

Applying liquid coatings by dipping

Overview

This standard identifies the competences you need to carry out material finishing operations by applying liquid coatings by dipping, in accordance with approved procedures. You will be expected to confirm with the authorised person, such as your immediate supervisor, that the equipment is ready for the coating operations to be performed and that all the required components/materials and consumables are available. You will be required to operate the dip coating equipment in line with safe working practices and approved procedures, continuously monitoring the coating operations and where necessary, making minor adjustments or seeking help from the authorised person to make the required adjustments, in order to ensure that the work output is to the required quality. Meeting production targets will be an important issue and your production records must show consistent and satisfactory performance. Your responsibilities will require you to comply with organisational policy and procedures for the coating activities undertaken and to report any problems with the coating 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 actions and for the quality of the work that you carry out. Your underpinning knowledge will be sufficient to provide a sound basis for your work and will enable you to adopt an informed approach to applying dip coating procedures. You will have an understanding of the dip coating process and its application and will know about the equipment, materials and consumables in adequate depth to provide a sound background for carrying out the activities, recognising and reporting coating defects and ensuring that completed components are to the required specification. You will understand the safety precautions required when working with dip coating equipment and solutions. You will be required to demonstrate safe working practices throughout. You will also understand your responsibilities for safety and the importance of taking the necessary safeguards to protect yourself and others in the workplace.

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 work instructions and specifications to apply liquid coatings by dipping
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 satisfactory operating conditions and levels
5. carry out the treatment process following operating procedures and the component specification
6. ensure that the treated workpiece achieves the required characteristics and meets the finishing 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

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 basic principles of the operation liquid dip coating equipment
6. how to examine components for visual defects, prior to coating them
7. how to prepare and mix liquid coatings
8. the pre-treatments carried out prior to the application of liquid coatings by dipping
9. the methods used to hold/secure components during the liquid dip coating process
10. the importance of monitoring equipment settings during the liquid dip coating process
11. how to make additions to coating solutions, safely and correctly
12. the procedure for the safe disposal of waste materials
13. the types of adjustment that can be made to equipment settings to maintain component quality
14. how to identify liquid dip coating processing faults (including excessive and low coating, rippling, contamination, bridging, cracking and poor coating adhesion)
15. the basic quality checks to be carried out on dip coated components
16. how to pack and store finished components to avoid damage
17. the importance of completing the production documentation throughout the dip coating process
18. the importance of keeping the coating plant and equipment clean
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. Apply liquid coatings by dipping, carrying out all of the following: 1. use the correct issue of process documentation (specifications, job cards, quality control documentation) 2. adhere to health and safety regulations, systems and procedures to realise a safe system of work 3. confirm with the authorised person that the equipment is ready for carrying out the coating operations 4. maintain sufficient quantities of process materials and components during the production cycle 5. seek any necessary instructions/training on the operation of the coating equipment 6. follow the defined operating procedures 7. leave the work area in a safe and clean condition

2. Apply liquid coatings by dipping to one of the following substrates: 1. wood 2. composites (glass fibre, Kevlar) 3. ferrous materials 4. plastic 5. pre-painted surfaces 6. non-ferrous materials

3. Apply one type of coating materials from the following: 1. polyurethane 2. zinc rich 3. water-based 4. acrylic 5. epoxy 6. temporary protective coatings 7. varnish 8. urethane 9. other special finishes

4. Carry out four of the following activities during the coating process: 1. segregate any defective components or batches (pre and post coating) 2. carry out pre-treatments (cleaning, de-greasing, pickling, rinsing) 3. jiggging 4. wiring 5. load components safely into plant 6. monitor solutions and process settings (time, speed temperature, evaporation, viscosity) 7. safely make adjustments to solutions or process settings 8. cure completed components (by air, thermal, induction, infra-red or ultra-violet methods)

5. Identify five of the following types of defect in the coated components: 1. missed coating 2. rippling (orange peel) 3. excessive coating 4. contamination 5. low coating 6. bridging 7. poor coating adhesion 8. cracking

6. Carry out four of the following checks on coated products: 1. freedom from damage 2. freedom from contamination 3. surface quality/appearance 4. completeness of coating 5. thickness of coating 6. gloss level 7. porosity

7. Carry out three of the following coating process completion activities of the: 1. check that components are dry before packing 2. place components in the specified container/area 3. store components in the correct quantities/weight 4. use the correct packaging to avoid damage 5. complete the production documentation 6. place all labels/production documentation in the specified location 7. clean the tools and equipment

8. Check coatings applied to components comply with one of the following quality and accuracy standards: 1. military or aviation standards 2. current industry standards or code of practice 3. international standards 4. company standards and procedures 5. customer standards and requirements

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