SEMFWE315

Preparing brazing machines for production

Overview

This standard identifies the competencies needed to prepare torch, inductance, resistance or furnace brazing installations for production in accordance with approved procedures. You will be required to set up and check both the brazing installation and all associated mechanical and electrical apparatus forming part of the mechanised or automated installation. This will include setting up of handling and loading equipment, workholding arrangements, traversing mechanisms, transfer mechanisms and safety equipment as is applicable to the machine type.

In setting up the brazing conditions you will be expected to set the brazing temperature controls, brazing time, flame conditions, flux dispensing arrangements, filler metal placement controls and brazing atmosphere controls as is applicable to the machine type. You must produce trial joints and prove the machine is working satisfactorily before declaring the installation ready for production. Making adjustments to settings to achieve specification and solving machine related problems during production, will also form part of your role.

Your responsibilities will require you to comply with organisational policy and procedures for setting up the brazing equipment 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 with minimum 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 provide an informed approach to applying mechanised brazing procedures. You will understand the brazing process carried out, and its application, and will know about the equipment, relevant materials and consumables in adequate depth to provide a sound basis for setting up the equipment, correcting faults and ensuring the work output is produced to the required specification. You will understand the safety precautions required when working with the machine and 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.

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 specification and job instructions for the work to be produced
3. check that the equipment is as specified and in usable condition
4. obtain the required components and check that the joint preparation complies with the specification
5. set up the handling, work-holding and associated equipment to achieve correct joint positioning
6. select and prepare the appropriate consumables in line with the joining procedure specification
7. set and adjust the machine operating conditions to achieve joints of the required quality and within specified dimensional accuracy
8. check that all safety mechanisms are in place and that the equipment is operating satisfactorily
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 setting and operating brazing installations (working with machinery; the use of appropriate personal protective equipment (PPE); machine guards; ventilation and fume extraction; machine safety devices; stopping the machine in an emergency; closing the machine down on completion of activities; statutory requirements, risk assessment procedures and relevant requirements of HASAWA, COSHH and Work Equipment Regulations; safe disposal of waste materials)
2. the hazards associated with brazing machines and how they can be minimised (dangers from relevant equipment sources; fumes and gases; hot metal; moving parts of machinery)
3. the basic principles of the relevant brazing process (principal features of brazed joints; wetting and capillary flow, role of fluxes/atmospheres; parameters, heat input; how variation in the parameters influences the quality and output; terminology used in brazing)
4. the key components and features of the relevant brazing equipment
5. mechanised and automated brazing basics (types of installations; machine functions: loading, handling, clamping, manipulating and transfer of components)
6. extracting information required from drawings and procedure specifications (to include symbols and conventions to appropriate British, European or relevant International standards in relation to work undertaken)
7. types and forms of filler metal; specification; control and storage of consumables
8. types of joints applicable and the surface preparation required; methods of applying filler metal
9. problems that can occur with the brazing activities and how these can be overcome, sources of brazing defects and methods of prevention
10. methods of setting up the joint to achieve correct location of components (work holding methods for component location)
11. setting up the equipment to the brazing procedure specification
12. checking the machine functions to the required specification (running pre-production trials to prove that the installation is working satisfactorily and producing joints of the specified quality) such as BS EN ISO 18279, 13134 or BS EN 14276
13. methods of flux removal and cleaning
14. organisational quality systems (standards to be achieved; production records to

be kept; testing of brazed joints)

15. personal approval tests and their applicability to your work

16. the extent of your own responsibility and whom you should report to if you have problems that you cannot resolve

Scope/range related to performance criteria

1.

Ensure the brazing machine is suitable for production by carrying out **all** of the following checks:

- 1.1 the equipment is correctly maintained and in a safe and usable condition
- 1.2 the equipment is correctly calibrated
- 1.3 all electrical and mechanical systems function smoothly
- 1.4 equipment shut down systems function correctly

2.

Prepare and set-up **one** of the following brazing installations for **two** different joint configurations in the specified materials, forms and positions, according to work instructions and the welding procedure specification:

- 2.1 torch
- 2.2 resistance
- 2.3 induction
- 2.4 furnace

3.

Set up the welding equipment and parameters in accordance with the welding procedure specification to include setting **all** of the following as is applicable to the machine type:

- 3.1 brazing temperature control
- 3.2 filler metal placement
- 3.3 brazing time
- 3.4 brazing atmosphere control
- 3.5 flame condition
- 3.6 safety devices
- 3.7 flux dispensing arrangements

4.

Set up the work piece to achieve correct joint fit-up and alignment to include setting and checking **all** of the following as is applicable to the machine type:

- 4.1 handling and loading equipment
- 4.2 preparation of materials and joint faces is to specification
- 4.3 workholding arrangements
- 4.4 traversing and indexing mechanisms
- 4.5 transfer mechanisms
- 4.6 safety mechanisms

5.

Prove the installation is operating correctly and is ready for production by producing specified trial joints and checking **all** of the following:

5.1 visual appearance of braze
5.2 quality of braze
5.3 dimensional accuracy
5.4 machine settings are as specified

6.

Solve problems in production relating to **two** of the following:

6.1 machine performance
6.2 condition of materials being joined
6.3 joint set-up
6.4 consumables

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

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