METAL FABRICATOR

Reference Number: ST0607

Details of standard

Occupation summary

This occupation is found in the advanced manufacturing engineering and engineering construction sectors. The broad purpose of the occupation is to carry out metal fabrication work using things such as rolled steel joists, columns, channels, steel plate and metal sheet etc. Work includes manufacturing bridges, oil rigs, ships, petro-chemical installations, cranes, platforms, aircraft, automotive and machinery parts, sheet metal enclosures, equipment supports, and anything that can be fabricated out of metal. Fabricators can work alone or in teams, in factories or on operational sites.

Fabricators use a large range of metals including steel, aluminium and titanium at a range of thicknesses from 0.5mm up to over 20mm. The size and weight of the fabrications can range from components that can easily be picked up by hand, to massive structures that require several cranes to manipulate. In their daily work, an employee in this occupation interacts with planners, supervisors, inspectors, designers, welders, pipefitters, fitters, machinists, riggers, steel erectors, stores personnel, painters and many others involved in manufacturing, production, maintenance and repair. An employee in this occupation will be responsible for the quality and accuracy of their own work whilst ensuring it conforms to a relevant specification such as an engineering drawing or an international standard. Fabricators are also responsible for the health, safety and environmental (HS&E) protection of themselves and others around them.

Entry requirements

Individual employers will set the recruitment and selection criteria for their Apprenticeships. In order to optimise success, candidates will typically have 4 GCSEs at Grade C/4 or equivalent, including Mathematics, English and a Science

Occupation duties

<table>
<thead>
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<th>Duty</th>
<th>Criteria for measuring performance</th>
<th>KSBs</th>
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<tr>
<td>Duty 1 Work safely at all times complying with health and safety legislation, regulations, organisational and environmental requirements</td>
<td>Comply with the health and safety guidance and procedures relevant to the activity, with a disciplined and responsible approach to identifying and managing risk. Maintaining a clean and tidy, safe working environment throughout their work,</td>
<td>K1, K2, K3, K4, K5, K6, K7, K8, K9, K10, K11, K12, K13, K14, K15, K16, K17, K18, K19, K20, K21</td>
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Duty 2 Plan and prepare for the METAL fabrication activities before commencing work

Follows instructions and guidance with attention to detail. Can confidently identify the parameters for the work at hand including, quality, speed, efficiency and resources. Follows a logical approach to identifying the requisite tools and equipment, materials and consumables in preparation for carrying out the work. Can identify sources of support should problems arise.

K1, K2, K3, K4, K5, K6, K7, K8, K9, K10, K11, K12, K13, K14, K15, K16, K17, K18, K19

S1, S2, S3, S4, S5, S6, S7, S8, S9, S10, S11, S12, S13

B1, B2, B3, B4, B5

Duty 3 Check materials conform to the specified grades, dimensions and thicknesses identified on detailed engineering drawings.

Can confidently identify the parameters for the work at hand including, quality, speed, efficiency and resources. Follows a logical approach to matching specific materials and consumables to the work instructions, ensuring quality and traceability of resources to be used in carrying out the work.

K1, K2, K3, K4, K5, K6, K7, K8, K9

S1, S2, S3, S4, S5, S6, S7, S8, S9

B1, B2, B3, B4, B5

Duty 4 Use the correct methods for the moving and handling resources and materials

Comply with the health and safety guidance and procedures, be disciplined and have a responsible approach to risk, work diligently regardless of how much supervision. Demonstrate correct interpretation of the moving loads risk assessment.

K1, K2, K3, K4, K5, K6, K7, K8, K9, K10

S1, S2, S3, S4, S5, S6, S7, S8, S9, S10

B1, B2, B3, B4, B5

Duty 5 Set up, check AND adjust the equipment for use in the safe and reliable fabrication of METAL

Follows operating instructions and guidance, demonstrating an attention to detail. Follows a logical approach to identifying the parameters for the work at hand including, quality, speed, efficiency and resources. Follows a logical approach to matching specific materials and consumables to the work instructions, ensuring quality and traceability of resources to be used in carrying out the work.

K1, K2, K3, K4, K5, K6, K7, K8, K9, K10, K11.
products or components and maintaining the equipment in a reliable and safe condition throughout.

Duty 6 Interpret technical drawings, patterns, templates and specifications to mark out, produce and assemble complex fabricated products to meet the required specification and quality requirements.

Finds technical drawings, patterns, templates and specifications to mark out, produce and assemble complex fabricated products to meet the required specification and quality requirements.

Duty 7 Use appropriate tools, equipment and techniques to shape and form (HOT or COLD) metal materials, demonstrating and applying knowledge of material properties and characteristics throughout.

Comply with the health and safety guidance and procedures, demonstrating a responsible approach to risk, and working diligently with minimal supervision. Follows work instructions accurately and logically to demonstrate a systematic approach to production and identifying and resolving problems as they occur. A competent fabricator will also seek opportunities to improve quality, speed and efficiency of the production process.

Duty 8 Monitor resources and activities throughout the fabrication of products or components, identifying areas for improving the production process where possible.

Follows work instructions accurately and logically to demonstrate a systematic approach to production and identifying and resolving problems as they occur. A competent fabricator will also seek opportunities to improve quality, speed and efficiency of the production process.
Duty 9 Cutting, drilling, shaping and preparing METAL materials during fabrication activities using manual and power tools, thermal and laser cutting, as required calculating dimensions and tolerances using knowledge of mathematics and instruments/equipment

Comply with the health and safety guidance and procedures, demonstrating a responsible approach to risks as they vary according to the specific nature of the work carried out, and working diligently with minimal supervision. Follows work instructions accurately and logically to demonstrate a systematic approach to production and identifying and resolving problems as they occur. A competent fabricator will also seek opportunities to improve quality, speed and efficiency of the production process.

Duty 10 Operate appropriate tools and equipment to join metal parts using a range of mechanical fasteners and fixing techniques required by the specifications appropriate to the fabrication activity being carried out and in accordance with approved joining procedures and quality requirements

Comply with the health and safety guidance and procedures, be disciplined and have a responsible approach to risk, work diligently with minimal supervision. Follows instructions and guidance, demonstrates attention to detail; follows a logical approach to problem solving and seeks opportunities to improve quality, speed and efficiency

Duty 11 Operate thermal joining equipment to join metal parts using a range of appropriate techniques to the standards required by the specifications for the fabrication activity being carried out

Comply with the health and safety guidance and procedures, be disciplined and have a responsible approach to risk, work diligently with minimal supervision. Follows instructions and guidance, demonstrates attention to detail and achieves identified specific joining standards for the fabrication. Follows a logical approach to problem solving and seeks opportunities to improve quality, speed and efficiency
Duty 12 Inspect and test joins for security against required standard

Can confidently identify the parameters for the work at hand including, quality, speed, efficiency and resources. Follows instructions and guidance demonstrating an attention to detail; adopting a logical, systematic approach to inspecting and testing component joints, accurately recording and reporting findings and seeking opportunities to improve quality, speed and efficiency

K1, K2, K3, K4, K5, K6, K7, K8, K9, K10, K11, K12, K13, K14, K15, K16, K17

S1, S2, S3, S4, S5, S6, S7, S8, S9, S10, S11, S12, S13, S14

B1, B2, B3, B4, B5

Duty 13 Carry out quality checks on component parts and completed assemblies

Can confidently identify the parameters for the work at hand including, quality, speed, efficiency and resources. Follows instructions and guidance demonstrating an attention to detail; adopting a logical, systematic approach to inspecting the assembled sub and main products, accurately recording and reporting findings and seeking opportunities to improve quality, speed and efficiency

K1, K2, K3, K4, K5, K6, K7, K8, K9, K10, K11, K12, K13, K14, K15, K16

S1, S2, S3, S4, S5, S6, S7, S8, S9, S10, S11, S12

B1, B2, B3, B4, B5

Duty 14 Deal with problems that occur within the fabrication activity in line with responsibilities of the role

Follows instructions and guidance, demonstrates attention to detail; follows a logical approach to problem solving and seeks opportunities to improve quality, speed and efficiency. A competent fabricator will also seek opportunities to identify improvements to product quality, and the speed and efficiency of the production process

K1, K2, K3, K4, K5, K6, K7, K8, K9, K10, K11, K12, K13, K14, K15, K16, K17, K18, K19, K20, K21, K22, K23, K24

S1, S2, S3, S4, S5, S6, S7, S8, S9, S10, S11, S12, S13, S14, S15, S16, S17

B1, B2, B3, B4, B5

Duty 15 Restore the work area and equipment to a safe and reliable condition on completion of the activity

Comply with the health and safety guidance and work with minimal supervision to account for and hand back the work area, any unused materials and consumables. Follows instructions and guidance,

K1, K2, K3, K4, K5, K6, K7, K8, K9, K10, K11, K12, K13, K14, K15, K16, K17, K18, K19, K20
demonstrates attention to detail and recording and reporting production related problems. K21, K22, K23, K24
S1, S2, S3, S4, S5, S6, S7, S8, S9, S10, S11, S12, S13, S14, S15, S16, S17
B1, B2, B3, B4, B5

Duty 16 Complete documentation at the appropriate stages of the work activity

Accurately record and report the specific information and data at the appropriate stages in line with the production requirements. A competent fabricator will also seek opportunities to identify improvements to product quality, and the speed and efficiency of the production process. K1, K2, K3, K4, K5, K6, K7, K8, K9, K10, K11, K12, K13, K14, K15, K16, K17, K18, K19, K20, K21, K22, K23, K24
S1, S2, S3, S4, S5, S6, S7, S8, S9, S10, S11, S12, S13, S14, S15, S16, S17
B1, B2, B3, B4, B5

KSBs

Knowledge

K1 - The importance of complying with statutory, quality, organisational and health and safety regulations

K2 - General engineering mathematical and scientific principles, methods, techniques, graphical expressions, symbols formulae and calculations

K3 - The structure, properties and characteristics of common materials

K4 - The typical problems that may arise within their normal work activities/environment

K5 - Approved diagnostic methods and techniques used to help solve engineering problems

K6 - The importance of only using current approved processes, procedures, documentation and the potential implications if they are not adhered to

K7 - The different roles and functions in the organisation and how they interact
K8 - Why it is important to continually review fabrication and general engineering processes and procedures

K9 - The correct methods of moving and handling materials

K10 - Processes for preparing materials to be marked out

K11 - The tools and techniques available for cutting, shaping, assembling and finishing materials.

K12 - Allowances for cutting, notching, bending, rolling and forming materials

K13 - Describe Pattern development processes, tooling and equipment

K14 - Describe Cutting and forming techniques, tooling and equipment

K15 - Describe Assembly and finishing processes, tooling and equipment

K16 - Inspection techniques that can be applied to check shape and dimensional accuracy

K17 - Factors influencing selection of forming process

K18 - Principles, procedures and testing of different joining techniques (Mechanised or Manual)

K19 - Equipment associated with Manual or Mechanised joining techniques including maintaining equipment in a reliable and safe condition

K20 - Consumables used in Manual or Mechanised joining

K21 - Effects of heating and cooling metals

K22 - Consumables used in Manual or Mechanised joining

K23 - Metallurgy associated with joining

K24 - Effects of heating and cooling metals

Skills

S1 - Work safely at all times, comply with health & safety legislation, regulations and organisational requirements

S2 - Comply with environmental legislation, regulations and organisational requirements

S3 - Obtain, check and use the appropriate documentation (such as job instructions, drawings, quality control documentation)

S4 - Carry out relevant planning and preparation activities before commencing work activity

S5 - Undertake the work activity using the correct processes, procedures and equipment

S6 - Carry out the required checks (such as quality, compliance or testing) using the correct procedures, processes and/or equipment

S7 - Deal promptly and effectively with problems within the limits of their responsibility using approved diagnostic methods and techniques and report those which cannot be resolved to the appropriate personnel
S8 - Complete any required documentation using the defined recording systems at the appropriate stages of the work activity

S9 - Restore the work area on completion of the activity and where applicable return any resources and consumables to the appropriate location

S10 - Identify and follow correct Metal work instructions, specifications, drawing etc.

S11 – Mark out using appropriate tools and techniques

S12 - Cut and form Metal for the production of fabricated products

S13 - Produce and assemble Metal products to required specification and quality requirements

S14 – Identify and follow correct joining instructions, specifications, drawing etc.

S15 – Carry out the relevant preparation before starting the joining fabrication activity

S16 - Set up, check, adjust and use joining and related equipment

S17 - Weld joints in accordance with approved welding procedures and quality requirements

**Behaviors**

B1 - Personal responsibility and resilience – Comply with the health and safety guidance and procedures, be disciplined and have a responsible approach to risk, work diligently regardless of how much they are being supervised, accept responsibility for managing time and workload and stay motivated and committed when facing challenges.

B2 - Work effectively in teams – Integrate with the team, support other people, consider implications of their own actions on other people and the business whilst working effectively to get the task completed.

B3 - Effective communication and interpersonal skills – An open and honest communicator, communicates clearly using appropriate methods, listen well to others and have a positive and respectful attitude.

B4 - Focus on quality and problem solving – Follow instructions and guidance, demonstrate attention to detail, follow a logical approach to problem solving and seek opportunities to improve quality, speed and efficiency.

B5 - Continuous personal development – Reflect on skills, knowledge and behaviours and seek opportunities to develop, adapt to different situations, environments or technologies and have a positive attitude to feedback and advice.

**Qualifications**

**English and Maths qualifications**

Apprentices without level 2 English and maths will need to achieve this level prior to taking the End-Point Assessment. For those with an education, health and care plan or a legacy statement, the apprenticeship's English and maths minimum requirement is Entry Level 3. A British Sign Language (BSL) qualification is an alternative to the English qualification for those whose primary language is BSL.

**Other qualifications** (Title / Level)
Professional recognition

IMechE - Eng Tech

IET - Eng Tech

Royal Aeronautical Society – Eng Tech

Additional details

Occupational Level:

3

Duration (months):

42

Review

This standard will be reviewed after three years.