

ST0250: Level 3 Science Manufacturing Technician

Occupational Profile

Science manufacturing technicians work in a wide range of companies, including, but not exclusively, chemical, primary and secondary pharmaceutical, biotechnology, formulated products and nuclear manufacturing. A science manufacturing technician will operate the systems and equipment, involved in the production of products. They may work in varied conditions including wearing specialist safety equipment, shift work and on sites running 365 day operations. Many companies operate under highly regulated conditions and a premium is placed on appropriate attitudes and behaviours to ensure employees comply with organisational safety and regulatory requirements.

Science manufacturing technicians are expected to work both individually and as part of a manufacturing team. They are able to work with minimum supervision, taking responsibility for the quality and accuracy of the work they undertake. They are proactive in finding solutions to problems and identifying areas for improving their work environment.

End-Point Assessment

The Science Manufacturing Technician standard is assessed through four End-Point Assessment methods as set out in the assessment plan:

- Review of behaviours evaluation log (graded by the Employer)
- Synoptic Assessment Test (SAT)
- Vocational Competence Discussion (VCD)
- Scenario Case Study (SCS)

Apprentices must spend a minimum of 18 months, with most typically spending 30 months, on-programme. Once the employer is satisfied that the Apprentice is consistently working at or above the level set out in the standard, and that all of the Gateway requirements have been met, the apprentice can proceed to their End-Point Assessment (EPA).

Gateway requirements before End-Point Assessment

- Level 3 or above Qualification –

The Apprentice must complete a qualification that is recognised for RSciTech or Eng Tech, whichever is relevant to the occupation, e.g.

- BTEC Level 3 Diploma in Applied Science (QCF)
- BTEC Level 3 Extended Diploma in Applied Science (QCF)
- BTEC Level 3 Subsidiary Diploma in Applied Science (QCF)
- BTEC Level 4 HNC Diploma in Applied Chemistry (QCF)
- BTEC Level 4 HNC Diploma in Applied Biology (QCF)
- BTEC Level 3 Diploma in Operations and Maintenance Engineering (QCF)
- BTEC Level 3 Diploma in Manufacturing Engineering (QCF)
- Level 3 Diploma in Process Technology (QCF)
- Level 3 Certificate in Laboratory Technical Skills(QCF)

A range of qualifications may be used to fulfil the requirement for the knowledge component of the apprenticeship standard. This allows employers the flexibility to tailor the apprenticeship to meet their specific local needs, whilst

meeting the minimum requirements of the apprenticeship standard. The application of theoretical knowledge will be tested during the formal End-Point Assessment. The qualification will not contribute to the grading of the apprenticeship award.

- Maths & English at Level 2 (GCSE equivalent grade A-C / 4-9)
- Vocational Competence Evaluation log
- Behaviours Evaluation review

Marshall Assessment will provide the following documents which must be used as part of the Gateway process:

- Gateway Declaration – Training Provider
- Gateway Declaration and conflict statement – Employer Registered Assessor
- Gateway Declaration – Employer
- Gateway Declaration – Apprentice
- Behaviours Evaluation template (final graded review must be submitted at Gateway)
- Vocational Competence Evaluation Log - should be used to track progress on-programme, which must be submitted once signed off by the nominated Employer Registered Assessor at Gateway.

The EPA must be completed within a 3-month period following successful gateway approval.

A summary of the assessment methods and how Marshall Assessment deliver them has been provided below. Further support can be found in the following documents which will be provided as part of our EPA support and customer / Apprentice engagement pack.

- **Synoptic Assessment Test (SAT) - Guidance & SAT planning template** giving guidance on what the Apprentice needs to be able to demonstrate to meet the required criteria for the observation
- **VCD guidance** – detailed guidance to help the Apprentice prepare for the discussion including what needs to be evidenced to meet and exceed the Knowledge, Skills and Behaviours being assessed.
- **Scenario Case Study** – guidance and mock paper with marking rationale

Synoptic Assessment Test

Laptop / PC with webcam with audio and video capabilities will be required for remote delivery.

Teams link and set up will be tested prior to the assessment date if required.

Arrangements for onsite assessment will be confirmed in writing beforehand with the Employer, IA and Apprentice.

SAT must be completed before the VCD.

GDPR policy available as session will be recorded for QA & training.

Duration: Between 2 - 4 hours

Grading outcomes:
Pass or Fail

- The employer will be able to select one of these options for the SATs to suit the assessment context:
 - Start up process
 - Operate process
 - Shut down process
- The purpose of the SAT is to validate the Apprentice's competence by observing them carrying out their job role in a normal working environment, under normal conditions.
- The SAT will be assessed by an Independent Assessor (IA – also known as External Assurer) from Marshall Assessment and an Employer Registered Assessor (ERA) nominated from the employer site.
- The Marshall IA will introduce themselves to the Apprentice and put them at ease. It will be confirmed the Apprentice understands how the assessment will be carried out and what is required of them.
- The Apprentice will confirm their name and show their Photographic Identification.
- Both the Marshall IA and the nominated Employer Registered Assessor will take notes on Marshall Assessment's evidence recording paperwork and map what they see to the required competencies for this element.
- Start and end times, and any breaks must be recorded on the evidence paperwork by the IA and the ERA.
- At the end of the SAT, the Apprentice must review the evidence notes and sign to say they are a true reflection of what they have demonstrated.
- A grade is agreed between the IA and ERA, if an agreement cannot be met, it will be referred to Marshall Assessment for a final decision. The Apprentice must NOT be notified of the outcome at this point.
- Original SAT paperwork must be retained by Marshall Assessment.
- Remote assessment may be requested for this element – Marshall Assessment will provide guidance on remote delivery protocols if the request is approved by the External Quality Assurance Provider. Remote assessment is delivered via Microsoft Teams.

Vocational Competence Discussion

Laptop / PC with webcam with audio and video capabilities will be required for remote delivery.

Timescale - between 1 – 1.5 hours max.

Takes place in a quiet place, free from distractions and interruptions.

GDPR policy available as session will be recorded for QA & training.

Grading outcomes: Fail / Pass / Distinction

- The Marshall IA will lead a professional discussion on a 1:1 basis with the Apprentice either remotely over Microsoft Teams or face to face.
- The discussion will cover all elements of the apprenticeship standard, and the Apprentice may draw on evidence from the SAT and evidence generated during the vocational competence evaluation process to support their responses.
- The discussion will provide the opportunity for presentation of evidence to support specific elements from the standard that it has not been possible to demonstrate during the SAT.
- Criteria fully met in the SAT will not be reassessed in the discussion except to provide the opportunity to evidence the “Exceeds” criteria.
- Before starting the test, the IA will ensure that the Apprentice understands the VCD process, the possible outcomes and how it is graded.
- A minimum of 8 open questions will be asked covering 15 topic areas, as outlined in the VCD guidance.
- Detailed guidance on what is expected in Apprentice’s responses to questions on these areas has been provided in the VCD guidance document.
- The Apprentice can have access to their OneFile or e-portfolio and competence evaluation log and can use any evidence contained in this to support the discussion.
- The Marshall IA will take notes during the discussion and the assessment will be recorded to ensure fair marking and quality assurance of the responses given.
- The VCD is graded out of 80.
- Grading outcomes: Fail (39 or below/80), Pass (40 to 59/80) and Distinction (60 or above/80)

Remote Assessments - any breaks in connectivity will be dealt with in the following way:

- A short break of up to 10 mins will be acceptable, this must be recorded by the IA and they will confirm the test can continue once connectivity has resumed.
- If there is a break in connectivity once a question has been asked, once resumed, the IA will ask a different question.
- If the break is during a response – the Apprentice will be allowed to continue as long as the break is less than 5 minutes. More than this, a new question will be asked.

Scenario Case Study

Laptop / PC with webcam with audio and video capabilities will be required if remote delivery.

Takes place in a quiet place, free from distractions and influence.

Test to be taken under exam conditions.

Timescale - up to 2.5 hours available.

GDPR policy available as session will be recorded for QA & training.

Grading outcomes:
Fail, Pass or
Distinction.

- Assessment will require an on-site invigilator which can be the Marshall IA (for onsite delivery of the assessment) or nominated ERA (for remote delivery of the assessment).
- If onsite delivery, the Marshall IA will provide the assessment paperwork.
- Alternatively, the test can be taken using Marshall Assessments online assessment platform. Login details will be provided for access to a mock paper and for the live assessment.
- If remote delivery, the IA will contact the Apprentice and ERA using Microsoft Teams at the agreed time of the test. The ERA (or previously agreed person from the workplace) will be required to invigilate.
- The Apprentice will be required to answer a set of questions based on the provided scenario to test the depth of their knowledge and understanding of core elements included in the Science Manufacturing Technician Standard, with the emphasis on demonstrating how well they can transfer and apply their understanding of the principles of working safely, following quality procedures and complying with regulations, to a new setting.
- The Case Study will focus on the knowledge for the following areas of the Occupational Standard:
 - Work safely in a science manufacturing environment, understanding personal responsibility for Health, Safety and the Environment and principles of risk management.
 - Understand and follow quality procedures to meet the requirements of quality standards relevant to the workplace.
 - Understand the internal and external regulatory environment pertinent to the sector and the employer and comply with regulations proficiently.
 - Control and monitor a process or plant and equipment, effectively, efficiently and securely, and resolve problems or correct abnormal conditions.
 - Complete documentation relevant to the manufacturing process including relevant calculations
- For each question, the marks available are clearly shown in the answer booklet.
- The SCS is scored out of 20 and is graded: Fail (less than 10/20), Pass (between 10-14 /20) and Distinction (15 or above /20)
- All questions must be answered, and the Apprentice will be allowed to leave the room when they are satisfied they have finished the test.
- The invigilator must stop the test at 2.5 hours.

Grading outcomes:

The Apprentice must, as a minimum, PASS each element to achieve their apprenticeship certificate. If any 1 element is graded a FAIL, the overall grade result will be a FAIL. If the Apprentice is awarded a PASS in the SAT and a Distinction in the VCD, SCS and Behaviour Evaluation, they will be awarded an overall DISTINCTION grade.

All evidence is submitted for Internal Quality Assurance before confirmation of results, which will be released to the Training Provider by Marshall Assessment. Following confirmation of results from Marshall Assessment, the Apprentice or Training Provider have 10 working days to request a review of the grade awarded. Appeals policy also available at <https://www.marshall-assessment.com/our-policies>. If no request is made, the certificate claim will then be submitted to the Apprenticeship Service (this may take up to 4 weeks to arrive following a claim being made and will be sent directly to the employer unless otherwise specified)

All relevant policies relating to End-Point Assessment are available to download from Marshall-assessment.com

Link to IfATE & Assessment Plan:

<https://www.instituteforapprenticeships.org/apprenticeship-standards/science-manufacturing-technician-v1-0>

The Knowledge, Skills and Behaviours required to be met for this Standard are listed in the assessment plan and also below. A detailed guidance pack with assessment criteria, amplifications, exemplifications, mock material where appropriate and support to prepare for EPA will be provided on registration with Marshall Assessment as the EPAO.

Knowledge & Skills	
S1	Both independently and within a team, start-up a manufacturing batch or continuous process in line with appropriate Standard Operating Procedures (SOP), understanding the principles of operation.
S2	Both independently and within a team, operate a manufacturing batch or continuous process in line with appropriate Standard Operating Procedures, understanding the principles of operation.
S3	Both independently and within a team, shut down/complete a run of the manufacturing batch or continuous process in line with appropriate Standard Operating Procedures, understanding the principles of operation.
Process Operations	
1	Understand the principles of the operating environment that may include specialist environments and conditions appropriate to job role, for example Flammable Atmospheres, lone working, confined spaces, containment and aseptic conditions
2	Prepare process materials or feeds for start-up and between production stages according to work instructions
3	Clean and prepare items of plant, facility and equipment
4	Prepare to start up a process/batch or prepare the area and process equipment
5	Start up a process/batch or plant and systems in accordance with any SOPs and communicate, if required, with relevant personnel
6	Monitor and control process or plant and equipment and resolve problems or correct abnormal conditions
7	Access, use and interpret documentation and logs, and pass on information, for example during handover
8	Prepare to shut down a process/batch or prepare the area and process equipment
9	Complete/shutdown a process/batch or plant and systems in accordance with any SOPs
10	Separate & dispose of by-products and waste as appropriate
Maintenance & Calibration	
11	Follow procedures for handover of the processes for maintenance
12	Prepare work areas for maintenance in line with Standard Operating Procedures
13	Undertake maintenance activities within own areas of responsibility
14	Reinstate the working area after completing maintenance
15	Understand the principles of planned maintenance and routine calibration in asset care (optional – please give rationale below if not covered)
16	Understand the principles of change management (optional – please give rationale if not covered)
17	Decontaminate plant equipment where appropriate (optional – please give rationale below if not covered)
18	Calibrate plant and equipment within own areas of responsibility (optional – please give rationale below if not covered)
S4	Work safely in a science manufacturing environment, understanding personal responsibility for Health, Safety and the Environment and principles of risk management
S5	Understand and follow quality procedures to meet the requirements of quality standards relevant to the workplace.
S6	Understand the internal and external regulatory environment pertinent to the sector and the employer and comply with regulations proficiently
General workplace Health and Safety	

19	Understand and comply with foundations of health and safety including responsibility for health and safety under HASWA
20	Understand the procedures for first aid relevant to your workplace
21	Understand and comply with risk assessment & control
22	Appropriate use of personal protective equipment e.g. respirators, breathing air hoods, PVC suits
23	Understand and practise site/plant safety requirements including for example: Fire, COSHH, Working at Height, Confined Spaces, Permits to work
Process Safety	
24	Understand foundations of process safety
25	Understand the safe operating conditions of the plant
26	Work safely in a process environment or in a bio-manufacturing environment
27	Describe common risks and control measures
28	Understand systems to prevent loss of containment within your area of responsibility
29	Carry out key plant integrity checks within own area of responsibility
30	Understand and comply with emergency response procedures participating in exercises pertinent to role
31	Understand Hazardous area classification & DSEAR regulations and how they apply within area of responsibility (optional please give rationale below if not covered).
Environmental Management	
32	Understand the foundations of environmental management
33	Understand the principles of control of emissions
34	Understand Management and control of waste
35	Understand environmental risk assessments (impact assessment)
36	Understand the concepts of resource efficiency applied to energy, water and waste
37	Maintain product quality throughout manufacture
38	Understand management of change principles and the impact of change on product quality
Regulatory Environment	
39	Understand the internal regulations pertinent to the sponsoring company & relative specialism in which they operate
40	Understand the external regulatory environment pertinent to the sponsoring company & relative specialism in which they operate (e.g. COMAH, NII, MHRA)
41	Demonstrate compliance with internal and external regulations pertinent to the sponsoring company & relative specialism in which they operate
S7	Control and monitor a process or plant and equipment, effectively, efficiently and securely, and resolve problems or correct abnormal conditions.
42	Monitor and control a process or plant and equipment
43	Identify and resolve abnormal process conditions
44	Demonstration of one or more problem solving techniques
S8	Complete documentation relevant to the manufacturing process including relevant calculations
45	Complete documentation proficiently including relevant calculations
46	Understand correction techniques and error reporting
S9	Understand the business environment in which the company operates including personal role within the organisation, ethical practice and codes of conduct.
47	Understand the business environment (customers, competitors etc.) in which the company operates
48	Understand personal role in the company and industry and those of others
S10	Participate in continuous performance improvement.
49	Demonstrate the application of principles of continuous improvement to own performance
50	Understand the principles of continuous improvement and the techniques that may be used (optional please give rationale below if not covered).
51	Participate in the application of a continuous improvement technique (optional please give rationale below if not covered).

52	Basic knowledge of relevant software packages e.g. MS WORD, EXCEL, LIMS where appropriate to role (optional please give rationale below if not covered).
S11	Develop and apply theoretical knowledge of relevant science and technology and its application to the required sector & job role.
53	Theoretical knowledge of the relevant science or technology required for the role i.e. Chemistry, Science, Engineering to a named qualification
S12	Demonstrate the required attitudes, behaviours and interpersonal skills associated with the professional workplace
Behaviours	
Personal Responsibility: Demonstrate personal responsibility towards safety systems (Incl. risk management and environment)	
Communication: Communicate effectively using a full range of skills: speaking; listening; writing; body language; presentation	
Team work: Work and interact effectively within a team	
Independence and responsibility: Work independently and take responsibility for initiating and completing tasks	
Impact of work: Understand impact of work on others, especially where related to diversity and equality	
Time management: Accepts responsibility for managing own time and workload within a given plan to complete work to schedule	
Change management: Ability to handle change and respond to change management processes	