

3.6 Preparing location – Checklist equipment for apprenticeship



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Alliance of Centres of Excellence in
Vocational Training for Sustainable Habitat



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Equipment checklist for carpentry

Section 3.6 of the Quality Apprenticeship Training Programme sets out the requirements that companies must meet in order to ensure a sufficiently high standard of training and, indeed, to be permitted to train apprentices in the first place.

Typically, the minimum facilities required are described in vague terms. In Austria, for example, it is stated that the company must be organised and run in such a way that the apprentice can be fully taught the necessary knowledge and skills. If this is not possible, the training can still be carried out within a training consortium, where the missing skills are provided by another organisation.

There are two reasons why no fixed minimum requirements for equipment are usually defined: on the one hand, the aim is to keep the barrier to offering an apprenticeship as low as possible. On the other hand, companies vary greatly and are structured differently, making it difficult to draw up a standardised list of what is required.

Nevertheless, to provide a sort of template for guidance, a list has been drawn up detailing the equipment that is necessary or useful for the carpentry apprenticeship. This list is neither exhaustive nor binding; it serves purely as a starting point to help assess the equipment required in line with one's own specific circumstances.

The first section provides a general overview of the equipment that is recommended, whilst the second section refers to the micro-credentials in the document '2.4 Developing occupational profiles and curricula - Microcredentials' and lists the equipment required for each micro-credential. The third and final section looks at how company size affects requirements and recommended equipment – what equipment small, medium-sized and large companies should have.

1) General equipment:

- Facilities & rooms
 - Space for storing personal belongings
 - Cloakroom
 - Break room
 - Accessible space for storing laws and documents that must be displayed
- Personal equipment
 - Starter pack
 - Folder for important documents
 - Guidelines
 - Learning overview (for tracking learning progress)
 - Training plan
 - Safety sheet (emergency numbers, what to do in an emergency, etc.)
 - Keys and key cards
 - Work-related equipment (laptop, USB stick, calculator, etc.)
- Personal protective equipment
 - Hearing protection
 - Safety goggles
 - Steel-toed shoes
 - Helmet
 - Gloves
 - Respiratory protection (for example for painting or finishing)
- Work clothes
 - Pants
 - T-Shirt
 - Jacket
 - Tool belt
- Common tools
 - Tape measure
 - Square
 - Hammer
 - Chisel
 - Stanley knife

2) Equipment for theory

Planning, drawing, etc. (Drawing and planning designs, conducting research, creating plans, etc.)

- Personal workplace
- Planning/Drawing (manually)
 - Drawing board
 - Writing/drawing utensils
 - Folder for documents, tasks, etc.
- Planning/drawing (computer-assisted)
 - PC hardware
 - PC or Laptop
 - PC software
 - Microsoft Office (Word, Excel, PowerPoint, etc.)
 - CAD programmes
 - Other work-related programmes
 - Other equipment
 - Printer/Scanner

3) Equipment for practical work - Workshop

Workshop (Manufacturing wooden structures, wood joints, working with various materials, etc. in the carpentry workshop)

- Facilities and rooms
 - Workshop
 - (Wood) storage room
 - Paint shop
 - Packaging and loading station
 - Residual material container
 - Wood drying plant
 - Metal workshop
 - Maintenance

- Personal workplace
 - Workbench
 - Screw clamps
- (Traditional) hand tools
 - Measuring tools
 - Square
 - Carpenter's square
 - Hammer
 - Chisels
 - Saws
 - Hand saw
 - Circular saw
 - Jigsaw
 - Sandpaper
 - Sanders
 - Orbital sander
 - Belt sander
 - Planes
 - Hand plane
 - Planer
 - Files and rasps
 - Screwdrivers
 - Power Drill
 - Nail gun
- Stationary machines
 - Circular saw
 - Band saw
 - Drill press
 - Panel saw
 - Joinery machine/CNC

- Building materials
 - Sawn timber
 - Wood-based materials
 - Non-wooden building materials
 - Connecting elements
 - Screws
 - Dowels
 - Nails
 - Adhesives
 - Alternative building materials
 - Insulation
 - Sealing materials
- Transport equipment
 - Pallet trucks
 - Overhead cranes
 - Other lifting equipment

4) Equipment for practical work – Construction site

(Construction site/training site)

- Necessary facilities
 - Construction/training site
- Building materials
 - Sawn timber
 - Wood-based materials
 - Non-wooden building materials
 - Surface coating materials
 - Fasteners (Adhesives)
 - Connecting elements
 - Screws
 - Dowels
 - Nails, etc.

- Scaffolding
 - Working scaffold
 - Protective scaffold
 - Support scaffold
- Transport equipment
 - Pallet trucks
 - Overhead cranes
 - Forklift
 - Other lifting equipment
- Disposal & Recycling
 - Material containers

Equipment for the various micro-credentials

The different micro-credentials require different equipment. Here is an overview on what is **needed** or **helpful** (not required but could improve training) for each MC:

Micro-credential 1: Business & wood construction laws, standards and regulations

- Classroom
 - Typical classroom equipment like whiteboard, projector, desks, etc
 - Personal PC or phone for apprentices for conducting research
- Construction site (to show safety regulations)

Micro-credential 2: Wood technology, processing & material science

- Classroom
 - Typical classroom equipment like whiteboard, projector, desks, etc.
 - Personal PC for apprentices for conducting research
- Materials
 - Show samples of different wood species (used for wood construction like spruce, pine, larch, etc.)
 - Show samples of different wood-based materials (like particle board, fibre board, CLT, GLT, etc.)
 - Show samples of other building materials (like metal H-beam, bricks, PU foam, etc.)
 - Show samples of protective layers (for fire protection, moisture protection, etc.)
 - Show samples of different wood pests (like mold, rot, insects, etc.)
 - Show samples of different drying errors
 - Different fasteners (like screws, dowels, etc.)
- Drying chamber
- Wood/Building material storage
- Workshop (showing woodworking tools to make it more tangible/interesting)
- CNC (to make it more tangible/interesting)

Micro-credential 3: Timber construction theory

- Classroom
 - Typical classroom equipment like whiteboard, projector, desks, etc.
 - Personal PC for apprentices for working with CAD/CAM programmes
- CNC for manufacturing the product, apprentices created in CAD

Micro-credential 4: Construction exercises

- Classroom
 - Typical classroom equipment like whiteboard, projector, desks, etc.
 - Personal PC for apprentices for working with CAD programmes
- Materials
 - Drawing board + drawing utensils

Micro-credential 5: Timber construction practice

- Workshop
 - Personal protective equipment
 - Personal workplace/workbench
 - Woodworking tools and machines (like hammer and chisel, saws, sanders, planers, etc.)
 - Measuring tools
 - Construction workshop
 - Lifting equipment (for handling construction parts)
 - Building materials (for producing construction parts)
 - Raw materials (like wood, wood-based materials, etc.)
 - Fasteners
 - Tools (like saws, nail gun, etc.)
 - CNC
 - Space for finishing/coating
 - Ventilation system
 - Materials (different liquid coatings)

Micro-credential 6: Applied mathematics

■ Classroom

- Typical classroom equipment like whiteboard, projector, desks, etc.
- Personal PC for apprentices for working with calculation/spreadsheet programmes

Micro-credential 7: Construction site

■ Construction site (training site)

- Personal protective equipment
- Lifting equipment (for handling construction parts)
- Scaffoldings
- Tools (saws, nail guns, etc.)
- Building materials
 - (Prefabricated) construction parts
 - Connecting materials
- Place to load and unload materials for transportation
- Building services
 - Materials (sanitary, heating, energy)
- Coating place
 - Materials
 - Respiratory protection

Micro-credential 8: Building removal & renovation

■ Classroom

- Typical classroom equipment like whiteboard, projector, desks, etc.
- Personal PC for apprentices for conducting research
 - Operational IT software
 - Word processing, spreadsheet and presentation programmes

■ Construction site (training site)

- Personal protective equipment
- Lifting equipment (for handling construction parts)
- Scaffoldings
- Tools (for dismantling)
- Building materials
 - Prefabricated parts for renovation/conversion

- Insulation & functional layers
- Energy systems
- Coating materials (sanders, coating, etc.)
- Material containers for recycling/disposal

Micro-credential 9: Customer service & operational organisation

- Classroom
 - Typical classroom equipment like whiteboard, projector, desks, etc.
 - Personal PC for apprentices for conducting research
 - Operational IT software
 - Word processing, spreadsheet and presentation programmes
- Workshop (for work planning and preparation)
- Construction site (for work planning and preparation)

Micro-credential 10: Timber construction planning

- Classroom
 - Typical classroom equipment like whiteboard, projector, desks, etc.
 - Personal PC for apprentices for working with CAD/CAM programmes and spreadsheet programmes
- Workshop
 - Personal protective equipment
 - Personal workplace/workbench
 - Woodworking tools and machines (like hammer and chisel, saws, sanders, planers, etc.)
 - Construction workshop
 - Lifting equipment (for handling construction parts)
 - Building materials (for producing construction parts)
 - Raw materials (like wood, wood-based materials, etc.)
 - Fasteners
 - Tools (like saws, nail gun, etc.)
 - CNC
 - Space for finishing/coating
 - Ventilation system
 - Materials (different liquid coatings)

Requirements based on company size

Small company:	<50 employees
Medium-sized company:	50 – 250 employees
Big company:	>250 employees

Expectedly, smaller companies have less budget/possibilities to procure comprehensive equipment just for apprenticeship training. Nevertheless, small companies should be given the opportunity to provide training. To ensure that the barriers to apprenticeship training are not too high, there is usually no set list of equipment that is absolutely essential; instead, it is simply stipulated that sufficient resources must be available to enable all the necessary content to be taught.

In order for companies to have something to orientate their system to, the equipment that is recommended depending on the size of the company is listed below. Of course, this does not mean that smaller companies cannot orientate themselves to the larger companies and obtain additional resources for the apprentices. Rather, it is intended to show that good training can also be provided with a smaller budget and that the equipment is only part of the training.

Both general equipment (1) and workstations for drawing and drafting (2) should be provided for apprentices, regardless of the size of the company. However, due to differing starting points and budgetary constraints, there are greater variations in the requirements for workshops (3) and construction sites (4) between small, medium-sized and large companies.

In principle, it is always preferable, if possible, for apprentices to be given their own workplace at the beginning, where they can work undisturbed by production. This allows apprentices to work at their own pace without being too stressed and prevents the training of apprentices from having a negative impact on production productivity. Over time, the apprentices can then be integrated more and more into ongoing production.

Both the procurement of general equipment (1) and the workstation for drawing/planning (2) should be feasible for all company sizes. As medium-sized and larger companies have greater budgetary resources, it is advisable for apprentices to be provided with their own work equipment. It is also preferable, where possible, for apprentices to have their own workstation where they can work undisturbed. In smaller companies, it is also possible that the general equipment is owned by the company and can be used by the apprentice when necessary (such as the tools or safety equipment) and that the workstation is not separate for the apprentice but, for example, a shared workstation with another employee.

In the workshop (3) of small companies, at least one workstation with a workbench should be provided to the apprentice(s). In addition, the most important hand tools should always be available and usable. It is recommended that the workstation is located separately from the workshop to provide good and safe working conditions. If this is not possible, it is also possible for small and medium-sized companies to set up the workplace in a quieter location. Large companies could possibly set up a separate training workshop for apprentices where they can work undisturbed, away from production.

For work with machines and tools, it would be preferable if apprentices were provided with their own tools and machines so as not to disrupt the normal working day and avoid putting apprentices in conflict and stressful situations. This might be difficult to realise for small companies, which is why it is then advisable to use quiet phases for working with machines through good planning. Medium-sized companies should try to provide apprentices with their own tools and machines. For larger companies, it is advisable to set up a separate training workshop for the apprentices, like in the carpentry workshop, where they are provided with their own set of tools and machines.

If companies only have a limited selection of materials and machines, it is a good idea to cooperate with other companies or the TVET Centre for providing apprentices with comprehensive training. This mainly applies to small companies; medium-sized and large companies should already have the necessary machines or, if financially justifiable, procure them for the training.

The construction site (4) is the most critical point in training, as training on the construction site can pose major financial and health risks. Medium-sized and large companies might set up a separate apprenticeship construction site that is designed to simulate work on the construction site. It should be set up in such a way that the apprentice can carry out all relevant work such as assembly, maintenance, repairs and dismantling in a safe environment.

As this is difficult for small companies to realise, they need to consider other methods of teaching apprentices how to do these tasks without disrupting the production flow and at the same time ensuring the health and safety of the apprentices.

In conclusion, it can be said that training can be successfully carried out by both small and large companies. However, to achieve the same level of quality of training, small companies must put in more planning effort. The costs of apprenticeship training also depend on the number of apprentices being trained at the same time. The higher the number of apprentices, the lower the costs per apprentice resulting from the training. Companies should take this into account when planning the apprenticeship.