Pearson
BTEC Level 2
Diploma in Manufacturing (Knowledge and Skills)

Specification

BTEC Specialist qualification

First teaching September 2019

Edexcel, BTEC and LCCI qualifications

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All information in this specification is correct at time of publication.

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1 Introducing BTEC Specialist qualifications

What are BTEC Specialist qualifications?

BTEC Specialist qualifications are work-related qualifications available from Entry to Level 3 in a range of sectors. They give learners the knowledge, understanding and skills they need to prepare for employment in a specific occupational area. The qualifications also provide career development opportunities for those already in work.

BTEC Specialist qualifications put learning into the context of the world of work, giving learners the opportunity to apply their skills and knowledge in relevant and realistic work contexts. This applied, practical approach means that learners develop the knowledge, understanding and skills they need for career progression or for further study. The qualifications are well suited to support the delivery of Apprenticeship Standards.

The qualifications may be offered as full-time or part-time courses in schools, colleges and training centres, and through employers.

Sizes of BTEC Specialist qualifications

For all regulated qualifications, Pearson specifies a total estimated number of hours that learners will require to complete and show achievement for the qualification – this is the Total Qualification Time (TQT). The TQT value indicates the size of a qualification.

Within the TQT, Pearson identifies the number of Guided Learning Hours (GLH) that we estimate a centre delivering the qualification might provide. Guided learning means activities, such as lessons, tutorials, online instruction, supervised study and giving feedback on performance, that directly involve tutors and assessors in teaching, supervising and invigilating learners. Guided learning includes the time required for learners to complete external assessment under examination or supervised conditions.

In addition to guided learning, other required learning directed by tutors or assessors includes private study, preparation for assessment and undertaking assessment when not under supervision, such as preparatory reading, revision and independent research.

BTEC Specialist qualifications are generally available in the following sizes:

- Award – a qualification with a TQT value of 120 or less (equivalent to a range of 1–12 credits)
- Certificate – a qualification with a TQT value in the range of 121–369 (equivalent to a range of 13–36 credits)
- Diploma – a qualification with a TQT value of 370 or more (equivalent to 37 credits and above).

2 Qualification summary and key information

Qualification title	Pearson BTEC Level 2 Diploma in Manufacturing (Knowledge and Skills)
Qualification Number (QN)	603/4344/8
Regulation start date	01/04/2019
Operational start date	01/09/2019
Approved age ranges	16–18 19+ Please note that sector-specific requirements or regulations may prevent learners of a particular age from embarking on this qualification. Please see *Section 6 Access and recruitment*.
Total Qualification Time (TQT)	370 hours
Guided Learning Hours (GLH)	260
Assessment	Internal assessment
Grading information	The qualification and units are at Pass grade.

Qualification title	Pearson BTEC Level 2 Diploma in Manufacturing (Knowledge and Skills)
Entry requirements	No prior knowledge, understanding, skills or qualifications are required before learners register for this qualification. However, centres must follow the information given in our document *A guide to recruiting with integrity and enrolling learners onto qualifications* (see *Section 6 Access and recruitment*).
Funding	Qualifications eligible and funded for post-16-year-olds can be found on the funding Hub. The Education and Skills Funding Agency also publishes a funding catalogue that lists the qualifications available for 19+ funding. The Apprenticeship funding rules can be found at www.gov.uk

Centres will need to use the Qualification Number (QN) when they seek public funding for their learners. The qualification title, unit titles and QN will appear on each learner's final certificate. Centres should tell learners this when recruiting them and registering them with Pearson. There is more information about certification in our *UK Information Manual*, available on our website, qualifications.pearson.com.

3 Qualification purpose

Qualification objectives

The Pearson BTEC Level 2 Diploma in Manufacturing (Knowledge and Skills) is for learners who are working in, or who are intending to work, in a Lean Manufacturing Operative job role. The qualification is designed to support off-the-job training and development of apprentices on the Lean Manufacturing Operative apprenticeship programme.

The qualification is also for those individuals who are not on an apprenticeship programme but who wish to achieve a qualification to prepare for employment.

The qualification gives learners the opportunity to:

- develop the technical skills, knowledge and understanding that underpin competence in the stated job role
- achieve a nationally recognised Level 2 qualification
- develop confidence and readiness for the apprenticeship end-point assessment (EPA).

Apprenticeships

The Level 2 Diploma in Manufacturing (Knowledge and Skills) is a mandatory requirement within the Lean Manufacturing Operative Apprenticeship Standard. Learners must achieve this qualification before progressing to the EPA.

An Apprenticeship standard consists of the following components: on programme training requirements; gateway 'assessment' and EPA.

The on programme training is made up of 20% of time spent away from the 'normal' working area on off-the-job training, and 80% of the time spent in the working environment to develop the skills, knowledge and behaviours required for the Apprenticeship occupation as defined by the standard and assessment plan.

This mandated qualification allows learners, providers and employers to structure the 20% off-the-job training requirement.

As part of the Apprenticeship Standard, learners must also have achieved English and Maths at Level 1 (either GCSE or Functional Skills) and have sat the assessment at Level 2 before progressing to the EPA.

Progression opportunities

Learners who achieve the qualification can progress to the EPA in the Lean Manufacturing Operative Apprenticeship. Learners and who have met all the specified requirements of the Apprenticeship in Lean Manufacturing Operative can progress to achieving the full Apprenticeship certification, which confirms competency in the job role stated above.

With further training and development, learners can progress to a more senior or complex job role such as Engineering Technician.

Alternatively, learners who have achieved the qualification but not completed the full Apprenticeship requirements, could progress to a job role such as Production Worker, Process Operative or Fabrication Operative. They could also progress to a qualification in the BTEC National suite of qualifications in Engineering at Level 3 or to the Pearson BTEC Level 3 qualification in Advanced Manufacturing Engineering.

Industry support and recognition

The Pearson BTEC Level 2 Diploma in Manufacturing (Knowledge and Skills) was developed through close collaboration with the Lean Manufacturing trailblazer group professional bodies, and City & Guilds and EAL awarding organisations.

The trailblazer group included the following employers: Nissan Motor Manufacturing, Toyota Motor Manufacturing, Calsonic Kansei, Adiant, DHL, JCB, NAC Group, Caterpillar, Perkins, Jaguar Land Rover, Bacoll, BMW, Vision Labs, Cargill Meats Limited, Nifty Lift.

The sector skills council, Science, Engineering and Manufacturing Technologies Alliance (Semta), has been involved in the development (via EAL) of the qualification.

4 Qualification structure

Pearson BTEC Level 2 Diploma in Manufacturing (Knowledge and Skills)

The learner will need to meet the requirements outlined in the table below before Pearson can award the qualification.

Minimum number of units that must be achieved	8
Number of mandatory units that must be achieved	5
Number of optional units that must be achieved	3

Learners must complete all **five** mandatory units from the table below.

Unit number	Mandatory unit(s)	Level	Guided Learning Hours
1	Health and Safety Within a Manufacturing Environment	2	30
2	Communicating and Working Effectively Within a Manufacturing Environment	2	30
3	Working Relationships and Individual Rights and Responsibilities Within a Manufacturing Environment	2	30
4	Workplace Organisational Techniques	2	30
5	Work-related Problem-solving Techniques	2	40

Plus, at least two units from the table below.

Unit number	Optional units	Level	Guided Learning Hours
6	Preparing for Manufacturing Operations	2	20
7	Controlling Manufacturing Operations	2	20
8	Handing Over and Concluding Manufacturing Operations	2	40

Plus, a minimum of **one** unit from the table below.

Unit number	Optional units	Level	Guided Learning Hours
9	Producing Products by Assembly Operations	2	60
10	Transferring Materials for Manufacturing Operations	2	60
11	Receiving and Checking Incoming Materials for Manufacturing Operations	2	60
12	Producing Products by Processing	2	60
13	Finishing Products	2	60
14	Analysing the Results of Inspection and Confirming Quality of Production	2	60
15	Carrying Out Inspection and Testing Activities	2	60
16	Recording and Reporting Inspection and Test Results	2	60

5 Centre resource requirements

As part of the approval process, centres must make sure that the resource requirements below are in place before offering the qualification.

General resource requirements

- Centres must have appropriate physical resources (for example, IT, learning materials, teaching rooms) to support the delivery and assessment of the qualification.
- Staff involved in the assessment process must have relevant expertise and occupational experience.
- There must be systems in place that ensure continuing professional development (CPD) for staff delivering the qualification.
- Centres must have in place appropriate health and safety policies that relate to the use of equipment by learners.
- Centres must have in place robust internal verification systems and procedures to ensure the quality and authenticity of learners' work as well as the accuracy and consistency of assessment decisions between assessors operating at the centre. For information on the requirements for implementing assessment processes in centres, please refer to the *BTEC UK Quality Assurance Centre Handbook*, available on our website.

Centres must deliver the qualifications in accordance with current equality legislation. For further details on Pearson's commitment to the Equality Act 2010, please see *Section 6 Access and recruitment*. For full details of the Equality Act 2010, visit www.legislation.gov.uk

6 Access and recruitment

Our policy on access to our qualifications is that:

- they should be available to everyone who is capable of reaching the required standards
- they should be free from barriers that restrict access and progression
- there should be equal opportunities for all wishing to access the qualifications.

Centres must ensure that their learner recruitment process is conducted with integrity. This includes ensuring that applicants have appropriate information and advice about the qualification to ensure that it will meet their needs.

Centres should review applicants' prior qualifications and/or experience, considering whether this profile shows that they have the potential to achieve the qualification.

We refer centres to the Pearson *Equality, diversity and inclusion policy*, which can be found in the support section of our website.

Prior knowledge, skills and understanding

No prior knowledge, understanding, skills or qualifications are required for learners to register for this qualification.

Access to qualifications for learners with disabilities or specific needs

Equality and fairness are central to our work. Pearson's *Equality, diversity and inclusion policy* document requires all learners to have equal opportunity to access our qualifications and assessments and ensures that our qualifications are awarded in a way that is fair to every learner.

We are committed to making sure that:

- learners with a protected characteristic (as defined by the Equality Act 2010) are not, when they are undertaking one of our qualifications, disadvantaged in comparison to learners who do not share that characteristic
- all learners achieve the recognition they deserve from undertaking a qualification and that this achievement can be compared fairly to the achievement of their peers.

For learners with disabilities and specific needs, the assessment of their potential to achieve the qualification must identify, where appropriate, the support that will be made available to them during delivery and assessment of the qualification. Please see *Section 8 Assessment* for information on reasonable adjustments and special consideration.

7 Programme delivery

Centres are free to offer this qualification using any mode of delivery that meets learners' and employers' needs. It is recommended that centres make use of a wide range of training delivery methods, including direct instruction in classrooms, simulated demonstrations, research or applied projects, e-learning, directed self-study, field visits and role play. Whichever mode of delivery is used, centres must make sure that learners have access to the resources identified in the specification and to the subject specialists delivering the units.

Centres must adhere to the Pearson policies that apply to the different models of delivery. Our document *Collaborative and consortium arrangements for the delivery of vocational qualifications policy* is available on our website.

Those planning the programme should aim to enhance the vocational nature of the qualification by:

- spending time with employers to better understand their organisational requirements and the methods of training that are most suitable, taking into consideration their available resources and working patterns
- collaborating with employers to ensure that learners have opportunities in the workplace to implement the knowledge and skills developed through the training programme
- developing up-to-date and relevant teaching materials that make use of scenarios relevant to the sector and relevant occupations
- giving learners the opportunity to apply their learning in realistic practical activities
- having regular meetings with employers to discuss learner progress, providing feedback and agreeing how any issues will be resolved
- developing projects or assessments with input from employers
- using 'expert witness' reports from employers to support assessment
- making full use of the variety of experience of work and life that learners bring to the programme.

Where legislation is taught, centres must ensure that it is current and up to date.

For further information on the delivery and assessment of the new Apprenticeships, please refer to our document *Apprenticeship funding rules and guidance for employers*.

8 Assessment

The table below gives a summary of the assessment methods used in the qualification.

Units	Assessment method
All units	Internal assessment (centre-devised assessments)

In administering internal assessments, centres need to be aware of the specific procedures and policies that apply to, for example, registration, entries and results. More information is given in our *UK Information Manual*, available on our website.

Language of assessment

Assessments for all units are in English only.

A learner taking the qualification may be assessed in British or Irish Sign Language where it is permitted for the purpose of reasonable adjustment.

Further information on the use of language in qualifications is available in our *Use of languages in qualifications policy* document, available on our website.

For further information on access arrangements, please refer to *Reasonable adjustments to assessments* later in this section.

Internal assessment – knowledge units

All knowledge units in these qualifications are internally assessed and subject to external standards verification. This means that centres set and mark the final summative assessment for each unit using the examples and support that Pearson provides. Centres need to be, if they are not already, approved to offer the qualifications before conducting assessments. *Section 10 Centre recognition and approval* gives information on approval for offering these qualifications.

Assessment through assignments

For internally assessed units, the format of assessment is an assignment taken after the content of the unit, or part of the unit if several assignments are used, has been delivered. An assignment may take a variety of forms, including practical and written. An assignment is a distinct activity, completed independently by learners, that is separate from teaching, practice, exploration and other activities that learners complete with direction from tutors and assessors.

An assignment is issued to learners as an assignment brief with a defined start date, a completion date and clear requirements for the evidence that they need to provide.

Assignments can be divided into tasks and may require several forms of evidence. A valid assignment will enable a clear and formal assessment outcome based on the assessment criteria.

Designing effective assignments

To ensure that final assessment decisions meet the required standard, assignments must be fit for purpose as a tool for measuring learning against the defined content and assessment criteria. Centres should make sure that assignments enable learners to produce valid, sufficient, authentic and appropriate evidence that relates directly to the specified criteria within the context of the learning outcomes and unit content.

An assignment that is fit for purpose and suitably controlled is one in which:

- the tasks that the learner is asked to complete provide evidence for a learning outcome that can be assessed using the assessment criteria
- the time allowed for the assignment is clearly defined and consistent with what is being assessed
- the centre has the required resources for all learners to complete the assignment fully and fairly
- the evidence generated will be authentic and individual to the learner
- the evidence can be documented to show that the assessment and verification have been carried out correctly.

Information on recommended assignments is given in the *Essential information for tutors and assessors* section of each unit. In designing assignments, centres need to work within the structure of the recommended assignments. They need to consider the following points when developing their assignment briefs.

- Centres may choose to combine all or parts of different units into single assignments provided that all units and all the associated learning outcomes are fully addressed in the programme overall. If this approach is taken, centres need to make sure that learners are fully prepared so that they can provide all the required evidence for assessment, and that centres are able to track achievement in the records.
- A learning outcome must always be assessed as a whole – it should not be split into two or more assignments.
- The assignment must be targeted to the learning outcomes but the learning outcomes and their associated criteria are not tasks in themselves. Criteria are expressed in terms of the outcome shown in the evidence.
- Centres do not have to follow the order of the learning outcomes of a unit in developing assignments, but later learning outcomes often require learners to apply the content of earlier learning outcomes, and they may require learners to draw their learning together.
- As assignments provide the final assessment, they will draw on the specified range of teaching content for the learning outcomes. The specified content is compulsory for teaching and learning. The evidence for assessment need not cover every aspect of the teaching content as learners will normally be given particular examples, case studies or contexts in their assignments. For example, if a learner is carrying out research on their employer organisation, then they will address all the relevant range of content that applies in that instance.

Providing an assignment brief

A good assignment brief is one that, through providing challenging and realistic tasks, motivates learners to give appropriate evidence of what they have learned. An assignment brief should include:

- a vocational scenario, context or application for the tasks to be completed
- clear instructions to the learner about what they are required to do – normally set out through a series of tasks
- an audience or purpose for which the evidence is being provided.

Forms of evidence

Centres may use a variety of forms of evidence as long as the evidence is suited to the type of learning outcome being assessed. For some units, practical demonstration of skills is necessary, while for others, learners will need to demonstrate their knowledge and understanding. The units give information on suitable forms of evidence.

Centres may choose to use suitable forms for evidence that are different from those proposed. Overall, learners should be assessed using varied forms of evidence.

Some of the forms of evidence include:

- written tasks or reports
- projects
- time-constrained simulated activities with observation records and supporting evidence
- observation and recordings of practical tasks or performance in the workplace
- sketchbooks, work logbooks, reflective journals, workbooks
- presentations with assessor questioning
- witness testimony.

The form(s) of evidence selected must:

- allow the learner to provide all the evidence required for the learning outcomes and the associated assessment criteria
- allow the learner to produce evidence that is their own independent work
- allow a verifier to independently reassess the learner to check the assessor's decisions.

For example, when using performance evidence, centres need to think about how supporting evidence can be captured through preparation notes, reflective accounts, logbook records, recordings, photographs or task sheets.

Centres need to take particular care that learners are enabled to produce independent work. For example, if learners are asked to use real examples, then best practice would be to encourage them to use examples of their own experiences.

For information on the requirements for implementing assessment processes in centres, please refer to the *BTEC UK Quality Assurance Centre Handbook* on our website.

Making valid assessment decisions

Authenticity of learner work

An assessor must assess only work that is authentic, i.e. learners' own independent work. Learners must authenticate the evidence that they provide for assessment by signing a declaration stating that it is their own work.

Assessors must ensure that evidence is authentic to a learner through setting valid assignments and supervising learners during the assessment period. Assessors must take care not to give direct input, instructions or specific feedback that may compromise authenticity.

Assessors must complete a declaration that:

- the evidence submitted for this assignment is the learner's own
- the learner has clearly referenced any sources used in the work
- they understand that false declaration is a form of malpractice.

Centres may use Pearson templates or their own templates to document authentication.

During assessment, an assessor may suspect that some or all of the evidence from a learner is not authentic. The assessor must then take appropriate action using the centre's policies for malpractice. More information is given later in this section.

Making assessment decisions using unit-based criteria

Assessment decisions for the qualification are based on the specific criteria given in each unit.

Assessors make judgements using the assessment criteria and must show how they have reached their decisions in the assessment records. The assessor needs to make a judgement against each criterion that evidence is present and sufficiently comprehensive.

For example, the inclusion of a concluding section may be insufficient to satisfy a criterion requiring 'evaluation'.

Assessors should use the following information and support in reaching assessment decisions:

- the *Essential information for tutors and assessors* section of each unit, which gives further information on the requirements to meet the assessment criteria
- the centre's Lead Internal Verifier and assessment team's collective experience supported by the information provided by Pearson.

When a learner has completed the assessment for a unit, the assessor will give an assessment outcome for the unit. To achieve a Pass, a learner must have satisfied all the assessment criteria for the learning outcomes, showing appropriate coverage of the unit content and therefore attainment at the stated level of the qualification. The award of a Pass is a defined level of performance and cannot be given solely on the basis of a learner completing assignments. Learners who do not satisfy the assessment criteria for the units should be reported as Unclassified.

Dealing with late completion of assignments

Learners must have a clear understanding of the centre's policy on completing assignments by the stated deadlines. Learners may be given authorised extensions for legitimate reasons, such as illness at the time of submission, in line with centre policies.

For assessment to be fair, it is important that learners are all assessed in the same way and that some learners are not advantaged by having additional time or the opportunity to learn from others.

If a late completion is accepted, then the assignment should be assessed normally using the relevant assessment criteria.

Issuing assessment decisions and feedback

Once the assessor has completed the assessment process for an assignment, the outcome is a formal assessment decision. This is recorded formally and reported to learners.

The information given to the learner:

- must show the formal decision and how it has been reached, indicating how or where criteria have been met
- may show why attainment against criteria has not been demonstrated
- must not offer feedback on how to improve evidence
- must be validated by an internal verifier before it is given to the learner.

Resubmissions and retakes

Learners who do not successfully pass an assignment are allowed to resubmit evidence for the assignment or to retake another assignment. As a matter of best practice, it is recommended that centres apply the BTEC Firsts and Nationals retake and resubmission rules; however, as these rules are not mandatory for BTEC Specialist programmes at Entry Level to Level 3, they do not need to be applied.

Internal assessment – skills units

All skills units in the Diploma qualification are assessed through an internally and externally quality-assured portfolio made up of evidence gathered during the course of the learner's work. Each skill unit has specified learning outcomes and assessment criteria. To pass each skills unit the learner must:

- achieve all the specified learning outcomes
- satisfy all the assessment criteria by providing sufficient and valid evidence for each criterion
- prove that the evidence is their own.

The learner must have an assessment record that identifies the assessment criteria that have been met. The assessment record should be cross-referenced to the evidence provided. The assessment record should include details of the type of evidence and the date of assessment. Suitable centre documentation should be used to form an assessment record.

Forms of evidence

To achieve a skills unit, the learner must gather evidence showing that they have met the required standard specified in the assessment criteria and Pearson's quality assurance arrangements (see *Section 10, Quality assurance of centres*)

The evidence for the skills units can take a variety of forms as indicated below:

- direct observation of the learner's performance by their assessor (O)
- outcomes from oral or written questioning (Q&A)
- products of the learner's work (P)
- authentic statements/witness testimony (WT)
- simulation (S) where a real-work context doesn't provide the opportunity for assessment

Learners can use the abbreviations in their portfolios for cross-referencing purposes. Learners must provide evidence of their achievement of the knowledge-based learning outcomes and the associated assessment criteria in skills units – achievement of these cannot be inferred from performance.

Centres must ensure that the assessment methods used are appropriate for the specific learning outcomes and assessment criteria. Guidance may need to be given to learners before the assessment is conducted to clarify the requirements of different command verbs. This will ensure that evidence provided has sufficient breadth and depth to meet the assessment requirements.

Learners can use one piece of evidence to prove their knowledge, skills and understanding across different assessment criteria and/or across different units. It is not necessary for learners to have each assessment criterion assessed separately.

They should be encouraged to reference evidence to the relevant assessment criteria. However, the evidence provided for each unit must reference clearly the unit that is being assessed. Evidence must be available to the assessor, the internal verifier and the Pearson standards verifier.

Any specific evidence requirements for a unit are given in the unit's *Assessment* section. Further guidance on the requirements for centre quality assurance and internal verification processes is available on our website at qualifications.pearson.com

Realistic Working Environment/Simulated Working Environment.

The assessment of the learners' competence in a sheltered but realistic environment is acceptable for the skills units (units 4-16) within this qualification, where the environment replicates the conditions expected in industry.

In order to assess these units appropriately, the machinery, tools, materials, equipment and resources used must be representative of industry standards and there must be sufficient equipment/resources available for each learner to demonstrate their competence on an individual basis.

Workpieces or work outcomes assessed must be the learners' own work and should be actual work examples that combine the skills and techniques required by each unit, so that achievement will properly reflect their capabilities. Tutors and Assessors must therefore ensure that the assessment activity is one that is representative of what would be required in the workplace.

Other aspects that should be considered when creating assessment activities that are carried out in a realistic or simulated working environment could include:

- environmental conditions such as lighting conditions, noise levels and the presence of hazards
- pressure of work such as time constraints and repetitive activities
- the production of actual workpieces or work outcomes including the consequence of making mistakes and the effect this has on customer, supplier and departmental relationships.

This assessment method will allow a minimum safe level of skills, knowledge and understanding to be achieved and demonstrated by the learner prior to being exposed to the hazards of the industrial environment, thus minimising the risk of injury to themselves and other employees.

Administrative arrangements for internal assessment

Records

Centres are required to retain records of assessment for each learner. Records should include assessments taken, decisions reached and any adjustments or appeals. Further information can be found in our *UK Information Manual.* We may ask to audit centre records, so they must be retained as specified.

Reasonable adjustments to assessments

Centres are able to make adjustments to assessments to take account of the needs of individual learners, in line with the guidance given in the Pearson document *Supplementary guidance for reasonable adjustment and special consideration in vocational internally assessed units*. In most instances, adjustments can be achieved by following the guidance, for example allowing the use of assistive technology or adjusting the format of the evidence.

We can advise you if you are uncertain as to whether an adjustment is fair and reasonable. Any reasonable adjustment must reflect the normal learning or working practice of a learner in a centre or a learner working in the occupational area.

Further information on access arrangements can be found in the Joint Council for Qualifications (JCQ) document *Access arrangements and reasonable adjustments*.

Both documents can be found on the policy page of our website.

Special consideration

Centres must operate special consideration in line with the guidance given in the Pearson document *Supplementary guidance for reasonable adjustment and special consideration in vocational internally assessed units*. Special consideration may not be applicable in instances where:

- assessment requires the demonstration of practical competence
- criteria have to be met fully
- units/qualifications confer licence to practise.

Centres cannot apply their own special consideration; applications for special consideration must be made to Pearson and can be made on a case-by-case basis only.

A separate application must be made for each learner. Certification claims must not be made until the outcome of the application has been received.

Further information on special consideration can be found in the JCQ document: *A guide to the special consideration process*.

Both of the documents mentioned above can be found on our website.

Appeals against assessment

Centres must have a policy for dealing with appeals from learners. Appeals may relate to assessment decisions being incorrect or assessment not being conducted fairly. The first step in such a policy is a consideration of the evidence by a Lead Internal Verifier or other member of the programme team. The assessment plan should allow time for potential appeals after learners have been given assessment decisions.

Centres must document all learner appeals and their resolutions. Further information on the appeals process can be found in the document *Enquiries and appeals about Pearson vocational qualifications and end point assessment policy*, available on our website.

Granting reasonable adjustments

For external assessment, a reasonable adjustment is one that Pearson agrees to make for an individual learner. A reasonable adjustment is defined for the individual learner and informed by the list of available access arrangements.

Whether an adjustment will be considered reasonable will depend on a number of factors, including:

- the needs of the learner with the disability
- the effectiveness of the adjustment
- the cost of the adjustment
- the likely impact of the adjustment on the learner with the disability and on other learners.

Adjustment may be judged unreasonable and not approved if it involves unreasonable costs or time frames or affects the integrity of the assessment.

Special consideration requests

Special consideration is an adjustment made to a learner's mark or grade after an external assessment to reflect temporary injury, illness or other indisposition at the time of the assessment.

An adjustment is made only if the impact on the learner is such that it is reasonably likely to have had a material effect on that learner being able to demonstrate attainment in the assessment.

Centres are required to notify us promptly of any learners whom they believe have been adversely affected and request that we give special consideration. Further information can be found in the special requirements section on our website.

Dealing with malpractice in assessment

Malpractice means acts that undermine the integrity and validity of assessment and the certification of qualifications, and/or acts that may damage the authority of those responsible for delivering the assessment and certification.

Pearson does not tolerate actual or attempted malpractice by learners, centre staff or centres in connection with Pearson qualifications. Pearson may impose penalties and/or sanctions on learners, centre staff or centres where malpractice or attempted malpractice has been proven.

Malpractice may occur or may be suspected in relation to any unit or type of assessment within a qualification. For further details on malpractice and advice on preventing malpractice by learners, please see Pearson's *Centre Guidance: Dealing with Malpractice*, available on our website.

The procedures we ask you to adopt vary between units that are internally assessed and those that are externally assessed.

Internal assessment

Centres are required to take steps to prevent malpractice and to investigate instances of suspected malpractice. Learners must be given information that explains what malpractice is for internal assessment and how suspected incidents will be dealt with by the centre. Our document *Centre Guidance: Dealing with malpractice and maladministration in vocational qualifications* gives full information on the actions we expect you to take.

Pearson may conduct investigations if we believe a centre is failing to conduct internal assessment according to our policies. The above document gives further information and examples and details the penalties and sanctions that may be imposed.

In the interests of learners and centre staff, centres need to respond effectively and openly to all requests relating to an investigation into an incident of suspected malpractice.

Learner malpractice

The head of centre is required to report incidents of suspected learner malpractice that occur during Pearson examinations. We ask centres to complete JCQ Form M1 (www.jcq.org.uk/malpractice) and email it with any accompanying documents (signed statements from the learner, invigilator, copies of evidence, etc.) to the Investigations Processing Team at candidatemalpractice@pearson.com.

The responsibility for determining appropriate sanctions or penalties to be imposed on learners lies with Pearson.

Learners must be informed at the earliest opportunity of the specific allegation and the centre's malpractice policy, including the right of appeal. Learners found guilty of malpractice may be disqualified from the qualification for which they have been entered with Pearson.

Teacher/centre malpractice

The head of centre is required to inform Pearson's Investigations Team of any incident of suspected malpractice by centre staff, before any investigation is undertaken. The head of centre is requested to submit a JCQ M2(a) form (downloadable from www.jcq.org.uk/exams-office/malpractice) with supporting documentation to pqsmalpractice@pearson.com. Where Pearson receives allegations of malpractice from other sources (for example, Pearson staff, anonymous informants), the Investigations Team will conduct the investigation directly or may ask the head of centre to assist.

Incidents of maladministration (errors in the delivery of Pearson qualifications that may affect the assessment of learners) should also be reported to the Investigations Team using the same method.

Heads of centres/principals/chief executive officers or their nominees are required to inform learners and centre staff suspected of malpractice of their responsibilities and rights – please see Section 6.15 of the JCQ document *Suspected malpractice in examinations and assessments policies and procedures.*

Pearson reserves the right in cases of suspected malpractice to withhold the issuing of results/certificates while an investigation is in progress. Depending on the outcome of the investigation, results and/or certificates may not be released or they may be withheld.

We reserve the right to withhold certification when undertaking investigations, audits and quality assurance processes. Centres will be notified within a reasonable period of time if this occurs.

Sanctions and appeals

Where malpractice is proven, we may impose sanctions or penalties.

Where there is evidence of learner malpractice, penalties may be imposed, such as:

- mark reduction for affected external assessments
- disqualification from the qualification
- debarment from registration for Pearson qualifications for a period of time.

If we are concerned about a centre's quality procedures, we may impose sanctions, such as:

- working with the centre to create an improvement action plan
- requiring staff members to receive further training
- placing temporary blocks on the centre's certificates
- placing temporary blocks on registration of learners
- debarring staff members or the centre from delivering Pearson qualifications
- suspending or withdrawing centre approval status.

The centre will be notified if any of these apply.

Pearson has established procedures for centres that are considering appeals against penalties and sanctions arising from malpractice. Appeals against a decision made by Pearson will normally be accepted only from the head of centre (on behalf of learners and/or members or staff) and from individual members (in respect of a decision taken against them personally). Further information on appeals can be found in our document Enquiries and appeals about Pearson vocational qualifications policy, available on our website. In the initial stage of any aspect of malpractice, please notify the Investigations Team (via pqsmalpractice@pearson.com), who will inform you of the next steps.

9 Recognising prior learning and achievement

Recognition of Prior Learning

Recognition of Prior Learning (RPL) is a method of assessment that considers whether a learner can demonstrate that they meet the assessment requirements for a unit through knowledge, understanding or skills they already possess and so do not need to develop those requirements through a course of learning.

Pearson encourages centres to recognise learners' previous achievements and experiences in and outside the workplace, as well as in the classroom. RPL provides a route for the recognition of achievements resulting from continuous learning.

RPL enables recognition of achievement from a range of activities using any valid assessment methodology. If the assessment requirements of a given unit or qualification have been met, the use of RPL is acceptable for accrediting a unit, units or a whole qualification. Evidence of learning must be sufficient, reliable and valid.

Further guidance is available in our policy document *Recognition of prior learning policy and process*, available on our website.

10 Centre recognition and approval

Centres that have not previously offered BTEC Specialist qualifications need to apply for, and be granted, centre recognition as part of the process for approval to offer individual qualifications.

Existing centres will be given 'automatic approval' for a new qualification if they are already approved for a qualification that is being replaced by a new qualification and the conditions for automatic approval are met.

Centres offering mandatory qualifications for the Apprenticeship Standards must be listed on the Education and Skills Funding Agency's Register of Training Organisations and have a contract to deliver these.

Guidance on seeking approval to deliver BTEC qualifications is given on our website.

Approvals agreement

All centres are required to enter into an approval agreement with Pearson, in which the head of centre or principal agrees to meet all the requirements of the qualification specification and to comply with the policies, procedures, codes of practice and regulations of Pearson and relevant regulatory bodies. If centres do not comply with the agreement, this could result in the suspension of certification or withdrawal of centre or qualification approval.

11 Quality assurance of centres

Quality assurance is at the heart of vocational qualifications and apprenticeships.

The centre assesses BTEC Specialist qualifications and will use quality assurance to make sure that their managers, internal verifiers and assessors are standardised and supported. This also ensures learners are given appropriate opportunities that lead to valid and accurate assessment outcomes.

Pearson uses external quality assurance processes to verify that assessment, internal quality assurance and evidence of achievement meet nationally defined standards.

Our processes enable us to recognise good practice, effectively manage risk and support centres to safeguard certification and quality standards.

Our Standards Verifiers provide advice and guidance to enable centres to hold accurate assessment records and assess learners appropriately, consistently and fairly.

For the qualification in this specification, the Pearson quality assurance model will consist of the following processes:

Centres will receive at least one visit from our Standards Verifier, followed by ongoing support and development. This may result in more visits or remote support, as required to complete standards verification. The exact frequency and duration of Standards Verifier visits/remote sampling will reflect the level of risk associated with a programme, taking account of the:

- number of assessment sites
- number and throughput of learners
- number and turnover of assessors
- number and turnover of internal verifiers
- amount of previous experience of delivery.

If a centre is offering a BTEC Specialist qualification alongside other qualifications related to the same Apprenticeship Standard, wherever possible, we will allocate the same Standards Verifier for both qualifications.

For further details please see the following handbooks available on our website:

- Pearson Centre Guide to Quality Assurance for NVQ/SVQ and Competence based qualifications
- Pearson Delivery Guidance and Quality Assurance Requirements for NVQ/SVQ and Competence based qualifications

Following registration, centres will be given further quality assurance and sampling guidance.

12 Units

Each unit in the specification is set out in a similar way. This section explains how the units are structured. It is important that all tutors, assessors, internal verifiers and other staff responsible for the programme review this section.

Units have the following sections.

Unit number

The number is in a sequence in the specification. Where a specification has more than one qualification, numbers may not be sequential for an individual qualification.

Unit title

This is the formal title of the unit that will appear on the learner's certificate.

Level

All units and qualifications have a level assigned to them. The level assigned is informed by the level descriptors defined by Ofqual, the qualifications regulator.

Unit type

This says whether the unit is mandatory or optional for the qualification. See *Section 4 Qualification structure* for full details.

Guided Learning Hours (GLH)

This indicates the number of hours of activities that directly or immediately involve tutors and assessors in teaching, supervising and invigilating learners, for example lectures, tutorials, online instruction and supervised study. Units may vary in size.

Pearson has consulted with users of the qualification and has assigned a number of hours to this activity for each unit.

Unit introduction

This is designed with learners in mind. It indicates why the unit is important, what will be learned and how the learning might be applied in the workplace.

Learning outcomes

The learning outcomes of a unit set out what a learner knows, understands or is able to do as the result of a process of learning.

Assessment criteria

The assessment criteria specify the standard the learner is required to meet to achieve a learning outcome.

Unit content

This section sets out the required teaching content of the unit and specifies the knowledge and understanding required for achievement of the unit. It enables centres to design and deliver a programme of learning that will enable learners to achieve each learning outcome and to meet the standard determined by the assessment criteria.

Where it is designed to support apprenticeships, the unit content is informed by the knowledge and understanding requirements of the relevant Apprenticeship Standard.

Relationship between unit content and assessment criteria

Content is compulsory except when shown as 'e.g.'. Although it is not a requirement that all of the content is assessed, learners should be given the opportunity to cover it all.

Learners should be asked to complete summative assessment only after the teaching content for the unit or learning outcomes has been covered.

Legislation

Legislation cited in the units is current at the time of publication. The most recent legislation should be taught and assessed internally.

Essential information for tutors and assessors

This section gives information to support the delivery and implementation of assessment. It contains the following subsections:

- *Essential resources* – this lists any specialist resources needed to deliver the unit. The centre will be asked to make sure that these resources are in place when it seeks approval from Pearson to offer the qualification.
- *Assessment* – for internally assessed units, this provides recommended assignments and suitable sources of evidence for each learning outcome. It also gives information about the standard and quality of evidence expected for learners to achieve the learning outcome and pass each assignment. It is important that the information is used carefully, alongside the assessment criteria.

Unit 1: Health and Safety Within a Manufacturing Environment

Level:	**2**
Unit type:	**Mandatory**
Assessment type:	**Internal**
Guided Learning Hours:	**30**

Unit introduction

Health and safety at work plays a vital part in manufacturing – it helps to keep the workforce safe and healthy. This has a positive effect on the wellbeing of the entire workforce.

In this unit, you will examine the working practices of a manufacturing organisation to ensure that you appreciate potential hazards. You will understand statutory regulations and organisational safety requirements, which will help you to work safely, efficiently and effectively in a manufacturing environment. You will investigate the importance of health and safety legislation and the responsibilities of individuals in manufacturing organisations. You will know the fire, accident and emergency procedures in a manufacturing activity, and the potential hazards and risks while working with materials and substances that may cause harm.

Learning outcomes and assessment criteria

To pass this unit, the learner needs to demonstrate that they can meet all the learning outcomes for the unit. The assessment criteria determine the standard required to achieve the unit.

Learning outcomes		Assessment criteria	
1	Know the requirements and responsibilities for health and safety in a manufacturing environment under current health and safety legislation and regulations	1.1	Describe the main requirements for health and safety in a manufacturing environment under current legislation and regulations
		1.2	Describe the responsibilities of employers and employees in a manufacturing environment under current health and safety legislation and regulations
2	Know the fire, accident and emergency procedures in a manufacturing environment	2.1	Describe the fire evacuation procedures used in a manufacturing environment
		2.2	Describe the different types of fire extinguishers used within a manufacturing environment
		2.3	Describe accident procedures for a manufacturing environment
		2.4	Describe emergency procedures for a manufacturing environment
3	Understand the relationship between hazards and risks in a manufacturing environment	3.1	Describe the different types of potential hazards in a manufacturing environment
		3.2	State the meaning of hazard warning signs and symbols used within a manufacturing environment
		3.3	Describe safety risks in a manufacturing environment

Learning outcomes		Assessment criteria	
4	Understand safe working practices and procedures in a manufacturing environment	4.1	Explain the use of different types of personal protective equipment used in a manufacturing environment
		4.2	Describe safe working practices and procedures in a manufacturing environment
		4.3	State why it is important to follow safe working practices and procedures in a manufacturing environment

Unit content

What needs to be learned
Learning outcome 1: Know the requirements and responsibilities for health and safety in a manufacturing environment under current health and safety legislation and regulations

All legislation cited in the content is current at the time of publication. The most recent legislation should be taught.
 	
1A Health and safety legislation and regulations
 	
• The main requirements of health and safety legislation in a manufacturing environment, including:
  ○ Health and Safety at Work etc. Act 1974
  ○ Personal and Protective Equipment at Work Regulations 1992
  ○ Manual Handling Operations Regulations 1992
  ○ other current and relevant legislation and regulations applicable to the manufacturing environment.
 	
1B Responsibilities of employers and employees under current health and safety legislation and regulations
 	
• Employers (to protect health, safety and welfare of their employees and other people by assessing risk, minimising risk of identified hazards, providing safe systems of work, personal protective equipment, adequate welfare facilities, suitable supervision, training, avoiding the need for activities that pose risk of injury).
 	
• Employees (to ensure own activities do not put others at risk, to follow safe systems of work and control measures provided by the employer, to attend training).

What needs to be learned

Learning outcome 2: Know the fire, accident and emergency procedures in a manufacturing environment

2A Fire evacuation and firefighting procedures

- Actions in the event of a fire.
- Procedures for what to do in the event of a fire, e.g. nominated people, fire action plan, training, evacuation procedures – fire exits, escape routes, muster points/assembly locations.
- Common causes of fire, e.g. spillage, discarded product, flammable and combustible materials, faulty electrical items.
- Classes of fire – A, B, C, D, E and F.
- Fire extinguishers and their uses under current legislation, according to the main type of fuel involved in the fire:
  - red – water – class A
  - cream – foam – classes A, B
  - blue – powder – classes A, B, C, D, E
  - black – CO_2 – classes B, E
  - yellow – wet chemical – classes A, F.
- Use by appropriately trained people (fire warden/fire marshal, firefighter).

2B Accident procedures

- Types of accident, e.g. injury, trips, slips or falls.
- Reporting routines of appropriately qualified people, e.g. first aider, fire warden, use of accident books.
- Roles of appropriately qualified people (e.g. first aider), including maintaining first-aid equipment, contacting emergency services, keeping a first-aid book and reporting to the Health and Safety Executive (HSE)).

2C Emergency procedures

- Serious injuries and incidents, e.g. electrocution, poisoning, explosion, flood, chemical spills.
- Procedures – sound emergency alarm, follow evacuation procedures, emergency exits, escape routes, report presence at muster/assembly point.

What needs to be learned

Learning outcome 3: Understand the types of hazards and risks in a manufacturing environment and how they are identified

3A Potential hazards in a manufacturing environment

- Moving parts of machinery, slippery and uneven surfaces, poorly placed equipment, dust and fumes, unshielded processes, working in confined spaces, lifting and moving loads, forklift trucks.
- Main groups of hazardous substances (explosive, flammable, oxidising, corrosive, acute toxicity, health hazard).

3B Hazard warning signs and symbols

- Warning signs applicable to manufacturing (classification, labelling and packaging (CLP) hazard pictograms for hazardous substances, safety signs, electrical, chemical).
- Location of signs, e.g. labels on hazardous substance containers, gas cylinders.

3C Risks in a manufacturing environment

- How hazards become risks in the manufacturing environment, e.g. slippery and uneven surfaces lead to risk of slips, trips and falls.
- Risk assessment: HSE risk assessment (including identifying hazards, deciding who might be at harm and how), evaluation of risks and control measures, record findings and implement, review and update.

What needs to be learned

Learning outcome 4: Understand safe working practices and procedures in a manufacturing environment

4A Personal protective equipment

- Personal protective equipment (PPE), including PPE to protect:
  - lungs, e.g. dust mask to avoid breathing in dust, hazardous materials
  - head, e.g. hard hat to prevent injury from falling objects
  - feet, e.g. safety boots to prevent slipping, injury from dropping heavy weights, treading on sharp objects
  - eyes, e.g. goggles to prevent hazardous materials entering eyes
  - ears, e.g. ear plugs, ear muffs to prevent hearing loss from machinery noise
  - skin and body, e.g. gloves, boiler suit to prevent hazardous materials being in contact with skin.

4B Safe working practices

- Maintaining a tidy workplace.
- Keeping exits and gangways free from obstruction.
- Using equipment safely and only for the purpose intended.
- Control measures, including instructions, training, use of PPE, guards.

4C Safe working practices and procedures

- Observing organisational safety rules, standard operating procedures (SOPs), signs and hazard warnings.
- Taking measures to protect others from any harm resulting from the work that they are carrying out, e.g. risk assessment, training.
- Maintenance of PPE in line with manufacturers' and organisational instructions.
- Training in safe practices and procedures.

4D Importance of following safe working practices and procedures

- Employee/employer protection (to protect against death, injury).
- Guard against prosecution.
- Prevents damage to tools and equipment, contamination of products.

Essential information for tutors and assessors

Assessment

This section must be read in conjunction with *Section 8 Assessment*.

This unit is internally assessed. To pass this unit, the evidence that learners present for assessment must demonstrate that they have met the required standard specified in the learning outcomes and assessment criteria.

The assessment for this unit must be set in a specific manufacturing workplace to allow learners to apply their knowledge and understanding in a realistic and practical way. It must draw on learning from the unit and be designed in a way that enables learners to meet all the assessment criteria. This manufacturing workplace can either be their own employer or another single manufacturing business that they are familiar with.

A recommended assessment approach is given below. Centres can create their own assessment as long as they are confident that it enables learners to provide suitable and sufficient evidence to meet the assessment criteria and achieve the learning outcomes to the same standards as demonstrated in the recommended assessments below.

Learning outcomes 1 and 2

To satisfy the assessment criteria for this learning outcome, learners research the health and safety requirements and emergency procedures in a manufacturing workplace. This manufacturing workplace can either be their own employer or another single manufacturing business that they are familiar with.

The research could be carried out by talking to employees at the manufacturing workplace, and/or from information from organisation-specific resources such as manuals.

Learners then present the information in an 'information sheet' to support new apprentices during their induction and training period. The information sheet can include diagrams and images. In their information sheet, learners will:

1. describe the main requirements of at least **three** different pieces of health and safety legislation or regulations applicable to the manufacturing workplace. Learners must identify the legislation and provide details to show how it protects those in a manufacturing environment (AC1.1)
2. describe at least **two** employer responsibilities and **two** employee responsibilities under each of these **three** pieces of current health and safety legislation. Learners must give clear details of actions each must take in order to fulfil their responsibilities under the legislation, and link these to the manufacturing workplace (AC1.2)
3. describe the evacuation procedures to be followed in case of fire in their manufacturing workplace. Learners must provide clear details of the method for reporting, the actions staff should take, escape routes to be used and assembly locations (AC2.1)
4. describe the use of **three** types of fire extinguishers. Learners must state the colour of each fire extinguisher and give clear details of the class of fire each should be used for, including what each class of fire involves (AC2.2)
5. describe the procedures to be followed in the event of a workplace accident. Learners must give clear details of the accident reporting requirements and the roles of appropriately qualified people, such as first aiders and fire wardens (AC2.3)
6. describe **two** emergency procedures to be followed in the event of an emergency incident in the manufacturing workplace. Learners need to identify the type of incident and relate this to the emergency procedures (AC2.4).

Learning outcome 3

To satisfy the assessment criteria for this learning outcome, learners map hazards found in the manufacturing workplace on a workshop plan provided by their tutor and then identify the possible associated risks. Learners will:

1. identify potential hazards on the workshop plan and label them with a brief description (learners could use a colour-coded key to illustrate this). Learners must use the workshop plan to identify at least **four** different types of hazard and give details of the risks to which the hazards could lead (AC3.1, AC3.3)
2. state the meaning of **four** hazard warning signs depicted on a given worksheet (AC3.2).

Learning outcome 4

To satisfy the assessment criteria for this learning outcome, learners produce a safety information leaflet for new apprentices to show safe working in the manufacturing workplace or a manufacturing organisation they are familiar with. Learners will:

1. outline the PPE required for **two** different manufacturing activities. Learners must give at least one detailed reason for why each type of PPE is needed for the respective activity (AC4.1)
2. outline procedures for safe working in the manufacturing workplace in relation to the **two** manufacturing activities. Learners must identify how the safety procedures reduce risks involved in the activities (AC4.2)
3. give at least **two** reasons why it is important to follow safety procedures in relation to the two manufacturing activities. Learners must give one reason why this is important to the employer and one reason why this is important to the employee (AC4.3).

Unit 2: Communicating and Working Effectively Within a Manufacturing Environment

Level:	**2**
Unit type:	**Mandatory**
Assessment type:	**Internal**
Guided Learning Hours:	**30**

Unit introduction

Good communication, planning and preparation are important in keeping the workplace functioning effectively. In this unit, you will investigate how to communicate effectively using a range of methods and technical information common to the manufacturing environment. This includes verbal, non-verbal and written methods, and specific terminology found in the manufacturing environment. You will gain an understanding of the importance of using the correct terminology when communicating technical information and you will examine how technical information is presented and shared.

You will be able to explain the need for effective planning and preparation before manufacturing engineering processes and operations begin.

You will understand how your continuous professional development and performance review are important for effective working and efficiency in the manufacturing environment.

Learning outcomes and assessment criteria

To pass this unit, the learner needs to demonstrate that they can meet all the learning outcomes for the unit. The assessment criteria determine the standard required to achieve the unit.

Learning outcomes		Assessment criteria	
1	Understand how to communicate effectively within a manufacturing environment	1.1	State why effective communication is important in a manufacturing environment
		1.2	Describe communication methods to be used in different situations in a manufacturing environment
		1.3	Explain the factors to consider when communicating in a manufacturing environment
2	Understand the types of technical information found in the manufacturing workplace	2.1	Describe the relevant drawings and documents needed to carry out and check own work
		2.2	State the importance of using correct terminology to communicate technical information in the manufacturing workplace
		2.3	Explain how to communicate types of technical information in the manufacturing workplace
3	Understand how planning and preparation support being effective in the manufacturing workplace	3.1	Describe the planning stages for manufacturing engineering activities in the workplace
		3.2	Describe the preparation methods for manufacturing engineering activities in the workplace
		3.3	State why careful planning and preparation are important in the manufacturing engineering workplace

Learning outcomes		Assessment criteria	
4	Understand the importance of good workplace organisation	4.1	Describe how to implement effective organisation in the manufacturing engineering workplace
		4.2	Describe how to implement effective housekeeping in the manufacturing engineering workplace
		4.3	State the benefits of maintaining a safe and efficient workplace
5	Understand why performance reviews are important for effective working	5.1	Define performance review
		5.2	State the importance of performance reviews
		5.3	Describe the types of feedback that can be given to an employee for personal and professional development
		5.4	Explain the benefits of feedback when reviewing performance
6	Understand the importance of continuous professional development and objectives	6.1	Describe the continuous professional development process for manufacturing engineering employees
		6.2	Describe the methods of personal and professional development in a manufacturing environment
		6.3	Describe the benefits of professional and personal development to the employee and the employer

Unit content

What needs to be learned
Learning outcome 1: Understand how to communicate effectively within a manufacturing environment
1A Importance of communication in a manufacturing environment • Purpose of communication (to inform, to confirm, to specify, to make a request, to instruct). • Importance of effective communication e.g. getting things right first time, avoiding wasted time, understanding task requirements. **1B Communication methods** • Verbal, e.g. face to face, telephone. • Written, e.g. taking notes, understanding and interpreting instructions. • Electronic, e.g. email, text. • Visual methods, e.g. graphs, diagrams. • Body language, e.g. posture, facial expression, eye contact, gesture. **1C Factors to consider when communicating in a manufacturing environment** • Audience, e.g. peers, supervisors, assessors, customers. • Environment, e.g. internal/external, noise levels. • Urgency/importance of message, e.g. related to safety.

What needs to be learned

Learning outcome 2: Understand the types of technical information found in the manufacturing workplace

2A Technical information

- How to communicate technical information (written documents, technical drawings, specifications, technical data, software).
- Importance of using correct terminology.
- Written documents (planning, production, schedules).
- Drawings (schematic, 2D orthographic, assembly).
- When different types of technical information are used during the manufacturing process.

2B Terminology and conventions

- Use of relevant technical language.
- Graphical information.
- Conventions, e.g. layout, line types, hatching, dimensions, tolerances, scale, colour.
- Use of symbols, e.g. surface finish, circuit symbols, projection.
- Standards, e.g. British (BSI), international (ISO).
- Importance of using correct terminology.

2C Drawings and documents

- Technical drawings, including 2D and 3D drawings, sketches, part drawings, assemblies.
- Circuit diagrams.
- Manufacturing schedules.
- Maintenance plans.
- Production plans.
- Technical data.

What needs to be learned
Learning outcome 3: Understand how planning and preparation support being effective in the manufacturing workplace
3A Planning stages • Production activity, including sequence of activities/processes, specifications (standards, drawings), raw materials and consumables to be used. **3B Preparation methods** • Types of production (jobbing, batch, continuous). • Production operations, e.g. tools and equipment, operating instructions, machine settings. **3C Importance of planning and preparation** • To meet inspection and quality procedures. • To meet health and safety precautions. • To meet environmental or legislative requirements.
Learning outcome 4: Understand the importance of good workplace organisation
4A Effective organisation and housekeeping • Organisation – preparing and maintaining the area, e.g. accessibility for receipt and removal of materials, freedom from obstructions and hazards, preparation of tools and equipment, storage of materials and components. • Housekeeping – leaving the work area in a clean, tidy and safe condition, e.g. disposal of waste, safe storage of equipment. • Benefits to be derived from a safe and efficient workplace, e.g. an efficient workplace leads to better communication between people, improved safety and quality, reduced wastage.

What needs to be learned

Learning outcome 5: Understand why performance reviews are important for effective working

5A Importance of performance reviews

- Definition of a performance review.
- Importance, e.g. to monitor progress, to identify training needs, to set new goals and objectives.

5B Personal and professional development

- Types of feedback:
  - formal, e.g. written reports, appraisals
  - informal, e.g. verbal feedback while carrying out job.

5C Reviewing feedback

- Benefits of feedback – identifies strengths, areas to improve, training needs, motivates, improves performance, provides evidence for personal targets, identifies potential progression routes.

Learning outcome 6: Understand the importance of continuous professional development and objectives

6A Continuous professional development (CPD)

- Tracking and documenting skills, knowledge and experience gained and applied through induction, legal requirements, updating skills on the job and training courses.

6B Methods of personal development

- On the job (work shadowing, instruction, training).
- Off the job (training, courses, education).

6C Benefits of personal development

- Benefits to individual e.g. identification of development needs, developing competence in job role, promotion and career opportunities.
- Benefits to employer e.g. meeting organisational objectives, meeting changing skills requirements.

Essential information for tutors and assessors

Assessment

This section must be read in conjunction with *Section 8 Assessment*.

This unit is internally assessed. To pass this unit, the evidence that learners present for assessment must demonstrate that they have met the required standard specified in the learning outcomes and assessment criteria.

The assessment for this unit must be set in a specific manufacturing workplace to allow learners to apply their knowledge and understanding in a realistic and practical way. It must draw on learning from the unit and be designed in a way that enables learners to meet all the assessment criteria. This manufacturing workplace can either be their own employer or another single manufacturing business that they are familiar with.

A recommended assessment approach is given below; centres can create their own assessment as long as they are confident that it enables learners to provide suitable and sufficient evidence to meet the assessment criteria and achieve the learning outcomes to the same standards as demonstrated in the recommended assessments below.

Learning outcome 1

To satisfy the assessment criteria for this learning outcome, learners produce a presentation aimed at new apprentices, focusing on communication in the manufacturing workplace. In their presentation, learners will:

1. give **three** reasons why effective communication is important in the manufacturing environment (AC1.1)
2. outline **two** different situations that could occur in the manufacturing environment. Learners must give clear details of the method of communication that should be used in each of these situations (AC1.2)
3. outline **three** factors to consider when communicating in relation to **one** of these situations. For each factor, learners must give at least **one** detailed reason to show why it is necessary to consider it (AC1.3).

Learning outcome 2

To satisfy the assessment criteria for this learning outcome, learners produce notes for new apprentices. The notes must include the correct technical and key terms appropriate to the manufacturing workplace. Learners will:

1. describe **three** technical drawings or documents that are used to carry out **two** manufacturing processes in their manufacturing environment. Learners must give clear details of how the drawings or documents are used when carrying out and checking their work (AC2.1)
2. give **two** reasons why the correct terminology should be used when communicating technical information, using examples of terminology (AC2.2)
3. describe **three** methods that are used to communicate types of technical information in their manufacturing environment for **two** given manufacturing processes that they are familiar with. For each method, learners must give **one** detailed reason why it is used to communicate the technical information (AC2.3).

Learning outcome 3

To satisfy the assessment criteria for this learning outcome, learners produce an instruction support pack as an induction tool for new apprentices in the manufacturing workplace. Learners will:

1. describe the planning stages for a given operation within their manufacturing environment. Learners must provide clear details of the purpose of each stage (AC3.1)
2. describe the preparation methods they would use for a given operation within their manufacturing environment. Learners must provide clear details of the purpose of each method (AC3.2)
3. give **three** reasons why careful planning and preparation are important in a manufacturing engineering workplace (AC3.3).

Learning outcome 4

To satisfy the assessment criteria for this learning outcome, learners produce an illustrated leaflet or PowerPoint® presentation, with induction information for new apprentices in the manufacturing workplace.
Learners will:

1. describe **three** methods that are used to effectively organise the manufacturing engineering environment. For each method, learners must include **one** detailed example to show how effective organisation is achieved (AC4.1)
2. describe how to implement effective housekeeping to maintain the work area in good condition. Learners must include detail to show how the way the area is maintained helps working practices to be carried out effectively (AC4.2)
3. give **three** benefits of maintaining the safety and efficiency of the work area (AC4.3).

Learning outcome 5

To satisfy the assessment criteria for this learning outcome, learners produce a leaflet with information for new apprentices in the manufacturing workplace.
Learners will:

1. give a definition of a performance review from within their manufacturing environment (AC5.1)
2. give **three** reasons for the importance of performance reviews (AC5.2)
3. describe the types of feedback they could receive for their personal and professional development. Learners must give details of **two** examples of types of feedback that could be given in their manufacturing environment, including the situation in which it would be given (AC5.3)
4. outline **three** ways in which feedback from performance reviews can contribute to reviewing their own performance. Learners must give detailed examples from their manufacturing environment of how feedback could help them to identify their strengths and areas to improve (AC5.4).

Learning outcome 6

To satisfy the assessment criteria for this learning outcome, learners produce a presentation with information for new apprentices joining the manufacturing workplace. Learners will:

1. describe the **four** important aspects of CPD. Learners must give details of how each aspect contributes to CPD (AC6.1)
2. describe **two** methods they could use to determine their personal objectives with their supervisor. Learners must include details of the actions they could take to work towards their development goals (AC6.2)
3. describe at least **four** benefits of professional and personal development. Learners must give clear details of **two** benefits to the employee and **two** benefits to the employer (AC6.3).

Unit 3: Working Relationships and Individual Rights and Responsibilities Within a Manufacturing Environment

Level:	**2**
Unit type:	**Mandatory**
Assessment type:	**Internal**
Guided Learning Hours:	**30**

Unit introduction

Forming good working relationships with others, being able to work in a team and a positive attitude to work contribute to efficient productivity in manufacturing environments. In order to carry out your role safely and effectively, it is important that you know the statutory rules and regulations relating to your job role and work area. Training and education will help you achieve your aspirations in developing your career, in turn this can motivate you to work more efficiently and effectively.

In this unit, you will investigate the factors that promote a positive working attitude, develop an understanding of the importance of effective working relationships and learn how you can contribute to effective team working. You will examine the statutory rules and regulations affecting the rights and responsibilities of employers and employees to keep manufacturing environments safe and free from discrimination. You will also look at how your job role can lead to further career development. This unit will give you an opportunity to examine the importance of representative bodies in manufacturing environments.

Learning outcomes and assessment criteria

To pass this unit, the learner needs to demonstrate that they can meet all the learning outcomes for the unit. The assessment criteria determine the standard required to achieve the unit.

Learning outcomes		Assessment criteria	
1	Understand how attitude has an influence on behaviour	1.1	Describe the characteristics of a positive working attitude
		1.2	Describe the factors which help to create a positive working attitude within a manufacturing environment
		1.3	State the importance of having a positive working attitude in a manufacturing environment
		1.4	Outline the consequences of a negative attitude to work in a manufacturing environment
2	Understand the importance of creating and maintaining effective working relationships	2.1	Identify the characteristics of effective working relationships
		2.2	Describe the factors that contribute to effective working relationships in manufacturing environments
		2.3	State the importance of creating and maintaining effective working relationships

Learning outcomes		Assessment criteria	
3	Understand the importance of effective team working	3.1	Describe the factors that contribute to effective team working in manufacturing environments
		3.2	State the importance of effective team working in manufacturing environments
		3.3	Describe how to implement effective team working in manufacturing environments
4	Know the main current legislation and rules that have an effect on employment in the manufacturing environment	4.1	Outline the main employment laws relating to the manufacturing environment
		4.2	Describe employment rights and responsibilities in the workplace
		4.3	Describe employee's rights and responsibilities in the workplace
5	Understand how job roles can lead to career development	5.1	Describe career opportunities within own manufacturing environment and related sectors
		5.2	Outline sources of information related to a chosen career pathway
		5.3	Describe the necessary steps for personal career development
6	Understand the role of representative bodies in the manufacturing environment	6.1	Describe the main roles and responsibilities of representative bodies within manufacturing environments
		6.2	Describe the benefits to employers and employees of representative body membership in manufacturing environments

Unit content

What needs to be learned
Learning outcome 1: Understand how attitude has an influence on behaviour
1A Influence of attitude on behaviour • Characteristics of a positive working attitude, e.g. taking responsibility, being a role model, sharing ideas. • Consequences of a negative attitude to work, e.g. being late to work, unwilling to try new things, lack of care, low morale, poor communication, deadlines not met. **1B Factors that contribute to a positive working attitude** • Responsibility e.g. timekeeping, personal appearance, obtaining information. • Role models e.g. experienced colleagues, team leaders, mentors. • Rewards e.g. performance-related bonuses, employee of the month, share schemes. • Workload e.g. sufficiently challenging, not underutilised or overstretched. • Accountability e.g. sharing of targets, performance review, appraisal, personal development. • Environment e.g. working safely, workspace organisation, climate control, lighting. **1C Importance of a positive working attitude** • Improved morale (effect on colleagues, collaboration, effects of keeping a positive outlook). • Good relationships (customers, clients and other stakeholders). • Job satisfaction, organisational commitment (effect on productivity).

What needs to be learned

Learning outcome 2: Understand the importance of creating and maintaining effective working relationships

2A Characteristics of effective working relationships

- Good communication, e.g. sharing information, listening to others.
- Appropriate respectful behaviour.
- Timekeeping, e.g. turning up on time, meeting deadlines.
- Offering and asking for help.

2B Factors contributing to effective working relationships

- Professionalism, e.g. seeking and offering help, not disrupting own or others' work, referring requests to the appropriate people if necessary.
- Respect, e.g. respecting people's views, ideas, opinions, rights and property, being polite.
- Dealing with issues, e.g. identifying and dealing with problems in working relationships, ensuring actions taken are within own responsibility/authority, resolving disagreements.
- Trust among work colleagues (difficult operations, helping each other, solving problems).

2C Importance of creating and maintaining effective working relationships

- Increased morale and job motivation.
- Effective communication, e.g. sharing ideas, pooling skills.
- Meeting deadlines, e.g. through hard work and collaboration.
- Improved productivity.
- Following correct organisational requirements (protocols, codes of behaviour).

What needs to be learned

Learning outcome 3: Understand the importance of effective team working

3A Factors that contribute to effective team working

- Characteristics of a team (shared purpose, defined roles, interdependence, effective working relationships).
- Communication with team (keeping people informed, record of actions required, sharing information).
- Managing and agreeing roles and responsibilities (leadership, sharing the workload, job description, target setting).
- Awards (team awards, sharing in the success of individuals).
- Building trust (being able to rely on colleagues, sharing common goals).
- Improved job satisfaction (performance review/appraisal).
- Planning techniques (sharing good practice).

3B Implementation of effective team-working strategies

- Team building, e.g. group work, team activities, social events.
- Shared projects, e.g. reorganising workspaces designing production layouts.
- Development, e.g. training programmes, support, case studies.
- Setting goals, e.g. shared targets, purpose of team, approach to teamwork.
- Knowledge/skills transfer, e.g. communication, priorities, strengths and weaknesses.

What needs to be learned

Learning outcome 4: Know the main current legislation and rules that have an effect on employment in the manufacturing environment

4A Current legislation and regulations

- The requirements of the following legislation in relation to working in a manufacturing environment. The most recent legislation should be taught:
  - Equality Act 2010
  - Employment Rights Act 1996
  - Working Times Directive
  - Employment Relations Act 2004
  - other related legislation, e.g. European Convention on Human Rights, EU employment directives, UN charter, company regulations.

4B Employment rights and responsibilities

- Contracts (zero hours, full time, part time, agency workers, self-employed).
- Recruitment and induction (interviews, pay, holiday pay, flexible working).
- Work–life balance.
- Health and wellbeing in the workplace.

4C Employee's rights and responsibilities

- Salary or wages.
- Working hours and restrictions.
- Leave entitlement.
- Contract of employment.
- Health and safety.
- Trade union membership.

What needs to be learned

Learning outcome 5: Understand how job roles can lead to career development

5A Career opportunities and sources of information

- Progression routes within manufacturing engineering, e.g. craft/technician apprenticeship frameworks.
- Importance of CPD, e.g. in-house training.
- Different sources of information, e.g. line manager, relevant websites, trade bodies, representative bodies, trade unions.

5B Career development

- Steps to take in creating a development plan (agreeing aspirations, training needs, ongoing education, timescale and milestones with mentor guidance); review and adapt.

Learning outcome 6: Understand the role of representative bodies in the manufacturing environment

6A Main roles and responsibilities of representative bodies

- Trade unions and professional bodies, e.g. HSE, Semta.
- The work of trade unions and professional bodies, e.g. representing and supporting employees/employers, supporting workers, lobbying government.

6B Benefits of representative bodies

- Review and set professional practice standards.
- Provide professional advice on training and development, career pathways, minimum qualifications.
- Influence policy relating to the sector.
- Support research into issues affecting the sector.
- Negotiate agreements on pay and conditions, dispute resolution.

Essential information for tutors and assessors

Assessment

This section must be read in conjunction with *Section 8 Assessment*.

This unit is internally assessed. To pass this unit, the evidence that learners present for assessment must demonstrate that they have met the required standard specified in the learning outcomes and assessment criteria.

The assessment for this unit must be set in a specific manufacturing workplace to allow learners to apply their knowledge and understanding in a realistic and practical way. It must draw on learning from the unit and be designed in a way that enables learners to meet all the assessment criteria. This manufacturing workplace can either be their own employer or another single manufacturing business that they are familiar with.

A recommended assessment approach is given below. Centres can create their own assessment as long as they are confident that it enables learners to provide suitable and sufficient evidence to meet the assessment criteria and achieve the learning outcomes to the same standards as demonstrated in the recommended assessments below.

Learning outcome 1

To satisfy the assessment criteria for this learning outcome, learners produce a leaflet as part of an induction pack aimed at new apprentices, focusing on why attitude affects behaviour in the manufacturing workplace. Learners will:

1. describe **two** characteristics of a positive working attitude. For each characteristic, learners must include examples of how they could demonstrate each characteristic (AC1.1)
2. describe each of the factors that contribute to creating a positive working attitude in a manufacturing environment. For each factor, learners must give **one** detailed example of how it contributes to creating a positive working attitude (AC1.2)
3. give **three** reasons why it is important to have a positive working attitude in a manufacturing environment. Learners must give examples in relation to morale, relationships and job satisfaction (AC1.3)
4. outline **three** consequences of an employee having a negative attitude to work, with at least **one** reason for each consequence (AC1.4).

Learning outcome 2

To satisfy the assessment criteria for this learning outcome, learners produce a leaflet or PowerPoint® presentation aimed at new apprentices, focusing on creating and maintaining good working relationships in the manufacturing workplace. Learners will:

1. outline **three** characteristics of effective working relationships and **three** contributing factors. For each factor, learners must describe three ways in which they contribute to effective working relationships (AC2.1, AC2.2)
2. give **four** detailed reasons for maintaining good working relationships (AC2.3).

Learning outcome 3

To satisfy the assessment criteria for this learning outcome, learners produce a presentation aimed at new apprentices, focusing on creating and maintaining effective team working in the manufacturing workplace. Learners will:

1. give a description of their team and describe **four** factors that contribute to effective team working. Learners must give specific details of their team to show how each factor affects how the team works (AC3.1)
2. give **four** reasons why effective team working is important in a manufacturing environment (AC3.2)
3. describe how **three** strategies are implemented/could be implemented to help the team work effectively (AC3.3).

Learning outcome 4

To satisfy the assessment criteria for this learning outcome, learners produce an illustrated leaflet **or** PowerPoint® presentation, with induction information for new apprentices. Learners will:

1. outline **three** relevant pieces of legislation and/or regulations that affect employment within the manufacturing workplace. Learners must identify the legislation and for each give **one** example of how the legislation affects employment in the manufacturing workplace (AC4.1)
2. describe **four** relevant aspects of employment rights and responsibilities relating to the manufacturing workplace. Learners must give clear details to show how these aspects are implemented in the workplace (AC4.2)
3. describe **two** employee rights and **two** employee responsibilities. Learners must give details of how each one could benefit the employee (AC4.3).

Learning outcome 5

To satisfy the assessment criteria for this learning outcome, learners produce an illustrated leaflet **or** a PowerPoint® presentation on career information in the manufacturing workplace. Learners will:

1. describe **two** job roles found in their own manufacturing environment. Learners must identify the skills needed for each role and the progression routes that each could lead to (AC5.1)
2. outline **three** sources of information that could inform them of the skills, knowledge and experience needed to progress in these roles (AC5.2)
3. describe the steps of their personal career development plan. Learners must include details of aspirations/goals, training or education needs, timescales and any further guidance needed. They must also show how they will record evidence of their progress (AC5.3).

Learning outcome 6

To satisfy the assessment criteria for this learning outcome, learners prepare a PowerPoint® presentation about the role of representative bodies in the manufacturing workplace. Learners will:

1. describe the responsibilities of **four** representative bodies in manufacturing environments. Learners must include details of how each of these bodies could support employees in their job roles (AC6.1)
2. describe **four** ways in which the support from representative bodies benefits both the member and the employer (this could take the form of a discussion with peers/supervisor). Learners must include details of how the support provided by the professional body could benefit the member and the employer (AC6.2).

Unit 4: Workplace Organisational Techniques

Level:	**2**
Unit type:	**Mandatory**
Assessment type:	**Internal**
Guided Learning Hours:	**30**

Unit introduction

Effective workplace organisation is at the heart of lean operations. In any role in this sector, you will be expected to help keep things clean, tidy and well organised. You will be asked to share your ideas on how to set up your workspace to make things safer, quicker or easier. Your ideas are important and employers will value your input. This unit gives you a framework to help improve workplace organisation.

In this unit, you will learn how to use the '5s' method of improving workplace organisation. You will gain an understanding of each of the five phases of 5s and you will be asked to apply them in a realistic working environment.

Learning outcomes and assessment criteria

To pass this unit, the learner needs to demonstrate that they can meet all the learning outcomes for the unit. The assessment criteria determine the standard required to achieve the unit.

Learning outcomes		Assessment criteria	
1	Understand the importance of having a well-organised working environment	1.1	Explain how poor organisation can have a negative effect on the working environment
		1.2	Explain how good organisation can have a positive effect on the working environment
		1.3	State the importance to lean manufacturing of a well-organised working environment
2	Understand the five phases of the 5s method of workplace organisation	2.1	Describe the overall aims of the 5s method of workplace organisation
		2.2	State the phases of the 5s method in the correct order
		2.3	Explain the Sort phase of 5s, typical actions and their effects on the working environment
		2.4	Explain the Set-in-Order phase of 5s, typical activities and their effects on workplace organisation
		2.5	Explain the Shine phase of 5s, typical activities and their effects on workplace organisation
		2.6	Explain the Standardise phase of 5s, typical activities and their effects on workplace organisation
		2.7	Explain the Sustain phase of 5s, typical activities and their effects on workplace organisation

Learning outcomes		Assessment criteria	
3	Be able to carry out a 5s workplace organisation audit	3.1	Select a manageable work area that can be improved by applying the 5s method
		3.2	Carry out a 5s workplace organisation audit using a given checklist
		3.3	Select actions required in the Sort phase of 5s as part of a workplace organisation audit
		3.4	Select actions required in the Set-in-Order phase of 5s as part of a workplace organisation audit
		3.5	Select actions required in the Shine phase of 5s as part of a workplace organisation audit
		3.6	Select documentation required in the Standardise phase of 5s as part of a workplace organisation audit
		3.7	Select resources required in the Sustain phase of 5s as part of a workplace organisation audit
4	Be able to carry out the implementation of 5s in a work area	4.1	Carry out the Sort phase of 5s in a work area
		4.2	Carry out the Set-in-Order phase of 5s in a work area
		4.3	Carry out the Shine phase of 5s in a work area
		4.4	Produce appropriate documentation to support the Standardise phase of 5s in a work area
		4.5	Produce appropriate resources to support the Sustain phase of 5s in a work area

Unit content

What needs to be learned
Learning outcome 1: Understand the importance of having a well-organised working environment
1A Organisation in the working environment • Signs of a poorly organised working environment, e.g. clutter, dirt and dust. • Effects of poor organisation, e.g. hazards, delays, confusion. • Signs of a well-organised working environment, e.g. clean, tidy, well maintained, storage, labelling. • Effects of good organisation, e.g. speed, safety, quality, effectiveness. • Benefits of a well-organised working environment, e.g. costs, quality, safety, wellbeing. • Importance of effective workplace organisation in lean manufacturing operations, e.g. continuous improvement, improved productivity, elimination of waste.

What needs to be learned

Learning outcome 2: Understand the five phases of the 5s method of workplace organisation

2A The 5s method of workplace organisation

- Overall aims of the 5s method of workplace organisation, e.g. effects on waste, efficiency, safety, wellbeing.
- Phases of the 5s methodology (Sort, Set in Order, Shine, Standardise, Sustain).
- Effects of the phases of 5s on workplace organisation:
  - Sort – reduce time taken to find tools/components, maximise the use of space, increased safety
  - Set in Order – improve flow of activities, increase efficiency, eliminate unnecessary movement
  - Shine – contributes to a pleasant working environment, early identification and resolution of problems
  - Standardise – establish procedures to help support and maintain ongoing Sort, Set in Order and Shine activities, keep all areas consistent
  - Sustain – develop behaviours to ensure the 5s approach to workplace organisation is continued over the long term.
- Typical activities involved in the implementation of each phase of 5s, how these are applied in practice and their effects:
  - Sort, e.g. remove outdated or broken items or equipment
  - Set in order, e.g. assign fixed places for materials needed for work
  - Shine, e.g. keep tools and equipment clean and ready for use
  - Standardise, e.g. implement colour coding, labelling system
  - Sustain, e.g. establish responsibilities, regular audits, reviews.

What needs to be learned
Learning outcome 3: Be able to carry out a 5s workplace organisation audit
3A 5s workplace organisation audit • Identification of work areas that would benefit from implementation of 5s, e.g. manageable size, potential impact. • Effective use of a 5s workplace organisation audit checklist, e.g. following audit procedures, observation skills, recording information clearly and accurately. • Actions to address common issues identified in a 5s workplace audit, e.g. provision of cleaning materials, shadow boards, labelling, signage.
Learning outcome 4: Be able to carry out the implementation of 5s in a work area
4A Carrying out 5s procedures • Practical aspects of carrying out safely the Sort, Set in Order and Shine phases of 5s, following appropriate procedures, e.g. safe working practices, manual handling. • Documentation, e.g. schedules, rotas, standard operating procedures; other documentation used to support the Standardise phase of 5s, e.g. daily cleaning and inspection procedures. • Training materials and other resources used to support the Sustain phase of 5s, e.g. presentations, workshops, leaflets, posters, 'how to' guides.

Essential information for tutors and assessors

Assessment

This unit is internally assessed. To pass this unit, the evidence that the learner presents for assessment must demonstrate that they have met the required standard specified in the learning outcomes and assessment criteria.

This unit is to be assessed in the realistic working environment and the evidence is expected to be naturally occurring and collected over a period of time.

Centres are responsible for deciding on the assessment activities that will enable learners to produce valid, sufficient, authentic and appropriate evidence to meet the assessment criteria. Learners must be given a clear assessment brief before the assessment takes place, detailing:

- the assessment activity and context
- the learning outcome(s) to be assessed
- the criteria they are expected to meet
- the time and duration of the assessment.

Wherever possible, centres should adopt a holistic and integrated approach to assessing the units in the qualification. This gives the assessment process greater rigour, minimises repetition and saves time. The focus should be on assessment activities generated through naturally occurring evidence in the workplace rather than on specific tasks. Taken as a whole, the evidence must show the learner meets all learning outcomes and assessment criteria over a period of time. Question and answer sessions should be used to meet the requirements of learning outcomes 1 and 2. Learners must link and apply their knowledge and understanding to the workplace activities they completed for outcomes 3 and 4. Learners' responses must be at the appropriate breadth and depth to meet the level of demand of the knowledge assessment criteria. It should be clear in the assessment records where each learning outcome and assessment criterion has been covered and achieved.

Please refer to the guidance on selecting suitable assessment activities for the skills units, available on our website.

Unit 5: Work-related Problem-solving Techniques

Level:	**2**
Unit type:	**Mandatory**
Assessment type:	**Internal**
Guided Learning Hours:	**40**

Unit introduction

Effective lean operations depend on a culture of continuous improvement. When problems are identified they must be tackled quickly and effectively. In any role in this sector, you will be expected to be involved in the process of solving problems to improve performance. This unit gives you a framework for structuring your approach to problem solving.

In this unit, you will learn how to use the A3 method of problem solving. You will gain an understanding of each element of the A3 method and be asked to apply the elements in a realistic working environment.

Learning outcomes and assessment criteria

To pass this unit, the learner needs to demonstrate that they can meet all the learning outcomes for the unit. The assessment criteria determine the standard required to achieve the unit.

Learning outcomes		Assessment criteria	
1	Understand the importance of eliminating the 7 wastes of lean manufacturing	1.1	Describe the 7 wastes of lean manufacturing
		1.2	Describe how the 7 wastes can be quantified in a lean operation
		1.3	Describe ways in which the 7 wastes of lean manufacturing can be minimised
		1.4	State the importance of minimising the 7 wastes of lean manufacturing in an engineering organisation
2	Understand methods of identifying problems in lean manufacturing	2.1	Describe the principles of Kaizen
		2.2	Explain how the principles of Kaizen encourage workers to become involved in continuous improvement activities
		2.3	Describe how Kaizen activities can be used to identify waste problems in a lean manufacturing operation
3	Know the A3 method of solving problems in lean operations	3.1	State the stages of the A3 method of problem solving in the correct order
		3.2	Describe the overall aims of the A3 method of problem solving in lean operations
		3.3	Describe how an A3 report is used to document each stage of the A3 method
		3.4	Describe the techniques used in root cause analysis
		3.5	Describe the importance of suitable metrics in the A3 method of problem solving

Learning outcomes		Assessment criteria	
		3.6	Describe the importance of completing each stage of the A3 method fully and in the correct order
4	Be able to define a problem using the A3 method	4.1	Identify a problem in a lean operation
		4.2	Define the problem identified in a lean operation
		4.3	Identify appropriate metrics to quantify the problem
		4.4	Describe how metrics will be measured, recorded and displayed
		4.5	Define the target against which success will be measured
5	Be able to solve a problem using the A3 method	5.1	Identify the root cause(s) of the problem using a suitable method
		5.2	Identify appropriate countermeasures to eliminate the problem
		5.3	Implement countermeasures within limits of own responsibility to eliminate the problem
		5.4	Evaluate the effectiveness of the countermeasures in eliminating the problem
		5.5	Summarise the problem-solving process using an A3 report

Unit content

What needs to be learned
Learning outcome 1: Understand the importance of eliminating the 7 wastes of lean manufacturing
1A The 7 wastes • The 7 wastes of lean manufacturing (transport, inventory, motion, waiting, over-processing, overproduction, defects). • Methods of quantifying and monitoring waste, e.g. inspection records, scrap rates, time and motion studies, process mapping. • Actions taken to minimise waste, e.g. reorganisation, elimination of non-value-added activities, process changes. • Costs. • Effects on an organisation of minimising waste, e.g. improved productivity, greater customer satisfaction, bigger profits, employee satisfaction.
Learning outcome 2: Understand methods of identifying problems in lean manufacturing
2A Kaizen • Using Kaizen activities to identify typical problems encountered in manufacturing operations, e.g. unnecessary operator movement, high scrap rates, operators waiting for components to arrive, bottlenecks. • Principles of Kaizen, e.g. continuous improvement through small changes, teamwork, generating suggestions for improvement, employee empowerment. • Kaizen activities used to identify waste in a process, e.g. value stream mapping, shop-floor walk-through, observation, data analysis.

What needs to be learned
Learning outcome 3: Know the A3 method of solving problems in lean operations
3A A3 method of problem solving • Aims of the A3 method, e.g. to provide a structured approach to problem solving. • Stages of the A3 method (problem definition, target, root cause analysis, countermeasures, implementation, follow-up, evaluation), importance of suitable metrics. • A3 report templates. • Selection, measurement, recording and display of appropriate metrics. • Techniques used in root cause analysis, e.g. fishbone diagrams, brainstorming, Pareto analysis.
Learning outcome 4: Be able to define a problem using the A3 method
4A Carrying out the A3 method of defining a problem • Practical aspects of identifying and defining a problem, e.g. safe working practices, PPE. • Practical aspects of selecting, defining and measuring suitable metrics. • Recording data and activities carried out clearly and legibly on an appropriate template.
Learning outcome 5: Be able to solve a problem using the A3 method
5A Carrying out the A3 method of problem solving • Practical aspects of implementing countermeasures, e.g. safe working practices, PPE. • Recording data and activities carried out clearly and legibly on an appropriate template. • Roles and responsibilities of those involved in a manufacturing process, e.g. production supervisor, quality manager. • Limits of own responsibility.

Essential information for tutors and assessors

Assessment

This unit is internally assessed. To pass this unit, the evidence that the learner presents for assessment must demonstrate that they have met the required standard specified in the learning outcomes and assessment criteria.

This unit is to be assessed in the realistic working environment and the evidence is expected to be naturally occurring and collected over a period of time.

Centres are responsible for deciding on the assessment activities that will enable learners to produce valid, sufficient, authentic and appropriate evidence to meet the assessment criteria. Learners must be given a clear assessment brief before the assessment takes place, detailing:

- the assessment activity and context
- the learning outcome(s) to be assessed
- the criteria they are expected to meet
- the time and duration of the assessment.

Wherever possible, centres should adopt a holistic and integrated approach to assessing the units in the qualification. This gives the assessment process greater rigour, minimises repetition and saves time. The focus should be on assessment activities generated through naturally occurring evidence in the workplace rather than on specific tasks. Taken as a whole, the evidence must show the learner meets all learning outcomes and assessment criteria over a period of time. Question and answer sessions should be used to meet the requirements of learning outcomes 1, 2 and 3. Learners must link and apply their knowledge and understanding to the workplace activities they completed for outcomes 4 and 5. Learners' responses must be at the appropriate breadth and depth to meet the level of demand of the knowledge assessment criteria. It should be clear in the assessment records where each learning outcome and assessment criterion has been covered and achieved.

Please refer to the guidance on selecting suitable assessment activities for the skills units, available on our website.

Unit 6: Preparing for Manufacturing Operations

Level:	**2**
Unit type:	**Optional**
Assessment type:	**Internal**
Guided Learning Hours:	**20**

Unit introduction

Thorough and careful preparation is the key to carrying out safe and efficient manufacturing operations. To carry out preparation activities effectively you must be able to understand and interpret manufacturing documentation. It is here that you will find all the information you need to guide your preparations and ensure that you work safely.

In this unit, you will first learn about how to use manufacturing information to help plan your preparation activities. You will then be asked to set up a work area safely and prepare the tools, equipment and materials needed for the manufacturing operations.

Learning outcomes and assessment criteria

To pass this unit, the learner needs to demonstrate that they can meet all the learning outcomes for the unit. The assessment criteria determine the standard required to achieve the unit.

Learning outcomes		Assessment criteria	
1	Know how to prepare a work area for a manufacturing operation	1.1	Explain how to obtain the necessary manufacturing documents and procedures
		1.2	Explain how to interpret the documentation used to prepare for manufacturing operations
		1.3	Describe how to work safely when preparing for manufacturing operations
		1.4	Describe the process of clearing and cleaning a work area safely
		1.5	Describe how to lay out and position tools, equipment and materials in the work area
		1.6	Describe how to check and prepare tools and equipment for use
		1.7	Describe the arrangements for receiving materials into the work area and the removal of finished goods
		1.8	Describe the quality control checks required to ensure materials meet required specifications
		1.9	Describe how to check that preparation is complete and correct

Learning outcomes		Assessment criteria	
2	Be able to prepare a work area for a manufacturing operation	2.1	Clear and clean a work area safely in accordance with preparation procedures and safe working practices
		2.2	Prepare suitable areas for the receipt and storage of materials
		2.3	Prepare a suitable area for the storage of finished products
		2.4	Obtain tools and equipment required to carry out a manufacturing operation
		2.5	Check the operation, condition and safety of tools and equipment
		2.6	Arrange tools and equipment appropriately for use in the work area
		2.7	Obtain materials required to carry out the manufacturing operation
		2.8	Check incoming materials against manufacturing documents for type, quantity and quality
		2.9	Arrange materials appropriately for use in the work area
		2.10	Maintain a safe and organised work area at all times

Unit content

What needs to be learned
Learning outcome 1: Know how to prepare a work area for a manufacturing operation
1A Using manufacturing information • Issuing and obtaining manufacturing documentation, e.g. hard copy, computerised storage and retrieval, version control. • Use and interpretation of a range of manufacturing documents and information relevant when preparing safely for manufacturing operations, e.g. safe working practices, setup procedures, job instructions.
Learning outcome 2: Be able to prepare a work area for a manufacturing operation
2A Preparing the work area • Safe preparation of work area, e.g. clearing area, cleaning, lighting, layout. • Material movement and storage, e.g. accessibility, clearance, component delivery and storage. **2B Preparing equipment/tooling** • Safe handling, setup, use and condition/safety checks for a range of tools and equipment, e.g. machinery, process plant, tools (handheld and portable), material handling equipment, jigs and fixtures. • Safety equipment, e.g. PPE, ventilation, dust/fume extraction, positioning welding screens. • Positioning tools and equipment for use in manufacturing operations, e.g. safe storage, easy access, material handling. **2C Preparing materials** • Types of materials (production, consumable). • Safe preparation, handling, identification and storage of a range of production components, e.g. Printed Circuit Boards (PCBs), mechanical components, electrical components and consumable components. • Checks carried out on production materials, e.g. availability, quantity, condition, correct identification. • Storage of production and consumable materials for use in manufacturing operations, e.g. easy access, labelling.

Essential information for tutors and assessors

Essential resources

The practical activities in this unit should be carried out in a realistic working environment, which could be located in a workshop or classroom adapted for that purpose. Learners will require access to the following additional resources:

- a range of documentation relating to the manufacture of a product (as detailed in the unit content)
- tools, equipment and materials required to carry out preparation for manufacture of a product.

Assessment

This unit is internally assessed. To pass this unit, the evidence that the learner presents for assessment must demonstrate that they have met the required standard specified in the learning outcomes and assessment criteria.

This unit is to be assessed in the realistic working environment and the evidence is expected to be naturally occurring and collected over a period of time.

Centres are responsible for deciding on the assessment activities that will enable learners to produce valid, sufficient, authentic and appropriate evidence to meet the assessment criteria. Learners must be given a clear assessment brief before the assessment takes place, detailing:

- the assessment activity and context
- the learning outcome(s) to be assessed
- the criteria they are expected to meet
- the time and duration of the assessment.

Wherever possible, centres should adopt a holistic and integrated approach to assessing the units in the qualification. This gives the assessment process greater rigour, minimises repetition and saves time. The focus should be on assessment activities generated through naturally occurring evidence in the workplace rather than on specific tasks. Taken as a whole, the evidence must show the learner meets all learning outcomes and assessment criteria over a period of time. Question and answer sessions should be used to meet the requirements of learning outcome 1. Learners must link and apply their knowledge and understanding to the workplace activities they completed for outcome 2. Learners' responses must be at the appropriate breadth and depth to meet the level of demand of the knowledge assessment criteria. It should be clear in the assessment records where each learning outcome and assessment criterion has been covered and achieved.

Please refer to the guidance on selecting suitable assessment activities for the skills units, available on our website.

Unit 7: Controlling Manufacturing Operations

Level:	**2**
Unit type:	**Optional**
Assessment type:	**Internal**
Guided Learning Hours:	**20**

Unit introduction

In a manufacturing role in this sector, you will be expected to monitor each stage of a manufacturing process as it is carried out. This is to ensure that any variation in key quality indicators, such as dimensions or surface finish, is kept within required tolerances. You will monitor other performance indicators, such as cycle time, to ensure that the required production rates are being achieved. Where this is not the case, you will be expected to bring them back into line in order to avoid problems during the manufacturing operation.

In this unit, you will be given the relevant information required and learn how to control manufacturing operations. You will gain an understanding of how process monitoring and adjustment are used to maintain the required quality and performance levels, and will apply these principles in a realistic working environment.

Learning outcomes and assessment criteria

To pass this unit, the learner needs to demonstrate that they can meet all the learning outcomes for the unit. The assessment criteria determine the standard required to achieve the unit.

Learning outcomes		Assessment criteria	
1	Know the relevant information required for controlling manufacturing operations	1.1	Explain how to interpret documentation used to control a manufacturing operation
		1.2	Describe the production data used to control a manufacturing operation
		1.3	Explain how to collect production data safely and how it is recorded
		1.4	Explain how to process and interpret production data
		1.5	Explain how problems in a manufacturing operation are identified from production data
		1.6	Describe the adjustments that can be made to a manufacturing operation to correct a problem identified in production data

Learning outcomes		Assessment criteria	
2	Be able to control manufacturing operations	2.1	Follow the correct job instructions, organisational procedures, safety requirements and any relevant production and quality specifications
		2.2	Collect quality control data for a manufacturing operation
		2.3	Collect performance data for a manufacturing operation
		2.4	Record and process production data accurately in a suitable and legible format
		2.5	Interpret collected production data to identify any problems with the performance of a manufacturing operation or the quality of production output
3	Be able to deal with problems during manufacturing operations	3.1	Identify the root cause of a problem indicated by production data for a manufacturing operation
		3.2	Adjust a manufacturing operation to address a problem with quality or performance requirements
		3.3	Collect production data to monitor the effects of adjusting a manufacturing operation
		3.4	Use production data to show an improvement in quality or performance of a manufacturing operation

Unit content

What needs to be learned
Learning outcome 1: Know the relevant information required for controlling manufacturing operations

1A Information required for controlling manufacturing operations
• Documentation, e.g. job instructions, equipment operating/adjustment procedures, quality control specifications, engineering drawings, production targets.
• Production data:
  ○ quality control, e.g. dimensional accuracy, surface finish
  ○ performance, e.g. cycle time, material usage, safety
  ○ data collection, processing and interpretation.
• Typical manufacturing problems, indicators in collected production data, possible root causes and corrective action.

Learning outcome 2: Be able to control manufacturing operations
2A Procedures and data collection for controlling manufacturing operations • Procedures and safety requirements for a manufacturing operation (health and safety and environmental regulations, safe working practices, job instructions, equipment/tool operating instructions, company standards and procedures). • Practical aspects of data collection for a manufacturing operation, e.g. use of forms, legibility, accuracy, precision, measuring equipment. • Types of data to collect, e.g. dimensional data, number of rejected parts, number of parts produced, manufacturing time.
Learning outcome 3: Be able to deal with problems during manufacturing operations
3A Problem identification and resolution • Identifying the root cause of problems indicated in collected production data. • Effects of adjusting process parameters for a manufacturing operation, e.g. changing sequence, speeding up an operation, replacing worn tooling.

Essential information for tutors and assessors

Essential resources

There are no special resources needed for this unit.

Assessment

This unit is internally assessed. To pass this unit, the evidence that the learner presents for assessment must demonstrate that they have met the required standard specified in the learning outcomes and assessment criteria.

This unit is to be assessed in a realistic working environment and the evidence is expected to be naturally occurring and collected over a period of time.

Centres are responsible for deciding on the assessment activities that will enable learners to produce valid, sufficient, authentic and appropriate evidence to meet the assessment criteria. Learners must be given a clear assessment brief before the assessment takes place, detailing:

- the assessment activity and context
- the learning outcome(s) to be assessed
- the criteria they are expected to meet
- the time and duration of the assessment.

Wherever possible, centres should adopt a holistic and integrated approach to assessing the units in the qualification. This gives the assessment process greater rigour, minimises repetition and saves time. The focus should be on assessment activities generated through naturally occurring evidence in the workplace rather than on specific tasks. Taken as a whole, the evidence must show the learner meets all learning outcomes and assessment criteria over a period of time. Question and answer sessions should be used to meet the requirements of learning outcome 1. Learners must link and apply their knowledge and understanding to the workplace activities they completed for outcomes 2 and 3. Learners' responses must be at the appropriate breadth and depth to meet the level of demand of the knowledge assessment criteria. It should be clear in the assessment records where each learning outcome and assessment criterion has been covered
and achieved.

Please refer to the guidance on selecting suitable assessment activities for the skills units, available on our website.

Unit 8: Handing Over and Concluding Manufacturing Operations

Level: 2

Unit type: Optional

Assessment type: Internal

Guided Learning Hours: 40

Unit introduction

In a manufacturing role in this sector, you will be expected to either hand over or properly conclude and close down a manufacturing process once it is completed. This is to ensure that the correct number of finished goods or components has been produced and that machines and equipment are left in a clean, safe condition ready for re-use. Where there are problems in the process, you will be expected to take action to solve them.

In this unit, you will learn how to hand over and how to conclude manufacturing operations. You will gain an understanding of how handover procedures, completion checks and shutdown procedures are used in a realistic working environment.

Learning outcomes and assessment criteria

To pass this unit, the learner needs to demonstrate that they can meet all the learning outcomes for the unit. The assessment criteria determine the standard required to achieve the unit.

Learning outcomes		Assessment criteria	
1	Know the relevant information required for handing over manufacturing operations	1.1	Describe how to interpret documentation used when handing over a manufacturing operation
		1.2	Identify when it is safe to hand over a manufacturing operation
		1.3	Describe what pre-handover checks need to be made
		1.4	Describe the procedures used to prepare equipment and the work area
		1.5	Describe the procedures for handling and disposal of waste material
		1.6	Describe how to carry out handover procedures safely and correctly
		1.7	Describe problems that can occur when handing over a manufacturing operation
		1.8	Describe how to solve problems that occur when handing over a manufacturing operation

Learning outcomes		Assessment criteria	
2	Be able to hand over a manufacturing operation	2.1	Work safely at all times, following all necessary safety procedures and requirements
		2.2	Follow correct job instructions and other relevant procedures
		2.3	Carry out pre-handover checks
		2.4	Carry out procedures for disposal of waste material
		2.5	Prepare and hand over equipment and the work area used in manufacturing operations
		2.6	Stop the manufacturing operation and shut down all machines and equipment safely
		2.7	Clean and check all machines, tools and equipment in preparation for handover
		2.8	Complete appropriate handover reporting procedure and confirm handover of a manufacturing operation
		2.9	Identify problems occurring during handover
		2.10	Resolve basic problems during handover within permitted authority
		2.11	Report problems that cannot be solved or are outside permitted authority to an appropriate person

Learning outcomes		Assessment criteria	
3	Know the relevant information required for concluding manufacturing operations	3.1	Explain how to interpret documentation used when concluding a manufacturing operation
		3.2	Describe shutdown procedures for machines or automated equipment
		3.3	Describe the procedures for cleaning and checking machines or automated equipment
		3.4	Describe the procedures for handling and disposal of waste material
		3.5	Describe the procedures for managing materials when concluding a manufacturing operation
		3.6	Describe problems that can occur when concluding and shutting down a manufacturing operation
		3.7	Explain how to solve problems that occur when concluding and shutting down a manufacturing operation
		3.8	Describe the checks that are carried out to confirm completion of a manufacturing operation

Learning outcomes		Assessment criteria	
4	Be able to conclude a manufacturing operation	4.1	Work safely at all times, following all necessary safety procedures and requirements
		4.2	Follow correct job instructions and other relevant procedures to conclude a manufacturing operation
		4.3	Shut down machinery and equipment safely in accordance with job instructions and specified procedures
		4.4	Clean and check machines, tools and equipment ready for future use
		4.5	Remove and store hand tools and portable equipment correctly and safely
		4.6	Dispose of waste material appropriately
		4.7	Transfer finished goods and excess production materials to stock using appropriate procedures
		4.8	Complete appropriate reporting procedure and confirm conclusion of a manufacturing operation
		4.9	Identify problems occurring during completion/shutdown
		4.10	Resolve basic problems during completion/shutdown within permitted authority
		4.11	Report problems that cannot be solved or are outside permitted authority to an appropriate person

Unit content

What needs to be learned
Learning outcome 1: Know the relevant information required for handing over manufacturing operations
1A Handover information for manufacturing operations • Interpretation of documentation, e.g. job instructions, safe working practices, equipment handover instructions, checklists. • Identification of a suitable point in a process when it is safe to hand over, e.g. between process steps, upon completion of a component. • Handover procedures, e.g. pre-handover checks, preparation of machines, equipment and work area, safe handling and disposal of waste. • Typical problems encountered when handing over manufacturing operations, e.g. equipment not up to standard, lack of or miscommunication, non-standard procedures being followed, human error. • Problem resolution, e.g. careful checking of equipment following operational procedures, effective two-way communication, use of logbooks.

What needs to be learned

Learning outcome 2: Be able to hand over a manufacturing operation

2A Handing over manufacturing operations

- Safety procedures, job instructions, safety requirements, pre-handover checks applicable when handing over a manufacturing operation.
- Preparation of equipment (stopping manufacturing processes, machinery, process plant, hand tools, portable tools, material handling equipment, other equipment specific to the operation).
- Preparation of work area (cleaning tools and equipment, equipment and materials correctly placed ready for use, freedom from obstructions and hazards, accessible for material movements).
- Managing waste materials, e.g. disposal of swarf, slugs, scrap material, fluids.
- Handover reporting and documentation, e.g. passing on important information, signing over responsibility.
- Problem identification, e.g. factors causing delay or preventing completion of handover procedures.
- Actions to resolve basic problems, e.g. emptying full scrap bins, obtaining appropriate cleaning materials.
- Reporting problems outside permitted authority, e.g. requesting equipment repair or servicing.
- Staff or departments supporting resolution of problems (supervisor, quality control department, maintenance department).

What needs to be learned

Learning outcome 3: Know the relevant information required for concluding manufacturing operations

3A Information for concluding manufacturing operations

- Documentation (job instructions, safe working practices, equipment shutdown instructions, checklists, dockets, interpretation of documents).
- Close-down procedures (safe cleaning, checking and shutdown of machines or automated equipment, safe handling and disposal of waste, moving materials).
- Checks carried out to confirm completion and close-down of a manufacturing operation, e.g. all machinery in a safe condition, work area clean and clear, checklists in documented procedures.
- Typical problems encountered when concluding manufacturing operations, indications in reported data, causes and possible corrective action.

Learning outcome 4: Be able to conclude a manufacturing operation

4A Concluding manufacturing operations

- Procedures, job instructions and safety requirements applicable when concluding a manufacturing operation.
- Close-down of equipment (machinery, process plant, hand tools, portable tools, material handling equipment, other equipment specific to the operation); safe removal and correct storage of equipment.
- Managing materials (finished goods/components, surplus production materials, surplus consumable materials, waste or scrap materials); transfer to stock, safe disposal of waste.
- Reporting procedures and important data (output, downtime, quality, maintenance requirements, scrap rates, work in progress).
- Practical aspects of data collection and reporting, e.g. use of forms, legibility, accuracy.
- Problem identification, e.g. factors causing delay or preventing completion of procedures.
- Actions to resolve basic problems, e.g. emptying full scrap bins, obtaining appropriate cleaning materials.
- Reporting problems outside permitted authority, e.g. requesting equipment repair or servicing.
- Staff or departments supporting resolution of problems (supervisor, quality control department, maintenance department).

Essential information for tutors and assessors

Assessment

This unit is internally assessed. To pass this unit, the evidence that the learner presents for assessment must demonstrate that they have met the required standard specified in the learning outcomes and assessment criteria.

This unit is to be assessed in the realistic working environment and the evidence is expected to be naturally occurring and collected over a period of time.

Centres are responsible for deciding on the assessment activities that will enable learners to produce valid, sufficient, authentic and appropriate evidence to meet the assessment criteria. Learners must be given a clear assessment brief before the assessment takes place, detailing:

- the assessment activity and context
- the learning outcome(s) to be assessed
- the criteria they are expected to meet
- the time and duration of the assessment.

Wherever possible, centres should adopt a holistic and integrated approach to assessing the units in the qualification. This gives the assessment process greater rigour, minimises repetition and saves time. The focus should be on assessment activities generated through naturally occurring evidence in the workplace rather than on specific tasks. Taken as a whole, the evidence must show the learner meets all learning outcomes and assessment criteria over a period of time. Question and answer sessions should be used to meet the requirements of learning outcomes 1 and 3. Learners must link and apply their knowledge and understanding to the workplace activities they completed for outcomes 2 and 4. Learners' responses must be at the appropriate breadth and depth to meet the level of demand of the knowledge assessment criteria. It should be clear in the assessment records where each learning outcome and assessment criterion has been covered and achieved.

Please refer to the guidance on selecting suitable assessment activities for the skills units, available on our website.

Unit 9: Producing Products by Assembly Operations

Level:	**2**
Unit type:	**Optional**
Assessment type:	**Internal**
Guided Learning Hours:	**60**

Unit introduction

This unit covers the skills and knowledge needed to prove the competences required to carry out product assembly operations that bring together a number of components in a logical sequence to construct an assembly or sub-assembly.

In this unit, you will learn how to work safely to manufacture products by assembly operations, following organisational procedures and job instructions for checking tools, aligning, positioning and fixing components. You will be able to check the quality of your work to minimise faults and waste. You will be able to resolve problems in your area of responsibility or, alternatively, you will understand who to report problems to. You will be able to complete the appropriate documentation and store products securely and safely.

Learning outcomes and assessment criteria

To pass this unit, the learner needs to demonstrate that they can meet all the learning outcomes for the unit. The assessment criteria determine the standard required to achieve the unit.

Learning outcomes		Assessment criteria	
1	Know how to manufacture products by assembly operations	1.1	Describe the relevant health and safety requirements of the assembly operations work area, including actions that need to be taken in case of an emergency
		1.2	Describe the specific safe working practices, assembly procedures and environmental regulations that need to be observed
		1.3	Describe the hazards associated with carrying out the assembly operations and how they can be minimised, including the use of PPE
		1.4	Describe how to obtain and interpret necessary job instructions, operating procedures and assembly specifications
		1.5	Describe how to check that tools and equipment are in a safe and usable condition
		1.6	Describe specific assembly operations that need to be performed, including method for aligning, positioning and fixing components securely in position
		1.7	State the importance of following the specified assembly sequence and procedure at all times
		1.8	Describe the methods to be used to minimise waste during the assembly operation

Learning outcomes		Assessment criteria	
		1.9	Describe how to check the quality of the assembly, against the required quality standards
		1.10	Describe faults, problems and variations which can occur during assembly operations and the allowable adjustments that can be made to achieve the required outcome
		1.11	Describe the documentation to be completed for the assembly operation, and the importance of completing documentation accurately and legibly
		1.12	Describe own responsibilities and those of others within the assembly operation
2	Be able to manufacture products by assembly operations	2.1	Work safely at all times, complying with health and safety, environmental and other relevant regulations and guidelines
		2.2	Follow the relevant assembly procedures, job instructions, equipment/tool operating instructions, quality specifications, company standards and procedures
		2.3	Check that the products have all the necessary components, are undamaged and are in a usable condition
		2.4	Secure the components in position using the specified fastening device/method
		2.5	Select appropriate tools, equipment and materials to manufacture products using appropriate assembly operations

Learning outcomes		Assessment criteria	
		2.6	Monitor and control the assembly operation, identifying faults, variations and/or problems that occur, making permitted adjustments as appropriate
		2.7	Show that adjustments were used to improve the assembly operation and final product
		2.8	Report any problems that cannot be solved, or that are outside permitted authority, to the appropriate person
		2.9	Carry out checks to include completeness of the assembly, component quality and freedom from damage
		2.10	Work to achieve own production targets for output and quality
		2.11	Show that finished products were stored correctly
		2.12	Complete all documentation accurately and legibly according to appropriate procedures

Unit content

What needs to be learned
Learning outcome 1: Know how to manufacture products by assembly operations
1A Monitoring performance • Relevant regulations, guidelines and procedures applicable to a specific work area and assembly operations (health and safety requirements, safe working practices, hazards, control measures, assembly procedures, environmental regulations, emergency procedures, PPE). • Job instructions, assembly specifications and operating procedures (obtaining, interpreting, performing, importance of following). • Tools and equipment (use, safety and operational checks). • Assembly operations (component alignment, positioning, fixing, waste minimisation). • Quality procedures (monitoring variation from specification/quality standards, faults, problems, allowable adjustments). • Documentation (use, importance of accuracy and legibility, lines of communication). • Roles and responsibilities, e.g. working with others, job roles (supervisor, quality control, team leader), lines of communication.

What needs to be learned

Learning outcome 2: Be able to manufacture products by assembly operations

2A Procedures, guidelines and regulations

- Practical application and compliance with relevant regulations, guidelines and procedures (health and safety regulations, environmental regulations, safe working practices, assembly instructions, equipment/tool operating instructions, company standards/procedures, job instructions, quality specifications).

2B Process for carrying out assembly operations

- Process of carrying out assembly operations (quality checks of components and materials, component positioning and fitting, use of necessary tools, equipment and materials).
- Carrying out assembly methods (by hand, manually operated machinery, automated machinery, combined operations).

2C Monitoring performance

- Monitoring and adjusting assembly operations to improve to key performance parameters, e.g. quality, accuracy, material utilisation, safety, productivity, manufacturing changes, reporting problems to those with authority.
- Quality control checks, e.g. component position, orientation, alignment, security, component quality, freedom from damage.
- Monitoring performance, e.g. volume, quantity, quality.
- Dealing with, documenting and booking in finished assemblies, completing all documentation accurately, legibly and according to procedures.

Essential information for tutors and assessors

Assessment

This unit is internally assessed. To pass this unit, the evidence that the learner presents for assessment must demonstrate that they have met the required standard specified in the learning outcomes and assessment criteria.

This unit is to be assessed in the realistic working environment and the evidence is expected to be naturally occurring and collected over a period of time.

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- the assessment activity and context
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- the criteria they are expected to meet
- the time and duration of the assessment.

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Please refer to the guidance on selecting suitable assessment activities for the skills units, available on our website.

Unit 10: Transferring Materials for Manufacturing Operations

Level:	**2**
Unit type:	**Optional**
Assessment type:	**Internal**
Guided Learning Hours:	**60**

Unit introduction

The effective and safe moving of loads, such as components and products, is critical to the workflow in a manufacturing environment. A smooth and safe transference of components and products minimises the risk of accidents and leads to a more efficient manufacturing operation.

In this unit, you will examine relevant statutory regulations and organisational safety requirements to enable you to move loads, efficiently and effectively, in a manufacturing environment. You will investigate potential hazards that could be found in a manufacturing organisation while lifting and moving loads. You will gain the skills and knowledge needed to show that you can transfer, move and transport materials, to their correct location, within a manufacturing operations environment.

Learning outcomes and assessment criteria

To pass this unit, the learner needs to demonstrate that they can meet all the learning outcomes for the unit. The assessment criteria determine the standard required to achieve the unit.

Learning outcomes		Assessment criteria	
1	Know the relevant information required for transferring materials for manufacturing operations	1.1	Outline relevant lifting and moving procedures and safety regulations for manufacturing operations
		1.2	Describe the correct techniques to move materials
		1.3	Identify who to report problems to that you cannot solve or that are outside your permitted authority
2	Be able to transfer materials for manufacturing operations	2.1	Carry out the transfer of materials using different types of equipment
		2.2	Demonstrate safe lifting and carrying techniques in line with organisational procedures and safety regulations
		2.3	Transfer materials safely, ensuring the correct items are safely loaded and secure
3	Be able to deal with problems while transferring materials for manufacturing operations	3.1	Identify problems that occur during material transfer
		3.2	Carry out appropriate actions to solve problems which are within your permitted authority/responsibility
		3.3	Carry out permitted adjustments to solve problems
		3.4	Describe any problems that you cannot solve or that are outside your permitted authority

Unit content

What needs to be learned
Learning outcome 1: Know the relevant information required for transferring materials for manufacturing operations

1A Moving materials safely
• The requirements of health and safety legislation and regulations relating to moving materials safely. The most recent legislation should be taught:
  ○ Health and Safety at Work etc. Act 1974
  ○ Personal and Protective Equipment at Work Regulations 1992
  ○ Manual Handling Operations Regulations 1992
  ○ other current and relevant legislation and regulations applicable to the manufacturing environment, including HSE guidelines.
• Types of instructions, equipment, company standards and procedures applicable to transferring materials, including PPE.
• Importance of tidying away equipment after use.
1B Techniques to move materials
• Lifting alone, with assistance from others, with mechanical assistance, stages of manual lifting.
• Equipment condition, including material weight, suitability for moving, securing the load in place.
1C Reporting problems
• Who to report problems to, depending on the situation, e.g. supervisor, quality controller, production manager.

What needs to be learned

Learning outcome 2: Be able to transfer materials for manufacturing operations

2A Move materials

- Equipment to move materials, including hand operated, e.g. sack barrows, and power operated, e.g. powered pallet trucks.
- Materials to be moved, e.g. raw materials, components, products.
- How to return equipment to its correct location on completion.
- How to complete materials and movement documentation.
- Safe use of PPE.

2B Lifting and carrying

- Correct techniques for lifting alone, lifting with assistance from others.
- Correct techniques for lifting with mechanical assistance, e.g. cranes, hoists.
- Equipment condition, including material weight, suitability for moving, securing the load in place.
- How to maintain materials and movement documentation.
- Safe use of PPE.

2C Material transfer

- The range of items required to facilitate material transfer, e.g. stock, components, assemblies, route card, job card.
- The procedures for safe and secure loading, transferring and unloading, e.g. adherence to current safety regulations in respect of handling and moving, use of PPE.

What needs to be learned

Learning outcome 3: Be able to deal with problems while transferring materials for manufacturing operations

3A Identification of problems

- Range of problems associated with transferring materials, e.g. incorrect routing, incorrect materials, incorrect packaging.
- Equipment suitability, e.g. lack of moving equipment, unsafe, insecure load.
- Lack of personnel, e.g. peers, supervisor.

3B Permitted adjustments

- Range of permitted adjustments according to the problem that has occurred, including equipment condition, e.g. unsafe, inappropriate.
- Material suitability, e.g. irregular, fragile, fluid.
- Securing the load in place using various tie-downs (fasteners, ropes, slings, straps, chains).

3C Reporting problems

- Instances when problems should be reported, including those outside your permitted authority.
- Problems you cannot solve, e.g. related to procedures, repairs to equipment, problems with material supply.
- Procedures for dealing with and reporting problems (what, how, when, to whom), e.g. supervisor, team leader, peers, quality control, production control.

Essential information for tutors and assessors

Essential resources

The following resources will be required: hand- and power-operated moving equipment, mechanical lifting equipment, loads to be lifted/moved/transported, PPE.

Assessment

This unit is internally assessed. To pass this unit, the evidence that the learner presents for assessment must demonstrate that they have met the required standard specified in the learning outcomes and assessment criteria.

This unit is to be assessed in the realistic working environment and the evidence is expected to be naturally occurring and collected over a period of time.

Centres are responsible for deciding on the assessment activities that will enable learners to produce valid, sufficient, authentic and appropriate evidence to meet the assessment criteria. Learners must be given a clear assessment brief before the assessment takes place, detailing:

- the assessment activity and context
- the learning outcome(s) to be assessed
- the criteria they are expected to meet
- the time and duration of the assessment.

Wherever possible, centres should adopt a holistic and integrated approach to assessing the units in the qualification. This gives the assessment process greater rigour, minimises repetition and saves time. The focus should be on assessment activities generated through naturally occurring evidence in the workplace rather than on specific tasks. Taken as a whole, the evidence must show the learner meets all learning outcomes and assessment criteria over a period of time. Question and answer sessions should be used to meet the requirements of learning outcome 1. Learners must link and apply their knowledge and understanding to the workplace activities they completed for outcomes 3 and 4. Learners' responses must be at the appropriate breadth and depth to meet the level of demand of the knowledge assessment criteria. It should be clear in the assessment records where each learning outcome and assessment criterion has been covered and achieved.

Please refer to the guidance on selecting suitable assessment activities for the skills units, available on our website.

Unit 11: Receiving and Checking Incoming Materials for Manufacturing Operations

Level:	**2**
Unit type:	**Optional**
Assessment type:	**Internal**
Guided Learning Hours:	**60**

Unit introduction

The effective and safe receipt of deliveries from internal or external sources such as components and products is critical to the workflow in a manufacturing environment. The smooth and safe receipt of components and products minimises the risk of stopping production and leads to a more efficient manufacturing operation.

In this unit, you will examine relevant statutory regulations and organisational safety requirements to enable you to receive materials, efficiently and effectively, in a manufacturing environment. You will investigate potential problems that could be found in a manufacturing organisation while receiving materials. You will gain the skills and knowledge to show that you can receive and check materials, from and to their correct location, within a manufacturing operations environment.

Learning outcomes and assessment criteria

To pass this unit, the learner needs to demonstrate that they can meet all the learning outcomes for the unit. The assessment criteria determine the standard required to achieve the unit.

Learning outcomes		Assessment criteria	
1	Know the relevant information required for receiving and checking incoming materials for manufacturing operations	1.1	Outline the relevant regulations and procedures for the receipt of the materials
		1.2	Describe the correct job instructions and any relevant material specifications for the receipt of the materials
		1.3	State where to obtain the correct job instructions and relevant material specifications for the receipt of the materials
		1.4	Describe how to correctly prepare the work area for the receipt of the materials
		1.5	Identify who to report problems to that you cannot solve or that are outside your permitted authority
		1.6	Explain the potential problems with carrying out the receipt of materials and how they can be avoided

Learning outcomes		Assessment criteria	
2	Be able to receive and check incoming materials for manufacturing operations	2.1	Interpret job instructions and material specifications in order to receive materials for manufacturing operations
		2.2	Prepare and maintain the work area for different materials safely, as requested by the supervisor or job card/work instructions
		2.3	Carry out the safe receipt of different materials, as requested by the supervisor or job card/work instructions
		2.4	Check that incoming materials for manufacturing operations are in line with job requirements
		2.5	Carry out quality checks on received materials
3	Be able to deal with problems while receiving and checking incoming materials for manufacturing operations	3.1	Resolve any problems with the materials that are within the limits of their responsibility, ensuring the correct items are safely received
		3.2	Report to the appropriate person any problems with the materials that they cannot solve or that are outside their permitted authority

Unit content

What needs to be learned
Learning outcome 1: Know the relevant information required for receiving and checking incoming materials for manufacturing operations
1A Regulations required for receiving and checking incoming materials • The requirements of health, safety and environmental regulations in relation to receiving and checking incoming materials. The most recent legislation should be taught: o Health and Safety at Work etc. Act 1974 o Personal and Protective Equipment at Work Regulations 1992 o Manual Handling Operations Regulations 1992 o other current and relevant legislation and regulations applicable to the manufacturing environment. **1B Job instructions and any relevant material specifications** • Where to obtain job instructions, specification details and specific procedures. • How to interpret job instructions and material specifications. **1C Prepare and maintain the work area for receipt of the materials** • Procedures for receipt of materials from correct locations within given timelines: o quality checks (concerns, damage), approaches to deal with/report in line with their responsibility o accessibility (freedom from obstructions and hazards) o delivery time of material o documents required for material receipt. **1D Report problems** • When and who to report problems to, depending on the situation, e.g. supervisor, quality control, production manager. • Types of problems encountered, e.g. incorrect materials, quality not up to standard, incorrect quantity. • Avoiding problems with materials, e.g. good communications with suppliers, careful checking of documentation, early quality checks of materials, reporting problems straight away.

What needs to be learned
Learning outcome 2: Be able to receive and check incoming materials for manufacturing operations
2A Work area preparations for the receipt of the incoming materials according to specified procedures • Procedures (health and safety and environmental regulations, company procedures, job instructions). • Interpretation of job instructions, procedures and specifications. • Accessibility for receipt and removal of materials (freedom from obstructions and hazards). • correct equipment and material layout. **2B Checking of materials** • Against documentation, including type, quantity, quality. • Delivery time of materials. • Sources of material (external sources, e.g. outside suppliers, delivery companies; internal sources, e.g. different departments, peers). • Location of material, e.g. stores, work area.
Learning outcome 3: Be able to deal with problems while receiving and checking incoming materials for manufacturing operations
3A Resolve problems that are within the limits of their responsibility • Record problems, e.g. shortfall, incorrect products, incorrect date, incorrect time. • Inform internal supplier of error. • reroute materials to the correct area. • Mixed products. • Excess product/materials. **3B Report to the appropriate person any problems that they cannot solve or that are outside their permitted authority** • Problems to report (poor quality, incorrect quantity, incorrect time). • Appropriate person (team leader, production manager, quality controller).

Essential information for tutors and assessors

Assessment

This unit is internally assessed. To pass this unit the evidence that the learner presents for assessment must demonstrate that they have met the required standard specified in the learning outcomes and assessment criteria.

This unit is to be assessed in the realistic working environment and the evidence is expected to be naturally occurring and collected over a period of time.

Centres are responsible for deciding on the assessment activities that will enable learners to produce valid, sufficient, authentic and appropriate evidence to meet the assessment criteria. Learners must be given a clear assessment brief before the assessment takes place, detailing:

- the assessment activity and context
- the learning outcome(s) to be assessed
- the criteria they are expected to meet
- the time and duration of the assessment.

Wherever possible, centres should adopt a holistic and integrated approach to assessing the units in the qualification. This gives the assessment process greater rigour, minimises repetition and saves time. The focus should be on assessment activities generated through naturally occurring evidence in the workplace rather than on specific tasks. Taken as a whole, the evidence must show the learner meets all learning outcomes and assessment criteria over a period of time. Question and answer sessions should be used to meet the requirements of learning outcomes 1. Learners must link and apply their knowledge and understanding to the workplace activities they completed for outcomes 2 and 3. Learners' responses must be at the appropriate breadth and depth to meet the level of demand of the knowledge assessment criteria. It should be clear in the assessment records where each learning outcome and assessment criterion has been covered and achieved.

Please refer to the guidance on selecting suitable assessment activities for the skills units, available on our website.

Unit 12: Producing Products by Processing

Level:	**2**
Unit type:	**Optional**
Assessment type:	**Internal**
Guided Learning Hours:	**60**

Unit introduction

The effective and safe production of products by processing is critical to the workflow in a manufacturing environment. An orderly production process minimises the risk of stopping production and leads to a more efficient manufacturing operation.

In this unit, you will examine relevant statutory regulations and organisational safety requirements to enable you to produce products by different processes, efficiently and effectively, in a manufacturing environment.

You will know where to obtain and how to interpret work instructions and will outline the sequence of events in the production process. You will explain potential problems in the production process and identify who to report problems to that you cannot solve or that are outside your permitted authority.

You will produce products, part/sub-assembly or components according to work instructions and operating procedures, and will monitor and control the production operation, making adjustments as necessary within your permitted authority. You will check that materials are in line with work requirements, minimising any waste and ensuring that the completed products are to the required specification. You will resolve any problems that occur within your permitted authority and report to the appropriate person any problems that you are unable to resolve.

Learning outcomes and assessment criteria

To pass this unit, the learner needs to demonstrate that they can meet all the learning outcomes for the unit. The assessment criteria determine the standard required to achieve the unit.

Learning outcomes		Assessment criteria	
1	Know the relevant information required for producing products by processing	1.1	Outline relevant regulations and procedures for producing products by processing
		1.2	Describe the correct work instructions, relevant processing procedure and quality specifications for producing products by processing
		1.3	State where to obtain the correct work instructions, relevant processing procedure and quality specifications for producing products by processing
		1.4	Describe the predefined sequence of events required for producing products by processing
		1.5	State who to report problems to that you cannot solve or that are outside your permitted authority
		1.6	Explain the potential problems with producing products by processing and how they can be avoided

Learning outcomes		Assessment criteria	
2	Be able to produce products by processing	2.1	Interpret work instructions, relevant processing, safety, environmental procedures and quality specifications required for producing products by processing
		2.2	Check that materials for producing products by processing are in line with job requirements and quality standards
		2.3	Prepare and maintain the work area for products by processing
		2.4	Carry out processing operations to produce products
3	Be able to deal with problems while producing products by processing	3.1	Identify problems that occur during the production of products by processing
		3.2	Resolve problems with producing products by processing that are within the limits of their own responsibility
		3.3	Report to the appropriate person any problems with producing products by processing that they cannot solve or that are outside their permitted authority

Unit content

What needs to be learned
Learning outcome 1: Know the relevant information required for producing products by processing
1A Regulations and company procedures required for producing products by processing • Current health, safety and environmental regulations. • Company procedures. • Job instructions. • Processing equipment tool operating instructions. **1B Work instructions and processing procedures** • Work instructions (operation documentation, specification details and specific procedures, SOPs, quality documentation). • How to interpret work instructions, specification details and specific procedures. **1C Obtain information required for producing products by processing** • Where to obtain work instructions, specification details and specific procedures, SOPs, quality documentation. **1D Sequence of events required for producing products by processing** • Receive work instruction from your supervisor. • Working instructions, e.g. planning, drawings, quality documents, specification, job cards. • Source appropriate material and tooling. **1E Problem reporting** • When and who to report problems to, depending on the situation, e.g. supervisor, quality controller, production manager. • Types of problems encountered, e.g. incorrect materials, quality not up to standard, process inoperable. • Avoiding problems with process, e.g. careful checking of documentation, early quality checks of materials/product, reporting problems straight away.

What needs to be learned

Learning outcome 2: Be able to produce products by processing

2A Preparation of the work area for processing procedures

- Procedures for processing of materials within given timescales:
  - documents required for processing of materials (operating instructions, specification details, specific procedures, process timings, health and safety and environmental)
  - quality checks (concerns, damage to process/product), deal with/report in line with their responsibility.
- Procedure to stop or restart process safely.
- Correct process layout, e.g. tooling, material, quality instruments, receipt and removal of product, removal of waste.

2B Carry out the production of products by processing safely

- Hand-processing operations, e.g. heat treatment, mixing of materials.
- Manually operated machine processing operations, e.g. photo process operations, drilling/milling using jigs and fixtures.
- Fully-automated machine-processing operations, e.g. packaging, food processing, photo process operations, assembly operations.
- Combined processing operations.
- Safe disposal of waste.

2C Checking of equipment, tools, materials and produce

- Against documentation, including type, quantity, quality, correct volume.
- Location of material and tooling, e.g. stores, work area.
- Monitoring produce (during/after production).
- Recording of quality (check sheets, terminology), correct tools and equipment in working order and safety checked.

What needs to be learned
Learning outcome 3: Be able to deal with problems while producing products by processing
3A Problem resolution within the limits of their own responsibility • Record problems, e.g. shortfall, incorrect materials, incorrect process times, incorrect from previous operation, incorrect documentation. **3B Problem reporting that cannot be solved/outside permitted authority** • Problems to report (poor quality, excess quantity, incorrect time to produce, incorrect quantity, production targets, lack of control of process, damage to process/product, damage to tooling). • Appropriate person (team leader, production manager, quality controller).

Essential information for tutors and assessors

Assessment

This unit is internally assessed. To pass this unit, the evidence that the learner presents for assessment must demonstrate that they have met the required standard specified in the learning outcomes and assessment criteria.

This unit is to be assessed in the realistic working environment and the evidence is expected to be naturally occurring and collected over a period of time.

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- the assessment activity and context
- the learning outcome(s) to be assessed
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Unit 13: Finishing Products

Level:	**2**
Unit type:	**Optional**
Assessment Type:	**Internal**
Guided Learning Hours:	**60**

Unit introduction

This unit covers the skills and knowledge needed to demonstrate competence when carrying out finishing operations on materials or products. The finishing operations are used to enhance appearance, increase protection or improve the safety properties of the materials or products. Examples could be applying decorative coatings, applying protective coatings or removing sharp edges.

In this unit you will learn how to safely carry out finishing operations, following job instructions and operational procedures. You will gain the skills to competently use correct finishing tools, equipment and materials, monitor and control the operation and check the quality of the finished products. You will understand the types of faults that can occur and how to minimise waste. You will know who to report problems to that you cannot resolve yourself or that are outside your area of responsibility. You will work towards your own production targets and be able to complete all relevant documentation correctly and legibly.

Learning outcomes and assessment criteria

To pass this unit, the learner needs to demonstrate that they can meet all the learning outcomes for the unit. The assessment criteria determine the standard required to achieve the unit.

Learning outcomes		Assessment criteria	
1	Understand the organisational procedures, health and safety legislation, environmental regulations and quality standards applicable to the finishing of products	1.1	Describe the health and safety requirements, specific safe working practices and environmental regulations relating to the finishing operations work area
		1.2	Describe hazards associated with carrying out finishing operations and actions to be taken in the event of an emergency
		1.3	Describe how to obtain and interpret the necessary job instructions, operating procedures and finishing specifications
		1.4	Describe how to check the quality of the finished components against the required quality standards
		1.5	Describe job roles and own responsibilities with regard to the reporting lines and procedures in the working area

Learning outcomes		Assessment criteria	
2	Know how to safely finish products to an approved standard	2.1	Describe tools and equipment to be used for finishing purposes and how to check they are fit for purpose
		2.2	Explain how to operate, monitor and control the finishing equipment to achieve the required specification
		2.3	Describe the methods or procedures used to minimise waste during the finishing operation
		2.4	Explain the types of faults, problems or variations that can occur in the finishing operation and how to deal with them
		2.5	Explain why it is important to report faults, variations or problems that are outside own permitted authority and/or cannot be solved
3	Be able to safely carry out finishing operations	3.1	Work safely at all times, complying with all necessary safe working practices, health and safety requirements and environmental guidelines
		3.2	Apply correct procedures when carrying out a finishing operation
		3.3	Use correct finishing tools, equipment and materials to carry out a finishing operation
		3.4	Produce finished products which comply with the finishing specification and quality requirements
		3.5	Carry out quality checks of the finished products to ensure conformity with required standards

Learning outcomes		Assessment criteria	
4	Be able to monitor own performance when carrying out finishing operations	4.1	Monitor and control the finishing operation and make permitted adjustments to solve production faults or problems
		4.2	Report to the appropriate person any problems that cannot be solved or that are outside permitted authority
		4.3	Work to achieve own production targets, showing how you monitored your output volume and quality
		4.4	Complete all necessary documentation accurately and legibly for finished products or components

Unit content

What needs to be learned
Learning outcome 1: Understand the organisational procedures, health and safety legislation, environmental regulations and quality standards applicable to the finishing of products
1A Procedures, guidelines and regulations • Obtaining and interpreting job instructions – relevant regulations, guidelines and procedures applicable to a specific work area for finishing operations, e.g. health and safety requirements, safe working practices, job instructions, finishing specifications, operating procedures, environmental regulations. • Hazards associated with finishing operations, e.g. skin contact with aggressive chemicals, fumes from liquid coatings, metallic dust, high temperatures, grit and swarf. **1B Monitoring performance** • Quality checking (monitoring variation from specification/quality standards, faults, problems, allowable adjustments). • Documentation (use, importance of accuracy and legibility, lines of communication). • Roles and responsibilities, e.g. working with others, job roles (supervisor, quality controller, team leader), lines of communication.

What needs to be learned

Learning outcome 2: Know how to safely finish products to an approved standard

2A Processes for carrying out finishing operations

- Tools and equipment (use, safety and operational checks).
- Finishing operations, e.g. de-burring, brush painting, spray painting, powder coating.
- Finishing work methods (operation of equipment, monitoring and adjustment of equipment settings to achieve required finish, minimisation of waste).

2B Faults and problems

- Identification, e.g. visual inspection, checks using measuring equipment, non-conformity when surface finishing batches of components.
- Resolving problems, e.g. rework, modify finishing procedure, product redesign.
- Reporting, e.g. inspection records (paper/'e' systems), verbal to supervisor.

Learning outcome 3: Be able to safely carry out finishing operations

3A Procedures, guidelines and regulations

- Practical application and compliance with relevant regulations, guidelines and procedures (health and safety regulations, environmental regulations, safe working practices, job instructions, finishing equipment/tool operating instructions, company standards/procedures, job instructions, finishing procedures, quality specifications).

3B Finishing operations

- Processes used to carry out finishing operations (preparation, use of appropriate tools and equipment, quality checks).
- Carrying out finishing operations, e.g. by hand, manually operated machinery, automated machinery, combined operations.
- Quality control checks, e.g. completeness, quality of appearance, freedom from damage (deformity, contamination), product complies with finishing specification.

What needs to be learned

Learning outcome 4: Be able to monitor own performance when carrying out finishing operations

4A Monitoring performance

- Monitoring and adjusting finishing operations to improve to key performance parameters, e.g. quality, accuracy, material utilisation, safety, productivity, manufacturing changes, minimisation of waste.
- Monitoring own performance, e.g. volume, quantity, quality, meeting set production targets.
- Reporting problems to an appropriate person, e.g. line manager, supervisor, colleague.
- Resolving production problems, e.g. reviewing processes used, pausing production until problem(s) resolved, reference to surface coating manufacturer's data sheets.

4B Completion documentation

- Documenting data about finished products, e.g. production targets achieved/not achieved, inspection records.
- Hand over documentation if the finishing process is a 24/7 operation.

Essential information for tutors and assessors

Assessment

This unit is internally assessed. To pass this unit, the evidence that the learner presents for assessment must demonstrate that they have met the required standard specified in the learning outcomes and assessment criteria.

This unit is to be assessed in the realistic working environment and the evidence is expected to be naturally occurring and collected over a period of time.

Centres are responsible for deciding on the assessment activities that will enable learners to produce valid, sufficient, authentic and appropriate evidence to meet the assessment criteria. Learners must be given a clear assessment brief before the assessment takes place, detailing:

- the assessment activity and context
- the learning outcome(s) to be assessed
- the criteria they are expected to meet
- the time and duration of the assessment.

Wherever possible, centres should adopt a holistic and integrated approach to assessing the units in the qualification. This gives the assessment process greater rigour, minimises repetition and saves time. The focus should be on assessment activities generated through naturally occurring evidence in the workplace rather than on specific tasks. Taken as a whole, the evidence must show the learner meets all learning outcomes and assessment criteria over a period of time. Question and answer sessions should be used to meet the requirements of learning outcomes 1 and 2. Learners must link and apply their knowledge and understanding to the workplace activities they completed for outcomes 3 and 4. Learners' responses must be at the appropriate breadth and depth to meet the level of demand of the knowledge assessment criteria. It should be clear in the assessment records where each learning outcome and assessment criterion has been covered and achieved.

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Unit 14: Analysing the Results of Inspection and Confirming Quality of Production

Level:	**2**
Unit type:	**Optional**
Assessment type:	**Internal**
Guided Learning Hours:	**60**

Unit introduction

In a quality assurance role in this sector, you will be expected to analyse and interpret the results of inspection and testing for a range of products and components. This is to enable you to correctly identify problems with either purchased or manufactured goods in your organisation. These problems can then be addressed immediately to minimise their impact on cost, production time and the overall quality expectations of your customers.

In this unit, you will be asked to analyse quality inspection data, compare your results to given quality control requirements and report your findings appropriately.

Learning outcomes and assessment criteria

To pass this unit, the learner needs to demonstrate that they can meet all the learning outcomes for the unit. The assessment criteria determine the standard required to achieve the unit.

Learning outcomes		Assessment criteria	
1	Understand the relevant information required to analyse the results of inspection and confirm quality of production	1.1	Explain why the correct interpretation of inspection data is important in a manufacturing operation
		1.2	Explain how to use procedures and documentation in the analysis of inspection test results
		1.3	State the importance of following specified procedures to analyse inspection test results
		1.4	Describe how quality inspection data is collected, processed and displayed
		1.5	Describe how to interpret inspection results from different sampling methods, inspection and testing procedures and product types
		1.6	Describe how results from the interpretation of inspection data are recorded and reported to an appropriate person
		1.7	Describe the actions to be taken when samples are found to be of unacceptable quality
		1.8	Describe potential problems associated with analysing inspection data and how they might be resolved

Learning outcomes		Assessment criteria	
2	Be able to analyse the results of inspection and confirm the quality of production	2.1	Work safely at all times, following all relevant safe working practices and safety regulations
		2.2	Process and display inspection data from a range of product types
		2.3	Interpret inspection data from a range of product types
		2.4	Distinguish accurately between materials and products which meet specified quality requirements and those that do not
		2.5	Record the results of interpretation of inspection data for a range of product types
		2.6	Take appropriate action to identify and isolate materials and products not meeting specified quality requirements
		2.7	Report the results and interpretation of inspection data to an appropriate person
3	Be able to deal with problems when analysing results of inspection and confirming the quality of production	3.1	Identify problems or issues affecting the analysis or reporting of inspection results
		3.2	Propose feasible solutions to problems affecting analysis or reporting of inspection results
		3.3	Report problems or issues and suggested solutions to an appropriate person

Unit content

What needs to be learned
Learning outcome 1: Understand the relevant information required to analyse the results of inspection and confirm quality of production
1A Analysing results of inspection • Importance of efficient, accurate and timely analysis and reporting of quality inspection data. • Interpreting documentation, e.g. job instructions, limits/tolerances, quality control specifications, engineering drawings, test procedures. • Stages of analysis (data collection, recording, processing, display, interpretation of inspection results from sampling). • Sampling methodologies (first off, random, defined, final). • Product types (raw material or purchased component, manufactured component, finished product). • Types and use of inspection and testing procedures (visual inspection, measurement, functional operation). **1B Confirming quality of production** • Recording, processing and displaying inspection data, e.g. inspection forms, tables, charts and graphs. • Recording and reporting the results of interpretation of inspection data analysis, e.g. completing and sending completed inspection reports. • Common issues or problems encountered during analysis of quality inspection data, e.g. ability to process data quickly enough, reliability of data, potential issues that lie outside existing inspection criteria. • Appropriate people, e.g. team leader, production supervisor, quality control supervisor. • Actions taken when inspection samples are outside required quality, e.g. stock quarantine, labelling.

What needs to be learned
Learning outcome 2: Be able to analyse the results of inspection and confirm the quality of production
2A Manufacturing methods and procedures • Manufacturing methods, e.g. hand manufacturing, manually operated machine operations, computer-controlled operations, fully-automated processes. • Procedures and safety requirements for sampling, inspection and analysis activities, e.g. health and safety and environmental regulations, safe working practices, machinery/equipment safety procedures, company standards and procedures. **2B Processing, analysing and reporting inspection data** • Practical aspects of processing, analysing and reporting inspection data, e.g. data storage, spreadsheet calculations, drawing charts/graphs.
Learning outcome 3: Be able to deal with problems when analysing results of inspection and confirming the quality of production
3A Problems when analysing results • Practical aspects of dealing with common problems encountered during processing, analysis and reporting of inspection data, e.g. use of spreadsheets to speed up data processing. • Identifying and proposing solutions to problems related to the processing, analysis and reporting of data. • Identifying and reporting problems or issues beyond the scope of own authority, e.g. changes to existing procedures.

Essential information for tutors and assessors

Assessment

This unit is internally assessed. To pass this unit, the evidence that the learner presents for assessment must demonstrate that they have met the required standard specified in the learning outcomes and assessment criteria.

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- the learning outcome(s) to be assessed
- the criteria they are expected to meet
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Please refer to the guidance on selecting suitable assessment activities for the skills units, available on our website.

Unit 15: Carrying Out Inspection and Testing Activities

Level:	**2**
Unit type:	**Optional**
Assessment type:	**Internal**
Guided Learning Hours:	**60**

Unit introduction

In a quality assurance role in this sector, you will be expected to carry out sampling, quality inspection and testing on a range of products and components. This is to ensure that any problems with either purchased or manufactured goods in your organisation are quickly identified. These problems can then be addressed immediately to minimise their impact on cost, production time and the overall quality expectations of your customers.

In this unit, you will safely conduct a range of sampling, testing and inspection procedures. You will gain an understanding of the importance of these procedures and how they are organised and carried out in a realistic working environment.

Learning outcomes and assessment criteria

To pass this unit, the learner needs to demonstrate that they can meet all the learning outcomes for the unit. The assessment criteria determine the standard required to achieve the unit.

Learning outcomes		Assessment criteria	
1	Know the relevant information required for carrying out inspection and testing activities in a manufacturing environment	1.1	Explain why inspection and testing are important in a manufacturing operation
		1.2	Describe how to use documentation to define inspection and test procedures
		1.3	Describe types and uses of inspection and test equipment
		1.4	Describe sampling methods used to carry out inspection and testing activities
		1.5	State the importance of following specified sampling, inspection and test procedures
		1.6	Describe potential problems associated with carrying out sampling, inspection and testing and how they might be resolved
		1.7	Describe methods of recording quality inspection data derived from inspection and testing activities
		1.8	State why it is important to record and report faults, variations or problems immediately

Learning outcomes		Assessment criteria	
2	Be able to carry out inspection and testing activities in a manufacturing environment	2.1	Work safely at all times, following all relevant safe working practices and safety requirements
		2.2	Sample and inspect raw materials, purchased components, manufactured components and finished products safely, following the correct procedures
		2.3	Record inspection data for raw materials, purchased components, manufactured components and finished products appropriately
		2.4	Present completed inspection records to an appropriate person
3	Be able to deal with problems during inspection and testing activities in a manufacturing environment	3.1	Identify problems or issues affecting sampling, inspection or recording of data
		3.2	Propose feasible solutions to problems affecting sampling, inspection or recording of data
		3.3	Report problems or issues and suggested solutions to an appropriate person

Unit content

What needs to be learned
Learning outcome 1: Know the relevant information required for carrying out inspection and testing activities in a manufacturing environment
1A Importance of inspection and testing in engineering • Importance of efficient, accurate and timely quality inspection, e.g. identifying quality problems early, minimising waste, meeting the requirements of specification, maintaining product quality. **1B Documentation** • Interpreting documentation, e.g. job instructions, sampling instructions, quality control specifications, engineering drawings, test procedures. **1C Types and uses of inspection equipment** • Types and uses of inspection equipment, e.g. callipers, micrometer, surface roughness gauge, go/no-go gauges. • Types and uses of functional testing equipment, e.g. mechanical test fixtures, electrical test rigs. **1D Inspection and testing procedures** • Importance of following specified inspection and testing procedures. • Sampling procedure types (first off, random, defined, final). • Elements of a typical sampling procedure, e.g. type, number of samples, sample size, source, time/frequency. • Types and uses of inspection procedures (visual inspection, measurement, functional operation). **1E Inspection records and reporting procedures** • Recording inspection data, e.g. inspection forms, tables, paper-based and electronic systems. • Reporting procedures, e.g. sending completed inspection reports, reporting problems. • Reporting of faults and variations, e.g. when to report them, who to report them to. • Appropriate people, e.g. team leader, production supervisor, quality control supervisor.

What needs to be learned
1F Common problems • Common issues or problems encountered during sampling and inspection that might affect safety, efficiency or accuracy, e.g. measuring equipment calibration overdue.
Learning outcome 2: Be able to carry out inspection and testing activities in a manufacturing environment
2A Safe working • Procedures and safety requirements for sampling and inspection activities, e.g. health and safety and environmental regulations, safe working practices, machinery/equipment safety procedures, company standards and procedures. **2B Sampling and inspection** • Practical aspects of safe sampling, inspection and data collection, e.g. storage and preparation of samples. • Manufacturing methods, e.g. hand manufacturing, manually operated machine operations, computer-controlled operations, fully automated processes. • Product types (raw materials, purchased components, manufactured components, finished products). **2C Inspection records and reporting procedures** • Completion of inspection records, e.g. filling in forms fully and legibly. • Reporting, e.g. communication methods, identifying appropriate people to report to.
Learning outcome 3: Be able to deal with problems during inspection and testing activities in a manufacturing environment
3A Common problems • Practical aspects of dealing with problems encountered during sampling, inspection and data collection, e.g. exchanging measuring equipment for equipment with current calibration certificate. **3B Reporting procedures** • Identifying and reporting problems or issues beyond the scope of own authority, e.g. requesting manufacture of test fixture to speed up inspection.

Essential information for tutors and assessors

Essential resources

The following special resources are needed for this unit: inspection and testing equipment appropriate to the content and assessment criteria, for example callipers, micrometer, surface roughness gauge, go/no-go gauges, mechanical test fixtures, electrical testing rigs.

Assessment

This unit is internally assessed. To pass this unit, the evidence that the learner presents for assessment must demonstrate that they have met the required standard specified in the learning outcomes and assessment criteria.

This unit is to be assessed in the realistic working environment and the evidence is expected to be naturally occurring and collected over a period of time.

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- the assessment activity and context
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- the time and duration of the assessment.

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Unit 16: Recording and Reporting Inspection Test Results

Level: 2

Unit type: Optional

Assessment type: Internal

Guided Learning Hours: 60

Unit introduction

In a quality assurance role in this sector, you will be expected to record and report inspection test results for a range of product and component types. This will enable problems with either purchased or manufactured goods to be identified and addressed quickly.

In this unit, you will be asked to complete quality control documentation and report results to appropriate people in line with organisational procedures.

Learning outcomes and assessment criteria

To pass this unit, the learner needs to demonstrate that they can meet all the learning outcomes for the unit. The assessment criteria determine the standard required to achieve the unit.

Learning outcomes		Assessment criteria	
1	Know the relevant information required to analyse the results of inspection and confirm quality of production	1.1	Explain why accurate recording and reporting of inspection test results are important in a manufacturing operation
		1.2	Explain how to interpret procedures and documentation used to record and report inspection test results
		1.3	State the importance of following specified procedures to record and report inspection test results
		1.4	Describe how to complete quality control records for different quality control sampling methods
		1.5	Describe how to complete quality control records for different types of inspection and testing procedures
		1.6	Describe how to complete quality control records for different product types
		1.7	State the points in the manufacturing process at which quality control documentation should be completed
		1.8	Describe the importance of completing quality control documentation legibly
		1.9	State to whom quality control documentation is passed when completed

Learning outcomes		Assessment criteria	
		1.10	Describe potential problems associated with completing quality records and passing on reports and how they might be resolved
2	Be able to analyse the results of inspection and confirm the quality of production	2.1	Work safely at all times, following all relevant safe working practices and safety requirements
		2.2	Obtain correct quality control documentation for a range of products
		2.3	Record and report inspection data for a range of product types
		2.4	Record and report inspection data for a range of sampling methods
		2.5	Record and report inspection data for a range of inspection or testing procedure types
		2.6	Record and report inspection data for a range of manufacturing methods
		2.7	Record inspection data in a range of appropriate formats
		2.8	Complete all relevant sections of inspection documentation legibly and accurately
		2.9	Pass completed records to an appropriate person

Learning outcomes		Assessment criteria	
3	Be able to deal with problems while recording and reporting inspection and test results	3.1	Show effective use of manual and electronic formats for recording test inspection results
		3.2	Show, using the appropriate documentation, that inspection and test records are complete, accurate and legible
		3.3	Identify problems or issues affecting recording or reporting of inspection results
		3.4	Propose feasible solutions to problems affecting recording or reporting of inspection results
		3.5	Report problems or issues and suggested solutions to an appropriate person

Unit content

What needs to be learned
Learning outcome 1: Know the relevant information required to analyse the results of inspection and confirm quality of production
1A Information to analyse inspection results • Importance of efficient, accurate and timely recording and reporting of quality inspection results. • Interpreting documentation, e.g. job instructions, limits/tolerances, quality control specifications, engineering drawings, test procedures. • Sampling methodologies (first off, random, defined, final). • Product types (raw material or purchased component, manufactured component, finished product). • Types and use of inspection and testing procedures (visual inspection, measurement, functional operation). • Recording inspection data related to sampling methodologies, e.g. inspection forms, tables, charts, graphs, spreadsheets. • Importance of timing, use of correct documentation, completeness and legibility when completing quality records. • Reporting inspection results, e.g. lines of communication. • Appropriate people to whom quality control documentation is passed, e.g. team leader, production supervisor, quality control supervisor. • Common issues or problems encountered during recording and reporting, e.g. ability to record data quickly enough.

What needs to be learned
Learning outcome 2: Be able to analyse the results of inspection and confirm the quality of production
2A Analysis of inspection results • Manufacturing methods, e.g. hand manufacturing, manually operated machine operations, computer-controlled operations, fully-automated processes. • Procedures and safety requirements for recording and reporting inspection test data, e.g. health and safety and environmental regulations, safe working practices, machinery/equipment safety procedures, company standards and procedures. • Formats for recording inspection test results (tick list, written, table, electronic). • Communication methods (verbal, handwritten, electronic). • Practical aspects of recording and reporting inspection test results, e.g. completing forms, electronic data storage, spreadsheets, lines of communication, reporting to responsible people.
Learning outcome 3: Be able to deal with problems while recording and reporting inspection and test results
3A Problem resolution • Use a range of communication methods to confirm results of inspections. • Practical aspects of dealing with common problems encountered during recording and reporting inspection and test results, e.g. use of email to speed up reporting. • Identifying and reporting problems or issues beyond the scope of own authority, e.g. changes to existing procedures.

Essential information for tutors and assessors

Assessment

This unit is internally assessed. To pass this unit, the evidence that the learner presents for assessment must demonstrate that they have met the required standard specified in the learning outcomes and assessment criteria.

This unit is to be assessed in the realistic working environment and the evidence is expected to be naturally occurring and collected over a period of time.

Centres are responsible for deciding on the assessment activities that will enable learners to produce valid, sufficient, authentic and appropriate evidence to meet the assessment criteria. Learners must be given a clear assessment brief before the assessment takes place, detailing:

- the assessment activity and context
- the learning outcome(s) to be assessed
- the criteria they are expected to meet
- the time and duration of the assessment.

Wherever possible, centres should adopt a holistic and integrated approach to assessing the units in the qualification. This gives the assessment process greater rigour, minimises repetition and saves time. The focus should be on assessment activities generated through naturally occurring evidence in the workplace rather than on specific tasks. Taken as a whole, the evidence must show the learner meets all learning outcomes and assessment criteria over a period of time. Question and answer sessions should be used to meet the requirements of learning outcome 1. Learners must link and apply their knowledge and understanding to the workplace activities they completed for outcomes 3 and 4. Learners' responses must be at the appropriate breadth and depth to meet the level of demand of the knowledge assessment criteria. It should be clear in the assessment records where each learning outcome and assessment criterion has been covered and achieved.

Please refer to the guidance on selecting suitable assessment activities for the skills units, available on our website.

13 Suggested teaching resources

This section lists resource materials that can be used to support the delivery of the units across the qualification.

Textbooks

Bicheno J – *The Lean Toolbox* (Picsie Press, 2016) ISBN 978-0956830753

Brenig-Jones M, Morgan J – *Lean Six Sigma for Dummies* (John Whiley & Sons, 2015) ISBN 978-1119067351

Boyce A, Clarke S, Darbyshire A, Mantovani B and Weatherill B – *BTEC Level 2 First Engineering Teaching Resource Pack* (Pearson, 2010) ISBN 9781846907258

Clarke S, Darbyshire A, Goulden S, Hallgarth C, Watkins N − *BTEC First in Engineering Student Book (Level 2 BTEC First Engineering)* (Pearson Education 26 Jun. 2013) ISBN-13: 978-1446902431

George M L, Maxey J, Rowlands D, Price, M − *The Lean Six Sigma Pocket Toolbook: A Quick Reference Guide to 100 Tools for Improving Quality and Speed: A Quick Reference Guide to 70 Tools for Improving Quality and Speed* (Mcgraw Hill 2004) ISBN 978-0071441193

Grimwood T, Scanlon S, Tooley M, Tooley R − *Performing Engineering Operations − Level 2 Student Book plus options (Performing Engineering operations)* (Heinemann 14 May 2012) ISBN-13: 978-043507507

Health and Safety Executive – *Essentials of Health and Safety at Work* (HSE Books, 2006) ISBN 9780717661794

Health and Safety Executive – *Health and Safety in Engineering Workshops* (HSE Books, 2004) ISBN 9780717617173

Imai M – Gemba Kaizen − *A Commonsense Low Cost Approach to Management* (McGraw-Hill, 2012) ISBN 978-0071790352

Womack J and Jones D – *Lean Thinking* (Simon & SchusterFree Press, 2003) ISBN 978-0743231640

Journals

International Journal of Operations and Production Management

Websites

www.freestudy.co.uk	Engineering Council open learning tutorials
www.hse.org	Health and Safety Executive
www.gov.uk	Official government website that explains all legislation
http://leanmanufacturingtools.org/	Provides resources and information on lean manufacturing techniques
www.theleangroup.co.uk	Provides advice on lean principles and case studies
www.leanproduction.com/	Provides resources and information on lean manufacturing techniques
www.pwemag.co.uk	Plant and Works Engineering Magazine
https://searcherp.techtarget.com/definition/kaizen-or-continuous-improvement	Provides advice on Kaizen Principles

14 Further information and useful publications

To get in touch with us, visit our 'Contact us' pages:

Edexcel, BTEC and Pearson Work Based Learning contact details: qualifications.pearson.com/en/support/contact-us.html

Books, software and online resources for UK schools and colleges: www.pearsonschoolsandfecolleges.co.uk

Key publications

- *Access and arrangements and reasonable adjustments* (JCQ)
- *A guide to recruiting with integrity and enrolling learners onto qualifications* (Pearson)
- *A guide to the special consideration process* (JCQ)
- *BTEC Centre Guide to Managing Quality* (Pearson)
- *BTEC UK Quality Assurance Centre Handbook* (Pearson)
- *Collaborative and consortium arrangements for the delivery of vocational qualifications policy* (Pearson)
- *Enquiries and appeals about Pearson vocational qualifications policy* (Pearson)
- *Equality, diversity and inclusion policy* (Pearson)
- *Recognition of prior learning policy and process* (Pearson)
- *Supplementary guidance for reasonable adjustment and special consideration in vocational internally assessed units* (Pearson)
- *Suspected malpractice in examinations and assessments – policies and procedures* (JCQ)
- *UK Information Manual* (Pearson)
- *Use of languages in qualifications policy* (Pearson)

All of these publications are available on our website.

Publications on the quality assurance of BTEC qualifications are also available on our website.

Our publications catalogue lists all the material available to support our qualifications. To access the catalogue and order publications, please visit our website.

Additional resources

If you need further learning and teaching materials to support planning and delivery for your learners, there is a wide range of BTEC resources available.

Any publisher can seek endorsement for their resources and, if they are successful, we will list their BTEC resources on our website.

15 Professional development and training

Pearson supports UK and international customers with training related to BTEC qualifications. This support is available through a choice of training options offered on our website.

The support we offer focuses on a range of issues, such as:

- planning for the delivery of a new programme
- planning for assessment and grading
- developing effective assignments
- building your team and teamwork skills
- developing learner-centred learning and teaching approaches
- building in effective and efficient quality assurance systems.

The national programme of training we offer is on our website. You can request centre-based training through the website or you can contact one of our advisers in the Training from Pearson UK team via Customer Services to discuss your training needs.

BTEC training and support for the lifetime of the qualifications

Training and networks: our training programme ranges from free introductory events through sector-specific opportunities to detailed training on all aspects of delivery, assignments and assessment. We also host some regional network events to allow you to share your experiences, ideas and best practice with BTEC colleagues in your region.

Regional support: our team of Curriculum Development Managers and Curriculum Support Consultants, based around the country, is responsible for providing advice and support in centres. They can help you with planning and curriculum developments.

To get in touch with our dedicated support teams, please visit our website.

Your Pearson support team

Whether you want to talk to a sector specialist, browse online or submit your query for an individual response, there's someone in our Pearson support team to help you whenever – and however – you need:

- Subject Advisors: find out more about our subject advisor team – immediate, reliable support from a fellow subject expert.
- Ask the Expert: submit your question online to our Ask the Expert online service and we will make sure your query is handled by a subject specialist.

Please visit our website at qualifications.pearson.com/en/support/contact-us.html

Annexe A

Glossary of terms used in assessment criteria

This is a summary of the key terms used to define the assessment requirements in the units.

Term	Definition
Define	Specify exactly the meaning, nature or scope of something. The use of correct terminology is expected.
Describe	Give a clear account in their own words, including all the relevant information (e.g. qualities, characteristics or events, etc.). Description shows recall and in some cases application.
Demonstrate	Performance or practice evidences the ability to carry out and apply knowledge, understanding and/or skills in a practical situation.
Explain	Provide details and give reasons, examples and/or evidence to support an argument or point. *OR* Provide details and give relevant examples to clarify and extend a point. This would usually be in the context of learners showing their understanding of a technical concept or principle.
Identify	Show the main features or purpose of something. Can recognise it and/or name characteristics or facts that relate to it.
Interpret	State the meaning, purpose or qualities of something through the use of images, words or other expressions.

Term	Definition
List	Presentation of specific, required information in a structured format. Essentially a recall of learned information, although this can be quite complex information.
Outline	A description setting out the main characteristics or points; write a clear description but without going into too much detail.
Record	Systematically retain or refine information using various media in formats that are appropriate to the task or response to an assignment or brief.
Report	Adhere to protocols, codes and conventions where matters, findings or judgements are set down in an objective way.
Select	Choose the best or most suitable option, whether this is of materials, techniques, equipment or processes. The options and choices should be based on specific criteria.
State	Express information in clear and precise terms.

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