

## Fettling cast components

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### Overview

This standard covers a range of basic competences that you need, to use hand and power tools to fettle and finish cast components. It will prepare you for entry into the engineering or manufacturing sectors, creating a progression between education and employment, or it will provide a basis for the development of additional skills and occupational competences in the working environment.

You will be expected to prepare for the fettling activities by obtaining all the necessary job instructions, materials, tools, equipment and any documentation that may be required.

You will be expected to check that the tools and equipment are in a safe and usable condition, and that the abrasive wheels/discs to be used during the fettling operation are suitable for the material and operations to be carried out. The cast components could be circular, square or irregular in shape, and may have projections and internal cavities. You will remove the runners and risers/feeders, using manual or mechanical means. Other surplus material present, on both external and internal surfaces (such as joint line and core print flash), must also be removed. On completion of the fettling activity, all waste material must be disposed of safely and correctly, and you will be expected to return all tools and equipment to the correct location, and to leave the work area in a safe and tidy condition.

Your responsibilities will require you to comply with health and safety requirements and organisational policy and procedures for the fettling activities undertaken. You will need to report any difficulties or problems that may arise with the fettling activities, and to carry out any agreed actions. You will work under a high level of supervision, whilst taking responsibility for your own actions and for the quality and accuracy of the work that you carry out.

Your underpinning knowledge will provide an understanding of your work, and will enable you to apply appropriate fettling techniques and procedures safely. You will understand the fettling techniques used, and their application, and will know about the equipment, materials and consumables, to the required depth to provide a sound basis for carrying out the activities to the required specification.

You will understand the safety precautions required when carrying out the fettling activities, and when using the associated tools and 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.

### Specific Standard Requirements

At least one of the cast components must require a combination of different fettling

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techniques to be used: such as removing sand/cores from a hole or cavity, cutting off runner and riser/feeder projections, grinding of flash from joint lines.

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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. remove the cast components from the moulds/dies, using appropriate tools and techniques
3. clean the cast components and, where appropriate, remove any cores
4. fettle and finish the castings to remove excess material
5. check the casting for visible defects
6. dispose of waste material safely and correctly, in line with organisational procedures
7. report any difficulties or problems that may arise with the fettling activities, and carry out any agreed actions
8. leave the work area in a safe condition on completion of the fettling activities

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## Knowledge and understanding

## You need to know and understand:

1. the specific health and safety precautions which must be taken when fettling and finishing cast components (such as wearing full protective clothing and protective equipment, using screens and dust extraction equipment)
2. the hazards associated with fettling and finishing cast components (such as handling hot castings, airborne sparks and metal particles, sharp edges on components, using power tools and abrasive discs, handling heavy materials), and how they can be minimised
3. the personal protective equipment (PPE) that should be used (such as eye protection, overalls, full face masks, breathing equipment); how to obtain it and check that it is in a safe and usable condition
4. the importance of ensuring that fume extraction equipment is operating effectively, and that good housekeeping and fire prevention procedures are observed
5. the importance of following job instructions and defined fettling procedures
6. manual lifting techniques, and requirements on acceptable weights to be handled by hand
7. the different methods that can be used to knock out and de-core moulds and shells, and how to avoid damaging the moulds and cast components
8. how to clean the castings and remove any cores, and the tools and equipment that can be used
9. how to correctly remove runners and associated systems by braking off or cutting off
10. how to fettle castings to remove joint line flash, runner and feeder stubs, and the amount of material that should be removed
11. the various hand and power tools that are used to carry out the fettling activities (such as hammers and chisels, files, grinding machines/discs, finishing equipment, knives and scrapers)
12. the checks to be made on the tools and equipment to ensure that they are in a safe, tested and usable condition
13. the various workholding methods and devices used to hold the cast components during the cleaning and fettling activities
14. the effect on casting quality of incorrectly fettling of castings (such as under or over-dressing)
15. why it is important to keep the equipment clean and free from damage, to practice good housekeeping of tools and equipment, to maintain a clean working area
16. when to act on your own initiative and when to seek help and advice from others
17. the importance of leaving the work area in a safe and clean condition on completion of the fettling activities (such as returning tools and equipment to the designated location, cleaning the work

area, and removing and disposing of waste)

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## Scope/range related to performance criteria

1. Carry out **all** of the following, in preparation for the fettling and finishing activities:
  1. adhere to procedures or systems in place for risk assessment, COSHH, personal protective equipment (PPE) and other relevant safety regulations
  2. ensure that the work area is clear of obvious hazards
  3. obtain any necessary personal protective equipment, and check that it is in good order
  4. follow job instructions, fettling and finishing specifications and procedures
  5. check that the tools and equipment you need are in a safe, tested and usable condition (such as extension leads, hoses, pneumatic equipment, hand tools)
  6. ensure that dust extraction and air filtering equipment is functioning correctly
  7. ensure that all guards and screens are in place and are in good order
  8. return all tools and equipment to the correct location on completion of the fettling and finishing activities
2. Remove cast components from moulds, and carry out **all** of the following, as appropriate to the castings produced:
  1. knocking castings out of the moulds
  2. removing runner/riser/feeder systems
  3. removing castings from the moulding material
  4. visually checking castings for obvious defects (such as incomplete or deformed castings, blow holes)
  5. de-coring
3. Fettle and finish cast components which have been produced from **one** of the following materials:
  1. ferrous alloys
  2. non-ferrous alloys
  3. plastics/polymers
  4. liquid ceramics
4. Fettle and finish cast components, to include the use of **three** of the following:
  1. hand tools (such as wire brushes, knives, scrapers, saws, files)

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2. finishers
  3. pneumatic chipping hammers
  4. pedestal grinders
  5. slitting saw
  6. band saw
  7. disc/angle grinder
  8. other specific method
5. Fettle and finish cast components that have **three** of the following shapes/profiles:
  1. square
  2. projections
  3. circular, curved or tapered profiles
  4. irregular
  5. internal cavities
6. Fettle castings in accordance with **one** of the following:
  1. company standards and procedures
  2. customer standards and requirements
  3. specific job requirements

## Behaviours

# Additional Information

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



## Fettling cast components

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