SEMMPF307

Locating, assembling and setting cores in sand moulds

Overview

This standard identifies the competencies you need to assemble, locate and secure cores in sand moulds for casting. Manual and mechanised methods will be used, in accordance with approved procedures.

You will be required to select the appropriate equipment to use, based on the size, shape and number of the cores to be located, assembled and secured within the moulds. The moulds you will core up will have been produced as one-offs or by batch production methods. You will be required to check the condition of the moulds and the cores you receive and to reject any considered as sub-standard, in accordance with the company control procedures.

You will be expected to clean the mould drags and copes and where appropriate, apply a suitable mould dressing. You will need to insert the cores into the moulds and secure them using, print locators, adhesives, or mechanical fastenings, as appropriate. On completion of the coring up, you will be expected to carry out final checks to ensure that the quality of the mould and cores meets company standards and that metal section thickness is correct. Core sealing will take place using approved sealing materials. Cored up moulds will be passed to the closing area.

Your responsibilities will require you to comply with organisational policy and procedures for the coring up of the sand moulds and to report any problems with the moulds, cores, materials or equipment in use, 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 actions and for the quality and accuracy of the work that you carry out.

Your underpinning knowledge will show a good understanding of your work, and will enable you to adopt an informed approach to the assembly, core setting and control of metal thickness in various types of sand moulds. You will understand the different types of materials used to make the moulds and the associated machinery that is used to handle the different types and size of cores and moulds. You will understand the different methods of locating and securing the cores in the moulds and why different methods are used to suite various casting requirements (such as pressure, tightness).

You will understand the safety precautions required when carrying out the coring up activities and when using 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 in the workplace.

Performance criteria

You must be able to:

1. work safely at all times, complying with health and safety legislation, regulations, directives and other relevant guidelines
2. follow the instructions, assembly drawings and any other specifications to set cores in sand moulds
3. check the condition and availability of required components for the task
4. assemble the components in their correct positions using appropriate methods and techniques
5. secure the 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
8. ensure that work records are completed, stored securely and available to others, as per organisational requirements
9. leave the work area in a safe condition on completion of the activities, as per organisational and legal requirements

Knowledge and understanding

You need to know and understand:

1. the specific safety precautions to be taken whilst carrying out the activities (including any specific legislation, regulations or codes of practice relating to the activities, equipment or materials)
2. the health and safety requirements of the work area and the activities, and the responsibility these requirements place on you
3. the hazards associated with the activities, and how to minimise them and reduce risks
4. the personal protective equipment and clothing (PPE) to be worn during the activities
5. how to obtain the necessary instructions and interpret the information
6. why it is necessary to check the moulds and cores prior to commencing core setting operations
7. the defects that can occur in the moulds and cores (dirty moulds, cracked surfaces, exposed reinforcements, friable surfaces, broken or weak mould and core sections, incomplete mould or cores, distorted cores, mismatch, damaged or broken core prints and core locations, mould location devices missing or distorted, uncoated moulds or cores)
8. the actions that are needed when moulds or cores are found to be sub-standard
9. the different types of sands that are used to produce the moulds and cores
10. the differences between box and boxless moulds and how this affects the assembly process
11. the reasons why core prints are needed and why cores must be located and secured correctly
12. the types of mechanical fastening devices that are available, and how they are used (prints, sprigs, adhesives, studs, chaplets, wires)
13. the effects on casting quality and accuracy of incorrectly located and secured cores
14. why different methods are used to secure cores in moulds produced from different sands
15. why different methods of securing cores in moulds are used when castings are required to be pressure tight, or where there are other operational requirements
16. why it is important to keep the equipment clean and free from damage, practice

good housekeeping of tools and equipment and to maintain a clean working area
17. the extent of your own authority and whom you should report to if you have problems that you cannot solve when assembling, core setting and closing sand/ceramic moulds
18. how to access, use and maintain information to comply with organisational requirements and legislation

Scope/range related to performance criteria

1.

Complete assembly, carrying out all of the following activities:

1.1 confirm that the moulds and cores received are complete and free from defects

1.2
adhere to health and safety regulations, systems and procedures to realise a safe system of work

1.3
comply with job instructions, mould assembly specifications

1.4 use the correct tools and equipment for the core assembly, core setting and preparation activities

1.5 follow the defined core assembly and preparation procedures

1.6 ensure that the completed core assembly meets the required specification for quality and accuracy

1.7 leave the work area in a safe condition on completion of the core assembly activities

2.

Locate, assemble and secure cores in one of the following types of mould:

2.1 boxed

2.2 boxless

2.3 core assembled moulds

3.

Prepare and clean out moulds produced from one of the following sands:

3.1 greensand

3.2 chemically bonded resin catalyst

3.3 dry silica (vacuum sealed)

3.4 chemically bonded gas activated

3.5 ester silicate bonded

4.

Apply mould coatings using one of the following methods:

4.1 brush

4.2 spray

5.

Use cores that have been produced as both of the following:

5.1 singular cores

5.2 core sub-assemblies

6.

Determine the cast metal thickness, using two of the following methods:

6.1 clay slugs

6.2 direct measurements

6.3 gauges
6.4 templates
6.5 jigs/fixtures
6.6 reference to drawings/specifications

7.

Insert, set and secure a minimum of four cores per mould, using two of the following:

7.1 horizontal locations
7.2 vertical locations
7.3 horizontal and vertical locations

8.

Secure the cores in the moulds, using two of the following methods:

8.1 print locations
8.2 adhesives
8.3 mechanical fixing devices

9.

Complete visual and dimensional checks to the mould, checking all of the following:

9.1 all cores have been inserted
9.2 required metal thickness will be achieved
9.3 cores are suitably secured to maintain metal thickness
9.4 moulds and cores are clean and undamaged
9.5 core vents are sealed and protected (where appropriate)

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