



## Apprentice Tool Maker, Tool and Die Maintenance Job Description Toolmaker and Tool and Die Maintenance Technician, Level 3

(Job Code and Level: MFGTOO000)

### **Definition:**

To learn the different types of tools to enable the production processes to be as efficient as possible. This may include jigs, fixtures, clamps or moulds to obtain a more robust consistently produced part that meets the specification of the customer. Time served apprenticeship with qualification.

### **Overall Purpose of the Role:**

Toolmakers and Tool & Die Maintenance Technicians are predominantly involved in the highly skilled, complex and specialist detailed work of manufacturing and maintaining the engineering tooling used to produce components, products and assemblies. These products, assemblies and systems affect all of our daily lives, whether it be for travel such as (cars, planes, boats and rail) energy, defence, food, clothing, packaging and health including medical equipment, devices and implants such as joint replacements. This requires the application of a broad range of activities including the interpretation of Engineering drawings and technical instructions and the use of hand, machine and automated computer controlled machine tools and measuring equipment.

Technicians must comply with applicable legislation and organisational safety requirements and be expected to work both individually and as part of a manufacturing team, working with minimum supervision, taking responsibility for the quality and accuracy of the work they undertake. They will be proactive in finding solutions to problems and identifying ways to improve the business

They will be expected to test and adjust the systems they have built or maintained ensuring tooling, jigs, fixtures and assemblies meet the required specification. This requires the application of a broad range of skills, knowledge and occupational behaviours across a range of engineering disciplines.

### **Duration:**

Typically 48 months, this may reduce for apprentices who possess prior relevant qualifications / experience

## **Key Responsibilities:**

### **General and Task Management**

On successful completion of training you will:

- Work with 2D and 3D computer-aided design and manufacturing software such as CAD or CAM
- Follow engineering drawings to mark out the design for the tool on the stock or casting
- Use a combination of lathes, presses, grinders and cutting machines (often controlled by a computer) to cut and shape the part
- Use precision measuring instruments like micrometers, gauges and co-ordinate measuring machines (CMM) to check the tool's dimensions
- Some basic machine maintenance
- Tooling strip down and diagnosis for repair
- Tooling improvements
- Preventive maintenance of tooling
- Complete tool reports and ordering of spare parts
- Maintenance data control of moulds
- Cleaning of tool faces within the moulding machine
- Preventive maintenance of the shop's machinery
- Implement modifications to moulds
- Fabrication of fixtures and spare parts for tooling
- Maintain Spare parts system
- Maintain tooling standards and enhance
- Interface with New production tooling manager on new tooling
- Comply with the quality and environment standards procedures and instructions

### **Self Management:**

Modern high value manufacturing organisations require their apprentices to have a set of occupational behaviours that will ensure success both in their current and future roles and in meeting the overall company objectives. These required behaviours include:

- Safety mindset: This occupation sits within an industry with a high level of safety critical activities. There has to be strict compliance and a disciplined and responsible approach to manage, mitigate and avoid risk.
- Strong work ethic: Positive attitude, motivated by engineering; dependable, ethical, responsible and reliable.
- Respect for others: Acts at all times with consideration to others and actively promotes equality and diversity.

- Logical approach: Able to structure a plan and develop activities following a logical thought process, but also able to quickly “think on feet” when working through them.
- Problem solving orientation: Identifies issues quickly, enjoys solving complex problems and applies appropriate solutions. Has a strong desire to push to ensure the true root cause of any problem is found and a solution identified which prevents further recurrence.
- Quality focus: Follows rules, procedures and principles in ensuring work completed is fit for purpose and pays attention to detail / error checks throughout activities.
- Personal responsibility and resilience: Motivated to succeed accountable and persistent to complete task.
- Clear communicator: Use a variety of appropriate communication methods to give/receive information accurately, and in a timely and positive manner.
- Team player: Not only plays own part but able to work and communicate clearly and effectively within a team and interacts/ helps others when required. In doing so applies these skills in a respectful professional manner.
- Continuous improvement/lean manufacturing mindset and responsibility to identify and drive through improvements to make the business more efficient, effective and productive.
- Adaptability: Able to adjust to different conditions, technologies, situations and environments.
- Self-Motivation: A ‘self-starter’ who always wants to give their best, sets themselves challenging targets, can make their own decisions.
- Willingness to learn: wants to drive their own continuous professional development
- Commitment: Able to commit to the beliefs, goals and standards of their own employer and to the wider industry and its professional standards.

### **Skills and Attributes:**

- Reading and interpreting engineering data: reading, interpreting and producing engineering drawings (both by CAD and by hand), specifications, limits, fits, and computer generated information in order to determine what has to be produced and to what specification
- Selecting and using a range of measuring and testing equipment to check components are to the required quality and accuracy
- Understanding the structure, properties and characteristics of common materials used for the manufacture and repair of tooling, Moulds, Dies and jigs and fixtures
- Understanding and demonstrating the safe operation, correct selection and skilled usage of a range of hand tools used for toolmaking and die maintenance, including grinders, drills, stones etc.
- Understanding the safe operation and theory of the range of complex and often state of the art workshop machinery used such as ( CNC lathes,

milling, grinding and erosion machining centres, drilling and welding equipment) and how to set up and operate the machinery/equipment efficiently and effectively

- Apply and understand the methods and techniques used to assemble and disassemble tools, dies, jigs and fixtures
- The basic principles of how the relevant tools, dies, jigs and fixtures being manufactured/maintained function, the operating sequences, the purpose of individual components/systems and how they interact
- The theory and application of Pneumatics, Hydraulics, Electrical and electronic systems as applied to various moulding, injection, pressing and similar associated machinery.
- Business improvement techniques : recommending and contributing to the designing and implementation of new or revised manufacturing processes in order to be more efficient and cost effective
- Complying with statutory, quality, organisational and health and safety regulations while carrying out manufacturing techniques
- Employer tailored skills as required such as undertaking equipment/asset care and/or Preventative Planned Maintenance processes and procedures
- Testing to confirm correct operation, and of the effectiveness of repairs and maintenance activities carried out.
- Obtaining, checking and using the appropriate documentation (such as job instructions, drawings, quality control documentation and hand over documentation)

### **Qualifications and Experience Levels:**

- Individual employers will set the selection criteria for their Apprenticeships. In order to optimise success, candidates will typically possess 4 GCSE's at Grade C or equivalent, including Mathematics, English and a Science/technical GCSE. Apprentices without level 2 Maths and English need to achieve this prior to completion of their Apprenticeship.
- Advanced Apprenticeships will generally be structured over 4 years, combining training with a local College and work based learning and experience. Examples are:

#### **Year 1 - Day release at College to cover:**

- Personal learning & thinking skills
- Safety
- Interpreting engineering drawings
- Working efficiently and effectively in Engineering
- Producing components using hand fitting techniques
- Preparing and using Lathes
- Preparing and using Milling Machines
- Maintaining mechanical devices
- Mechanical Principles
- Electrical & Electronic principles
- Maths for Engineering

#### **Year 2 Day release at College to cover:**

- Applications of mechanical Systems in Engineering
- Selecting and using programmable controllers
- Electro, pneumatic and hydraulic systems and devices
- Principles and applications of electronic devices and circuits
- Engineering secondary and finishing techniques

### **Year 3 - Workplace Assessment**

- In this year, they will do 4 x 3 month placements which will include PO, Engine Die Maintenance, Maintenance, Tooling and Press

After a period of foundation skills and technical knowledge development all apprentices will be required to achieve the following qualifications (working titles – currently in development):-

- Level 2 Advanced Manufacturing Engineering (Foundation Competence)

After a further period of skill and technical knowledge development all apprentices will be required to achieve the following qualifications (working titles – currently in development):-

- Level 3 Advanced Manufacturing Engineering (Development Competence)
- Level 3 Advanced Manufacturing Engineering (Development Technical Knowledge)

All of the qualification requirements in the foundation and development phases are mandatory outcomes for the completion and final certification of the apprenticeship standard. Each qualification has a core and options approach and employers will select the most applicable pathway and unit options to meet their business requirements

### **Further information:**

<https://www.gov.uk/government/publications/apprenticeship-standard-toolmaker-tool-and-die-maintenance-technician>

### **Example roles this job description may cover:**

- Trainee Tooling Technician