

National Apprenticeship - Occupational Profile

Apprenticeship Title Polymer Processing Technologist

NFQ Level 7

Duration 3 Years

Typical tasks/ responsibilities

The Polymer Processing Technologist is responsible for the efficient set up and operation of polymer processing lines in the fields of Injection Moulding, Blow Moulding or Extrusion moulding for the production of plastic components relevant to industry standards.

They will have a strong technical aptitude of processing characteristics & parameters for a broad range of polymer materials; they will work cross-functionally with Production Team Leaders/Moulding Managers/Quality/Toolroom /Maintenance Department/ Material Suppliers & external customers to address machine, material, mould, die or tooling issues, including complex tooling assembly & breakdown.

On successful completion, the Polymer Processing Technologist will have:

Knowledge

- Polymer processing activities including Injection Moulding, Blow Moulding and Extrusion moulding
- Polymer processing equipment including materials handling equipment, tooling, robotics, metrology, printing, post processing/packaging, automation, cleanroom equipment, 3D printing/additive manufacturing and labelling equipment
- Plastics processing equipment including electrical systems, electro-mechanical, electro-pneumatic, electronic, temperature and pressure control systems, hydraulic/electrical and microprocessor based systems
- Range of thermoplastic and thermoset polymers including their fields of application and processing characteristics
- Read mould/die and part design drawings
- Read process data and understand the proper use of test instruments- e.g. go/no go gauges, Vernier callipers, tensile, impact testing
- Engineering principles – such as speeds, pressures, times in order to effectively troubleshoot the process for product optimisation
- Mould design concepts including hot-runner system, core pulling, sliding cores/cavities (polymer processing machines, injection blow moulding and extrusion)

Core Skills

- Prepare and set up polymer materials, feed systems and ancillary equipment necessary to support a polymer production process
- Material Drying systems and protocols
- Apply process settings in order to begin a production process in line with company protocols and procedures
- Follow quality policies and procedures in order to produce product within specification - e.g. Lean, Six sigma & Quality systems
- Conduct logical troubleshooting and root cause analysis using agreed methodology to identify the mode of failure (material, man, machine)
- Safety awareness re machines and ancillary equipment with due consideration to the hazards associated with the processing of some polymer materials
- IT skills - Word, Excel, Powerpoint, Project Management software
- Disassemble, clean, inspect and reassemble tooling associated with a polymer process
- Record and complete quality and process documentation
- Conduct set ups and tool changes using fast changeover techniques (e.g. (SMED - Single Minute Exchange of Die)
- Ensure compliance to internal company procedures and current Good Manufacturing Practice (cGMP)/Cleanroom)
- Principles of mould, part, die design, tubing, film & sheet
- Implement the principles of Project Management

Specialist/Technical Skills:**Injection moulding**

- Understand the set up and control of the following:
 - Servo-valve gate control of Hot Runners & contour cooling
 - Conformal Cooling systems
 - Sprue Picker/ Pick and Place Robots
 - 6 axis robot setup (excluding programming)
 - Cavity Pressure Monitoring system

Blow moulding

- Understanding of extrusion and injection blow moulding tooling design
- Parison Programming
- Blow mould design - cooling, venting, pinch off, surface finish, ejectors, pressure testing, in mould punching, in mould decoration

Skills

Cont'd

- Needle blow, bottom blow
- Part take out system
- Leak testing
- Assembly processes – welding, labelling, printing, riveting, stapling, heat staking
- Final finishing - Deflashing, cutting, trimming, labelling

Extrusion

- Understand, set up and control the following:
 - Multilayer extrusion process
 - Melt Pressure control without using a melt pump
 - Melt Pressure control using a melt pump
 - Ultrasonic on line wall measurement system

Competencies

- Communications
- Customer service
- Adaptability
- Ability to work in a team
- Ability to work independently and efficiently
- Demonstrate initiative in day to day work
- Ability to Problem solve using appropriate tools
- Diagnose processing problems and propose solutions
- Planning
- Information gathering
- Follow Quality procedures/requirements coherently
- Report writing
- Data recording
- Business awareness relating to production costs
 - Waste awareness
 - Overall equipment efficiencies
 - Understand business priorities
- Achieve tasks/objectives as directed by Management

Industry/industries served by the apprenticeship

Polymer Sector, Medical Devices Sector, Engineering Sector, Packaging sector, Contracted Moulders & Domestic Appliances.