

Applying finishes to motorsport composite mouldings

Overview

This standard identifies the competences you need to apply finishes to motorsport composite mouldings (such as moulds, wings, body panels, ductwork, fairings), in accordance with approved procedures. You will be required to use appropriate drawings, specifications and documentation to apply finishes, using the correct techniques.

You will apply finishes to composite mouldings using a range of techniques and processes. A variety of finishes will be applied to a range of resin and fibre materials.

Your responsibilities will require you to comply with organisational policy and procedures for the finishing activities undertaken, and to report any problems with the finishing activities, equipment or materials that you cannot personally resolve, or that are outside your permitted authority, to the relevant people. You will be expected to work with a minimum of supervision, taking personal responsibility for your own actions and for the quality and accuracy of the work that you carry out.

Your underpinning knowledge will provide a good understanding of your work, and will provide an informed approach to applying finishing techniques and procedures to motorsport composite mouldings. You will understand the finishing techniques used, and their application, in adequate depth to provide a sound basis for carrying out the activities, correcting faults and ensuring that the work output is to the required specification.

You will understand the safety precautions required when carrying out the finishing operations, and when using the associated tools and equipment. You will be required to demonstrate safe working practices throughout, and will understand the responsibility you owe to yourself and others in the workplace.

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Performance criteria

You must be able to:

1. work safely at all times, complying with health and safety and other relevant regulations, directives and guidelines
2. ensure the material surfaces to be treated are suitably prepared for the finishing operations to be carried out
3. check that the finishing equipment and treatment solutions are set up and maintained at satisfactory operating conditions and levels
4. carry out the treatment process in accordance with operating procedures and the component specification requirements
5. check that the treated workpiece achieves the required characteristics and meets the finishing specification
6. deal promptly and effectively with problems within your control and report those that cannot be solved
7. dispose of waste and excess materials in line with agreed organisational procedures
8. ensure that work records are completed, stored securely and available to others, as per organisational requirements
9. leave the work area in a safe condition on completion of the activities, as per organisational and legal requirements

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Knowledge and understanding

You need to know and understand:

1. the specific safety precautions to be taken whilst carrying out the activities (including any specific legislation, regulations or codes of practice relating to the activities, equipment or materials)
2. the health and safety requirements of the work area and the activities, and the responsibility these requirements place on you
3. the hazards associated with the activities, and how to minimise them and reduce risks
4. the personal protective equipment and clothing (PPE) to be worn during the activities
5. the various specifications and documentation that will be used during the finishing activities (finishing specifications, material data sheets, mixing ratios, cure times)
6. quality procedures used in the workplace to ensure production control (in relation to currency, issue, meeting specification), and the completion of such documents
7. conventions and terminology used for applying finishes (surface keying, finish thickness, matt finish, gloss finish, treatment reactions)
8. the surface treatment methods and techniques to be undertaken, prior to applying the finishing materials (application of degreasers, solvents and soap washes, primers)
9. recognition of surface defects (bubbles, foreign object damage, contamination), and how these will effect the final finish
10. the preparation methods and techniques for mixing primers and finishing materials
11. the procedures for the transportation and storage of finishing materials
12. the equipment care and control procedures (fume extraction systems)
13. cleaning and maintenance procedures for spray guns, spray booths and ovens
14. safe operation of compressed air facilities, and how to set the different air pressures
15. correct methods of storage, handling and disposal of finishing materials
16. methods of preparation for applying different finishes
17. mixing ratios for two-part finishes, and the associated working times
18. methods of application for different finishes
19. the problems that can occur during the finishing process (including

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- defects such as contamination)
- 20. how defects can be overcome during the finishing activity
- 21. tools and equipment used in finishing activities; their care, preparation and control procedures
- 22. the importance of marking and identifying specific pieces of work in recording documentation
- 23. the procedures for dealing with waste materials
- 24. the extent of your own responsibility and to whom you should report if you have problems that you cannot resolve
- 25. how to access, use and maintain information to comply with organisational requirements and legislation

Scope/range related to performance criteria

1. Carry out all of the following during the finishing activities:
 1. obtain and use the appropriate finishing documentation (such as job instructions, drawings, planning and quality control documentation, material data sheets, specifications)
 2. adhere to procedures or systems in place for risk assessment, hazardous substances, personal protective equipment and other relevant safety regulations and procedures to realise a safe system of work
 3. provide and maintain a safe working environment for the composite finishing activities
 4. obtain the correct tools and equipment for the activity, and check that they are in a safe, tested and usable condition
 5. follow safe practice/approved composite moulding finishing techniques and procedures at all times
 6. return all tools and equipment to the correct location on completion of the finishing activities
 7. dispose of waste materials in accordance with approved procedures
 8. leave the work area in a safe and appropriate condition on completion of the activities

2. Carry out all of the following when preparing for the finishing activity:
 1. check that mouldings are correct and complete
 2. select correct equipment for the activity
 3. check for any defects in the mouldings
 4. check that equipment is suitable for use
 5. check availability of ancillary materials required
 6. identify and protect the moulding in the work area

3. Apply finishes to six of the following motorsport composite mouldings:
 1. tub/monocoque
 2. wheels
 3. nose cones
 4. seats
 5. floor/diffuser
 6. wings
 7. wishbones
 8. exhausts
 9. splitters
 10. fuel tank housings

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11. radiator ducts
 12. trim panels
 13. body panels
 14. wing endplates
 15. dash panels
 16. side pods
 17. bumpers
 18. fairings/shrouds
 19. engine covers
 20. brake ducts
 21. moulds/jigs
4. Apply finishes to motorsport composite mouldings, using two of the following techniques:
1. cloth application
 2. brush
 3. spray
 4. laying films
 5. roller
5. Prepare surfaces of motorsport composite mouldings, using two of the following methods:
1. abrading
 2. bead blasting
 3. water cleaning
 4. solvent cleaning
 5. priming
6. Apply two types of finishes to motorsport composite mouldings from:
1. surface sealers
 2. top coats
 3. UV coatings
 4. speciality coatings
 5. primers
 6. adhesive films
 7. heatproof coatings
 8. flexible coatings
7. Apply finishes to motorsport composite mouldings, using three of the following:
1. one-part finishes
 2. multiple coatings
 3. solvent based
 4. water based
 5. single coatings

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6. two-part finishes
 7. combination coats
 8. adhesive based
8. Apply finishes to motorsport composite mouldings, using four of the following consumable materials:
1. abrasives
 2. masking films
 3. thinners
 4. stoppers
 5. sealers
 6. cutting compounds
 7. masking tapes
 8. polishes
 9. solvents
 10. fillers
 11. primers
 12. cleaning agents
9. Apply finishes to motorsport composite mouldings suitable for two of the following resin types:
1. polyester
 2. epoxy
 3. bismaleimide
 4. vinyl ester
 5. phenolic
 6. cyanate ester
10. Apply finishes to motorsport composite mouldings suitable for two of the following fibre types:
1. polyethylene
 2. aramid
 3. hybrid
 4. glass
 5. carbon
11. Check finishes to motorsport composite mouldings, comply with one of the following:
1. legislation, industry standards, codes of practice and procedures
 2. customer standards and requirements
 3. recognised compliance agency/body's standards

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