



Australian Government

Assessment Requirements for MEM48003 Monitor nonferrous melting and casting processes

Release: 1

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Modification History

Release 1. Supersedes and is equivalent to MSATCM303A Monitor non-ferrous melting and casting processes.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy the requirements of the elements and performance criteria and include:

- following work instructions, standard operating procedures (SOPs) and safe work practices
- identifying and interpreting specifications, safety procedures and codes of practice and/or standards for the required melting and casting processes
- calculating charges
- checking for contaminants when verifying metal changes to melting on at least two occasions and recommending changes and/or additions to the charge as required
- performing visual checking of furnaces for operational condition and safety risks on at least two occasions
- taking samples on at least two occasions for analysis in accordance with work health and safety (WHS) and quality procedures.

Note: Where a volume and/or frequency is not specified, demonstration must be provided at least once.

Knowledge Evidence

Evidence required to demonstrate the required knowledge for this unit must be relevant to and satisfy the requirements of the elements and performance criteria and include knowledge of:

- safe work practices and procedures and use of personal protective equipment (PPE)
- types of moulds
- charge calculations including importance of composition control, methods used to calculate for additions and types of alloy additions
- nonferrous alloys including definitions and their physical properties, density, tensile, hardness, melting points, shrinking percentage, fluidity, brass, bronze, gunmetal, copper-based alloys, aluminium based alloys and lead
- selection including customer and manufacturer's requirements, metal analysis and Australian Standards
- types of furnaces and their maintenance including crucible, oil, gas, induction, channel, coreless, resistance and reverberatory
- refractories including silica, ganister, coatings and others common to nonferrous
- linings including monolithic, castable, rammable and bricks

- types of ladles, crucibles, safety, maintenance, care of crucibles and porous plug
- safety including housekeeping, PPE, dry area, pre-heating of ladles and overhead cranes
- furnace operation procedures including PPE, dry charge and equipment, pre-heating, scrap selection, housekeeping, melting and alloying program, charge calculations including percentages, ratio and proportion, calculations including volume and mass, operation and maintenance
- lifting and handling equipment including tongs, shanks, cranes, hoists, bogey ladles and maintenance
- types of control equipment including thermal analysis, pyrometers, gas analysis, chemical analysis, wet, dry, spectrograph, fluidity and shrinkage test
- quality control including accurate weighing, correct chemical analysis, temperature control, covers and fluxes, mould and metal reactions, thermal analysis, degassing, deoxidising and ladle refining
- types of defects including contamination, gas absorption, metal analysis, temperature control, oxidation and other defects common to nonferrous metals
- methods of avoiding and overcoming defects
- alloy production including charge, analysis, calculation, preparation and melt control
- tapping and pouring including pouring method sequence, temperature check, capacity requirements, ladle and crucibles, checks, preparation, pre-heating, transfer including safety clips, filling, metal maintenance, covers and fluxes, temperature, metal pouring, mould condition, test bar including reasons and method, pig pouring and tagging, ladle and crucible return, emptying, cleaning, maintaining, lubrication, repairs and cleaning of refractory.
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Assessment Conditions

- Assessors must:
 - have vocational competency in monitoring nonferrous melting and casting processes at least to the level being assessed with relevant industry knowledge and experience
 - satisfy the assessor requirements in the *Standards for Registered Training Organisations 2015* or its replacement and comply with the *National Vocational Education and Training Regulator Act 2011*, its replacement or equivalent legislation covering VET regulation in a non-referring state/territory as the case requires.
- Where possible, assessment must occur in operational workplace situations. Where this is not possible or where personal safety or environmental damage are limiting factors, assessment must occur in a sufficiently rigorous simulated environment that reflects realistic operational workplace conditions that cover all aspects of workplace performance, including environment, task skills, task management skills, contingency management skills and job role environment skills.
- Conditions for assessment must include access to all tools, equipment, materials and documentation required including relevant workplace procedures, product and manufacturing specifications.
- Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=b7050d37-5fd0-4740-8f7d-3b7a49c10bb2>