SEMMME3083

Producing composite assemblies

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, 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 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 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 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

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. use the appropriate methods and techniques to assemble the components in their correct positions
5. secure the components using the specified connectors and securing devices
6. produce a finished composite assembly
7. check the completed assembly to ensure that all operations have been completed and the finished assembly meets the required specification
8. complete the required production documentation
9. deal promptly and effectively with problems within your control and report those that cannot be solved

Knowledge and understanding

You need to know and understand:

1. how to work safely at all times, complying with health and safety and other relevant regulations, directives and guidelines
2. the hazards associated with carrying out composite assembly activities, and with the composite materials, consumables, tools and equipment used, and how to minimise these and reduce any risks
3. protective equipment (PPE) that is needed for personal protection and, where required, the protection of others
4. the application of regulations in relation to the storage, use and disposal of composite materials and consumables
5. the specific environmental conditions the must be observed when producing composite mouldings
6. how to extract and use information from engineering drawings and related specifications (to include symbols and conventions to appropriate standards) in relation to work undertaken
7. how to interpret drawings, lay up manuals, imperial and metric systems of measurement, workpiece reference points and system of tolerancing
8. quality procedures used in the workplace to ensure production control (in relation to currency, issue, meeting specification) and the completion of such documents
9. conventions and terminology used for assembly activities
10. the types of component trimming/cutting methods and preparation methods available
11. the visual identification of cured composite materials
12. assembly operations and their sequence
13. methods for handling composite assemblies throughout the assembly activities
14. the identification and rectification of defects in composite assemblies
15. tools and equipment used in assembly activities, and their care, preparation and control procedures
16. the extent of your own responsibility and to whom you should report if you have problems that you cannot resolve

Scope/range related to performance criteria

1. Carry out all of the following during the assembly activities:
   1.1 obtain and use the appropriate documentation
   1.2 adhere to procedures or systems in place for risk assessment, personal protective equipment and other relevant safety regulations and procedures to realise a safe system of work
   1.3 provide and maintain a safe working environment for the composite assembly activities
   1.4 check that all tools and equipment to be used are in a safe and usable condition
   1.5 follow safe practice/approved composite assembly techniques at all times
   1.6 return all tools and equipment to the correct location on completion of the assembly activities
   1.7 segregate and dispose of waste materials using the correct procedure
   1.8 leave the work area in a safe and appropriate condition on completion of the activities
2. Carry out all of the following activities when preparing for the assembly activity:
   2.1 check that mouldings are correct and complete
   2.2 select correct equipment for the activity
   2.3 check for any defects in the mouldings
   2.4 check that equipment is suitable for use
   2.5 check that components are correct and complete
   2.6 check for any defects in the components
   2.7 check availability of ancillary materials required
   2.8 identify and protect the moulding and components in the work area
3. Produce two of the following types of composite assembly:
   3.1 trial assemblies
   3.2 one-off assemblies
   3.3 batch assemblies
   3.4 assembly line
4. Produce assemblies that incorporate four of the following features:
   4.1 loose fit tolerances
   4.2 non-permanent fixing
   4.3 joggle joins
   4.4 return joins
   4.5 close fit tolerances
   4.6 shape location
   4.7 permanent fixing
   4.8 overlap joins
   4.9 strap joins
5. Produce composite assemblies that require four of the following methods to be used:

5.1 fettling
5.2 pinning
5.3 clamping
5.4 trial fitting
5.5 aligning
5.6 tongue and groove
5.7 assembly sequences
5.8 assembly jigs
5.9 datum points
5.10 orientation

6. Produce composite assemblies that use three of the following joining methods:
6.1 thread inserts
6.2 quick-release fasteners
6.3 mechanical fasteners
6.4 blind fasteners
6.5 adhesive bonding
6.6 anchor nuts
6.7 pinning
6.8 rivets
6.9 thermo-welding
6.10 other specific method

7. Produce composite assemblies that must include three of the following composite components:
7.1 trim
7.2 closing panels
7.3 body panels
7.4 structural
7.5 aerodynamic
7.6 core materials
7.7 inserts
7.8 tubes
7.9 sections
7.10 housings
7.11 other specific component

8. Produce composite assemblies that must include must include three of the following non-composite components:
8.1 brackets
8.2 fixtures
8.3 metal components
8.4 fittings
8.5 trim
8.6 non-metallic components
8.7 finishing tapes
8.8 memory foam
8.9 labels/decals
8.10 surface films

8.11 edge bands
8.12 other specific component

9. Produce a range of assemblies which comply with one of the following standards:

9.1 BS, ISO or BSEN standards and procedures
9.2 customer standards and requirements
9.3 company standards and procedures
9.4 recognised compliance agency/bodies standards

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