

Trimming vehicle composite mouldings using hand tools

Overview

This standard identifies the competences you need to trim vehicle composite mouldings (body mouldings, structural sections, cover panels, trim panels) using hand tools, in accordance with approved procedures. You will be required to use appropriate drawings, specifications and documentation to inform the way you trim various mouldings, using the correct trimming techniques.

You will be expected to select the correct tools and equipment for the trimming activity. You will trim a range of composite mouldings incorporating a variety of features, using cutting, sanding, drilling and polishing techniques and processes. Mouldings trimmed will include a range of resin and fibre materials.

Your responsibilities will require you to comply with organisational policy and procedures for the trimming activities undertaken, and to report any problems with the trimming 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 composite moulding trimming techniques and procedures. You will understand the trimming techniques used, and their application, in adequate depth to provide a sound basis for carrying out the activities, correcting faults and ensuring that the trimmed mouldings meet the required specification.

You will understand the safety precautions required when carrying out the trimming activities 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.

Trimming vehicle composite mouldings using hand tools

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 relevant specifications for the component to be produced
3. obtain the appropriate tools and equipment for the trimming operations and check they are in a safe and usable condition
4. trim the materials using appropriate methods and techniques
5. check that all the required trimming operations have been completed to the required specification
6. deal promptly and effectively with problems within your control and report those that cannot be solved
7. ensure that work records are completed, stored securely and available to others as per organisational requirements
8. leave the work area in a safe condition on completion of the activities, as per organisational and legal requirements

Trimming vehicle composite mouldings using hand tools

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. health and safety precautions to be taken and procedures used when working with composite materials, consumables, tools and equipment in the specific work area
4. the hazards associated with the activities, and how to minimise them and reduce riskss
5. the personal protective equipment and clothing (PPE) to be worn during the activities
6. the application of current regulations in relation to the storage, use and disposal of composite materials and consumables
7. the specific workshop environmental conditions the must be observed when trimming composite mouldings (such as temperature, humidity, styrene levels to threshold limits, fume/dust extraction systems and equipment)
8. how to extract and use information from engineering drawings and related specifications (to include symbols and conventions,current industry standards and codes of practice) in relation to work undertaken
9. how to interpret first and third angle drawings, imperial and metric systems of measurement, workpiece reference points and system of tolerancing
10. quality procedures used in the workplace to ensure production control (in relation to currency, issue, meeting specification)
11. conventions and terminology used for trimming activities (scribe lines, sanding grades, types of cutting tools, speeds)
12. different types of manual and power tools, and their merits
13. different types of cutting tools and abrasives, and their merits
14. different types of materials used in cutting tools and abrasives, and their merits
15. different types of resins, fibres, reinforcement, and their merits
16. the visual identification of cured composite materials
17. the identification and rectification of defects in composite mouldings
18. the methods used in the trimming of composite mouldings
19. operations and their sequence when preparing for trimming activities
20. methods for handling composite mouldings throughout the trimming activities
21. tools and equipment used in trimming activities, and their care,

Trimming vehicle composite mouldings using hand tools

- preparation and control procedures
- 22. the care and safe handling of composite mouldings throughout the trimming cycle
- 23. the problems that can occur with the trimming operations and how these can be overcome
- 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

Trimming vehicle composite mouldings using hand tools

Scope/range related to performance criteria

1. Carry out all of the following during the trimming activities:
 1. obtain and use the appropriate 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 mould trimming activities
 4. obtain the correct tools and equipment for the activities, and check that they are in a safe, tested and usable condition
 5. follow safe practice/approved mould trimming techniques and procedures at all times
 6. return all tools and equipment to the correct location on completion of the mould trimming activities
 7. dispose of waste materials in accordance with approved procedures
2. Prepare for trimming activity:
 1. check the moulding is correct and complete
 2. check equipment is suitable for use
 3. check for any defects in the moulding
 4. identify and protect the moulding in the work area
 5. select the correct equipment for the activity
3. Mark out mouldings using all of the following methods:
 1. scribe
 2. height gauge
 3. moulded scribe lines
 4. centre punch
 5. trimming templates
4. Cut mouldings using two of the following methods:
 1. cutting wheels/discs
 2. saws
 3. routers
 4. trim jigs

Trimming vehicle composite mouldings using hand tools

5. Sand mouldings using three of the following methods:
 1. rubbing blocks
 2. diamond files
 3. pencil grinders
 4. disc sanders
 5. belt sanders
6. Use a hand drill or pedestal drill to trim mouldings, using three of the following methods:
 1. drill jigs
 2. hole saws
 3. counterbores
 4. countersinks
 5. drill bits
7. Polish mouldings using four of the following methods:
 1. wet sanding
 2. polishing compound
 3. orbital sander
 4. polisher
 5. cutting compound
 6. rubbing block
8. Trim mouldings using techniques for two of the following resins types:
 1. polyester
 2. vinyl ester
 3. epoxy
 4. phenolic
 5. bismaleimide
 6. cyanate ester
9. Trim mouldings using techniques for two of the following fibre types:
 1. polyethylene
 2. glass
 3. aramid
 4. carbon
10. Trim mouldings that require, or incorporate, eight of the following features:
 1. straight edges
 2. radius corners
 3. multiple holes

Trimming vehicle composite mouldings using hand tools

4. inserts to be drilled
 5. curved edges
 6. returns
 7. multiple hole sizes
 8. inserts to be tapped
 9. flat surfaces
 10. nett edges
 11. countersinks
 12. solid cores
 13. polished surfaces
 14. joggle details
 15. counterbores
 16. honeycomb cores
 17. shaped surfaces
 18. removal of join lines
 19. further lay-up stages
 20. edge filling
11. Check mouldings comply with all of the following quality and accuracy standards:
1. meet company standards and procedures
 2. dimensionally accurate within specification tolerances
 3. free from false tool cuts, defects or damage

Trimming vehicle composite mouldings using hand tools

Developed by	Enginuity
Version Number	2
Date Approved	30 Mar 2020
Indicative Review Date	31 Mar 2023
Validity	Current
Status	Original
Originating Organisation	Semta
Original URN	SEMAUT3030
Relevant Occupations	Engineering, Engineering and Manufacturing Technologies, Science and Engineering Technicians, Vehicle Trades
Suite	Automotive Engineering Suite 3
Keywords	engineering; automotive; manufacturing; trimming; composite; moulding; sanding; drilling; polishing; trimming methods