

Health and Safety - Ladder and Stepladder Safety

1. Introduction

In the UK, a third of all reported falls from height involve either ladders or stepladders – on average this accounts for 14 deaths and 1200 major injuries to workers each year. Many of these injuries are caused by inappropriate or incorrect use of the equipment.

This guidance is to help ABC Ltd employees and contractors working at ABC Ltd sites:

- Know when to use a ladder
- Decide how to go about selecting the right sort of ladder of a particular job
- Understand how to use it
- Know how to look after it, and
- Take sensible safety precautions

As with all work equipment, ladder users need adequate information and training to be able to use ladders and stepladders safely. Adequate supervision is needed so that safe practices continue to be used.

2. References:

Work at Height Regulations 2005

3. Definitions:

HSE Health and Safety Executive
BERR Department for Business, Enterprise and Regulatory Reform

4. Correct Selection of Appropriate Equipment

The process for selecting access equipment has to take into account the work at height hierarchy of control:

- Firstly wherever possible **avoid** work at height where possible
- Then, take steps to **prevent** falls from height
- And finally ensure measures are in place to **reduce** the consequences of a fall

Where work at height is necessary, you need to justify whether a ladder or stepladder is the most suitable access equipment compared to other access equipment options. This should be done via risk assessment and the use of the hierarchy of controls.

When considering the use of a ladder or stepladder, consideration must be given to the following factors:

4.1 Is it a suitable activity?

Both the type of work and its duration must be considered. As a guide, **only** use a ladder or stepladder:

- in one position for a maximum of 30 minutes
- for “light work” – they are not suitable for strenuous or heavy work. If a task involves a person carrying more than 10kg up the ladder or steps, it will need to be justified by a detailed manual handling assessment or alternative access equipment should be used
- where a handhold is available on the ladder or stepladder
- where you can maintain three points of contact (hands and feet) at the working position. On a **ladder** where you cannot maintain a handhold, other than for a brief period of time, other measures will be required to prevent a fall or to reduce the consequences of one. On **stepladders** where a handhold is not practicable, a detailed risk assessment will need to be completed to justify whether it is safe or not

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On a ladder or stepladder you must **NOT**:

- overload it – the person and anything they are carrying must not exceed the highest load stated on the ladder
- overreach – keep your belt buckle (navel) inside the stiles of the ladder and both feet on the same rung throughout the task (see figures 1a and 1b)

When working on **stepladders** you must avoid work that imposes any type of side loading (such as side-on drilling through solid materials, e.g. bricks or concrete) – to do this, the steps should face the work activity (see figure 2a and 2b). Where side-on loadings cannot be avoided, then you must prevent the steps from tipping over, for example by tying the steps to a suitable point. Otherwise a more suitable type of access equipment should be used.

You should also avoid holding items when climbing:

- on a **ladder** where you must carry something you must have one hand free to grip the ladder.
- on a **stepladder** where you cannot maintain a handhold (eg. Putting a box onto a shelf), the use of a stepladder will need to be justified by taking into account:
 - the height of the task
 - a safe handhold still being available on the stepladder
 - whether it is light work (less than 10kg)
 - whether it avoids side loading
 - whether it avoids overreaching
 - whether the user's feet are fully supported, and
 - whether you can tie the stepladder

The requirement to hold items whilst climbing can be avoided in several ways, such as with the use of tool belts.

4.2 Is the ladder suitable for the task?

When buying a new ladder, consideration should be given to the worst type of surface conditions that the ladder could be used on (e.g. smooth, wet floor tiles). Manufacturers should be able to indicate the types of surfaces their products are intended to be used on when they are unsecured (untied). Only purchase the ladder and associated stability devices that suppliers/manufacturers can confirm will be stable enough to be used unsecured in this worst case scenario, otherwise additional measures must be taken to secure it.

The HSE & BERR recommend the use of either a Class 1 (Industrial) or EN131 ladders or stepladders for use in the work place. It is important to ensure that the ladder is a suitable size of the work being carried out (also see section 6.6 - Ladder classification).

5. Safe Places To Use A Ladder Or A Stepladder

This covers the specific place where the ladder or stepladder is to be set up and used.

As a guide, **only** use a ladder or stepladder as follows:

- on firm ground or spread the load (e.g. use a board under the ladder)
- on level ground – for **stepladders** refer to the manufacturer's instructions, for **ladders** the maximum safe ground slopes on a suitable surface (unless the manufacturer states otherwise) are as follows:
 - side slope 16° – but the rungs still need to be levelled (see figure 3)
 - back slope 6° (see figure 3)



Figure 1a Incorrect - overreaching and not maintaining three points of contact



Figure 1b Correct - user maintaining three points of contact



Figure 2a Incorrect - steps side-on to work activity

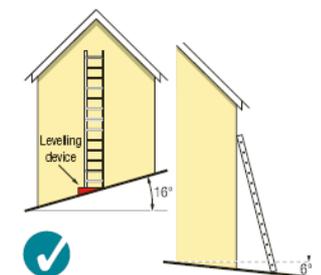


Figure 3 Ladder showing maximum angles at 16° on a side slope and 6° on a back slope

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- on clean, solid surfaces (paving slabs, floors etc). These need to be clean (no oil, moss or leaf litter) and free of loose material (sand, packaging materials etc) so that the feet can grip. Shiny floor surfaces can be slippery even without contamination
- where it has been secured

The options for securing a **ladder** are as follows:

- tie the ladder to a suitable point, ensuring both stiles are securely tied (see figures 4, 5, 6 and 7)

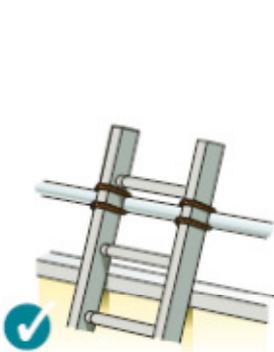


Figure 4 Ladder tied at top stiles (correct for working on, not for access)



Figure 5 Tying part way down



Figure 6 Tying near the base

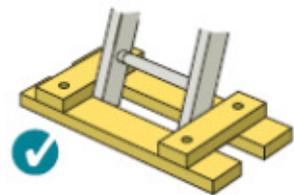


Figure 7 Securing at the base

- where this is not practical, use a safe, unsecured ladder or a ladder supplemented with an effective ladder stability device
- if this is not possible, then securely wedge the ladder, e.g. against a wall
- if none of the above can be achieved, foot the ladder. Footing is the **last resort** and should be avoided, where reasonably practicable, by the use of other access equipment

Ladders used for access to another level should be securely tied (see figure 8).

Stepladders should not be used for access to another level unless they have been specifically designed for this. Consider tying a **stepladder** where possible and beneficial to the task (e.g. side-on working or where two free hands are needed).

Ladders and stepladders must only be used:

- where **ladders** can be put up at the correct angle of 75°. To judge the angle use the angle indicator marked on the stiles of some ladders or use the 1 in 4 rule (1 unit out for every 4 units up, as shown in figure 10).
- where they will not be struck by vehicles, by protecting them with suitable barriers or cones
- where they will not be pushed over by other hazards such as doors or windows, by securing doors (not fire exits) and windows where possible. If this is impractical, have a person standing guard at a doorway, or inform workers not to open windows until they are told it is safe to do so.
- where pedestrians are prevented from walking under the ladders or near to them, by using barriers, cones or as a last resort, a person standing guard at the base
- where the restraint devices on the **stepladders** can be fully opened. Any locking devices must also be engaged.

On a ladder or stepladder:

- do not work within 6m horizontally of any overhead power lines, unless the line owner has made them dead or protected them with temporary insulation. If this is a regular activity, investigate as to whether the lines can be moved.

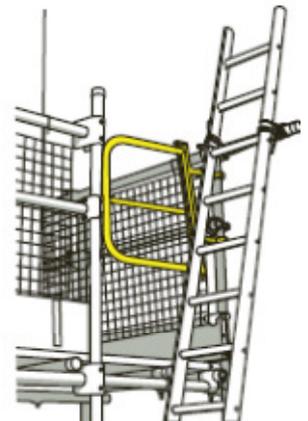


Figure 8 Access ladders should be tied and extend at least 1 m above the landing point to provide a



Figure 9 Stand-off device and working maximum height on a ladder

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- always use a non-conductive ladder or steps for any necessary live electrical work (note: live-working is prohibited at ABC Ltd sites, and consultation with the health and safety department must be carried out)
- do not rest **ladders** against weak upper surfaces (e.g. glazing or plastic gutters). Alternatively, spreader bars or effective stand-off can be used (see figure 9)

6. Safe Condition of a Ladder Or Stepladder

The user must ensure that the ladder or stepladder is in a safe condition before using it.

As a guide, only use ladders or stepladders that:

- have no visible defects. They should have a pre-use check each working day
- have a current detailed visual inspection. Ladders that are part of a scaffold system have to be inspected every seven days
- are suitable for work use. Class 1 or EN131 ladders or stepladders should be used – Class 3 (domestic use) are not normally suitable for use in a work environment
- have been maintained and stored in accordance with the manufacturer's instructions
- wooden ladders must NOT be painted

6.1 Ladder Inspection

There are 3 stages of inspection:

1. Pre-use Checks (by the user) – carried out each working day, do not have to be recorded, also inspection after something has changed (e.g. ladder dropped or moved from dirty to clean area etc)
2. Detailed Visual Inspection – carried out at intervals dependant on level of use. HSE would expect these to be carried out in-house, and for results to be recorded. Interim inspections may be required if something has changed.
3. Maintenance – carried out in accordance with manufacturers instructions, could be done at the same time as Detailed Visual Inspection.

As a guide detailed inspections should be carried out as follows:

- 6 monthly for ladders used frequently or occasionally (daily to weekly use)
- 12 monthly for ladders used infrequently (in excess of monthly)

However, ladders as part of scaffolding need to be inspected every 7 days, but there is no need to remove it for each inspection.

There is no requirement for non-destructive testing or load testing – inspections should ensure that visual checks are carried out for obvious defects (e.g. bent stiles, missing rivets etc)

6.2 Pre-use checks

Both pre-use checks and detailed visual inspections look for obvious visual defects – they only differ in detail. Both types of inspection can be carried out in-house, and pre-use checks should form part of a user's training. Pre-use checks do not need to be recorded, however detailed visual inspections must be recorded and records retained.

Ladder stability devices and other accessories should be checked prior to use (pre-use check) and also inspected in accordance with the manufacturer's instructions. A pre-use check should include checking of the following:

- Rungs
- Stiles
- Mounting brackets and locking mechanisms
- Hinges
- Ladder feet
- Non-slip devices
- Extension guides and locks

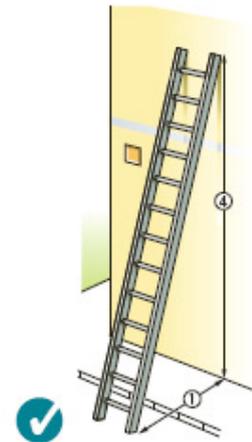


Figure 10 Ladder showing correct 1 in 4 angle (means of securing omitted for clarity)

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- General condition

Ladder feet are essential for preventing the base of the ladder slipping. Missing stepladder feet will cause it to wobble. Therefore the feet must be in good repair (not loose, missing, splitting, excessively worn, secure etc) and they must also be clean – the feet must be in contact with the ground.

Ladder feet should also be checked when moving from soft/dirty ground (e.g. dug soil, loose sand/stone, a dirty workshop) to a smooth, solid surface (e.g. paving slabs) to ensure that the foot material and not the dirt, such as soil, embedded stones or swarf, is making contact with the ground.

6.3 Detailed visual inspections

As a guide detailed inspections should be carried out as follows:

- o 6 monthly for ladders used frequently or occasionally (daily to weekly use)
- o 12 monthly for ladders used infrequently (in excess of monthly)

Records of a detailed visual inspection should be recorded and records should be retained for the lifespan of the ladder.

6.4 Maintenance

Ladder maintenance should be carried out in accordance with manufacturers instructions, and this could be done at the same time as Detailed Visual Inspection. This may include tasks such as thorough cleaning of the equipment, tightening of bolts, rivets etc.

6.5 Ladder Identification

Ladders should be clearly identified so that records can easily be matched to the ladder in question. A recommended method is the use of ladder tags (see photo).

Any ladders that have been hired or loaned must have a proof of inspection provided with them (either in tag or document format).

Contractors' ladders should also be clearly identified with the company name visible on the ladder/tag.



6.6 Ladder Classification

All ladders manufactured and supplied within the UK and the EU should be manufactured to specified standards and correctly classified. These requirements apply to all portable ladder types and include stepladders, portable ladders, platform steps and extension ladders. Specialist single use ladders, (eg. pole ladders, loft ladders), and fixed access ladders, (eg. static roof access ladders), are not intended for classification under these standards.

There are three main classifications of ladder – Class 1, Class EN131 and Class III. Each classification indicates the safe working load that a ladder is designed to support. The value of the safe working load (SWL) is intended to cover the weight of a single person and their equipment and is also referred to as the 'Maximum Static Vertical Load'. These classifications can be broadly categorised into the type of use that a ladder is designed to support ie. Heavy Duty Industrial Use, Commercial Light Trade Use and Light Domestic Use.

Ladders have also been previously classified under their 'Duty Rating'. These values, based upon the frequency of use and type of environment in which a ladder was used, were originally determined by the British Standards organisation. These values are now outdated by the most recent classifications and users should be aware that a Duty Rating does not provide an accurate measurement of a ladder's safe working load. Hence the value of the Maximum Static Vertical Load should be used to provide a more accurate indication of the relative strengths of different ladders.

The table below shows the three main ladder classifications:

Classification	Duty Rating	Maximum Static Vertical Load	Application	Label
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Class 1	130kg	175kg	Industrial	
Class EN131	115kg	150kg	Commercial	
Class III	95kg	125kg	Domestic	

Ladders should be colour coded to provide a simple visual indication of their classification:

- Class 1 Ladders are commonly marked in blue
- Class EN131 Ladders are commonly marked in green or yellow
- Class III Ladders are identified by the colour red. Colour identification is often used on the feet of ladders and steps and attached user instructions and warning labels.

Class 1 Ladders are the highest rated ladders in terms of strength and quality. These ladders are suitable for use in heavy-duty industrial applications and environments.

The European Standard **EN131** is a Europe wide classification and it replaces the old British Class II Ladder Standard. Within the UK this classification is known as BS EN131. Ladders of this type are most suitable for commercial light trade work or heavy duty DIY use.

Class III Ladders are only suited to occasional light domestic tasks and are NOT suitable for use within any commercial or trade environment.

ABC Ltd will only authorise a minimum ladder quality of a BS EN131 to be used at their sites. Class III (Domestic) ladders are not to be used on site.

7. Ladder Users

Ladder users should know how to set up and use ladders and stepladders in the correct, safe manner. Users should also be aware of the limitations detailed within this document. People should **only** use a ladder, stepladder or stability device if:

- they are competent – users should be trained and instructed to use the equipment safely
- the ladder or stepladder is long enough for the task:
 - o for **ladders**:
 - **don't use the top three rungs** (figure 9)
 - ladders used for access should project at least 1m above the landing point and be tied; alternatively a safe, secure handhold should be available (see figure 8)
 - o for **stepladders**:
 - **don't use the top two steps** of a stepladder where a hinge or step forms the top of the stepladder, unless a suitable handrail is available on the stepladder (see figure 11)

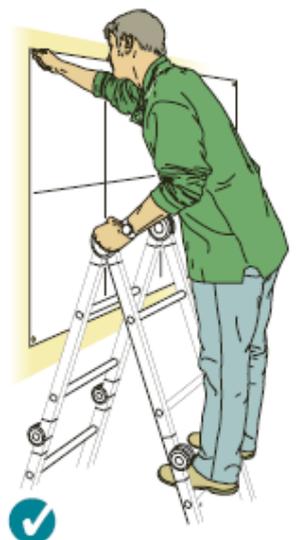


Figure 11 Correct - two clear rungs. Don't work any higher up this type of stepladder

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- **don't use the top three steps** of swing-back or double-sided stepladders, where the top of the stepladder is a step (see figure 12)
- the ladder or stepladder rungs or steps are level. This can be judged by the naked eye. **Ladders** can be levelled using specially designed devices – but NOT by bricks or bits of wood or whatever else is at hand.
- The weather is suitable – do not use stepladders or ladders in strong or gusting winds (follow the manufacturer's safe working guidelines)
- They are wearing robust, sensible footwear (e.g. safety shoes/boots or trainers). Shoes should not have the soles hanging off, have long or dangling laces or be covered with mud or other slippery contaminants
- They know how to prevent members of the public or other workers from using them
- They are fit – certain medical conditions or medication, alcohol or drug abuse could stop them from using ladders. ABC Ltd employees who undertake any work at height will be required to complete a work at height questionnaire and to be examined by the Occupational Health Nurse during routine health screening.
- They know how to tie a ladder or stepladder properly



Figure 12 Correct - three clear steps. Don't work any higher up this type of stepladder

On a ladder or stepladder do **NOT**:

- Move them whilst standing on the rungs/steps/platform
- Support them by the rungs or steps at the base
- Slide down the stiles
- Stand them on moveable objects such as pallets, bricks, lift trucks, tower scaffolds, excavator buckets, vans or mobile elevating work platforms
- Extend a ladder whilst standing on the rungs

8. Ladder Defects

The following photographs demonstrate typical defects that can be seen with ladders or stepladders:

A Split stile – this ladder is beyond repair

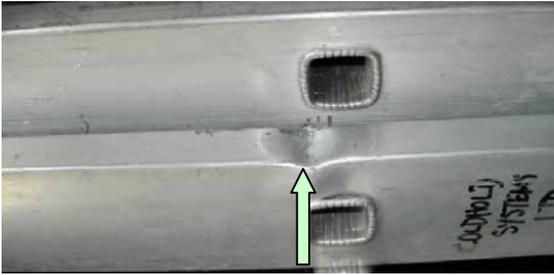


B Dented or twisted rung – beyond repair

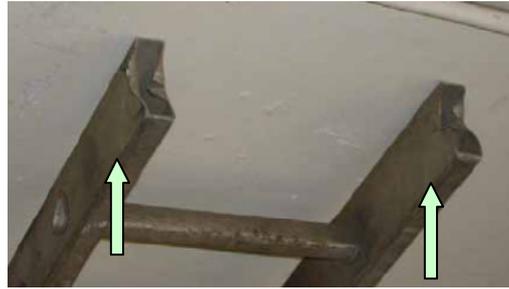


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C Dented stiles – beyond repair:



D Missing ladder feet:



E Damaged restraint connection – beyond repair as hole in stile has become worn or made larger:



F Bent back bar – this reduces overall stability of stepladder – the defective part should be replaced



9 Further Information

Further information and guidance on the use of ladders and stepladders can be found at:

- *Top tips for ladder and stepladder safety*, Pocket Card INDG405, HSE Books 2005, ISBN 978 0 7176 6127 5
- *Evaluating the performance and effectiveness of ladder stability devices* RR205, HSE Books 2004, ISBN 976 0 7176 2822 3
- *Ergonomics evaluation in the safety of stepladders (Phase 1 and 2)*, CRR418 & CRR243 HSE Books 2002, ISBN 978 0 7176 2302 0 and ISBN 978 0 7176 2315 0
- *HSE Website*: www.hse.gov.uk/falls/index.htm

10 Acknowledgements

Some of these illustrations/pictures are taken from the HSE website and the HSE guide for employees on the safe use of ladders and stepladders