

Manufacturing vehicle components by resin casting

Overview

This standard identifies the competences you need to manufacture vehicle components using cast resin techniques, in accordance with approved procedures. You will be required to use appropriate manufacturing drawings, instructions, specifications and documentation, together with other quality documentation, to produce the various types of component. The size, shape and complexity of the parts to be produced will vary, and it is anticipated that originals and duplicates will be used in the process.

Your responsibilities will require you to comply with organisational policy and procedures for the resin casting activities undertaken, and to report any problems with the casting activities, materials or equipment used 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 resin-casting procedures. You will understand the resin casting requirements and procedures, and their application, and will know about the tools, techniques, materials and consumables used, in adequate depth to provide a sound basis for carrying out the activities, correcting faults and ensuring that the components produced are to the required specification.

You will understand the safety precautions required when carrying out the casting operations. 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. follow the correct component drawing or any other related specifications for the component to be produced
3. obtain and prepare the appropriate tools, equipment and materials
4. carry out the moulding or laying-up activities using the correct methods and techniques
5. produce components to the required specification
6. check that all the required operations have been completed to specification
7. deal promptly and effectively with problems within your control and report those that cannot be solved
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/codes of practice for the activities, equipment or materials)
2. the health and safety requirements of the work area and activities, and the responsibility they place on you
3. the personal protective equipment and clothing (PPE) to be worn during the activities the hazards associated with the activities, and how to minimise them and reduce any risks
4. the interpretation of drawings, standards, quality control procedures and specifications used for the casting activity, and the currency/issue checks of the documents you are working with
5. the use of, and conventions/terminology used in, resin casting
6. the procedures for ensuring that you have the correct tools and equipment for the casting activities, and how to check that they are in good order and fit for purpose
7. the different methods used to produce cast resin components for vehicle activities
8. the types of resin and other materials that are used in the casting process, and why different amounts of materials are used in the resin mixes
9. the function and application of the following materials: release agents, liquid resins, catalysts, accelerators, pigments, wax, stoppers, fillers, inserts
10. the different mixing methods that can be used when preparing materials for use both manually and mechanically
11. the correct sequence and technique of mixing the various materials together, and the effects on the cast resins of using incorrect sequences and volumes
12. the importance of keeping the masters clean and free from damage; practicing good housekeeping of mixing tools, containers and equipment; maintaining a clean, unobstructed and well ventilated working area
13. methods of removing the completed casting from the moulds without causing damage to the casting or the mould
14. methods of trimming and dressing the finished casting, and the tools and techniques that are used
15. the quality control procedures to be followed during the casting operations
16. how to recognise casting defects, contamination and surface defects; their cause, effect and prevention
17. the problems that can occur with the resin casting operations and how these can be overcome

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18. the importance of identifying and marking specific resin casting work on recording documents
19. the extent of your own responsibility and to whom you should report if you have problems that you cannot resolve
20. 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 resin casting operations:
 1. obtain and use the appropriate documentation (such as job instructions, drawings, material data sheets, 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 resin casting activities
 4. obtain the correct materials for the resin casting activities (in life batches, correctly protected)
 5. obtain the correct tools and equipment for the activity, and check that they are in a safe, tested and usable condition
 6. follow safe practice/approved resin casting techniques and procedures at all times
 7. return all tools and equipment to the correct location on completion of the resin casting activities
 8. dispose of waste materials in accordance with approved procedures
 9. leave the work area in a safe and appropriate condition on completion of the activities
2. Prepare all of the following equipment for the casting activities:
 1. masters
 2. frames
 3. inserts
 4. release systems
3. Prepare and cast materials, to include all of the following:
 1. determining the correct type and amount of resin mixes
 2. mixing the materials either manually or mechanically
 3. casting full or part mould sections or models
 4. applying correct de-moulding techniques
 5. trimming and dressing cast components
 6. rectifying minor surface defects (as appropriate)
4. Produce a range of components which cover five of the following features:

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1. flat faces
 2. stepped features
 3. tapered faces
 4. concave profiles
 5. curved profiles
 6. convex profiles
5. Use seven of the following materials during the casting activities:
1. resins (including quick-set)
 2. release agents
 3. catalysts
 4. fillers
 5. accelerators
 6. stoppers
 7. pigments
 8. wood/metal inserts
 9. wax
6. Check components comply with all of the following standards:
1. dimensionally accurate within specification tolerances
 2. have an appropriate surface finish and is free from defects or surface blemishes
 3. meet job requirements
 4. meet company standards and procedures

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