

Setting pressure die casting machines for production

Overview

This standard identifies the competencies you need to check and set up high and low pressure die casting machines, in accordance with approved procedures. You will obtain information on which dies are required for the production activity and will check that they are available for use. The dies will be cleaned and coated, where appropriate and fully inspected for any damage or non-conformance that could impair the quality of the castings produced. You will be expected to mount the dies on the platens in the machines, using safe and approved techniques and procedures. You will need to check that all services required to operate the machine are connected and fully operational. You will be required to set the machine operating conditions and to test all the safety systems that are in place on the machine to confirm that they are functioning correctly.

Your responsibilities will require you to comply with organisational policy and procedures for the checking and setting of pressure die casting machines and to report any problems with the die casting machines, 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 to instructions, 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 checking and setting of pressure dies. You will understand the different types of pressure die casting machines used. You will also understand how the dies are located and secured to the machine platens and how the machine conditions are set to achieve the optimal results. Your knowledge will enable you to identify any faults in the dies, the machine or the connected services and you will understand the actions that are required to correct these faults. You will also be familiar with the defects/flaws that can occur in the castings if the necessary remedial actions are not taken.

You will understand the safety precautions required when setting up pressure die casting machines 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.

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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 specifications for the component to be cast
3. mount and set the correct dies, moulds, shells or receivers for the component being produced
4. set the machine operating parameters for production operations
5. check the components produced meet casting requirements and 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

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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 for the machine setting operations and how to interpret the information
6. the basic parts and functions of a pressure die casting machine and dies (to include fixed and moving platen; cavities, runner and gating systems; die location points; core locations; die heating/cooling arrangements; die coolant supply, connection and operation; furnace type; die spray system; machine controls; hydraulic, pneumatic and electricity supplies; metal transfer systems; guards and other safety devices)
7. the methods that are used to locate dies and associated parts in the machine
8. the different types of core used in the pressure die casting process
9. the different materials used to manufacture pressure dies
10. the different metals used in producing pressure die castings
11. the temperature range of the alloy being cast and the die being used
12. the importance of carrying out pre-production checks on the dies
13. the organisational quality control checks to be carried out on the prepared pressure die (such as cleanliness, completeness, freedom from foreign bodies, damage or defects)
14. the importance of keeping the pressure dies and equipment clean and free from damage, good housekeeping of tools and equipment, and maintaining a clean and unobstructed working area
15. the extent of your own authority and whom you should report to if you have problems that you cannot resolve when setting pressure die casting machines
16. how to access, use and maintain information to comply with organisational requirements and legislation

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Scope/range related to performance criteria

1. Set up pressure die casting machines, carrying out all of the following:
 1. comply with job instructions and equipment setting up documentation and procedures
 2. follow the defined setting up procedures
 3. adhere to health and safety regulations, systems and procedures to realise a safe system of work
 4. leave the work area in a safe condition on completion of the activities
2. Set up one of the following pressure die casting machines:
 1. high pressure hot chamber
 2. squeeze process
 3. high pressure cold chamber
 4. low pressure
 5. other pressure processes (specify)
3. Mount and secure two of the following types of dies to the machine platens, using correct location devices:
 1. split die with no secondary die movement
 2. split die with one secondary die movement
 3. split die with two or more secondary die movements
 4. split die with no cores
 5. split dies with one core
 6. split dies with two or more cores
 7. core assembly with external cores
 8. core assembly with internal cores
4. Prepare the machine for use, carrying out all of the following:
 1. checking that dies are free from damage and are correctly and securely mounted
 2. ensuring all machine services are connected and operational (such as electrical, pneumatic, hydraulic)
 3. setting the die heating and cooling arrangements
 4. setting and checking that the metal transfer systems are operating correctly
 5. setting and checking that all safety mechanisms and features are operating correctly (such as guards, emergency stop)
 6. setting up the machine operating conditions to suit the castings being produced
 7. checking that all the machine controls function correctly

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5. Check the materials used during the production cycle, to include all of the following:
 1. required materials are available in sufficient quantities
 2. materials meet the casting/component specification
 3. materials have been correctly prepared for the casting operation

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