SEMFWE345

Producing pipe fabrications

Overview

This standard identifies the competencies you need to produce pipe fabrications such as flanged pipes, elbows, tee pieces, reduction pieces and segmented bends to specification and in accordance with approved procedures. You will be required to cut, form, lay out and secure parts of the pipe fabrication in the correct orientation and configuration for fixing using tack welding or mechanical securing methods as is specified or appropriate to the application and in a manner that is fit for purpose.

Your responsibilities will require you to comply with organisational policy and procedures for the manufacture and assembly of the pipe fabrications and the associated activities to be undertaken and to report any problems with the activities that you cannot personally 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 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 producing fabricated pipe components and their assembly and fixing procedures. You will understand the techniques used and the requirements of the manufacturing and assembling procedures and their application. You will know about the methods of producing pipe components of the required strength. That are fit for purpose and meet the requirements of pressure tests, in adequate depth to provide a sound basis for carrying out the activities, correcting faults and ensuring the work output is produced to the required specification. You will understand the safety precautions required when working with pipe fabrications/components and their 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 instructions, assembly drawings and any other specifications
3. ensure that the specified pipework components are available and that they are in a usable condition
4. use the appropriate methods and techniques to assemble the pipework components in their correct positions
5. secure the pipework components using the specified connectors and securing devices
6. check the completed assembly to ensure that all operations have been completed and the finished assembly meets the required specification
7. 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 specific safety precautions to be taken when working in a pipe fabrication environment and when producing fabricated pipe components (general workshop and site safety, appropriate personal protective equipment (PPE), accident procedure; statutory regulations, risk assessment procedures and COSHH regulations)
2. the personal protective clothing and equipment that needs to be worn when carrying out the pipe fabrication activities (such as leather gloves, eye protection, safety helmets, ear protection)
3. safe working practices and procedures needed for producing fabricated pipe components
4. the correct methods of moving or lifting long or heavy pipe fabrications
5. the hazards associated with pipe fabrication work and assembly operations and how they can be minimised (such using dangerous or badly maintained tools and equipment; lifting and handling long and heavy components; slips, trips and falls)
6. how to obtain the necessary pipe fabrication drawings and joining specifications
7. 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)
8. how to interpret first and third angle drawings, imperial and metric systems of measurement, workpiece reference points and system of tolerancing
9. how to interpret marking out conventions (such as cutting lines, centre lines)
10. the preparations that need to be carried out on the pipe components prior to assembling them
11. the various methods of securing the pipe components (temporary tack welding methods and techniques, self securing methods such as knocked up, paned down, swaged and joggled, adhesive bonding of components)
12. how to prepare the pipe ends ready for welding (clean, correct shape, appropriate weld preparations)
13. how to set-up and align the various components and the tools and equipment that is used (such as jigs, fixtures, templates)
14. the material cutting characteristics and process considerations that needs to be taken into account when producing pipe fabrications
15. the use and care of tools and equipment, and control procedures

16. the importance of using tools or equipment only for the purpose intended; the care that is required when using the tools or equipment; the proper way of preserving tools or equipment between operations.
17. the problems that can occur when producing pipe fabrications and assemblies, and how these can be avoided
18. inspection techniques that can be applied to check shape (including roundness, straightness and dimensional accuracy) is to specification and within acceptable limits
19. how to pressure test completed assemblies and the tools, equipment and techniques that are used
20. the extent of your own responsibility and whom you should report to if you have problems that you cannot resolve
21. reporting lines and procedures, line supervision and technical experts

Scope/range related to performance criteria

1.

Carry out **all** of the following during the pipework assembly operations:

1.1 fabricate the pipe components in the correct order and manner
1.2 produce suitable weld preparations on the pipe ends
1.3 correctly prepare and set up the pipe components and faces to be joined
1.4 check that the fabrication has the required configuration
1.5 use the specified or appropriate fixing method
1.6 produce a pipe fabrication which meets the required specification

2.

Produce **three** of the following pipe fabrications/assemblies:

2.1 flanged pipe
2.2 straight reduction piece
2.3 elbow
2.4 equal tee piece
2.5 reduction tee piece
2.6 segmented bend

3.

Produce pipe fabrications from **one** of the following materials:

3.1 ferrous
3.2 non-ferrous
3.3 non-metallic

4.

Assemble the components using **two** of the following methods:

4.1 bolted
4.2 riveted
4.3 self secured (knocked up, paned down, swaged, joggled)
4.4 temporary tack welded
4.5 adhesive bonding

5.

Produce pipe fabrications which meet **all** of the following quality and accuracy standards:

5.1 all components are correctly assembled and aligned in accordance with the specification
5.2 overall dimensions are within specification tolerances
5.3 assemblies meet appropriate geometric tolerances (square, straight, angles free from twists)
5.4 pitch of flange holes meet specification requirements (where appropriate)
5.5 assemblies are leak and pressure tested (where appropriate)
5.6 completed assemblies are secure, clean and free from burrs or flash

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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Developed by	Enginuity
Version Number	3
Date Approved	30 Mar 2017
Indicative Review Date	31 Mar 2020
Validity	Current
Status	Original
Originating Organisation	Semta
Original URN	SEMFWE345
Relevant Occupations	Engineering, Engineering and Manufacturing Technologies, Metal Forming, Welding and Related Trades
Suite	Fabrication and Welding Engineering Suite 3
Keywords	engineering; welding; fabrication; assembly; pipe; flanges; straight reductions; elbows; tee pieces; reduction pieces