SEMMPF210

Preparing materials for moulding and coremaking

Overview

This standard identifies the competences you need to prepare materials used in the production of sand moulds and cores, for a range of processes. 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 type and amount of the processed materials needed. Both continuous and batch production methods are included in this standard. The materials covered include sands, refractory slurries, additives and additions. You will be required to perform simple tests on the materials processed, in accordance with the company control procedures. The tests may be performed manually, or by using in-built continuous monitoring equipment, which provides information visually or as a print out. For the manually performed tests you will be expected to record the results obtained on control charts. From the information contained in your test results you will, if necessary, be expected to adjust equipment mechanisms to correct any deficiencies. Following tests performed manually, you will be expected to adjust the properties of the prepared mixes by physically adding further materials. In extreme cases, you will notify supervision of non-conformance or, for batch-produced amounts, you will dispose of the batch in accordance with procedures. You will maintain an adequate amount of the materials you use and notify supervision when stocks reach re-ordering levels. You will respond to requests for additional material mixes as required. Your responsibilities will require you to comply with organisational policy and procedures for the preparation and control of the activities undertaken and to report any problems with the materials, equipment or mixing procedures that you cannot personally resolve, or are outside your permitted authority, to the relevant people. You will be expected to work to instructions, with minimal supervision and take personal responsibility for the quality and accuracy of the materials you prepare. Your underpinning knowledge will be sufficient to provide a sound basis for your work and will enable you to adopt an informed approach to applying material preparation and control procedures. You will have an understanding of the different types of materials in use, and the associated machinery that is used to prepare the materials. You will also understand the different methods of preparing materials, such as continuous or batch processing and the tests which are used to confirm that the mixing process is being carried out to the required specification. You will understand the safety precautions required when working with the machinery and its associated equipment. You will be required to demonstrate safe working practices throughout. You will also understand your responsibilities for safety and the importance of taking the necessary safeguards to protect 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 correct component drawing or any other related specifications for the component to be produced 3. obtain the required materials and check them for quantity and quality 4. prepare materials using appropriate equipment 5. check preparations or materials and equipment are completed to specification 6. deal promptly and effectively with problems within your control and report those that cannot be solved 7. ensure that work records are completed, stored securely and available to others, as per organisational requirements 8. 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 job instructions and how to interpret their information 6. the importance of checking the amounts and quality of materials prior to commencing mixing operations 7. the actions that are needed when materials are found to be below the required amounts 8. how preparation problems can affect materials (if the base product has passed its`use by' date, differs from the organisational requirement/specification, or if the mix is incorrect) 9. the different processes and machines used to prepare the materials (manual, semi and fully automatic) 10. the additions and additives that are used when preparing the materials 11. the reasons why different materials are used for different molten metal alloys 12. why sampling of prepared materials is performed 13. why some prepared materials, which are outside of specification after testing, have to be disposed of 14. the organisational quality control checks to be carried out on the prepared material (moisture content, strength, viscosity and freedom from foreign bodies) 15. how to identify prepared material non-conformance (dry or wet sand, unmixed sand, thick/thin slurry or unmixed slurry) 16. the importance of keeping the equipment clean and free from damage, of good housekeeping of tools and equipment and maintaining a clean working area 17. the extent of your own authority and whom you should report to if you have problems that you cannot resolve when preparing the materials 18. how to access, use and maintain information to comply with organisational requirements and legislation

Scope/range related to performance criteria

1. Prepare materials, carrying out all of the following activities: 1. confirm that the machine/equipment is ready for material production 2. adhere to health and safety regulations, systems and procedures to realise a safe system of work 3. seek and complete any necessary instruction/training on the operation of the machine 4. comply with job instructions and material preparation specifications 5. follow the defined operating procedures 6. ensure that machine settings are adjusted to maintain the required material quality 7. ensure the mixtures produced meet the required specification for quality and accuracy 8. leave the work area in a safe condition on completion of the activities 2. Check that correct amounts of materials are available prior to processing, to include all of the following: 1. sand 2. additives 3. additions 4. refractory material 3. Check the quality of the materials prior to mixing and after mixing, using one of the following methods: 1. visual inspection 2. reference to approved authority 3. `use by' dates 4. electronically 5. manual testing of material 6. material specification complies with procedures documentation 4. Prepare the machine(s) for use, to include all of the following: 1. material supply feed and discharge points are clean and operational 2. services and auxiliary equipment are operational 3. previous shift notes/reports are referred to and actioned 4. safety locks/guards/screens are operational 5. material supply feeds are clean and operational 6. correct start-up procedures are initiated 7. emergency stop controls are tested 8. visual display panels are operational 5. Produce the mixed materials, using any one of the following methods: 1. manual mixing 2. ribbon flow semi-automatic 3. batch mixing 4. continuous mixing 5. combined methods 6. Complete preparations of materials, carrying out all of the following: 1. making adjustments for out-of-specification mixes 2. confirming that prepared materials are ready for use and comply with required specification 3. discharging mixed materials according to company procedure 4. completing all relevant documentation

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