

---

## Overview

This standard identifies the competences you need to prepare ferrous and non-ferrous materials/components before and after heat treatment processes have been carried out, in accordance with approved procedures. You will be required to access the appropriate heat treatment specifications, check that these are of the latest issue and extract all necessary information in order to carry out the heat treatment preparation activities. You will be required to carry out preparations on a variety of materials/components, this will involve the use of mechanical tools, blasting equipment, degreasing agents, masking and jiggling techniques.

Your responsibilities will require you to comply with organisational policy and procedures for the heat treatment material pre/post preparation activities undertaken and to report any problems with the heat treatment material preparation activities, equipment or materials 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 appropriate pre/post preparation procedures to ferrous and non-ferrous materials/components that are to be and have been, heat treated. You will understand the heat treatment preparation procedures, their application and relevant standards, in adequate depth to provide a sound basis for carrying out the activities to the required specification.

You will understand the safety precautions required when carrying out the heat treatment material preparatory operations. You will need to take particular account of the hazards associated with hot working and the use of heat treatment solutions/salt baths and to take actions that minimise the risks of working in the vicinity of these processes. 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. obtain and follow instructions, standards and other specifications 3. identify the conditions of the material/component surface to be prepared 4. select materials, tools and equipment and check that they are in a safe and usable condition 5. prepare for heat treatment activities, using appropriate tools and techniques 6. check the prepared surface to ensure that it meets the required specification 7. deal promptly and effectively with problems within your control and report those that cannot be resolved 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 the required work procedures, specifications and instructions, and interpret their requirements 6. the reasons for carrying out heat treatment material surface preparation, and the effects on the heat treatment activities if preparations are not carried out correctly 7. the damage that may result from using inappropriate tools and techniques 8. why different types of substrate require different preparation techniques 9. the types of defects and contamination to be found on materials/components to be heat treated 10. types of tools and equipment used for the surface preparation activities (to include setting up and safe operation, manufacturers' operating instructions and techniques for using them) 11. why some surfaces may require masking/protection from the heat treatment process and the type of masking materials and mediums that are used 12. methods of jiggging and wiring/holding components for the heat treatment process 13. quality control techniques and procedures used during the heat treatment material preparation activities 14. how to dispose of waste materials safely, the environmental impact of the materials you are using and the minimisation of this impact 15. the extent of your own responsibility and whom you should report to if you have problems that you cannot resolve 16. how to access, use and maintain information to comply with organisational requirements and legislation

## Scope/range related to performance criteria

1. Prepare for heat treatment, by carrying out all of the following activities: 1. use the correct heat treatment preparation specifications, procedures and quality control documentation 2. adhere to health and safety regulations, systems and procedures to realise a safe system of work 3. ensure that all tools and equipment are correctly prepared for the operations being performed 4. leave the work area in a safe and tidy condition on completion of the activities 2. Carry out pre/post heat treatment material preparation activities on two of the following types of material/components: 1. ferrous low carbon materials/components 2. non-ferrous materials/components 3. ferrous high carbon materials/components 4. specialised steels 3. Check surfaces and identify defects and pre/post heat treatment surface preparation requirements for four of the following conditions: 1. surface corrosion 2. surface contamination 3. blistering, deformation 4. sharp and jagged edges 5. coating detachment 6. heat treatment bloom 7. toolmarks, scars and tears 4. Prepare surfaces using tools and techniques appropriate to the substrate, to include using two of the following: 1. hand/power tools 2. flame cleansing 3. degreasing solvents 4. surface blasting (such as abrasive blasting, vapour blasting) 5. chemical cleaning 5. Carry out heat treatment pre/post preparation processes to include three of the following: 1. cleaning and removing all surface contamination 2. applying/removing any required masking/surface protection to areas not requiring heat treatment 3. carrying out drying or pre heating requirements 4. ensuring that materials/component to be immersed in hot treatment solutions are dry 5. carrying out/removing jiggling and hanging of components 6. Check heat treatment pre/post preparations on materials/components, comply with one of the following standards: 1. current industry standards or codes of practice 2. customer (contractual) standards and requirements 3. company standards and procedures 4. specific heat treatment process requirements 5. other international standards

---

<b>Developed by</b>	Enginuity
<b>Version Number</b>	2
<b>Date Approved</b>	30 Mar 2020
<b>Indicative Review Date</b>	31 Mar 2023
<b>Validity</b>	Current
<b>Status</b>	Original
<b>Originating Organisation</b>	SEMTA
<b>Original URN</b>	MPF3.63
<b>Relevant Occupations</b>	Engineering and Manufacturing Technologies, Manufacturing Technologies, Process Operatives, Process, Plant and Machine Operatives
<b>Suite</b>	Materials Processing and Finishing Suite 3
<b>Keywords</b>	Heat Treatment; Surface Corrosion; Surface Contamination; Heat Treatment Bloom; Degreasing Solvents; BS or ISO Standards; Hot Treatment Solutions; Flame Cleansing; Surface Blasting; Abrasive Blasting

---