

Overview

This standard identifies the competencies you need to apply powder coatings to various substrates, using either manual or automated methods, in accordance with approved procedures. You will be required to access the appropriate specifications, to check that these are the current issue and to extract all necessary information in order to carry out the coating operations. The coating methods used will be either fluidised bed dipping or electrostatic application methods, either manually or using automated application equipment. You will be expected to use specified/appropriate processes to assess the component and to pre-treat the substrate and this will include cleaning, degreasing, masking, pre-heating and other appropriate treatments. You will apply the powder coatings by using the application equipment chosen, which will include spray booths, dust collection and recovery systems and ovens for melting and curing the coating.

Your responsibilities will require you to comply with organisational policy and procedures for the powder coating activities undertaken and to report any problems with these activities or with the materials and equipment used, 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 powder coatings by either fluidised bed dipping or electrostatic application methods. You will understand the powder coating process and procedures used and their application and will know about the base materials, coating materials and their preparation requirements, in adequate depth to provide a sound basis for carrying out the activities, correcting faults, and ensuring the finished components are to the required standards and to the customer's expectations.

You will understand the safety precautions to be taken when carrying out the preparation and powder coating 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 and towards the environment.

Performance criteria

You must be able to:

1. work safely at all times, complying with health and safety legislation, regulations, directives and other relevant guidelines
2. follow relevant job instructions and specifications
3. ensure the material surfaces to be treated are prepared for the finishing operations
4. check that the finishing equipment and treatment solutions are set up and maintained at required operating conditions and levels
5. carry out finishing according to operating procedures and to meet specifications
6. check that the treated workpiece achieves the required characteristics and meets the finishing specifications
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

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. the environmental impact of the chemicals and powdered coating materials you are using and how to minimise of this impact
6. the types of specifications that are used during the finishing activity
7. how to assess component suitability for powder coating (to include methods of handling, methods of pre-treatment, the coating material to use, the most efficient and appropriate method of application, the selection of the melting/curing process)
8. how to assess the coating specification and/or end user requirements, to define the process and to meet the quality and performance standards of the final coating
9. the correct handling of the component to suit the application process
10. the procedures for the handling and safe use of coating powder materials
11. the confirmation of the correct parameters of the coating materials to be used
12. the setting up and correct technique for efficient use of the powder coating plant and equipment
13. the selection and setting up for efficient use of the application environment (including positive pressure spray booths, suction methods for controlling over-spray and dry-backed spray booths)
14. the selection of the curing process (to include advantages and disadvantages of thermal heating and curing, infra-red heating and curing, induction heating and curing and operation and locations of emergency stops)
15. the cleaning and maintenance requirements of the powder coating plant and equipment, including the use of 5S or similar techniques
16. simple non-destructive testing procedures to ensure that colour, gloss, adhesion and other required performance qualities are achieved

Finishing materials by applying powder coatings

17. how to recognise coating defects, and their prevention and/or correction
18. how to minimise and handle waste materials (including the environmental impact of the materials and the minimisation of their impact)
19. the extent of your own responsibility and whom you should report to 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.

Finish materials by applying powder coatings, carrying out all of the following activities:

- 1.1 use the correct issue of drawings, Product Data Sheets, process and other related specifications
- 1.2 adhere to health and safety regulations, systems and procedures to realise a safe system of work
- 1.3 ensure that the equipment is correctly prepared for the powder coating operations
- 1.4 carry out handling/jigging of the component (where appropriate)
- 1.5 clean all tools and equipment on completion of the finishing activities
- 1.6 complete the production documentation (such as condition/pre-treatment of substrates, coating material preparation, equipment settings, confirmation of standard of finish)
- 1.7 leave the work area in a safe and clean condition

2.

Apply powder coatings to three different types of component from the following:

- 2.1 complex components with multiple surfaces
- 2.2 tubular components
- 2.3 welded/joined components
- 2.4 flat components

3.

Use one of the following for locating work during the powder coating process:

- 3.1 wiring
- 3.2 jigging components, which are masked prior to processing
- 3.3 specialised jigs
- 3.4 jigs with integral masking

4.

Apply powder coatings using one of the following types of equipment:

- 4.1 fluidised bed dipping system
- 4.2 manual electrostatic powder spray gun
- 4.3 automated powder coating unit

5.

Apply powder coatings to two different substrates from the following:

- 5.1 ferrous material
- 5.2 glass
- 5.3 non-ferrous material
- 5.4 composite material (such as MDF)

6.

Prepare for the powder coating activities by carrying out all of the following:

Finishing materials by applying powder coatings

- 6.1 degreasing and cleaning
- 6.2 pre-heating (where appropriate)
- 6.3 masking

7.

Use two of the following consumables during the preparation activities:

- 7.1 masking tape
- 7.2 cleaning materials
- 7.3 other masking products

8.

Use two of the following types of powder coating materials:

- 8.1 fluidised bed thermoplastic coating powder
- 8.2 fluidised bed thermosetting powder
- 8.3 electrostatic grade thermoplastic powder
- 8.4 electrostatic grade thermosetting powder

9.

Apply powder coatings for two of the following purposes:

- 9.1 decorative
- 9.2 protective
- 9.3 insulative

10.

Cure the coatings using one of the following methods:

- 10.1 thermal curing (convection)
- 10.2 induction curing
- 10.3 infra-red curing

11.

Apply finishes using the appropriate techniques to achieve all of the following requirements:

- 11.1 correct film thickness
- 11.2 correct colour and gloss level
- 11.3 correct surface appearance (such as. smooth or textured), free of defects

12.

Check powder coatings applied to components comply with one of the following quality and accuracy standards:

- 12.1 military or aviation standards
- 12.2 current industry standards and codes of practice
- 12.3 international standards
- 12.4 company standards and requirements
- 12.5 customer standards and requirements

Finishing materials by applying powder coatings

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