



Level 3 NVQ Extended Diploma in

Mechanical Manufacturing Engineering

ENGINEERING

Qualification Specification

Overview

This qualification has been developed to enable learners to demonstrate competence in their mechanical manufacturing occupation.

Typical Job

Engineering craft/CNC machinist, manufacturing production planner, mechanical engineer, mechanical engineering technician, plastics process operative, production engineer.

Qualification code:	600/1701/6
Level:	3
Total qualification time:	1060
Guided learning hours:	439 (min) 1037 (max)
Credits:	106
Minimum age	16

Issue 1.0

Purpose of the qualification

This qualification is designed to cover the skills and knowledge of a wide variety of mechanical manufacturing engineering activities. It also includes level 2 Performing Engineering Operations (PEO) units to provide essential basic engineering training for apprentices in England and Wales. Successful learners will:

- develop skills and competencies relating to their specific role
- meet the competence requirements of Semta's engineering manufacture Apprenticeship at level 3 for the mechanical manufacturing engineering pathway
- gain a recognised qualification to support their progress to further learning and greater responsibility in the workplace.

What could this qualification lead to?

A career in the engineering sector, further or higher study such as project management, supervision, and business improvement techniques.

Entry Requirements

Learners must have the potential to achieve the assessment criteria set out in the units

How is the qualification achieved?

The learner must present evidence (portfolio) which clearly shows they have met the assessment criteria and learning outcomes. The PEO units must be delivered in a realistic work environment, before the level 3

units are undertaken in the learner's workplace. The learner must achieve the mandatory and optional units relevant to their pathway (occupational role).

What will be assessed?

All evidence submitted by the learner against the assessment criteria.

How will it be assessed?

Evidence for this qualification will be assessed in accordance with the SEMTA engineering assessment strategy, which has been created from engagement with stakeholders (employers etc.) in the engineering sector.

The qualification is not graded and only a pass can be achieved – which indicates the learner's occupational competence.

Structure

Structure of the EAL Level 3 NVQ Extended Diploma

The Extended Diploma is comprised of a Level 3 Engineering Qualification **extended** by inclusion of technically specific PEO Units as follows:-

Mandatory Units – A combination of Level 2 & 3

Group A - Level 2 PEO Units x 3 (Engineering practices)

OR

Group B - Level 2 PEO Units x 5 (Technical support)

And

Group C - One of the Mechanical Manufacturing Engineering pathways

Delivery requirements

In the context of the Apprenticeship Framework, the technically specific level 2 PEO units **must** be delivered and assessed in a sheltered work environment **before** starting delivery and assessment of the level 3 components in the working environment.

PEO:

To support these basic engineering skills and techniques, the learner must be trained in, and continuously practice the relevant Health and Safety, engineering communication requirements along with all the other Mandatory Unit(s) listed within that qualification. The Learner cannot be signed off as being competent for these units in this period.

Level 3:

On completion of the PEO2 Units, the Learner moves on to the Units from the Level 3 qualification which can only be assessed within a workplace environment.

This qualification will be achieved when the learner has successfully completed the common mandatory Assessment route followed by the required number of optional Assessment route.

Mandatory assessment routes for all pathways: All three assessment routes must be completed

EAL code	Assessment route title	Level	Credit value	Guided learning hours	Ofqual code
QMME2/001	Complying with Statutory Regulations and Organisational Safety Requirements	2	5	35	A/601/5013
QMME2/002	Using and Interpreting Engineering Data and Documentation	2	5	25	Y/601/5102
QMME3/003	Working Efficiently and Effectively in Engineering	3	5	25	K/601/5055

Group A (Engineering practices)

Optional Units: Learners must complete **three** more units from the following

Notes:

Only one unit from **4, 32** and **61** may be included in the learner's choice of three units.

If unit **65** is selected units **5, 6, 8, 11, 12, 15, 16, 17** cannot be included in the learner's choice of three units.

If unit **66** is selected units **10, 22, 23, 25, 26, 27, 28, 29, 30, 34** cannot be included in the learner's choice of three units.

If unit **67** is selected units **33, 35, 36, 40** cannot be included in the learner's choice of three units.

If unit **68** is selected units **19, 21, 37, 38, 39, 40, 58, 59** cannot be included in the learner's choice of three units

QPEO2/004	Producing Mechanical Engineering Drawings using a CAD System	2	11	61	F/504/6348
QPEO2/005	Producing Components using Hand Fitting Techniques	2	14	64	J/504/6349
QPEO2/006	Producing Mechanical Assemblies	2	15	68	F/504/6351
QPEO2/007	Forming and Assembling Pipework Systems	2	14	64	L/504/6353
QPEO2/008	Carrying Out Aircraft Detail Fitting Activities	2	14	64	R/504/6354
QPEO2/009	Installing Aircraft Mechanical Fasteners	2	11	61	L/504/6367
QPEO2/010	Producing Aircraft Detail Assemblies	2	14	65	L/504/6370
QPEO2/011	Preparing and Using Lathes for Turning Operations	2	15	68	Y/504/6372
QPEO2/012	Preparing and Using Milling Machines	2	15	68	K/504/6375
QPEO2/013	Preparing and Using Grinding Machines	2	15	68	T/504/6377
QPEO2/014	Preparing and Proving CNC Machine Tool Programs	2	14	64	F/504/6379
QPEO2/015	Preparing and Using CNC Turning Machines	2	14	64	F/504/6382
QPEO2/016	Preparing and Using CNC Milling Machines	2	14	64	L/504/6384
QPEO2/017	Preparing and Using CNC Machining Centres	2	14	64	D/504/6387
QPEO2/018	Preparing and Using Industrial Robots	2	14	64	D/504/6390
QPEO2/019	Maintaining Mechanical Devices and Equipment	2	14	64	T/504/6394
QPEO2/020	Assembling and Testing Fluid Power Systems	2	14	64	J/504/6397
QPEO2/021	Maintaining Fluid Power Equipment	2	14	64	F/504/6401
QPEO2/022	Producing Sheet Metal Components and Assemblies	2	14	64	J/504/6402
QPEO2/023	Producing Platework Components and Assemblies	2	14	64	L/504/6403
QPEO2/024	Cutting and Shaping Materials using Thermal Cutting Equipment	2	14	64	R/504/6404
QPEO2/025	Preparing and Proving CNC Fabrication Machine Tool Programs	2	14	64	Y/504/6405
QPEO2/026	Preparing and Using CNC Fabrication Machinery	2	14	64	D/504/6406
QPEO2/027	Preparing and Using Manual Metal Arc Welding Equipment	2	15	68	K/504/6408

QPE02/028	Preparing and Using Manual TIG or Plasma-arc Welding Equipment	2	15	68	M/504/6409
QPE02/029	Preparing and Using Semi-automatic MIG, MAG and Flux cored arc Welding equipment	2	15	68	H/504/6410
QPE02/030	Preparing and Using Manual Oxy/fuel Gas Welding Equipment	2	14	64	Y/504/6419
QPE02/031	Preparing and Using Manual Flame Brazing and Braze Welding Equipment	2	11	61	L/504/6420
QPE02/032	Producing Electrical or Electronic Engineering Drawings using a CAD System	2	11	61	R/504/6421
QPE02/033	Wiring and Testing Electrical Equipment and Circuits	2	14	64	Y/504/6422
QPE02/034	Forming and Assembling Electrical Cable Enclosure and Support Systems	2	13	65	D/504/6423
QPE02/035	Assembling, Wiring and Testing Electrical Panels/Components Mounted in enclosures	2	14	64	H/504/6424
QPE02/036	Assembling and Testing Electronic Circuits	2	14	64	K/504/6425
QPE02/037	Maintaining Electrical Equipment/Systems	2	15	68	M/504/6426
QPE02/038	Maintaining Electronic Equipment/Systems	2	15	68	T/504/6427
QPE02/039	Maintaining and Testing Process Instrumentation and Control Devices	2	15	68	A/504/6428
QPE02/040	Wiring and Testing Programmable Controller Based Systems	2	15	68	F/504/6429
QPE02/041	Using Wood for Pattern, Modelmaking and Other Engineering Applications	2	15	68	T/504/6430
QPE02/042	Assembling Pattern, Model and Engineering Woodwork Components	2	14	64	A/504/6431
QPE02/043	Producing Composite Mouldings using Wet Lay-up Techniques	2	14	64	F/504/6432
QPE02/044	Producing Composite Mouldings using Pre-Preg Laminating Techniques	2	14	64	L/504/6434
QPE02/045	Producing Composite Mouldings using Resin Flow Infusion Techniques	2	14	64	R/504/6435
QPE02/046	Producing Composite Assemblies	2	14	64	Y/504/6436
QPE02/047	Producing Components by Rapid Prototyping Techniques	2	11	61	D/504/6437
QPE02/048	Producing and Preparing Sand Moulds and Cores for Casting	2	14	64	H/504/6438
QPE02/049	Producing and Preparing Molten Materials for Casting	2	14	64	K/504/6439
QPE02/050	Producing Cast Components by Manual Means	2	13	65	D/504/6440

QPEO2/051	Fettling, Finishing and Checking Cast Components	2	11	61	H/504/6441
QPEO2/052	Finishing Surfaces by Applying Coatings or Coverings	2	9	41	M/504/6443
QPEO2/053	Finishing Surfaces by Applying Treatments	2	9	41	T/504/6444
QPEO2/054	Carrying Out Heat Treatment of Engineering Materials	2	9	41	A/504/6445
QPEO2/055	Carrying Out Hand Forging of Engineering Materials	2	9	41	F/504/6446
QPEO2/056	Stripping and Rebuilding Motorsport Vehicles (Pre-Competition)	2	14	64	J/504/6447
QPEO2/057	Inspecting a Motorsport Vehicle During Competition	2	14	64	L/504/6448
QPEO2/058	Diagnosing and Rectifying Faults on Motorsport Vehicle Systems (During a Competition)	2	15	68	R/504/6449
QPEO2/059	Carrying Out Maintenance Activities on Motor Vehicle Electrical Equipment	2	15	68	J/504/6450
QPEO2/060	Stripping and Rebuilding Motorsport Engines (Pre – Competition)	2	14	64	L/504/6451
QPEO2/061	Producing CAD Models (Drawings) using a CAD System	2	11	61	R/504/6452
QPEO2/065	General Machining, Fitting and Assembly Applications	2	12	55	K/504/6456
QPEO2/066	General Fabrication and Welding Applications	2	12	55	M/504/6457
QPEO2/067	General Electrical and Electronic Engineering Applications	2	12	55	T/504/6458
QPEO2/068	General Maintenance Engineering Applications	2	12	55	A/504/6459
QPEO2/069	Joining Public Service Vehicle Components by Mechanical Processes	2	11	61	L/503/4056
QPEO2/070	Assembling Structural Sub Assemblies to Produce a Public Service Vehicle	2	14	64	R/503/4057
QPEO2/071	Fitting Sub Assemblies and Components to Public Service Vehicles	2	14	64	Y/503/4058
QPEO2/072	Preparing and Manoeuvring Armoured Fighting Vehicles AFVs for Maintenance and Transportation	2	14	64	R/503/7198
QPEO2/073	Producing Composite Mouldings using Resin Film Infusion Techniques	2	14	64	J/504/3404

Or
Group B:

Learners must complete one of the following PEO Level 2 assessment routes:

QPEO2/004	Producing Mechanical Engineering Drawings using a CAD System	2	11	61	F/504/6348
QPEO2/032	Producing Electrical or Electronic Engineering Drawings using a CAD System	2	11	61	R/504/6421
QPEO2/061	Producing CAD Models (Drawings) using a CAD System	2	11	61	R/504/6452

Plus two from the following PEO Level 2 assessment routes:

QPEO2/062	Producing Engineering Project Plans	2	8	37	Y/504/6453
QPEO2/063	Using Computer Software Packages to Assist with Engineering Activities	2	8	37	D/504/6454
QPEO2/064	Conducting Business Improvement Activities	2	8	41	H/504/6455

Plus two more from the following PEO Level 2 assessment routes:

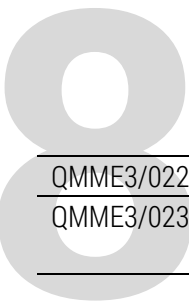
QPEO2/065	General Machining, Fitting and Assembly Applications	2	12	55	K/504/6456
QPEO2/066	General Fabrication and Welding Applications	2	12	55	M/504/6457
QPEO2/067	General Electrical and Electronic Engineering Applications	2	12	55	T/504/6458
QPEO2/068	General Maintenance Engineering Applications	2	12	55	A/504/6459

In addition to the PEO Level 2 unit requirements in Group A or B, learners must complete the unit requirements for one of the following Level 3 Mechanical Manufacturing Engineering pathways within

Group C: Pathway MMA: Machining

Optional assessment routes: Any functional pair of the following assessment routes must be taken:

EAL code	Assessment route title	Level	Credit value	Guided learning hours	Ofqual code
QMME3/004	Setting Centre Lathes for Production	3	91	210	T /600/5385
QMME3/005	Machining Components using Centre Lathes	3	77	161	A/600/5386
QMME3/006	Setting Turret Lathes for Production	3	91	210	F/600/5387
QMME3/007	Machining Components using Turret Lathes	3	77	161	J/600/5388
QMME3/008	Setting Milling Machines for Production	3	91	210	J/600/5391
QMME3/009	Machining Components using Milling Machines	3	77	161	L/600/5392
QMME3/010	Setting Shaping, Planing or Slotting Machines for Production	3	78	175	R/600/5393
QMME3/011	Machining Components using Shaping, Planing or Slotting Machines	3	69	126	Y/600/5394
QMME3/012	Setting Gear Cutting Machines for Production	3	91	210	D/600/5395
QMME3/013	Machining Components using Gear Cutting Machines	3	77	161	K/600/5397
QMME3/014	Setting Gear Grinding Machines for Production	3	91	210	M/600/5398
QMME3/015	Machining Components using Gear Grinding Machines	3	77	161	D/600/5400
QMME3/016	Setting Horizontal Boring Machines for Production	3	91	210	K/600/5402
QMME3/017	Machining Components using Horizontal Boring Machines	3	77	161	L/600/5411
QMME3/018	Setting Vertical Boring Machines for Production	3	91	210	F/600/5423
QMME3/019	Machining Components using Vertical Boring Machines	3	77	161	Y/600/5430
QMME3/020	Setting Electro-Discharge Machines for Production	3	91	210	H/600/5432
QMME3/021	Machining Components using Electro-Discharge Machines	3	77	161	L/600/5439



QMME3/022	Setting Grinding Machines for Production	3	91	210	M/600/5448
QMME3/023	Machining Components using Grinding Machines	3	77	161	Y/600/5458
QMME3/024	Setting Honing and Lapping Machines for Production	3	78	175	L/600/5473
QMME3/025	Machining Components using Honing and Lapping Machines	3	33	119	L/600/5487
QMME3/026	Setting Broaching Machines for Production	3	78	175	L/600/5490
QMME3/027	Machining Components using Broaching Machines	3	33	119	A/600/5503
QMME3/028	Setting Metal Spinning Machines for Production	3	78	175	D/600/5509
QMME3/029	Producing Components using Metal Spinning Machines	3	77	161	K/600/5514

Pathway MMB: CNC Machining

Optional assessment routes: One of the following assessment routes must be taken:

EAL code	Assessment route title	Level	Credit value	Guided learning hours	Ofqual code
QMME3/030	Loading and Proving CNC Machine Tool Programs	3	24	91	L/600/5523
QMME3/031	Carrying Out CNC Machine Tool Programming	3	84	231	M/600/5529

Plus: One functional pair of the following assessment routes must be taken:

QMME3/032	Setting CNC Turning Machines for Production	3	70	140	H/600/5561
QMME3/033	Machining Components using CNC Turning Machines	3	63	126	F/600/5566
QMME3/034	Setting CNC Milling Machines for Production	3	70	140	R/600/5572
QMME3/035	Machining Components using CNC Milling Machines	3	63	126	K/600/5576
QMME3/036	Setting CNC Grinding Machines for Production	3	70	140	J/600/5584
QMME3/037	Machining Components using CNC Grinding Machines	3	63	126	R/600/5622
QMME3/038	Setting CNC Punching Machines for Production	3	70	140	K/600/5643
QMME3/039	Machining Components using CNC Punching Machines	3	63	126	T/600/5662
QMME3/040	Setting CNC Laser Profiling Machines for Production	3	70	140	R/600/5670
QMME3/041	Machining Components using CNC Laser Profiling Machines	3	63	126	H/600/5916
QMME3/042	Setting CNC Electro-Discharge Machines for Production	3	70	140	M/600/5921
QMME3/043	Machining Components using CNC Electro-Discharge Machines	3	63	126	F/600/5924
QMME3/044	Setting CNC Vertical Boring Machines for Production	3	70	140	R/600/5927
QMME3/045	Machining Components using CNC Vertical Boring Machines	3	63	126	Y/600/5928

QMME3/046	Setting CNC Horizontal Boring Machines for Production	3	70	140	K/600/5951
QMME3/047	Machining Components using CNC Horizontal Boring Machines	3	63	126	K/600/5965
QMME3/048	Setting CNC Gear Cutting Machines for Production	3	70	140	L/600/5974
QMME3/049	Machining Components using CNC Gear Cutting Machines	3	63	126	D/600/5980
QMME3/050	Setting CNC Machining Centres for Production	3	70	140	L/600/5991
QMME3/051	Machining Components using CNC Machining Centres	3	63	126	D/600/5994

Pathway MMC: Machine Tool Setting

Optional assessment routes: The following assessment routes must be taken:

EAL code	Assessment route title	Level	Credit value	Guided learning hours	Ofqual code
QMME3/052	Handing Over Machine Tools to Production Operators	3	38	98	A/600/5436

Plus: One of the following assessment routes must be taken:

QMME3/053	Setting Capstan and Turret Lathes for Production	3	91	210	Y/600/5444
QMME3/054	Setting Single-Spindle Automatic Turning Machines for Production	3	91	210	K/600/5450
QMME3/055	Setting Multi-Spindle Automatic Turning Machines for Production	3	77	161	T/600/5452
QMME3/056	Setting Single and Multi-Spindle Drilling Machines for Production	3	77	161	J/600/5455
QMME3/057	Setting Tool and Cutter Grinding Machines for Production	3	77	161	Y/600/5461
QMME3/058	Setting Special-Purpose Machines for Production	3	91	210	D/600/5462
QMME3/059	Setting Power Presses for Production	3	91	210	A/600/5467
QMME3/008	Setting Milling Machines for Production	3	91	210	J/600/5391
QMME3/022	Setting Grinding Machines for Production	3	91	210	M/600/5448
QMME3/010	Setting Shaping, Planing or Slotting Machines for Production	3	78	175	R/600/5393
QMME3/012	Setting Gear Cutting Machines for Production	3	91	210	D/600/5395
QMME3/014	Setting Gear Grinding Machines for Production	3	91	210	M/600/5398
QMME3/020	Setting Electro-Discharge Machines for Production	3	91	210	H/600/5432
QMME3/024	Setting Honing and Lapping Machines for Production	3	78	175	L/600/5473
QMME3/026	Setting Broaching Machines for Production	3	78	175	L/600/5490
QMME3/032	Setting CNC Turning Machines for production	3	70	140	H/600/5561
QMME3/034	Setting CNC Milling Machines for Production	3	70	140	R/600/5572
QMME3/036	Setting CNC Grinding Machines for Production	3	70	140	J/600/5584

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QMME3/038	Setting CNC Punching Machines for Production	3	70	140	K/600/5643
QMME3/040	Setting CNC Laser Profiling Machines for Production	3	70	140	R/600/5670
QMME3/042	Setting CNC Electro-Discharge Machines for Production	3	70	140	M/600/5921
QMME3/048	Setting CNC Gear Cutting Machines for Production	3	70	140	L/600/5974
QMME3/050	Setting CNC Machining Centers for Production	3	70	140	L/600/5991

Pathway MMD: Fitting and Assembly

Optional assessment routes: Three of the following assessment routes must be taken:

EAL code	Assessment route title	Level	Credit value	Guided learning hours	Ofqual code
QMME3/060	Producing Components using Hand Fitting Techniques	3	70	210	A/600/5470
QMME3/061	Assembling Mechanical Products	3	70	210	J/600/5472
QMME3/062	Producing Components by Manual Machining	3	70	210	H/600/5477
QMME3/063	Fitting Fluid Power Components to Mechanical Assemblies	3	60	161	H/600/5480
QMME3/064	Fitting Pipework Systems to Mechanical Assemblies	3	60	161	F/600/5485
QMME3/065	Fitting Electrical/Electronic Components to Mechanical Assemblies	3	60	161	R/600/5488
QMME3/066	Producing Power Turbine Combustion Assemblies	3	70	210	Y/600/5492
QMME3/067	Producing Power Turbine Compressor Assemblies	3	70	210	A/600/5498
QMME3/068	Producing Turbine Assemblies	3	70	210	F/600/5504
QMME3/069	Producing Power Turbine Gearbox Assemblies	3	70	210	R/600/5510
QMME3/070	Producing Power Turbine Major Assemblies	3	70	210	M/600/5515
QMME3/071	Producing Piston Engine Assemblies	3	70	210	J/600/5522
QMME3/072	Repairing and Modifying Mechanical Assemblies	3	70	210	H/600/5527
QMME3/073	Checking that Completed Assemblies Comply with Specification	3	30	91	L/600/5537

Pathway MME: Pipe Fitting and Assembly

Optional assessment routes: One of the following assessment routes must be taken:

EAL code	Assessment route title	Level	Credit value	Guided learning hours	Ofqual code
QMME3/074	Pipe Bending and Forming by Hand Methods	3	46	150	Y/600/5542
QMME3/075	Pipe Bending and Forming using Bending Machines	3	46	150	T/600/5547
Plus: Two of the following assessment routes must be taken:					
QMME3/076	Assembling Screwed Pipework	3	30	91	L/600/5554
QMME3/077	Assembling Small Bore Non-Ferrous Pipework	3	30	91	D/600/5557
QMME3/078	Assembling Non-Metallic Pipework	3	30	91	K/600/5562
QMME3/079	Preparing and Testing Pipework Systems	3	46	150	J/600/5567
QMME3/080	Producing Socket and Flange Fillet Welded Joints in Pipe using a Manual Welding Process	3	86	210	L/600/5571

Pathway MMF: Composite Manufacture Engineering

Optional assessment routes: One of the following assessment routes must be taken:

EAL code	Assessment route title	Level	Credit value	Guided learning hours	Ofqual code
QMME3/081	Producing Composite Mouldings using Pre-Preg Laminating Techniques	3	86	210	D/600/5574
QMME3/082	Producing Composite Mouldings using Wet Lay-up Techniques	3	86	210	T/600/5578
QMME3/083	Producing Composite Assemblies	3	86	210	M/600/5580

Plus: One of the following assessment routes must be taken:

QMME3/081	Producing Composite Mouldings using Pre-Preg Laminating Techniques	3	86	210	D/600/5574
QMME3/082	Producing Composite Mouldings using Wet Lay-up Techniques	3	86	210	T/600/5578
QMME3/083	Producing Composite Assemblies	3	86	210	M/600/5580
QMME3/084	Bonding Composite Mouldings	3	30	91	F/600/5583
QMME3/085	Repairing Composite Mouldings	3	77	161	Y/600/5587
QMME3/086	Applying Finishes to Composite Mouldings	3	46	150	D/600/5588
QMME3/087	Trimming Composite Mouldings using Hand Tools	3	46	150	K/600/5593
QMME3/088	Identifying Defects in Composite Mouldings	3	30	91	A/600/5596

Note: Two different assessment routes must be taken.

Pathway MMG: Mechanical Overhaul and Test

Optional assessment routes: Two of the following assessment routes must be taken:

EAL code	Assessment route title	Level	Credit value	Guided learning hours	Ofqual code
QMME3/100	Slinging, Lifting and Moving Equipment, Components or Materials for Overhauling Activities	3	24	89	T/600/5600
QMME3/101	Dismantling Mechanical Equipment in Preparation for Overhaul	3	49	161	R/600/5605
QMME3/102	Checking Mechanical Components for Serviceability During Overhauling Activities	3	24	89	H/600/5611
QMME3/103	Carrying Out Non-Destructive Flaw Detection on Components During Overhauling Activities	3	24	89	A/600/5615
QMME3/104	Restoring Mechanical Components to Usable Condition by Repair	3	49	161	R/600/5619
QMME3/105	Producing Replacement Components for Overhauling Activities	3	49	161	D/600/5624
QMME3/106	Checking that Overhauled Mechanical Assemblies Comply with Specification	3	30	91	A/600/5629

Plus: One of the following assessment routes must be taken:

QMME3/107	Overhauling Industrial Power Turbines by Module Replacement	3	86	210	T/600/5631
QMME3/108	Overhauling Industrial Power Turbine Compressor Assemblies	3	86	210	R/600/5636
QMME3/109	Overhauling Industrial Power Turbine Combustion Assemblies	3	86	210	Y/600/5640
QMME3/110	Overhauling Turbine Assemblies from Industrial Power Turbines	3	86	210	A/600/5646
QMME3/111	Overhauling Piston Engines	3	86	210	F/600/5650
QMME3/112	Overhauling Gearbox Assemblies	3	86	210	Y/600/5654
QMME3/113	Overhauling Industrial Clutch and Brake Assemblies	3	77	161	K/600/5657
QMME3/114	Overhauling Pump Assemblies	3	77	161	F/600/5468
QMME3/115	Overhauling Valve Assemblies	3	77	161	K/600/5478
QMME3/116	Overhauling Components of Hydraulic Equipment	3	77	161	J/600/5486
QMME3/117	Overhauling Components of Pneumatic, Vacuum or Compressed Air Equipment	3	77	161	D/600/5493
QMME3/118	Carrying Out Tests on Overhauled Industrial Power Turbines	3	70	210	K/600/5500
QMME3/119	Carrying Out Tests on Overhauled Piston Engines (Fixed Dynamometer)	3	70	210	D/600/5512

Pathway MMH: Spring Making

Optional assessment routes: Four of the following assessment routes must be taken:

EAL code	Assessment route title	Level	Credit value	Guided learning hours	Ofqual code
QMME3/120	Making Compression Springs using Hand Forming Methods	3	46	150	F/600/5521
QMME3/121	Making Torsion Springs using Hand Forming Methods	3	46	150	K/600/5531
QMME3/122	Making Extension Springs using Hand Forming Methods	3	46	150	Y/600/5539
QMME3/123	Making Spring Wire Forms using Hand Forming Methods	3	46	150	A/600/5548
QMME3/124	Grinding Spring Ends by Hand	3	16	57	D/600/5560
QMME3/125	Setting Automatic Cold Wire Compression Spring Making Machines for Production	3	46	150	H/600/5575
QMME3/126	Setting Automatic Cold Wire Torsion Spring Making Machines for Production	3	46	150	L/600/5635
QMME3/127	Setting Automatic Cold Wire Extension Spring Making Machines for Production	3	46	150	J/600/5648
QMME3/128	Setting Automatic Spring Making Machines for the Production of Clock, Power, Scroll and Volute Springs	3	46	150	R/600/5653
QMME3/129	Setting Automatic Cold Wire Forming Machines to Produce Spring Wire Forms	3	46	150	M/600/5661
QMME3/130	Setting Automatic Hot Wire Compression Spring Making Machines for Production	3	46	150	D/600/5672
QMME3/131	Setting Automatic Spring End Grinding Machines for Production	3	16	60	L/600/5683
QMME3/132	Programming CNC Spring Making Machines	3	84	231	H/600/5687
QMME3/133	Setting CNC Spring Making Machines for Production	3	46	150	H/600/5690
QMME3/134	Operating CNC Spring Making Machines	3	30	91	T/600/5693
QMME3/135	Setting and Using a Fly Press for Spring Making Activities	3	30	91	F/600/5695
QMME3/136	Making Strip Spring Components using Shearing Machines	3	30	91	Y/600/5699
QMME3/137	Forming Strip Spring Components using Power Rolling Machines	3	30	91	L/600/5702

QMME3/138	Bending Strip Spring Components using Press Brakes	3	30	91	Y/600/5704
QMME3/139	Forming Strip Spring Components using Power Presses	3	30	91	M/600/5708
QMME3/140	Drilling and Finishing Holes in Strip Spring Components	3	16	57	M/600/5711
QMME3/141	Using Heat to Assist with the Bending and Forming of Spring Components	3	16	57	L/600/5716
QMME3/142	Carrying Out Heat Treatment of Springs	3	30	91	D/600/5719
QMME3/143	Carrying Out Shot Peening of Springs	3	30	91	H/600/5723
QMME3/144	Carrying Out Quality Control of Spring Making Activities	3	46	150	M/600/5725
QMME3/145	Manufacturing One-Off Tooling for Spring Making Activities	3	77	161	M/600/5739
QMME3/146	Setting and Operating CNC Laser Profiling Machines for Strip Spring Making	3	77	161	A/600/5744

Pathway MMI: Photonics Engineering

Optional assessment routes: Three of the following assessment routes must be taken:

EAL code	Assessment route title	Level	Credit value	Guided learning hours	Ofqual code
QMME3/150	Machining Infra-Red/Special Material Lenses	3	77	161	J/600/5746
QMME3/151	Machining Optical Glass Lenses	3	77	161	R/600/5751
QMME3/152	Machining Optical Prism and Flat Components	3	77	161	H/600/5754
QMME3/153	Setting CNC Aspheric Glass and Diamond Turning Machines	3	78	175	A/600/5758
QMME3/154	Machining Components using CNC Aspheric Glass and Diamond Turning Machines	3	46	150	F/600/5762
QMME3/155	Setting CNC Optical Grinding and Polishing Machines for Production	3	78	175	Y/600/5766
QMME3/156	Machining Components using CNC Optical Grinding and Polishing Machines	3	46	150	D/600/5770
QMME3/157	Machining Optical Cylinders and Domes	3	77	161	J/600/5813
QMME3/158	Machining Optical Plastic Components	3	77	161	L/600/5814
QMME3/159	Polishing and Smoothing of Lens or Mirror Surfaces	3	77	161	R/600/5815
QMME3/160	Vacuum Coating Optical Materials	3	30	91	Y/600/5816
QMME3/161	Inspecting Optical Components using Mechanical Instruments	3	30	91	D/600/5817
QMME3/162	Inspecting Optical Components using Co-ordinate Measuring Machines (CMM)	3	46	150	K/600/5819
QMME3/163	Carrying Out Laser/Optic Metrology	3	46	150	D/600/5820
QMME3/164	Terminating Fibre-Optic Cables	3	30	91	K/600/5822
QMME3/165	Building Optical Systems	3	78	175	M/600/5823
QMME3/166	Performing Laser Optical System Alignment	3	46	150	F/600/5826
QMME3/167	Aligning and Setting Up Holographic Equipment	3	77	161	J/600/5827
QMME3/168	Following Clean Room/Clean Work Area Protocols	3	16	57	R/600/5829

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