Composites Technician Apprenticeship (Level 3)

Job Titles: Composites Designer, Composites Tool-Maker, Composites Laminator, Composites Inspector, Composites Repairer, Composite Materials Technician.

Composites manufacture is the combining of materials to form a lighter and stronger rigid structure as an alternative to metal. These lightweight rigid structures are essential in the Aerospace, Automotive, Marine and Renewables industries and are becoming increasingly important in the Oil & Gas, Construction and Rail sectors. The composite industry therefore has an increasing requirement for skilled employees.

A Composites Technician employed within a Composites Manufacturing environment will find themselves at the heart of cutting edge technologies using state of the art equipment and will become a skilled resource that will be an enabler for manufacturing technologies, processes and practices.

A Composites Technician is engaged in a variety of processes in the production and creation of materials and components that are used in a range of applications including but not limited to: airplanes, cars, boats, turbine blades, oil & gas rigs, bridges, trains and satellites. They provide specialised knowledge and skills that support manufacturing programmes and projects and may be deployed in the areas of design, tooling, moulding, lay-up, curing, machining, inspection, testing, repair and material production. As the Technician grows in competence and expertise, other areas of composites technology such as automated manufacture development, preform technologies, processing technologies, validation and post processing, may form part of their role and responsibility**.**

Apprenticeship Entry Requirements and Duration

Each employer will stipulate their own entry requirements but it is likely that many will seek a Grade A* to C in Maths, English and a Science or Technology based subject.

The typical duration of this apprenticeship will be 3 years

Knowledge, Skills and behaviours

All technicians employed in the Composites sector will need to develop specialist knowledge, skills and behaviours. These will be generic and/or technology specific, but the subject areas indicated below will provide a foundation for development in composites manufacture.

Knowledge

A Composites Technician will require a thorough understanding of the industry in which they are employed. They will be able to understand and apply the following areas :

- Working safely, appropriately and collaboratively
- Equality & diversity.
- Maths, science and engineering disciplines.
- The characteristics of Composites and their various applications.
- Composite materials and consumables
- Types of Resins. e.g. Polyester, Epoxy, Bio-resins.
- The manufacture of materials. e.g. Semi-finished, woven reinforcements, preforms.
- Material Science, Design, Tooling, Moulding, Laminating, Curing, Testing, Inspection & Repair.
- Hand Lay-up. e.g. Open moulding, Spray Lay-up.
- Automated Lay-up. e.g. Automated Fibre Placement, Automated Tape Layup.
- The manufacture of complex parts eg. Airplane Wings, Body Armour, Turbine Blades.
- Quality, Cost and Delivery (QCD) standards and their importance in the workplace
- Manufacturing costs and the need for preventative maintenance.
- Business Improvement Techniques and waste reduction.
- Application of IT systems to support manufacture (including CAD/CAM/CMM)
- Automation techniques including programming and operating robots.
- Supporting R & D projects
- New Product Development.

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Skills

A Composites Technician will develop skills in the disciplines of design, mould tool making and preparation, part lay-up, curing, testing, inspection, repair and material science. They will be able to:

- Select appropriate techniques, procedures and methods to undertake part manufacture.
- Identify and select materials (resins, matrix and core),
- Design and prepare mould tools.
- Design and manufacture components
- Select appropriate consumables required to ensure satisfactory progress and completion of projects and/or manufacturing programmes, in conjunction with any relevant Health and Safety legislation.
- Read and understand technical drawings for part manufacture
- Laminate geometrically complex parts
- Operate machinery associated with laminating and automated manufacture
- Carry out maintenance to machines or equipment to comply with preventative maintenance plans
- Assist and advise in the planning and preparation of manufacturing programmes and research projects to ensure they meet customer requirements and schedules
- Understand and follow work instructions
- Use metrology equipment applicable to the workplace

Behaviour

The behaviour of Technicians in the Composites industry is one of the most important aspects of the standard. Composites Technicians will be expected to:

- Manage and apply safe systems of work, ethically and responsibly
- Show respect for colleagues and the work environment
- Be focused on customer satisfaction, ensuring that work is undertaken following Quality, Cost and Delivery principles to meet or exceed customers expectations
- Have a “right first time” approach
- Understand and implement continuous improvements in the workplace
- Solve problems, eliminate waste and risks
- Undertake engineering activities which contribute to sustainable development
- Be able to work in a team with effective interpersonal skills
- Be able to communicate clearly
- Commit to & apply a professional code of conduct
- Carry out CPD activities and have a desire to develop a career in composites engineering

Qualifications

As part of the apprenticeship, apprentices will be required to achieve a recognised L3 Engineering qualification, as approved by the relevant professional institution, to be deemed eligible to apply for Engineering Technician (Eng.Tech.) status with The Institute of Materials(IOM3) and/or the Institution of Mechanical Engineers (IMechE).

Link to Professional Registration

This standard will meet the professional standards required for Eng.Tech. registration.

Progression

Career development / progression opportunities into posts will include, but not be limited to: Supervisor, Team Leader or Senior Technician. Further progression via a Higher Level Apprenticeship or Foundation degree in either Composites Manufacture, Materials Engineering or Materials Science may be encouraged, leading to a full degree where employers deem this to be appropriate and desirable.

Review Date

The apprenticeship framework will be reviewed within three years.

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