

## Installing marine pipework and components

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### Overview

This standard identifies the competences you need to install marine pipework and associated components on board vessels, in accordance with approved procedures. The marine pipework systems to be installed could include fresh water, chilled water, air conditioning, lubricating oil, waste water, steam drains, sea water and other salvage drainage systems. In installing the marine pipe-work, you will be expected to select and use a range of equipment, hand tools and techniques, appropriate to the operations being performed.

The installation activities could include producing cemented/glued joints, hot welded plastic joints, compression joints, threaded joints, flanged joints and push-fit joints. The marine pipe installations will use a range of fittings, which could include straight connectors, elbows, tee pieces, reduction pieces, flanges, tank connectors, tap connectors, valves and other fittings, as appropriate to the application.

Your responsibilities will require you to comply with organisational policy and procedures for the marine pipework installation activities undertaken and to report any problems with the equipment, materials or installation activities 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.\* \*

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Your underpinning knowledge will provide a good understanding of your work and will provide an informed approach to installing marine pipework and associated components on board vessels. You will understand marine pipework system being installed and its application and will know about the installation techniques, pipe components and materials used, in adequate depth to provide a sound basis for carrying out the activities, correcting faults and ensuring that the work output is produced to the required specification.

You will understand the safety precautions required when working on the installation of the marine pipework and with the 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 on board the vessel.

## 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 all relevant drawings and specifications for the installation being carried out
3. use the correct tools and equipment for the installation operations and check that they are in a safe and usable condition
4. install, position and secure the equipment and components in accordance with the specification
5. ensure that all necessary connections to the equipment are complete
6. deal promptly and effectively with problems within your control and report those that cannot be solved
7. check that the installation is complete and that all components are free from damage
8. complete relevant documentation in line with company procedures

## Knowledge and understanding

### *You need to know and understand:*

1. the specific safety precautions to be taken when installing marine pipework onboard vessels and with the tools and equipment used (including general workshop and site safety, accident procedure; statutory regulations, risk assessment procedures and COSHH regulations)
2. the personal protective equipment (PPE) to be used when installing marine pipework
3. the hazards associated with carrying out marine pipework installation activities (including tag-out systems and how they operate, ship boundaries and handling long lengths of pipe in confined spaces, working with heating elements for plastic welding) and how they can be minimised
4. the procedures to be carried out before starting work on the installation (such as obtaining permits to work, obtaining and complying with risk assessments and other health and safety requirements)
5. how to use and extract information from engineering drawings and related specifications (to include symbols and conventions to appropriate BS or ISO standards) in relation to work undertaken
6. how to interpret installation drawings, using both imperial and metric systems of measurement
7. how to carry out currency/issue checks of the specifications you are working with
8. the preparation of pipework and fittings for the installation operation (including checking for damage, removing foreign objects, dirt and swarf from bore of pipe, removing burrs)
9. the range of marine pipe fittings that can be used and how to identify them (including straight connectors, elbows, tee pieces, reduction pieces, tank fittings, flanged fittings, valves, plastic hot welding fittings, blanking pieces/cap ends)
10. the different methods of connecting pipework (such as bolted flanges, screwed couplings, nut and ferrules, compression fittings and push-fit fitting)
11. how to ensure alignment and identify the correct orientation of fittings with regard to flow and the consequences of incorrectly orientating the fitting
12. the methods used to prepare pipe ends and why it is necessary to ensure that these preparations are carried out
13. the use of compression fittings; how the pipes are sealed and the effects of over-tightening the fittings

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14. the use of flanged fittings, jointing materials, fasteners and the effect of over-tightening fasteners
15. the use of push-fit connectors and their advantages and disadvantages
16. the use of threaded connections and their advantages and disadvantages
17. methods of fastening pipe supports to the vessel structure and the need to protect the integrity of the vessel at all times
18. methods of supporting pipework and the type of fittings that are used
19. the importance of ensuring that the completed installation is free from dirt, swarf and foreign object damage and of ensuring that any exposed components or pipe ends are correctly covered/protected
20. the procedure for the safe disposal of waste materials
21. the tools and equipment used when installing marine pipework
22. the standards to be attained and company quality procedures
23. 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.

Carry out **all** of the following during the marine pipework installation activities:

- 1.1 plan the installation activities prior to beginning the work
- 1.2 keep the site accessible and free from obstructions or hazards
- 1.3 use the correct marine pipework installation drawings, specifications or job instructions
- 1.4 ensure that components and pipes are free from foreign objects, dirt or other contamination
- 1.5 check that all tools are in a safe and usable condition (such as calibration/care and control procedures)
- 1.6 ensure that tag-out systems are in place before removal of any blanks prior to installation
- 1.7 ensure appropriate COSHH regulations are adhered to (such as safety and environmental conditions maintained)
- 1.8 leave the work area in a safe condition and to the prescribed category of cleanliness

2.

Install marine pipework which contain **six** of the following types of fittings:

- 2.1 straight couplings
- 2.2 valves
- 2.3 elbows
- 2.4 blanking caps
- 2.5 tee pieces
- 2.6 pipe clips/supports
- 2.7 reduction pieces
- 2.8 drain/bleeding devices
- 2.9 screwed fittings (such as tank, tap, pump, gauges)
- 2.10 flanged fittings

3.

Install marine pipework which contains **two** of the following jointing methods:

- 3.1 nut and ferrule
- 3.2 bolted flanges
- 3.3 screwed fittings
- 3.4 snap-on/push fittings
- 3.5 compression fittings
- 3.6 cemented/glued joints
- 3.7 plastic hot welding

4.

Install marine pipework, to include carrying out **all** the following:

- 4.1 securing pipework supports to vessel structures
- 4.2 connecting pipe to pipe

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- 4.3 making bulkhead penetrations
- 4.4 connecting pipe to vessel's equipment
- 4.5 using gaskets, seals or jointing compounds
- 4.6 aligning and levelling equipment
- 4.7 torque loading of bolts

5.

Install marine pipes and components to form **five** of the following marine pipework systems:

- 5.1 high pressure
- 5.2 low pressure
- 5.3 air system
- 5.4 fluid system
- 5.5 gas system
- 5.6 steam system

6.

Produce marine pipework assemblies which comply with **one** of the following standards:

- 6.1 BS or ISO standards and procedures
- 6.2 customer (contractual) standards and requirements
- 6.3 company standards and procedures
- 6.4 specific system requirements
- 6.5 recognised compliance agency/body's standards
- 6.6 other accepted international standards

## Behaviours

### **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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