

Overview

This standard identifies the competences you need to produce composite assemblies from composite components and non-composite components, in accordance with approved procedures. You will be required to use appropriate drawings, specifications and documentation to produce composite assemblies, using the correct techniques. You will produce a range of composite assemblies (such as moulds, wings, body panels, ductwork, fairings, jigs), incorporating a range of features and using a range of techniques and processes.

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

You will understand the safety precautions required when carrying out the assembly 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.

Producing motorsport composite assemblies

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 relevant instructions, assembly drawings and any other specifications
3. ensure that the specified components are available and that they are in a usable condition
4. assemble the components in their correct positions using appropriate methods and techniques
5. secure the components using the specified connectors and securing devices
6. check the completed assembly to ensure that all operations have been completed and the finished assembly meets the required 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

Producing motorsport composite assemblies

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. how to extract and use information from engineering drawings and related specifications (to include symbols and conventions to current industry standards and codes of practice)
6. how to interpret first and third angle drawings, imperial and metric systems of measurement, workpiece reference points and system of tolerancing
7. the quality procedures used in the workplace to ensure production control (in relation to currency, issue, meeting specification), and the completion of such documents
8. conventions and terminology used for assembly activities (types of components used, types of fittings and fasteners, materials and adhesives used, metric and imperial threads, rivet specifications)
9. the visual identification of cured composite materials
10. the preparations to be undertaken on the composite components prior to assembly
11. the assembly/joining methods, techniques and procedures to be used, and the importance of adhering to these procedures
12. how the components are to be aligned, adjusted, positioned and clamped prior to assembly, and the tools and equipment to be used
13. the importance of using the specified components and joining devices for the assembly, and why you must not use substitutes
14. where appropriate, the application of sealants and adhesives within the assembly activities, and the precautions that must be taken when working with them
15. the quality control procedures to be followed during the assembly operations
16. how to conduct any necessary checks to ensure the accuracy, position, security, completeness and the function of the assembly
17. how to detect assembly defects (ineffective joining techniques, foreign objects, component damage), and what to do to rectify them
18. problems with the assembly operations, and the importance of informing appropriate people of non-conformances
19. methods for handling composite assemblies throughout the

Producing motorsport composite assemblies

- assembly activities
- 20. tools and equipment used in assembly activities; their care, preparation and control procedures
- 21. the extent of your own responsibility and to whom you should report if you have problems that you cannot resolve
- 22. 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 motorsport composite assembly 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 assembly 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 assembly techniques and procedures at all times
 6. return all tools and equipment to the correct location on completion of the composite assembly 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. Prepare for the assembly activities, to include carrying out all of the following:
 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 that components are correct and complete
 6. check for any defects in the components
 7. check availability of ancillary materials required
 8. identify and protect the moulding and components in the work area
3. Produce motorsport composite assemblies, to include:

Either two of the following:

1. tub/monocoque
2. floor/diffuser
3. wings

Producing motorsport composite assemblies

4. wishbones

OR six of the following:

5. splitters
6. pedal boxes
7. brake ducts
8. fairings/shrouds
9. body panels
10. floor trays
11. air intakes
12. moulds/jigs
13. side pods
14. fuel tank housings
15. radiator ducts
16. exhausts
17. engine covers
18. bumpers
19. dash panels

4. Produce two of the following types of motorsport composite assembly:

1. trial assemblies
2. one-off assemblies
3. batch assemblies
4. assembly line

5. Produce motorsport composite assemblies that incorporate four of the following features:

1. loose fit tolerances
2. non-permanent fixing
3. joggle joins
4. return joins
5. close fit tolerances
6. shape location
7. permanent fixing
8. overlap joins

6. Produce motorsport composite assemblies, using four of the following methods and techniques:

1. fettling
2. clamping
3. aligning
4. following the assembly sequence
5. pinning
6. trial fitting

Producing motorsport composite assemblies

7. use of assembly jigs
 8. drilling
7. Produce motorsport composite assemblies, using three of the following joining methods:
1. thread inserts
 2. mechanical fasteners
 3. anchor nuts
 4. rivets
 5. quick-release fasteners
 6. adhesive bonding
 7. laminating
8. Produce motorsport composite assemblies which comply with one of the following:
1. current industry standards, codes of practice and procedures
 2. customer standards and requirements
 3. company standards and procedures
 4. recognised compliance agency/body's standards

Producing motorsport composite assemblies

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	SEMAUT3083
Relevant Occupations	Engineering, Engineering and Manufacturing Technologies, Science and Engineering Technicians, Vehicle Trades
Suite	Automotive Engineering Suite 3
Keywords	Engineering; assembly; automotive; composite; joins; fixing; motorsport; moulding; vehicle