

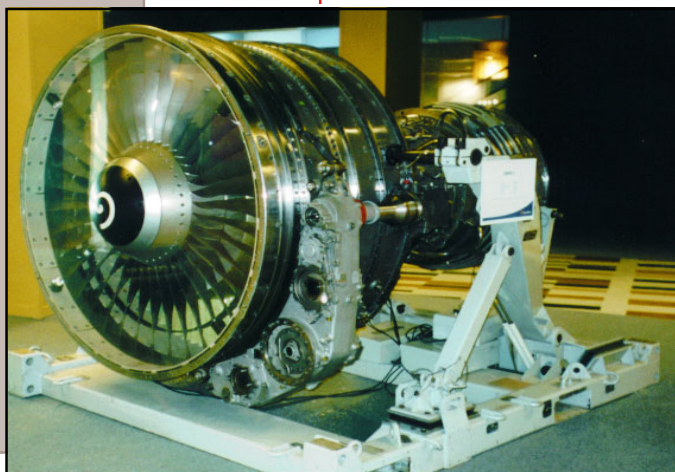
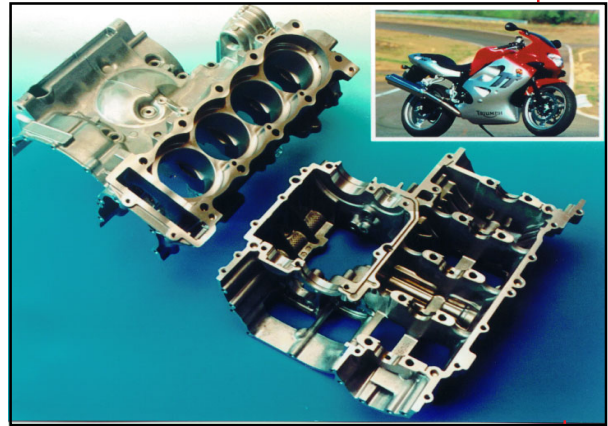
# ICME

Institute of Cast Metals Engineers

## CAREERS

The Casting Industry produces a wide range of products in a variety of metals. Many products that are familiar to us contain castings, from cars and fridges to mobile phones. The automotive and aircraft industries use the majority of castings but they are also used in the telecommunications and IT industries. Some examples of products made from or containing castings are shown here.

Castings are used because they offer one of the quickest ways to make components, from the design stage to actual production. The production techniques are versatile enough to allow the components to be produced either on a one off or as a mass-produced component. Indeed casting is sometimes the only way to make components with complex internal cavities (that cannot be drilled or machined).

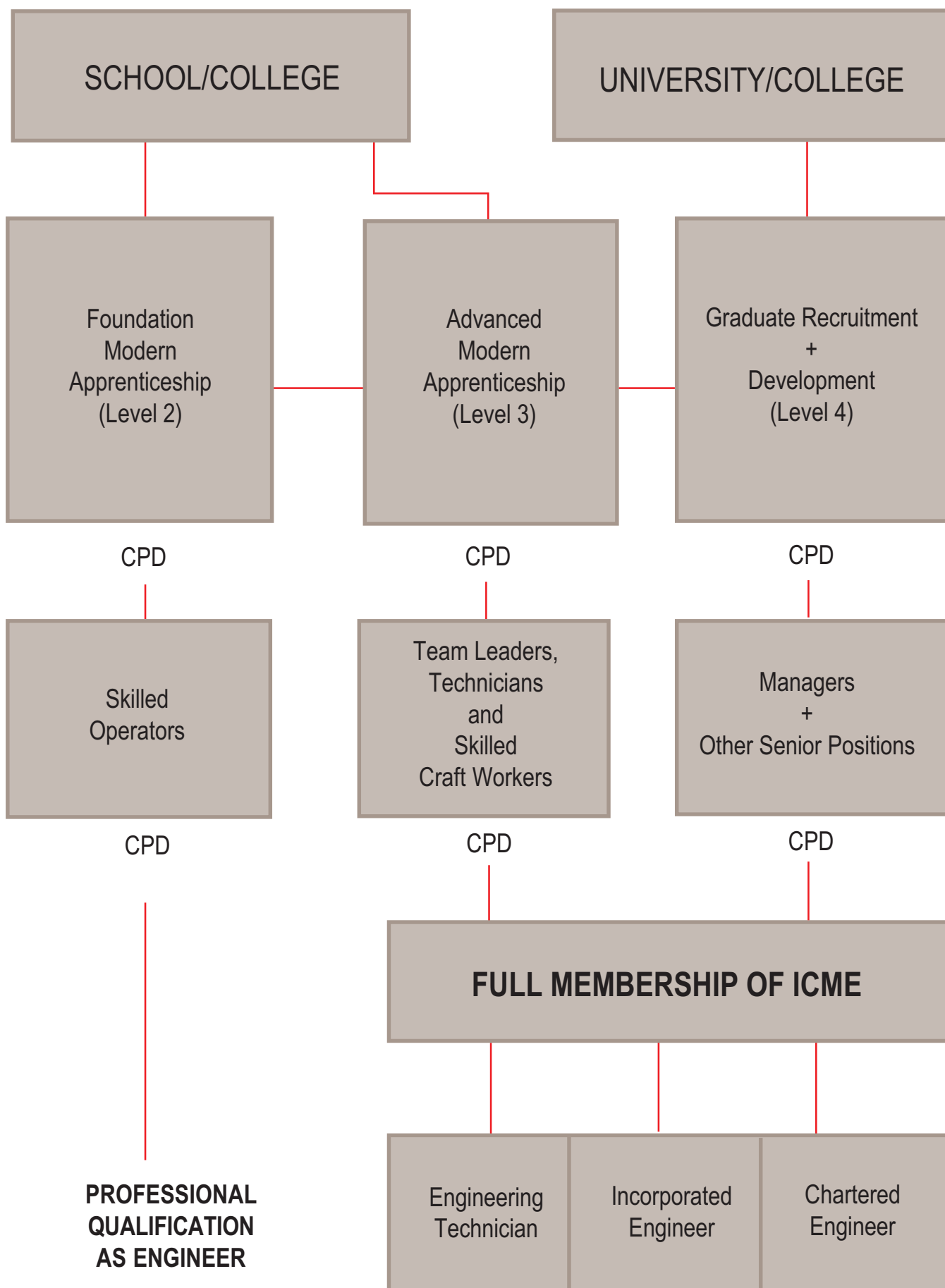


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**CPD - Continuing Professional Development** - employees continue to learn and develop new skills in order to develop their careers on an on-going basis.

The Casting Industry is high-tech, dynamic and modern and the casting process itself is often highly automated with a high dependence on computers.

There are opportunities for practical people, who enjoy working with their hands, highly skilled technicians as well as graduates and post-graduates.

Indeed the industry offers career opportunities for people with a wide range of skills and abilities.

Some examples of the career opportunities are shown below:



***Please refer to the flow chart on the previous page for educational progression and career advancement***

### **Skilled / Craft workers**

are normally trained up to NVQ Level 3 or equivalent.

There is a Modern Apprenticeship scheme for the industry at either a **Foundation** or an **Advanced** level.

**Foundation Modern Apprenticeship in Engineering and Manufacture**  
is designed to enable young people to become skilled operators / assemblers or to carry out maintenance work.

The Foundation MA incorporates training to NVQ level 2.

The **entry requirements** are normally GCSEs including maths and science subjects.

### **Progression**

*The Foundation Modern Apprentices make ideal candidates to progress onto Advanced Modern Apprenticeships. Operators can progress to team leader and supervisory roles within companies.*

### **Advanced Modern Apprenticeship in Engineering**

is designed to attract bright young people into the industry and to develop them to be the skilled craftsmen or technicians of tomorrow or the potential supervisors or managers of the future. The Advanced Modern Apprenticeship incorporates off the job basic training (College day or block release) and specialist training in a specific occupation.

The AMA results in an NVQ at levels 3 & 4.

The **entry requirements** are normally 3 to 5 middle grade GCSEs although many entrants have higher qualifications.

#### **Progression**

*You can further develop your skills and aim to become a supervisor or manager.*

An Advanced Modern Apprenticeship is designed to provide entrance qualifications for university. They are ideal for people who may want to go to university but who may find A Levels too theoretical.

ICME is able to offer Continuing Professional Development for its members to enable them to become full members of the Institute and ultimately Engineering Technicians, Incorporated Engineers or Chartered Engineers through registration with the Engineering Council. Contact ICME direct for further information on membership.

### **Graduate Development and Opportunities**

The Casting Industry can offer a wide variety of career opportunities for graduates and post-graduates. Metallurgists, materials scientists, chemists, physicists and engineers are some of the specialities relevant to the castings industry.

Typical occupations for graduates include:

#### **Mechanical Engineer** (quality assurance, maintenance, robotics)

Mechanical engineers are employed to undertake many different functions in casting companies from advising and assisting designers to running plant maintenance departments or running quality assurance systems. The specialist knowledge needed for each of these functions is quite different but all demand that the engineer is able to apply complex ideas and theories to practical situations. Their basic function is often that of the problems solver applying particular knowledge to such items as the selection or modification of plant or machinery, planning and implementing complex installation or maintenance procedures.

Many engineers specialise after their initial training and two of the most common choices are production engineering and designing.

#### **Production Engineer** (process design, production planning and control)

The function of production engineers is to plan the complex operations, which enable the company to manufacture its products in the most efficient way. They need to apply modern planning methods; organise different processes to fit together and if unexpected breakdowns are concerned they must be able to change plans with minimum of disruption and down time.

## **Metallurgist**

As might be expected metallurgists are involved with most aspects of the metal casting business. They have to develop a high level of knowledge about metals, their strengths and weaknesses, their resistance to corrosion or to heat and how their structures and properties can be changed. They also have to understand theoretical data, be able to apply it to practical shop-floor operations and communicate it to no technical personnel.

They may be involved in the selection of alloys to suit particular conditions specified by a customer, they could find themselves investigating problems in production processes or researching new techniques. They are often found advising the sales and marketing people and designers.

Metals are the life-blood of the industry and the metallurgist's main task is to ensure that they are of the right quality so that finished castings comply with all aspects of the customer's specification.

## **Designer** (casting design, methoding, process design)

The design process relies increasingly on the use of computers, via CAD (Computer Aided Design) and CAM (Computer Aided Manufacture) and rapid prototyping using highly advanced, automated processes. Training in casting methoding is important to designers, as is knowledge of casting processes, metals and materials and mechanical properties.

## **Research** (metals and materials, alloy development, mechanical properties, testing, production methods)

Researchers are needed in universities to undertake research in a wide variety of sciences as well as in equipment and raw material suppliers to develop the products of tomorrow. Research varies from innovative blue skies research to the application of the latest technology to shop floor production.

## **Management** (a career in management can develop from some initial experience in any of the above)

Managers in foundries and casting houses often have direct experience of many of the different specialities within the casting industry. Specific management training and even an MBA can follow this. Many foundries are now owned by overseas organisations and this can lead to international opportunities.

Also, sales, marketing, finance, administration and purchasing.

## Graduate Apprenticeships - GAs

Graduate Apprenticeships are now available and can bridge the gap between higher education and first employment. The GA has three separate components

The foundation component in applying engineering principles  
The HE component for an appropriate academic qualification  
A work based component

### Graduate Apprenticeships

**Foundation Component** — This aims to provide an introduction to engineering operations and materials and focuses on developing an early appreciation for how ideas are converted into practical solutions including material selection, developing and using technical drawings and quality control.

**Work Based Component** — This is aimed at enabling the apprentice to develop his/her professional skills within a work-based environment and complete selected technical units at NVQ level 4. The programme can be extremely flexible in order to cater for the needs of the individual trainee.

**The HE Component** — The aim of the GA scheme to facilitate entry into the effective employment so there are a variety of HE programmes which can satisfy this aspect. The successful completion of the engineering course will satisfy the requirement of the HE component of the Graduate Apprenticeship.

### **Progression and Career Development**

*Graduates can aspire to senior positions within the industry and there are many opportunities for well-qualified, highly motivated individuals.*

*Graduates with qualifications relevant to the industry are able to become full Members of the Institute of Cast Metals Engineers and ultimately Incorporated Engineers or Chartered Engineers through registration with the Engineering Council.*

**Contact:** Pam Murrell at ICME for more information on opportunities for Graduates and Graduate Apprenticeships.

## Undergraduate Courses

A full listing of under graduate and further education courses is available from the UCAS web site at [www.ucas.org.uk](http://www.ucas.org.uk).

## Post graduate Courses

A number of universities now offer postgraduate courses specifically for the castings industry.

**Birmingham University** - Post Graduate Certificate in Casting Technology

**Wolverhampton University** — Masters Degree

**In-Service Training** —This is available in a number of companies once you are working in the industry, to allow you to continue lifelong learning throughout your career. Many companies now encourage CPD (continuing professional development) which allows you to constantly train and improve your skills.

## Schools Information

The Institute of Cast Metals Engineers has a range of materials available for schools. This includes information on:

- Careers *(via web site or careers leaflet)*
- Further education: *Casting a Career (video)*  
*Courses directory (a list of further and higher education college courses)*
- Educational material: *Hot Metal DVD (a definitive educational DVD on metal casting and forming for craft design and technology students in UK secondary schools)*  
*FIDGET (CD Rom to satisfy Design and Technology part of curriculum)*
- Advice on equipment *(suitable for schools' use)*
- Advice on health and safety
- Advice on vocational GCSE s
- Annual Schools Prize Competition *(organised by ICME's West Midlands, Birmingham and Coventry Branch)*

**For more information on the industry and ICME visit our website on**

**[www.icme.org.uk](http://www.icme.org.uk)**

**Alternatively contact Dr Pamela Murrell at ICME for more information and copies of videos, DVDs and CD roms for the industry. Tel: +44 (0) 121 601 6979. Fax: +44 (0) 121 601 6981. Email: [pam@icme.org.uk](mailto:pam@icme.org.uk)**