

Overview

This standard identifies the competences you need to carry out material coating operations by chemical conversion processes, 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 chemical conversion coating equipment, in line with safe working practices and approved procedures, continuously monitoring the chemical conversion 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 chemical conversion coating activities undertaken and to report any problems with these 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 chemical conversion coating procedures. You will have an understanding of the chemical conversion 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 chemical conversion 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 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 to meet 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. how to obtain and interpret the production documentation required during the coating activity 6. the basic principles of the operation of chemical conversion coating equipment 7. the importance of keeping process tanks clean 8. the visual checks to be made on components prior to coating 9. the pre-treatments to be carried out on components prior to coating 10. the methods used to hold/secure components during the coating process 11. the importance of monitoring the equipment settings and process solutions during coating process 12. how to make additions to process solutions 13. the types of adjustment that can be made to equipment settings to maintain component quality 14. how to identify chemical conversion processing faults (including incorrect colour, nodules, blisters, missed coating, uneven coating, substrate attack by coating or pre-treatment) 15. the importance of agitation to prevent uneven deposits and temperature layering 16. the basic quality checks to be carried out on coated components 17. how to dispose of spent solutions 18. how to pack and store finished components to avoid damage 19. the importance of keeping plant and equipment clean 20. the importance of completing the production documentation throughout the chemical conversion coating process 21. the extent of your own responsibility and whom you should report to 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. Apply coatings using the chemical conversion process, carrying out all of the following activities:

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 plant 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 or training on the operation of the coating equipment
6. follow the defined operating procedures ensure that the equipment settings and process solutions are adjusted (either by yourself or the authorised person) to maintain the correct customer specification
7. leave the work area in a safe and clean condition

2. Apply coatings, by chemical conversion processes, to one of the following types of substrate:

1. electroplated zinc
2. magnesium alloy
3. copper
4. mechanically plated zinc
5. aluminium
6. other specific substrate

3. Carry out four of the following activities for the chemical conversion coating process:

1. prepare the conversion solutions
2. segregate any defective components or batches
3. carry out pre-treatments (such as de-greasing, phosphating, activation, cleaning)
4. load components safely into plant
5. monitor the solutions and process settings (such as time, level, pH, temperature)
6. make adjustments to solutions or process settings
7. masking
8. jigging
9. wiring

4. Identify five of the following types of defect in chemical conversion coated components:

1. incorrect colour
2. missed coating
3. poor iridescence
4. substrate attack by coating or pre-treatment
5. nodules
6. uneven coating
7. blisters

5. Carry out four of the following checks on chemical conversion coated products:

1. freedom from damage
2. freedom from contamination
3. surface quality/appearance
4. completeness of coating operations
5. colour
6. coating adherence

6. Carry out three of the following completion activities:

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 so as to avoid damage
5. complete the production documentation
6. place all labels/production documentation in the specified location
7. clean the tools and equipment

7. Check chemical conversion coatings applied to components comply with one of the following quality standards:

1. military or aviation
2. current industry standards or codes of practice
3. international standards
4. company standards and requirements
5. customer standards and requirements

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