National Careers Service
Helping you take the next step

Plain Guide to Advanced Manufacturing and Engineering

Job Market Information

Advanced manufacturing is about transforming raw materials into products. Examples produced in the Yorkshire and Humber region include precision medical instruments, new agrichemical products, satellite components, state-of-the-art metal castings, offshore wind turbines and many more. The latest technology is used to improve products and the way they are made. Most manufacturing is computerised so that goods can be produced in large numbers at competitive cost. It uses high technology techniques such as 3D printing, friction welding and CNC machining. Manufacturing employs the second largest number of people in Yorkshire and the Humber, second only to healthcare.

Largest number of manufacturing employees in the region, by specialism

Food products	46,550
Fabricated metal	31,650
Machinery and equipment	21,800
Rubber and plastics	15,300
Printing and reproduction of media	13,300
Basic metals	12,500
Chemicals, chemical products	12,250
Electrical equipment	12,000
Furniture	10,900
Wood and wood products	10,300

Business Register Employment Survey 2015

Most employment is concentrated around Bradford, Hull, Kirklees, Leeds, Rotherham and Sheffield.

Manufacturing contributes 15% of gross value added (GVA) in Yorkshire and the Humber, compared with 10% for the UK as a whole.
ONS 2012

Manufacturing has an older workforce, with large numbers due to retire in the next 10 years – so there is a big gap for young people and those wanting to change careers to move into.

The rapid growth in low carbon technologies, such as wind turbines, carbon capture, biomass and biorefinery, is predicted to create more jobs in the region. The Humber is a particular case with the Siemens 'green port' alone predicted to create 1,000 jobs.

Examples of pay range

Mechanical engineers	£27,250-58,075
Electrical engineers	£24,672-51,641
Engineering technicians	£24,672-51,641
Laboratory technicians	£14,635-26,654
Metal working production and maintenance fitters	£16,673-44,147
Food, drink and tobacco process operatives	£12,711-27,830

Annual Survey of Hours and Earnings 2013

Number of engineering, advanced manufacturing and science-based industries in the region

	Mature engineering industries	Leading-edge technology industries	Science-based industries
Yorkshire and the Humber	5,130	5,000	230
UK	51,400	76,380	4,020
Yorkshire and the Humber as % of UK	9.98%	6.55%	5.72%

Advanced engineering and materials
Forgemasters, Sheffield – state of the art castings and forgings for power, defence and nuclear industries
Newburgh Precision Engineering, Rotherham – CNC machining

Aerospace
Wesco Aircraft, Huddersfield – aircraft hardwear, electronics, bearings etc.
Marshall Aerospace, Kirkbymoorside – composite structures and components

Chemicals
BASF, Bradford – industrial chemical products
Clariant, Yeadon – chemical products
Essecco UK Ltd, Wakefield – ammonia based and other speciality products

Plastics
BNL Bearings, Knaresborough – plastic bearings and gears

Nuclear and scientific
Nuclear Advanced Manufacturing Research Centre, Rotherham
National Metals Technology Centre, Rotherham

Healthcare technologies
Brandon Medical, Leeds – medical lighting and healthcare devices
Tissuemed Ltd, Leeds – surgical films
Smith and Nephew, Hull – advanced wound management products

Food
Arla Foods, Leeds – dairy products
Cranswick plc, Hull – meats, pastries and sandwiches

Environmental Technologies
Vivergo, Hull – largest UK bioethanol plant
Siemens, Hull – 'green port' development, off-shore wind turbines
C20, Don Valley – carbon capture projects
Byworth Boilers, Keighley – industrial biomass boilers

Future trends

Leeds City Region will need 20% more science, research, engineering and technology professionals by 2022 – 82,000 in total. In contrast the region will need 9% fewer in skilled metal, electrical and electronic trades, and 28% fewer as process, plant and machine operatives. This is mainly due to the continued development of more efficient or automated processes. However, because of the need to replace many workers who are due to retire, it is forecast that there will be a total of around 1,000 vacancies in engineering, and 37,000 in other manufacturing in the region between 2012 and 2022. That amounts to around 4,700 vacancies each year. Demand will be highest for managers, professionals, technicians and skilled craftspeople.

Working Futures 2012-2022, UKCES 2014; Leeds LEP Labour Market Analysis 2014/15.

Skills and personal qualities

- **Ability in maths, science, technology, IT**
- **Problem solving skills, practical and theoretical**
- **Mechanical aptitude**
- **Decision making skills**
- **Communication skills**
- **People and teamwork**
- **Awareness of health and safety procedures**
- **Budget management**

Education and training

Apprenticeships are one of the main routes into engineering and manufacturing, especially at craft or technician level, but it is also possible to become a professional engineer through an Advanced Apprenticeship. You can search for vacancies here: **www.gov.uk/apply-apprenticeship**

Higher education is also a route to professional engineering. Entry requirements generally include A levels or equivalent in maths, physics or engineering, or equivalent science or engineering qualifications like BTEC Level 3 Diploma in Engineering.

Foundation Degrees can be an entry route if you lack the qualifications for a BSc degree or HND/HNC. Universities and colleges throughout the region offer a wide range of courses.

A new Advanced Manufacturing Training Centre opened in 2014. It is part of the University of Sheffield, and supported by Boeing. The centre provides training in high value engineering from apprenticeships to postgraduate level. **www.amrctraining.co.uk**

If you want to search for further education courses go to **www.ucasprogress.com**, or for higher education courses **www.ucas.com**

Entry to technician jobs is possible with a BTEC Engineering qualification. Some trainee positions don't specify particular qualifications.

For more information see **https://nationalcareersservice.direct.gov.uk**, see Career tools/job profiles.

Manufacturing/engineering vacancies 2014, Yorkshire and the Humber

Engineering professionals	9,447
Metal machining, fitting and instrument making	3,073
Science, engineering and production technicians	2,117
Production managers and directors	1,598
Metal forming, welding and related trades	1,544
Plant and machine operatives	1,411
Electrical and electronic trades	1,330
Assemblers and operatives	1,167
Quality and regulatory professionals	1,116
Process operatives	930

Labour Insight, Burning Glass Solutions 2015

Job vacancies – where to look

Many engineering jobs are filled by specialist recruitment agencies; you can search recruitment consultants on **www.yell.com**, or do an internet search on 'engineering jobs'. Professional jobs are also advertised in specialist journals. Social media channels such as LinkedIn are used increasingly.

www.gov.uk/jobsearch
http://jobs.theengineer.co.uk/
www.engineerjobs.co.uk
http://engineering-jobs.theiet.org
www.prospects.ac.uk
www.graduatesyorkshire.co.uk

More information...

Sector Skills Council for engineering and advanced manufacturing: **www.semta.org.uk**
Sector Skills Council for science-based industries: **www.cogent-ssc.com**
National STEM Centre - **http://www.nationalstemcentre.org.uk**
National Careers Service **https://nationalcareersservice.direct.gov.uk**
See 'job profiles' for information on different jobs in manufacturing and engineering

STEM is short for science, technology, engineering and maths. These subjects are vital for the UK's success, especially in manufacturing and engineering, and there is a national shortage of such people, especially women. STEM graduates have the potential to earn amongst the highest of salaries of all new recruits.

Skill shortages

The main skills employers in advanced manufacturing and engineering say are in short supply are technical and engineering skills at all levels. Technical skill gaps include:

- CNC machining
- materials equipment planning
- welding
- robotics
- tool setting
- electronics and electrical engineering
- general engineering skills.

Further help...

National Careers Service advisers are available in your local area to provide information, advice and guidance on learning and work. See the website or call 0800 100 900.