

Overview

This standard identifies the competencies you need to set up and use manual torch brazing and soldering equipment, in accordance with approved instructions or procedures. You will be required to check that all the hoses and equipment are correctly connected, free from leaks or damage, and are ready for use. You will be required to set and adjust the brazing conditions, in line with the specification. You will also need to select and use workholding and manipulating devices that are appropriate to the size and shape of materials and joint configuration being produced. You must operate the equipment safely and correctly and make any adjustments to settings, in order to produce the joints to the required specification.

Your responsibilities will require you to comply with organisational policy and procedures for carrying out the brazing activities, and to report any problems with the brazing equipment, or brazing activities that you cannot 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 that you carry out.

Your underpinning knowledge will be sufficient to provide a sound basis for your work, and will provide an understanding of how the torch brazing process works. You will know about the equipment, materials and consumables, in adequate depth to provide a sound background for the brazing operations to be performed, and for ensuring the work output is produced to the required specification.

You will understand the safety precautions required when working with the brazing 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. follow the relevant joining procedure and job instructions
3. check that the joint preparation complies with the specification
4. check that joining and related equipment and consumables are as specified and fit for purpose
5. make the joints as specified using the appropriate thermal joining technique
6. produce joints of the required quality and of specified dimensional accuracy
7. shut down the equipment to a safe condition on completion of joining activities
8. deal promptly with excess and waste materials and temporary attachments, in line with approved and agreed procedures
9. deal promptly and effectively with problems within your control and report those that cannot be solved

Knowledge and understanding

You need to know and understand:

1. the safe working practices and procedures to be observed when working with gas brazing and soldering equipment (general workshop and site safety, appropriate personal protective equipment (PPE), fire and explosion prevention, fume extraction, protecting other workers, safety in enclosed/confined spaces, statutory regulations, risk assessment procedures and COSHH regulations)
2. the hazards associated with torch brazing and soldering (naked flames, explosive gas mixes, oxygen enrichment, fumes and gasses, hot metal, enclosed spaces), and how they can be minimised
3. the torch brazing and soldering process (basic principles of the process, wetting and capillary flow, role of fluxes, equipment type and its care)
4. types of filler metal and fluxes; forms of filler metal
5. the types of joints to be produced
6. setting up and locating the joint (methods of cleaning joint faces; use of jigs and fixtures, restraining devices; self-locating joints; pre-placement of filler metal and flux)
7. how to prepare to braze or solder (checks to confirm correct set-up and cleanliness; use of gauges, setting up the equipment, checking connections for leaks, checking operating parameters)
8. the techniques of operating the equipment to produce a range of joints (selection of nozzle and flame adjustment, application of flux, correct manipulation of torch and filler wire, safe closing down of the equipment)
9. the importance of complying with job instructions and the joining procedure specification
10. how to use and extract information from engineering drawings and related specifications (to include symbols and conventions to appropriate British, European or relevant International standards in relation to work undertaken)
11. problems that can occur with the joining activities and how these can be overcome (causes of distortion and methods of control; effects of heat on materials and sources of defects; methods of prevention)
12. methods of removing flux residues and cleaning the finished joint
13. organisational quality control systems and standards to be achieved; visual and non-destructive tests
14. personal approval tests and their applicability to your work

Joining materials by manual torch brazing and soldering

15. the extent of your own authority and whom you should report to if you have problems that you cannot resolve
16. reporting lines and procedures, line supervision and technical experts

Scope/range related to performance criteria

1.

Prepare for the manual torch brazing and soldering activities, to include carrying out **all** of the following:

- 1.1 obtaining the appropriate equipment for the brazing or soldering activities to be carried out
- 1.2 correctly handling and storing gas cylinders (where appropriate)
- 1.3 checking the condition of, and correctly connecting hoses and valves
- 1.4 connecting the brazing/soldering torch and selecting and fitting the correct size nozzle
- 1.5 fitting a flashback arrestor (where applicable)
- 1.6 setting appropriate gas pressures
- 1.7 using the correct procedure for lighting, adjusting and extinguishing the flame
- 1.8 preparing the work area for the brazing or soldering activities (such as siting protective screens, positioning fume extraction equipment)
- 1.9 ensuring that the workpiece is correctly set up with regard to specified joint preparation and that it is secure
- 1.10 obtaining and wearing appropriate personal protective equipment

2.

Set up, check, adjust and use one of the following processes and related equipment:

- 2.1 brazing
- 2.2 soldering

3.

Use specified consumables appropriate to the parent metals, to include both of the following:

- 3.1 two different filler metals
- 3.2 appropriate fluxes

4.

Produce brazed or soldered joints according to work procedures, and in good access situations, covering both of the following:

- 4.1 two different components or assemblies
- 4.2 two different parent metal groups

5.

Produce components which:

- 5.1 achieve the specified joint quality equivalent to the level given in the relevant European/International standard (such as BS EN 18279, 13134 or 14276) required by the application standard or specification
- 5.2 meet the required dimensional accuracy within specified tolerance

5.3 are of good appearance, free from flux residues and excess filler metal

Behaviours

Additional Information

You will be able to apply the appropriate behaviours required in the workplace to meet the job profile and overall company objectives, such as:

- strong work ethic
- positive attitude
- team player
- dependability
- responsibility
- honesty
- integrity
- motivation
- commitment

Developed by Enginuity

Version Number 3

Date Approved 30 Mar 2017

Indicative Review Date 31 Mar 2020

Validity Current

Status Original

Originating Organisation Senta

Original URN SEMFWWE217

Relevant Occupations Engineering, Engineering and Manufacturing Technologies, Metal Forming, Welding and Related Trades

Suite Fabrication and welding suite 2

Keywords engineering; welding; fabrication; manual welding; brazing; soldering; set up equipment; brazing techniques; soldering techniques
