

Basic list of machinery and equipment required for engineering Domains commonly used in off job training.

Below is a list of the main capital machinery and equipment by NZQA Domain and Level that a TEO must have on its asset register in order to gain support for or be compliant in consent to assess.

Should the Domain being sought not be listed, please contact Competenz for further information.

	Level 1	Level 2	Level 3	Level 4	Level 5
Engineering Core Skills	N/A	Lifting equipment such as; <ul style="list-style-type: none"> • Small floor cranes; • Electric hoists; • Block and tackle; • Weston pulley block; • Tirfor winch; • Recon winch; • Hoists and Genie hoist. Range of common engineering machinery, hand tools and power tools such as; <ul style="list-style-type: none"> • Lathes; • Drill presses; • Milling machine. 	22897 - A range of equipment for dismantling and re assembly to meet outcome 7. 22898 – Two sets of machines, involving two different methods of coupling to meet outcome 3.	N/A	N/A

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Engineering Measurement	<ul style="list-style-type: none"> • Rules; • Steel tapes; • Spring calipers; • Friction calipers; • Protractors; • Thermometers; • Mass balances; • Spring balances; • Stop watches; • Spirit levels; • Plumb bobs; • Fixed gauges (Go/No-Go, thread, length). 	<ul style="list-style-type: none"> • Vernier calipers; • Internal, external, and depth micrometers; • Dial gauges; • Dial test indicators; • Height gauges; • Surface tables; • Steel rulers; • Mark-out tables; • Engineer's squares; • Rules; • Straight edges; • Scribing blocks; • Height gauges; • Trammels; • Protractors; • Scribes; • Vee blocks; • Parallels; • Angle plates; • Dividers; • Centre punches. 	<ul style="list-style-type: none"> • Gauge blocks; • Length bars; • Cylindrical squares; • Sine bars; • Surface texture gauges/standard blocks; • Digital level indicator; • Displacement transducer; • Precision squares; • Precision surface; • Tables/plates. 	<ul style="list-style-type: none"> • Gear tooth verniers; • Bevel protractors; • Thread measuring Equipment; • Surface finish instruments; • 2D optical comparators (profile projectors); • Computer-controlled height gauges; • Sine bars; • Co-ordinate Measuring machines. 	CMM technology (coordinate measuring machine).

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Engineering Fabrication	N/A	<p>A range of fabrication equipment with capability of processing up to 3mm M/S at a 1220mm width;</p> <ul style="list-style-type: none"> • Pan folders; • Guillotine; • Rollers ; • Croppers; • Jenny wheels; • Powered fabrication equipment capable of processing 10mm M/S at a 1220mm width; • Guillotine; • Croppers; • Rollers; • Press brake. <p>Typical tools and equipment may include but not limited to;</p> <table border="0"> <tr> <td> <ul style="list-style-type: none"> • Files; • Hacksaws; • Taps; • Dies; • Reamers; • Hammers drills; • Calipers; • Squares; • Dividers; • Rules; • Protractors; • Radius/beam gauges; </td> <td> <ul style="list-style-type: none"> • Tape measures; • Straight edges; • Combination sets; • Chalk line; • Trammels; • Punches; • Angle meters; • Spanners; • Clamps; • Screw driver; • Allen keys. </td> </tr> </table>	<ul style="list-style-type: none"> • Files; • Hacksaws; • Taps; • Dies; • Reamers; • Hammers drills; • Calipers; • Squares; • Dividers; • Rules; • Protractors; • Radius/beam gauges; 	<ul style="list-style-type: none"> • Tape measures; • Straight edges; • Combination sets; • Chalk line; • Trammels; • Punches; • Angle meters; • Spanners; • Clamps; • Screw driver; • Allen keys. 	As per Levels 2 and 4	<p>Powered fabrication equipment such as;</p> <ul style="list-style-type: none"> • Guillotines; • Croppers; • Cutoff saws; • Drop saws; • Punches/notches; • Jig saw; • Band saws/bevellers. <p>Powered hand tools such as;</p> <ul style="list-style-type: none"> • Shears; • Nibblers; • Circle cutters; • Hole punches; • Drills; • Angle grinders. <p>CNC equipment such as a Press brake.</p>	As per levels 2 and 4
<ul style="list-style-type: none"> • Files; • Hacksaws; • Taps; • Dies; • Reamers; • Hammers drills; • Calipers; • Squares; • Dividers; • Rules; • Protractors; • Radius/beam gauges; 	<ul style="list-style-type: none"> • Tape measures; • Straight edges; • Combination sets; • Chalk line; • Trammels; • Punches; • Angle meters; • Spanners; • Clamps; • Screw driver; • Allen keys. 						

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Engineering Machining and Tool Making	N/A	Core Machining equipment such as; <ul style="list-style-type: none"> • Drill press; • Lathe; • Mill; • Surface grinder. 	Supporting equipment for the mill such as; <ul style="list-style-type: none"> • Dividing / indexing head and rotary table; • Cylindrical grinder; • CNC Lathe; • CNC Machining center; • Supporting programming software. 	<ul style="list-style-type: none"> • Electro-discharge Machine; • Wire Cutting Machine. <p>Advanced material cutting tools such as;</p> <ul style="list-style-type: none"> • High speed, long life, multi-insert, and special material tooling. 	<ul style="list-style-type: none"> • 3-axis and additional function CNC turning centre; • 4-axis CNC machining centre using proprietary software.
Engineering Drawing and Design	N/A	Drawing software capable of producing 2D drawings.	Drawing software capable of producing 3D drawings.	<ul style="list-style-type: none"> • Drawing software capable of producing 2D drawings; • Unit 20803 requires manual engineering drawing equipment. 	Drawing software capable of producing 3D drawings.

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Metal Surface Finishing	N/A	N/A	<ul style="list-style-type: none"> • Equipment and plant for this domain is varied and specific to each assessment standard. <p>Basic equipment may include;</p> <ul style="list-style-type: none"> • Polishing machines both fixed and hand held; • A range of buffs and abrasive consumables. 	N/A	N/A

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Refrigeration and Air-Conditioning	N/A	<p>A range of common engineering hand and power tools plus a range of commonly used refrigeration assembly equipment such as;</p> <ul style="list-style-type: none"> • Tube bending and cutting equipment; • Flaring and swaging tools; • Flare nut tools. <p>And a range of refrigeration units and models and components for assembly.</p> <p>Refer to the special notes of the assessment standard for more detail.</p>	<p>A range of commonly used refrigeration equipment used in installation, servicing, maintenance and commissioning such as;</p> <ul style="list-style-type: none"> • Vacuum pumps; • Leak detection equipment; • Refrigerant recovery machines; • Manifold gauges for various refrigerants; • Charging equipment; • Electrical diagnostic equipment; • Temperature reading equipment. <p>Refer to the special notes of the assessment standards for more detail.</p>	<ul style="list-style-type: none"> • Refrigeration equipment as found in retail food outlets, truck and shipping-container; • Refrigeration; • Horticultural cool room refrigeration; • Controlled atmosphere fruit stores; • Air conditioning equipment as found in commercial buildings. 	As per Level 3

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Split System Air-conditioning	N/A	N/A	Please refer to the list of equipment for Refrigeration and Air-conditioning.	N/A	
Welding	N/A	At least three different welding and cutting processes required such as <ul style="list-style-type: none"> • Mig; • Tig; • Arc; • Oxy fuel; • Resistance welder (spot); • Plasma cutter; • Fume extraction system if required for site; • Shielding equipment in the form of welding booths and / or welding curtains. 	The welding equipment and consumables required is specified by each assessment standard. For Thermal Cutting at this level, mechanized cutting equipment is required such as; <ul style="list-style-type: none"> • CNC Plasma / laser cutter; • Creeper cutter; • Unit 18106 requires an Air carbon arc gouger. 	As per Levels 2 and 3.	As per levels 2 and 3 Unit 2698 allows use of Water jet cutters.

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Locksmithing	N/A	<ul style="list-style-type: none"> • Core engineering hand tools and measuring equipment; • Core carpentry hand tools; • Core engineering workshop power tools and equipment; • Access to automotive air bag training equipment; • Access to common welding equipment; • Access to load shifting equipment • Manual key cutting and key duplication machines: pin and wafer, warded, tumbler etc; • CNC/ code key cutting machines to match the software; • Automotive Transponder code reading equipment; • Pin boards and pin gear; • Lock picks and manipulation gear; • A range of safes to service and troubleshoot - key lock, combination lock, digital lock; • A range of impressing equipment. 	As per Level 2.	As per Level 2. Unit 22453 requires a computer program to design Master key systems and loading charts.	As per level 2. Unit 12922 requires suitable lifting equipment. Unit 22454 requires design charts to cut keys from.

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Locksmithing cont.		Consumables: <ul style="list-style-type: none"> • Pins for rekeying; • A full range of common key blanks for residential, commercial and automotive; • A full range of door hardware, both mechanical and electronic to install and rekey; • A range of material to install locking devices into such as timber and common aluminium joinery profiles; • Lubricants, cleaning equipment, paint and surface finishing equipment. 			
Fluid Power - Hydraulics	N/A	<ul style="list-style-type: none"> • Containers; • Blanking flanges; • Plates and Plugs; • Absorbent materials; • Hand tools; • Cleaning equipment and fluids; • two and three-position valves; • actuator(s). 	As per L2.	Flow meter, Pressure gauge.	N/A

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Fluid Power - Pneumatics	N/A	<ul style="list-style-type: none"> • Hand Tools; • Two and three-position valves; • Lubricators; • Tubing and piping; • Pumps; • Solenoid valves; • Reed switches; • Actuators; • Controllers; • Motors. 	<p>Air control devices, examples of which include;</p> <ul style="list-style-type: none"> • Pressure switch; • Check valve; • Pressure gauge; • Safety valve. <p>Air service unit components of which include ;</p> <ul style="list-style-type: none"> • Standard filters; • Oil removal filters; • Regulators - relieving and non-relieving, lubricators. <p>Directional control valves that meet the following requirements;</p> <ul style="list-style-type: none"> • Three and five port; • Two and three position, pilot and solenoid operated. 	<ul style="list-style-type: none"> • Flow Meter; • Pressure Gauge. 	N/A

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Maintenance and Diagnostics	N/A	N/A	<ul style="list-style-type: none"> • Equipment lock off devices and tags; • Spirit or hand levels; • Optical ,electronic or laser technology for leveling; • Abney Level; • Theodolite. 	<ul style="list-style-type: none"> • Bearing diagnostic equipment; • Thermometer; • Strobe; • Vibration sensor; • Transducer; • Ultrasound. <p>Fixed and hand held instruments- may include;</p> <ul style="list-style-type: none"> • Vibration meter; • Thermometer; • Noise meter; • Digital ultrasonic detector; • Dial gauges; • Straight edges; • Feeler gauges; • Laser alignment; • Test water for ph., solids and additives; • Test oil for viscosity and contamination; • NDT- Nondestructive testing- dye penetrant; • Magnetic particle. 	<p>Test equipment for</p> <ul style="list-style-type: none"> • Fluid flow; • Pressure; • Temperature; • Vibration; • Humidity; • Angular/Linear velocities; • Thermal contraction and expansion; • Stress and strains; • Electrical and physical measurements; • shaft alignment.