. They may also be asked to completely repaint a whole vehicle either to change its colour or reinstate its newness. Car painters may also become involved in matching colours to an original colour no longer available or to colours that prove difficult to match. A car painter must match the colour, shade, and texture of the adjoining panels that are not being painted.

Car painters can work in various work environments from an autobody repair shop to an aircraft hangar, dependent upon what vehicle or transport system they are painting. They work to apply paints inside an enclosed spray booth/oven in order to protect the environment from harmful products.

Car painters prepare panels or vehicles to receive paint. They may carry out minor panel repairs and apply undercoats, colour coats, and clear sealant coats which provide the high gloss levels required. They may be required to identify a colour code using various methods, mix the correct amount of colour to pre-determined formulae, and spray test cards to test the suitability of this colour match to the original colour and shade.

A car painter needs to be aware of time schedules and may often be working on several vehicles at one time while waiting for previously applied materials to dry.

Car painters (refinishers) may be required to refinish a wide range of items such as passenger cars, racing cars, vintage and classic vehicles, commercial goods vehicles, trains, aeroplanes, static structures or furniture. They may be required to refinish a wide variety of materials such as metals, plastics, composite materials, or wood.

1.1.3 Number of Competitors per team

Car Painting 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.

2 The WorldSkills Occupational Standards (WSOS)

2.1 General notes on the WSOS

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

The skill competition is intended to reflect international best practice as described by the WSOS, and to the extent that it is able to. 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 that are set out in the Standards Specification. 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, provided that this does not distort the weightings assigned by the Standards.

2.2 WorldSkills Occupational Standards

Section		Relative importance (%)
1	**Work organization and management**	5

The individual needs to know and understand:

- Current occupational Health, Safety, and Environmental regulations related to the car painting industry
- Correct use, storage and maintenance of personal protective equipment and clothing
- All recommendations and information published by the supplier or manufacturer of products and equipment
- The procedures and process for maintaining and using specialist equipment
- Terminology that relates to paint materials, processes, and applications
- The importance of the correct handling and disposal of environmentally harmful products
- The potentially harmful impact car painting products can have on the environment
- The impact that the environment and climate can have on paints and products

The individual shall be able to:

- Apply occupational Health, Safety, and Environmental regulations and best practice related to the car painting industry
- Use correctly and maintain personal protective clothing and equipment
- Set-up, use, adjust, and maintain all specialist application equipment
- Set up, adjust, and use all specialist preparation and drying equipment
- Promote health and safety in the workplace
- Apply all recommendations and guidance provided by suppliers and manufacturers of equipment or products
- Adhere to MSDS (Manufacturers Safety Data Sheets)
- Adopt correct procedures for handling and disposal of environmentally harmful products
- Only use products that are Volatile Organic Compound (VOC) compliant
- Adapt materials to take account of the impact of the environment and climate on paints and products
- Maintain clean spraying environment within paint areas

2	**Communication and interpersonal skills**	5

The individual needs to know and understand:

- the range and purposes of documentation, including written and technical drawings, in paper and electronic forms
- the technical language associated with the occupation
- the industry standards required for quality control in oral, written, and electronic formats
- the required industry standards for customer service and care

Section		Relative importance (%)
	The individual shall be able to: • read, interpret, and extract technical data and instructions from workshop manuals in any available format • communicate in the workplace by written and electronic means, using standard formats • communicate in the workplace by oral, written, and electronic means to ensure clarity, effectiveness, and efficiency • use a standard range of communication technologies • complete reports and respond to issues and questions arising • Respond to customers' needs face to face and indirectly	
3	**Preparation for painting**	**14**

	The individual needs to know and understand:
	• The range, purpose, and application of products used in the car painting industry for the following procedures:
	  • Cleaning
	  • Removal of contaminants
	  • Repairing minor panel and paint damage
	  • Abrading and final cleaning
	  • Other surface contaminants
	  • Removal of dust from all areas to be finished
	  • Protection of parts and areas not being painted	

	The individual shall be able to: • Use appropriate cleaning products to remove contaminants • Prepare surfaces to be coated with appropriate abrasive products • Carry out minor panel repairs • Carry out final cleaning of surfaces prior to paint application • Remove dust from all areas to be refinished • Suitably remove contaminates such as glues, labels, and seam-sealers • Carry out masking procedures to protect surrounding areas	

Section		Relative importance (%)
4	**Application of adhesion promoters and primers**	**11**

The individual needs to know and understand:

- The range of adhesion promoters and primers available
- The purpose of adhesion promoters and primers
- The context of where and when various adhesion promoters and primers are used
- Mixing and application techniques for each of the adhesion promoters and primers
- The preparation and application process for the full range of seam sealers, e.g. gap sealers, weld sealers, seam sealers, etc.
- Which materials to select for a particular application
- The drying characteristics of each adhesion promoter or primer

The individual shall be able to:

- Apply suitable primers and or fillers to the substrate and appropriate for the process being used:
  - Etch primers;
  - Primer surfaces;
  - Primer fillers;
  - Plastic primers;
  - UV primers.
- Apply the correct procedures for sanding (flatting) primer fillers
- Reinstate the corrosion protection of the panels being painted
- Apply seam sealers
- Follow the Original Engineering Manufacturer (OEM) or paint manufacturer's (Technical Data Sheet – TDS) recommendations
- Measure out materials carefully to minimize environmental effects and cost implications

5	**Base coat and ground coat application**	**16**

The individual needs to know and understand:

- How to access information related to colour and application
- Types and specifications of car paints and their uses
- Warranty procedures applied to particular vehicles
- The correct use of equipment used in applying base coats and ground coats
- Specialist paint finishes
- The impact upon cost and environment of over mixing materials

Section		Relative importance (%)
	The individual shall be able to: • Retrieve colour and application information from printed and electronic sources • Use appropriate equipment and technology to access colour formulations (computer based and photo spectrometer) • Use colour swatches/chips to identify the correct colour and shade and variant • Apply the electronic information to mix required colour and shade • Follow the correct procedure to spray out a test paint card and compare with the original standard, adjust as necessary • Mix and apply straight/solid colours, metallic, pearls, multi-stage effect colours and special effect colours • Apply base/ground coats to metal and non-metal parts • Follow the Original Engineering Manufacturer (OEM) or paint manufacturer's (Technical Data Sheet – TDS) recommendations • Measure materials to minimize the environmental and cost factors	
6	**Clear coat application**	17
	The individual needs to know and understand: • The purpose of a clear coat • The process for identifying, mixing, and applying clear coats • The importance of following manufacturer's instructions • The need for flexible additives as required • The spray gun set up and adjustment for clear coat materials • The correct gun pressure, speed, distance, and overlap required to produce an excellent finish with clear coats and achieve high gloss levels	
	The individual shall be able to: • Identify, mix, and apply clear coats correctly • Adjust spray gun to achieve the correct outlet pressure, fan width and fan shape • Apply clear coats to match existing finishes (matt clear coat, ceramic, and soft healing clear coat) • Apply clear coats as per paint manufacturer's instructions to avoid defects such as runs, excessive orange peel, etc. • Follow the Original Equipment Engineering Manufacturer (OEM) or paint manufacturer's (Technical Data Sheet – TDS) recommendations • Dispose of unused clear coat in an environmentally safe manor • Maintain organized and clean work areas • Prevent over-use of products	

Section		Relative importance (%)
7	**Colour evaluation and colour adjustment**	11

The individual needs to know and understand:

- Colour technology and colour adjustment techniques (Munsell Colour Wheel)
- Technical terms and definitions for colour descriptions
- The effects of colour miss-match in terms of face and flop tone
- The effects of varying strengths and values of toners
- The impact of light quality and type on colour
- The impact of spraying techniques upon colour match

The individual shall be able to:

- Locate and document vehicle manufacturers paint codes
- Determine types and colours of paint using manufacturers' paint codes and vehicle information
- Evaluate spray-out cards against the standards to identify colour miss-matches in terms of hue, chroma, saturation, lightness, and darkness
- Select and apply suitable procedures to adjust colour to match the given standards
- Select toners to correct colour miss-matches
- Identify and use the correct lighting to match colours
- use the correct gun speeds, distance, and overlap to produce quality spray out cards
- Maintain organized and clean work areas
- Use spectrophotometer
- Use mixing scales to produce ready to spray products
- Prevent overuse of products

8	**Design, layout, and measurement**	13

The individual needs to know and understand:

- Basic geometry
- Appropriate materials for masking different areas for two-tones
- Uses of different types of masking materials
- How to select and use of specialist measuring and marking out equipment e.g. rules, straight edges etc.
- Techniques for applying decals/transfers
- Techniques for applying covering vinyl (carbone or matt) to given locations without creases, bubbles, cuts, etc.

Section		Relative importance (%)
	The individual shall be able to: • Mask areas of vehicle panels for the prevention of overspray between colours for painting • Mask and protect adjacent panels that will not be refinished • Apply vinyl decals/transfers to specified locations without creases, bubbles, cuts, etc. • Apply covering vinyl (carbone or matt) to given locations without creases, bubbles, cuts, etc. • Mask door jambs and other moveable panels • Mask for design painting and two-tone finishes • Apply a range of special effect coatings, including blended colours	
9	**Remove minor damage and defects from painted and non-painted surfaces**	**8**
	The individual needs to know and understand: • Types of paint-related defects • The correct repair procedures to rectify minor paint damage or defects • The procedures and materials required to rectify minor panel damage • Techniques and materials for removal and repair of minor paint defects • Techniques to invisibly perform a spot repair or blend paint in confined areas	
	The individual shall be able to: • Identify the types of defects that may occur on a painted surface such as dirt nibs, pin holes, runs, environmental effects, etc. • Apply correct repair procedures to remove or repair paint defects • Carry out 'smart' repairs to small areas of damage • Evaluate the extend of minor panel damage and plan work accordingly to rectify this damage • Wet and dry sand clear coat to remove and rectify defects • Apply polyester and epoxy fillers to repair small stone chip damage to panel surfaces • Prepare and blend invisibly scratch and scuff damage • Reinstate original gloss levels using polishing techniques and materials	
	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, in order 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 people 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 Rules for further details.

Experts and Independent Assessors 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
		A	B	C	D	E	F	G	H			
STANDARDS SPECIFICATION SECTION	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)
- 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

WorldSkills is committed to continuous improvement. This particularly applies to assessment. The SMT is expected to learn from past and alternative practice and build on the validity and quality of assessment and marking.

- The tolerances are established by the Experts at the Competition site prior to the event;
- The Experts will establish and adhere to international procedures for the preparation and application of global automotive refinishing systems;
- Competitors are given technical manuals from the selected paint system;
- Points may be deducted if the selected paint systems procedures are not adhered too during the processing of the selected Test Project;
- Blind marking must be performed for clear base, design, and colour matching.

Criteria for Measurement Marking

Example: section A1 Preparation of the OEM exterior panels

1.0 mark	Was the panel correctly cleaned before non-sanding?	Y/N
1.0 mark	Was the panel sanded correctly?	Y/N
3.0 marks	Was the panel correctly sanded? The surfacer should not be cut through 1-3 cuts	Y/N

Criteria for Measurement Marking

Example: section B1 matching colours - adjusting colour by eye

Marks awarded	%	colour accuracy
Edge to Edge	10.0	95%
	9.5	90%
	9.0	85%
	8.5	80%
	8.0	75%
Blendable	7.5	70%
	7.0	65%
	6.5	60%
	6.0	55%
	5.5	50%
	5.0	45%
Not blendable	4.5	40%
	4.0	35%
	3.5	30%
	3.0	25%
	2.5	20%
	2.0	15%

Criteria for Measurement Marking

Example: section F1 dimensions of decoration

1.0 mark	dimension # one tolerance = ± 2.0 mm	Y/N
1.0 mark	dimension # two tolerance = ± 2.0 mm	Y/N

Criteria for Measurement Marking

Example of aspects: Application of base coat to spot repair

0.5 mark	Was the base coat applied correctly? *Base coat spot repair applied with-in the correct boundary*
1.0 mark	Base coat free of banding and mottling *Minor mottling lose 0.5 mark, heavy mottling lose 1.0 mark*
0.5 mark	Were Health, Safety, and Environmental standards adhered too? *Spray application of base coats*

4.10 Skill assessment procedures

Assessment and marking are an intense process that depends upon skilful leadership, management, and scrutiny.

The Test Project, marking forms, the marking criteria, and the dimensional tolerances on the Measurement and Judgement Marking Forms are developed prior to the competition. Standards are set on the Marking Forms that the marking teams can follow. Example: craters, fisheyes, etc.

The assessments are performed by different groups of Experts. Each group consists of an Expert with previous international competition knowledge. Assessments are weighted to allow an even distribution of marks through ALL groups evolved with assessment procedures.

Each group is rotated throughout the Competition to give a daily balance between assessments of Competitors and the exchange of knowledge amongst Experts.

Marks are recorded into the CIS system after each section/module is completed by the selected groups of Experts.

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 Developer, 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

The Competitor shall carry out, independently, the tasks, which are selected from the proposed project designs. This document is to be updated by the Experts at each Competition.

The Test Project proposals or the actual Test Project are prepared on the standard Competitor Instructions and car painting Measurement Marking Form.

Test Project are based on standard modern cars that are known worldwide. A balanced choice of cars is necessary taking into consideration the different origins of the Competitors.

The person responsible for the design should also produce a marking scale for the design.

5.4 Test Project 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 Who develops the Test Project or modules

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

5.4.2 When is the Test Project developed

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

Time	Activity
Prior to the Competition	The Test Project/modules are developed.
No later than 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-4	The Test Project/modules are presented to Experts.
At the Competition on C-2	The Test/Project modules are presented to 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 is expected to identify one or more independent, expert, and trusted individuals initially to review the 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 and will ensure that the Test Project/modules can be completed within the material, equipment, knowledge, and time constraints of Competitors.

5.7 Test Project selection

The Test Project/modules are selected by the Independent Test Project Designer in collaboration with the Skill Competition Manager.

5.8 Test Project circulation

The Test Project/modules are not circulated prior to the Competition. The Test Project/modules are presented to Experts on C-4 and to Competitors on C-2.

5.9 Test Project coordination (preparation for Competition)

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

5.10 Test Project change

There is no 30% 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 to infrastructure limitations.

5.11 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 such items may include those for fault finding modules or modules not circulated.

At CPW the Workshop Manager and the Skill Competition Manager agree on the car manufacturer used at the competition.

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 skill specific Discussion Forum (http://forums.worldskills.org). Skill related decisions and communication are only valid if they take place on the forum. The Chief Expert (or an Expert nominated by the Chief Expert) will be the moderator for this Forum. Refer to 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 during the Competition is defined in the Skill Management Plan that is created by the Skill Management Team led by the Skill Competition Manager. The Skill Management Team comprises the Skill Competition Manager, Chief Expert, and Deputy Chief Expert. The Skill Management Plan is progressively developed in the six months prior to the Competition and finalized at the Competition by agreement of the Experts. 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
Viewing of Test Project	• Test Project is released on C-4
Translation of the Test Project	• Translation of the Test Project will take place on C-3 and may be done using personal laptops and downloaded to a USB stick. The USB stick is given to the Chief Expert or the Deputy Chief Expert. The translation is printed and attached to the English version. • The Test Project documents distributed to the Competitors are collected before Competitors leave the workshop. • Translations must be completed within the scheduled time, no extension is allowed.

7 Skill-specific safety requirements

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

Task	Safety glasses with side protection	Solvent Respirator	Nytril Gloves	Dust Mask	Long sleeve shirt	Sturdy shoes	Fire resistant protective clothes	Air Supplied Respirator with hood	Paint Coveralls
General PPE for safe areas	√				√	√			
Applying product in paint cabin	√		√		√	√	√	√	√
Workshop floor	√				√	√			
Mixing paint products	√	√	√		√	√		√	√
Sanding	√			√	√	√			

- Safety procedures must relate to the paint sponsors data sheets.

Other skill-specific safety requirements are:

- Experts will use the appropriate Personal Protective Equipment when inspecting, checking, or working with a Competitor's project;
- Competitors must use safety protection during the Competition according to Competition Rules.

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 such 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.

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 are not allowed to send a toolbox to the Competition. All tools are provided by the Competition Organizer.

8.3 Materials, equipment, and tools supplied by Competitors

It is not applicable for the Car Painting skill competition for Competitors to bring materials, equipment, and tools to the Competition.

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

8.4 Materials, equipment, and tools supplied by Experts

Experts are not required to bring materials, equipment, or tools. All is supplied by the Competition Organizer.
Experts are required to supply their own Personal Protective Equipment as specified in section 7 skill-specific safety requirements.

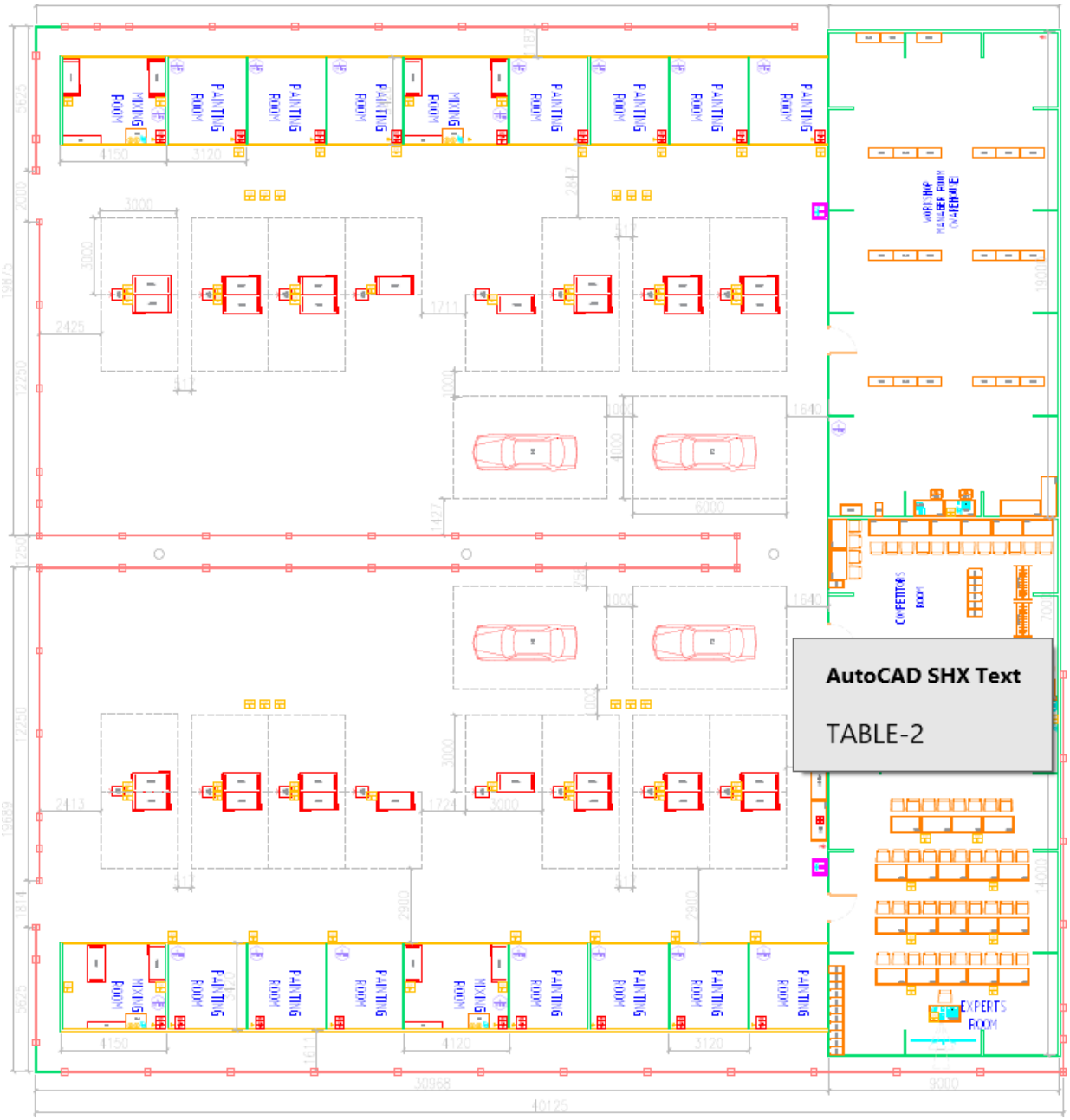
8.5 Materials and equipment prohibited in the skill area

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

8.6 Proposed workshop and workstation layouts

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

Example workshop layout:



9 Skill-specific rules

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.

Topic/task	Skill-specific rule
Use of technology – USB, memory sticks	• USB or memory devices are not allowed in the workshop.
Use of technology – personal laptops, tablets, and mobile phones	• Competitors are not allowed to bring personal laptops and tablets into the workshop. • Skill Competition Manager, Chief Expert, Deputy Chief Expert, Experts, and Interpreters are allowed to bring and use personal laptops and tablets in the workshop. • Competitors are not allowed to have mobile phones in the workshop until the end of competition on C4. If these are brought into the workshop they must be locked in the personal locker however they can remove them at lunchtime and at the end of each day. • Skill Competition Manager, Chief Expert, Deputy Chief Expert, Experts, and Interpreters are allowed to keep their mobile phone in their pocket from C-4 until C+1 and use them as necessary as long as it does not interfere with their role as an Expert. • Mobile phones cannot be used to take photos in the workshop until the end of competition on C4.
Use of technology – personal photo and video taking devices	• Competitors, Experts, and Interpreters are allowed to use personal photo and video taking devices in the workshop at the end of competition on C4 and C+1 only. The Chief Expert and Deputy Chief Expert may appoint an Expert to take photos prior to C4 and then share the photos with all Experts at the end of the competition.
Templates, aids, etc.	• Chief Expert, Deputy Chief Expert, Experts, Interpreters, and Competitors are not permitted to bring and use templates, patterns and prepared parts in the workshop.
Drawings, recording information	• Experts, Competitors, and Interpreters are not permitted to bring drawings and prepared information into the workshop. • The Skill Competition Manager, Chief Expert, and Deputy Chief Expert are exempt from this rule.
Assessment	• Skill Competition Manager, Chief Expert, Deputy Chief Expert, Competitors, Experts, and Interpreters a not permitted to take paper or digital copies of the Assessment out of the workshop until the competition has finished on C4.

10 Visitor and media engagement

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

- Try-a-Skill;
- Display screens;
- Test Project descriptions;
- Enhanced understanding of Competitor activity;
- Competitor profiles;
- Career opportunities;
- Daily reporting of competition status.

11 Sustainability

This skill competition will focus on the sustainable practices below:

- Recycling;
- Use of "green" materials;
- Use of completed Test Projects after Competition.

12 References for industry consultation

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.**onet**online.org/)

This WSOS (Section 2) appears most closely to relate to *Painters, Transportation Equipment*: https://www.onetonline.org/link/summary/51-9122.00

and/or *Transportation Equipment Painter:* http://data.europa.eu/esco/occupation/a784b063-89cf-441b-9624-deed9dbdeae6

These links can also be used to explore adjacent occupations.

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 Shanghai 2021.

Organization	Contact name
BASF Coatings GmbH (Global)	Andreas Jansen, STAMPP Manager, STimulate and revAMp the Paint Professions
Festool GmbH (Global)	Stefan Langenberg, Training Manager International Automotive
PPG (global)	Jessica Neri, Commercial Territory Manager
PPG Industries Australia/New Zealand	John Hristias, Business Support Manager, Technical, Product, Training and Sales - Technical, Product, Training and Sales
SATA GmbH & Co. KG (Global)	Jörn Stöver, Export Sales Manager
The National Institute for Automotive Service Excellence – ASE (United States of America)	Teresa Bolton, Director, Collision Repair Test Development