

Joining materials using brazing machines

Overview

This standard identifies the competences you need to operate torch, inductance, resistance or furnace brazing installations that have already been prepared for production, in accordance with approved instructions or procedures. You will be expected to check that the equipment has been approved for production and that sufficient supply of all the required materials and consumables are present and correct and are ready for production operations to be performed.

You must operate the installation safely and correctly, in accordance with instructions and approved procedures and achieve a joint quality and tolerances that meet the product specification. You must continuously monitor the operation of the installation and make any necessary adjustments to equipment settings, in line with your permitted authority, in order to produce the brazed joints to the required specification. Meeting production requirements 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 operating the brazing installation and to report any problems or adjustments to the installation 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, enabling you to adopt an informed approach to applying brazing procedures and instructions. You will have an understanding of how the brazing process works and is applied in mechanised form and will know about the equipment, materials and consumables, in adequate depth to provide a sound background to the process operation and for carrying out the brazing activities to the required specification.

You will understand the safety precautions required when working with the machine and with its associated tools and 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.

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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 work instructions
3. confirm that the machine is set up and operating correctly, ready for the joining operations to be carried out
4. check that the parent material, components, consumables and joint preparation comply with specifications
5. carry out and monitor the machine operations in accordance with specifications and job instructions
6. braze the materials and achieve joints of the required quality and specified dimensional accuracy
7. produce brazed components to relevant standards
8. make sure that the rate of output is as specified
9. deal promptly and effectively with problems within your control and report those that you cannot solve
10. shut down the equipment to a safe condition on conclusion of the joining activities

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Knowledge and understanding

You need to know and understand:

1. the safe working practices and procedures to be observed when operating brazing installations (to include working with machinery; the use of appropriate personal protective equipment (PPE); machine guards; operation of machine safety devices; stopping the machine in an emergency; closing the machine down on completion of activities)
2. statutory requirements, risk assessment procedures and relevant requirements of HASAWA, COSHH and Work Equipment Regulations
3. the hazards associated with brazing machines (such as dangers from relevant equipment sources; fumes and gases; hot metal; moving parts of machinery) and how they can be minimised
4. the basic principles of the relevant brazing process and the terminology used in brazing
5. the key components and features of the equipment
6. mechanised and automated brazing basics (such as types of installations; machine functions; safety features)
7. how to extract the information required from drawings and brazing procedure specifications (to include symbols and conventions to appropriate British, European or relevant International standards in relation to work undertaken)
8. operation of the machine controls and their function; care of equipment; control and storage of consumables
9. setting up and aligning the workpieces
10. monitoring the installation during the brazing process; recognition of problems and action to be taken
11. problems that can occur with the brazing activities, materials, filler metals and joint defects
12. how to carry out self inspection of completed work
13. organisational quality systems (such as standards to be achieved; production records to be kept)
14. why tool/equipment control is critical and what to do if a tool or piece of equipment is unaccounted for on completion of the activities
15. personal approval tests and their applicability to your work
16. the disposal of waste materials in a safe and environmentally friendly way
17. the extent of your own authority and whom you should report to if you have problems that you cannot resolve
18. reporting lines and procedures, line supervision and technical experts

Scope/range related to performance criteria

1. Confirm that the installation is ready for brazing operations, to include checking all of the following:
 1. the installation has been approved for production
 2. supplies of components and consumables are adequate and correctly prepared
 3. machine settings comply with instructions and the brazing procedure specification
 4. all machine functions operate correctly
 5. all safety equipment is in place and functioning correctly
2. Operate one of the following mechanised brazing processes, in the specified materials, forms and positions:
 1. torch
 2. induction
 3. furnace
 4. resistance
3. Produced brazed assemblies covering both of the following:
 1. two different joint configurations
 2. two different material groups
4. Monitor the process operation and machine functions and make adjustments, as required, to parameters and mechanisms within your permitted authority and tolerances, to include adjusting all of the following, as applicable to the machine type:
 1. brazing temperature
 2. brazing time
 3. flux and filler metal dispensing
 4. brazing atmosphere
 5. flame condition
 6. mechanical functions (handling, loading, workholding, transfer)
 7. safety devices
5. Produce brazed components or assemblies which:
 1. achieve the specified joint quality equivalent to the level given in the relevant European/International standard (such as BS EN 13133, 13134 or 14276) required by the application standard or specification

2. meet the required dimensional accuracy, within specified tolerances

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Behaviours

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

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Developed by	Enginuity
Version Number	2
Date Approved	28 Feb 2018
Indicative Review Date	01 Feb 2021
Validity	Current
Status	Original
Originating Organisation	Semta
Original URN	SEMME2086
Relevant Occupations	Engineering, Engineering and Manufacturing Technologies
Suite	Marine Engineering Suite 2
Keywords	Engineering; marine; machine; welding; joining; materials; brazing; torch brazing; induction brazing; furnace brazing; resistance brazing