SEMMME236

Identifying defects in composite mouldings

Overview

This standard identifies the competences you need to identify and deal with defects in composite mouldings (such as moulds, panels, components, jigs), in accordance with approved procedures. You will be required to follow appropriate drawings, specifications and documentation to identify and deal with defects in composites mouldings.

You will be able to identify a range of defects in composite mouldings, using various methods and techniques. Defects will be identified in a range of mouldings with a variety of resin and fibre materials.

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

Your underpinning knowledge will be sufficient to provide a good understanding of your work, and will provide an informed approach to identifying defects in composite mouldings. You will have an understanding of composite materials, and their application, and will know about the associated defects, in adequate depth to provide a sound basis for identifying the defects in line with organisation practice and procedures.

You will understand the safety precautions required when working with the composite mouldings and when using 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. inspect and identify defects with regard to the composite moulding specification
3. assess the defects and determine action required to return the moulding to specified condition
4. report recommendations for action to the appropriate people promptly and in accordance with organisational procedures
5. record details of defects in accordance with quality assurance and control systems and procedures

Knowledge and understanding

You need to know and understand:

1. health and safety precautions to be taken and procedures used when working with composite materials, consumables, tools and equipment in the specific work area
2. the hazards associated with working with composite materials, consumables, tools and equipment, and how to minimise these and reduce any risks in the work area
3. protective equipment (PPE) that is needed for personal protection and, where required, the protection of others
4. the application of COSHH regulations in relation to the storage, use and disposal of composite materials and consumables
5. the specific environmental conditions the must be observed when handling composite mouldings (such as temperature, humidity, fume/dust extraction systems and equipment)
6. how to extract and use information from engineering drawings and related specifications (to include symbols and conventions to appropriate BS, ISO or BSEN standards) in relation to work undertaken
7. how to use imperial and metric systems of measurement, work piece reference points and system of tolerance
8. quality procedures used in the workplace to ensure production control (such as in relation to currency, issue, meeting specification), and the completion of appropriate documents
9. conventions and terminology used when identifying and rectifying defects (such as dis-bonds, de-lamination, resin injection, resin voids, core potting, repair patches)
10. how to recognise the different types of defect that can occur in composite mouldings
11. the different methods used to identify defects in composite mouldings including sensory checks, hand measuring tools and machine tools
12. the factors to be taken into consideration when selecting the method to check composite moulding for defects
13. the importance of identifying defects in composite mouldings and the implications if defects are not identified during production
14. correct methods of storage and handling of composite materials
15. tools and equipment used for checking the various composite mouldings
16. the extent of your own authority 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 inspection activities:

1.1 obtain and use the appropriate documentation (such as job instructions, drawings, quality control documentation, material data sheets)

1.2 adhere to procedures or systems in place for risk assessment, COSHH, personal protective equipment and other relevant safety regulations and procedures to realise a safe system of work

1.3 maintain a safe working environment for the composite moulding inspection activities

1.4 check that all tools and equipment to be used are in a safe and usable condition and, where appropriate, are within current calibration/certification dates

1.5 follow safe practice/approved techniques and procedures at all times

1.6 return all tools and equipment to the correct location on completion of the activities

1.7 leave the work area in a safe and appropriate condition on completion of the activities

2. Identify defects in composite mouldings using two of the following methods:

2.1 touch

2.2 sound

2.3 visual

2.4 mechanical equipment

2.5 other method to be specified

or one of the following:

2.6 non-destructive testing (NDT)

2.7 co-ordinate measuring machines

2.8 testing equipment to check features (such as tensile strength, compression, sheer, impact and peel)

2.9 other method to be specified

3 Identify defects applicable to one of the following resin types:

3.1 bio resin

3.2 thermoplastic

3.3 polyester

3.4 vinyl ester

3.5 epoxy

3.6 phenolic

3.7 bismaleimide

3.8 cyanate ester

3.9 other (to be specified)

4 Identify defects applicable to one of the following fibre types:

4.1 natural fibre

4.2 thermo plastic

4.3 glass

4.4 aramid

4.5 carbon

4.6 hybrid

4.7 other (to be specified)

5 Where core materials are required identify defects applicable to one of the

following:

5.1 solid timber

5.2 end grain balsa

5.3 rigid foam

5.4 expanding foam

5.5 coremat

5.6 honeycomb

5.7 fibrous honeycomb

5.8 aluminium honeycomb

5.9 syntactic core

5.10 expanding core

5.11 thermoplastic core

5.12 other (to be specified)

6 Identify seven of the following types of defect in composite mouldings:

6.1 dimensional

6.2 tolerances

6.3 surface finish

6.4 colour separation

6.5 distortion

6.6 blisters

6.7 dents or 'dings'

6.8 surface cracks

6.9 incorrect material

6.10 contamination

6.11 bridging

6.12 broken fibres

6.13 stray fibres

6.14 ply orientation

6.15 wrong join type

6.16 gaps at joins

6.17 incorrect overlap

6.18 wrinkles

6.19 splintering

6.20 voids

6.21 resin rich areas

6.22 fibre deviation

6.23 damaged cores

6.24 dis-bonds

6.25 excessive adhesive

6.26 wrong inserts

6.27 insert positions

6.28 porosity

6.29 local exotherm

6.30 fayed/burned area

6.31 incomplete curing

6.32 de-lamination

6.33 impact damage

6.34 puncture

6.35 gouges

6.36 holes

6.37 abrasion/erosion

6.38 fluid ingress

6.39 fractures

6.40 other (to be specified)

7 Ensure actions recommended to rectify the defect comply with one of the following standards:

7.1 BS, ISO or BSEN standards and procedures

7.2 customer standards and requirements

7.3 company standards and procedures

7.4 recognised compliance agency/body standards

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