

# Reducing manual handling of plasterboard

## Best practice guidance

### The problem

Manual handling of plasterboards in order to construct interior building walls and ceilings represents a moderate to high risk of back and other musculoskeletal injury (e.g. neck and upper limb problems).

### The risks

- Plasterboard can be heavy and unwieldy in nature, which make it difficult to grip and handle
- Handling and installation often requires highly repetitive tasks and the adoption of awkward postures (e.g. bent forward, trunk twisting and reaching with hands above shoulder height)
- Workers often have to handle the sheets in a restricted space, e.g. a stairwell and narrow walkways
- Workers often stand for long periods, particularly on uneven surfaces; which can lead to discomfort in the legs, knees and feet
- Fixing plasterboard to the ceiling exposes individuals to a higher risk of musculoskeletal injury compared to fixing to walls. This is due to the static nature of the activity when holding the plasterboard in position overhead and the repetitive hammering or use of a power drill above shoulder height with the neck hyper-extended.
- The risk of neck injury is likely to be increased due to the hyperextension required when installing plasterboards to ceilings
- The shoulders and upper limbs are also likely to be at an increased risk of developing a musculoskeletal injury, due to the repetitive use of power tools, particularly at or above shoulder height.

### Handling of plasterboard

Provide training in manual handling for all workers:

This should be as a matter of immediate concern for construction sites where large quantities of plasterboard are handled. Workers should be trained in handling techniques, both for individual and team lifts. The training should be tailored to the needs of the worker, covering the specific manual handling tasks they will encounter, the planning of lifts and the use of handling aids appropriate to their environment.

Training should cover communication to ensure a coordinated approach to team handling, especially considering the often-frenetic nature of the work environment. This is particularly relevant where part-time or agency workers are assigned to heavy manual handling tasks (e.g. loading out), as these workers are not part of the core workforce.

Manual handling of plasterboards in order to construct interior building walls and ceilings represents a moderate to high risk of back and other musculoskeletal injury (e.g. neck and upper limb problems).

Due to the insidious nature of many musculoskeletal disorders it is quite possible that workers may suffer accumulative damage to their musculoskeletal system without feeling symptoms and so without being aware of the risk. This would be partially rectified through the provision of training.

The completion of the training programme for each worker should be recorded and signed by the appropriate supervisor/manager. These records will become part of the company's Health and Safety arrangements, which should be reviewed at least annually.

## Key tasks in the handling and installation of plasterboard

### LOADING OUT

Represents a high to moderate risk of musculoskeletal injury. This is the first stage of plasterboard installation. It involves transporting the plasterboard from the delivery point to the area where it is required.

Plasterboard is generally delivered and stored on pallets and mechanical pre-loading and determination of the optimum position of boards can reduce the amount of manual handling required on-site.

A specific problem during the loading out phase may be the transportation of plasterboard between floors. These large boards may need to be carried manually up flights of stairs. This leads to constrained postures, particularly

where there is insufficient room to manoeuvre the plasterboard.

Furthermore, if the load is put down to rest such as when negotiating large stairwells, they will have to lift the load again, placing them at increased risk of musculoskeletal injury. Lifting and lowering when working in restricted spaces typically increases the amount of trunk twisting and sideways bending that workers perform.

### SUMMARY

The key manual handling risk factors associated with loading out are due to:

- Size and weight of plasterboard
- Frequency of lifts
- Carrying distance (Carrying distances greater than 10m are associated with a high level of risk)
- Postural constraints and awkward postures (e.g. bent forward, trunk twisting and reaching with the hands above shoulder height) associated with transporting plasterboard, particularly upstairs

### RECOMMENDATIONS FOR RISK REDUCTION

**Avoid handling upstairs:** This is an activity with a particularly high level of risk for musculoskeletal disorders (MSDs). It also requires workers to work at a live edge without edge protection. Creating access routes (e.g. through floors or external openings) for the movement of plasterboard can reduce the need to adopt awkward postures when handling.

**Planning:** A safe system of work should be developed to reduce the level of MSD risk individuals are exposed to, which should consider how the plasterboards are going to be delivered to the area where they are required. E.g. use of trolleys to transport plasterboard around site and placing of boards as close to where they are needed as possible.

**Use of mechanical aids:** Where possible mechanical aids, such as cranes, lifts and trolleys, should be used to transport the pallets / stacks of plasterboard as close to where they are required as possible.

## MEASURING AND CUTTING PLASTERBOARD

After plasterboard is loaded out the installer measures and cuts the board to the appropriate size. Workers adopt a number of methods for measuring and cutting the plasterboard. In general, boards are cut while still on the pallet.

This causes the worker to stoop forward, maintaining a relatively static posture, as they make the cut and may also involve them working with their hands away from their body. This is exacerbated when cutting the last few boards; as workers either bend their backs further or kneel / crouch down to see what they are doing. Alternatively, workers may cut the board while it is resting on its edge, propped against a wall or stack of plasterboard.

This causes the worker to twist, bend or kneel in order to see what they are doing. Furthermore, this task may require workers to adopt awkward postures of the wrist, as they grip the tools. The design of such tools may not facilitate a power grip and some use of a pinch grip may occur. Other factors that effect grip, such as gloves, exposure to cold or draughts, or exposure to vibration may increase discomfort or cramping of the hand and fingers when using such tools.

After the plasterboard has been cut the waste board needs to be disposed of, in order to keep the work area tidy and free from tripping hazards. Where possible, larger boards should be cut into small pieces and put into a skip, which will be removed mechanically.

When access is difficult waste is put into smaller buckets / wheelie bins and carried or wheeled to the nearest exit. The weights lifted and the forces exerted when using a wheelie bin will be highly variable and may be difficult depending on the floor surface and number of obstacles to negotiate.

## SUMMARY

Cutting and measuring plasterboard is a moderate risk activity. The key risk factors with loading out are:

- Forward flexion of the lower back
- Increased distance between the hands and lower back as workers stoop forward to see what they are doing
- The level of risk is increased when cutting boards at floor level

## RECOMMENDATIONS FOR RISK REDUCTION

**Avoid cutting boards on edge:** This would eliminate the need to squat or kneel in front of the plasterboard, reducing the strain placed on the lower limbs and the amount of twisting and bending required finding a suitable working position.

**Use trestles to raise working height:** Raising the height at which plasterboard is measured and cut would help to reduce the amount of forward bending (e.g. by placing more plasterboard onto the stack / pallet). Raising the working height that the boards are measured and cut at will improve the posture of workers,

as they will spend less time in a forward stooped posture.

## Lifting and handling plasterboard

In order to install the plasterboard, the workers must lift and carry the boards from where they have been measured and cut to where they are to be fitted and hold them in place while they are fixed.

This can be particularly awkward depending on where the boards are being installed. During the fixing process the majority of plasterboard installers work in pairs, with one worker lifting and carrying the board while the other fixes the board in place.

Individuals will be most at risk from lower back injury due to the frequent handling of the plasterboard. Often workers have to lift over a large vertical lift region (from floor height to above head height).

The grip workers have on the plasterboard is often poor as plasterboard is generally bulky and difficult to handle. When lifting and positioning plasterboards workers are exposed to static workloads of the shoulder, arms and neck. The trunk is often extended (both twisting and sideways flexion) when performing this task, as are the neck and head, as workers hold the plasterboard against their body.

## SUMMARY

Lifting and carrying plasterboard is a moderate risk activity. The key risk factors associated with lifting and carrying plasterboard are:

- Size and weight of plasterboard
- Frequency of lifts
- Vertical lift region
- Asymmetric loading during carrying

## RECOMMENDATIONS FOR RISK REDUCTION

**Reduce dimensions of board:** Reducing the dimensions of the plasterboard will improve its handling characteristics.

**Reduce the weight of loads:** Many of the boards handled are not that heavy and can be easily lifted either alone or in teams, however handling becomes problematic when: loads are handled above head height; there are limited opportunities for rest after handling heavier loads.

**Adopt good lifting technique:** Lift by using the legs, carry board in a balanced manner, only lift what is manageable and if necessary, seek assistance (For more detail see [www.british-gypsum.com](http://www.british-gypsum.com), Manual Handling and Lifting section).

**Use of mechanical aids:** Where possible mechanical aids such as ceiling lifts and adjustable props should be used to alleviate the burden associated with holding the board above head height.

## Ceiling installation

Lifting (and holding) plasterboard into position while fitting it to ceilings has been identified as having a higher level of MSD risk than the more general activities associated with lifting and handling discussed thus far.

Workers who fit the plasterboard to ceilings may be at increased risk of musculoskeletal injury as they are constantly working with their arms at or above shoulder height.

Furthermore, the risk of neck injury is likely to be increased due to the hyperextension required when installing plasterboards to ceilings.

### SUMMARY

Installing plasterboard ceilings is a moderate risk activity. The key risk factors associated with ceiling installation are:

- Size and weight of plasterboard
- Frequency of lifts
- Vertical lift region
- The variety of postures required to fix plasterboard including; squatting or kneeling to make the lower fixings, stooping or bending forward to make thigh height fixings and reaching up to shoulder height or above to make the upper fixings
- Working below knee level and above shoulder height are risk factors for back complaints and upper extremity complaints, respectively.
- Repetitive use of upper limbs and awkward wrist postures when using drills to fix plasterboard

- The level of risk is increased when raising boards to the ceiling, as workers adopt static postures, with hands raised above head height
- The risk of neck injury is likely to be increased due to the hyperextension required when fixing plasterboards to ceilings
- Manual handling aids reduce the risk of MSD associated with installing ceilings from high to moderate / low risk

### RECOMMENDATIONS FOR RISK REDUCTION

**Improve handling postures:** Reducing the dimensions of the plasterboard will improve its handling characteristics. However, this is not considered a practicable solution in most situations. Avoid the need to handle at shoulder height and close to floor level. Try to ensure that team members are reasonably matched in size. Keeping workspaces as clear as possible so as to avoid restricting postures (i.e. causing people to twist and bend sideways etc.)

**Reduce the weight of loads:** Many of the boards handled can be easily lifted either alone or in teams, however handling becomes problematic when: loads are handled above head height, there are limited opportunities for rest after handling heavier loads. Given the weight of the boards workers should avoid handling multiple boards at the same time.

**Use of mechanical aids:** Where possible mechanical aids such as ceiling lifts and adjustable props should be used to alleviate the burden associated with holding the board above head height. They can help reduce the amount and duration of forces applied during manual handling operations.

**Examine the drills used:** Workers use drills to fix plasterboard for a large part of the working day and are likely to benefit from having lightweight, low vibration drills to help minimise the amount of muscle fatigue. Furthermore, cordless drills would reduce the risk of tripping associated with mains supply drills.

## Overview of recommendations for risk reduction

There is clear potential for risk of musculoskeletal injury in moving and handling panel products such as plasterboard. Taking sensible precautions may reduce these risks. This section recommends certain risk control strategies. Those with more general application are presented first, followed by others, which are specific to each of the tasks specific to handling and installing plasterboard.

Elements of plasterboard handling and installation are covered by legislation including the Health and Safety at Work Order 1978, the Construction (Design and Management) Regulations (Northern Ireland) 2016 (CDM) and the Management of Health and Safety at Work Regulations (Northern Ireland) 2000. The CDM regulations extend legal duties to principal contractors, even though they may not be the direct employers of those undertaking manual handling activities.

The most relevant legislation is the Manual Handling Operations Regulations (Northern Ireland) 1992. These require employers to avoid hazardous manual handling activities where reasonably practicable.

These regulations set out a clear hierarchy of measures that should be followed to reduce the risk associated with manual handling:

- 1. Avoid hazardous manual handling operations so far as reasonably practicable.** In some cases, changing the way that activities are carried out can remove (or reduce) the need for manual handling.
- 2. Assess any hazardous manual-handling problem that cannot be avoided.** This leads to an understanding of the risks so that means can be considered for reduction.
- 3. Reduce the risk of injury so far as is reasonably practicable.** The duty holder should take steps to reduce risk of injury arising from the manual handling work. They should consider providing manual handling assistance where reasonably practicable.

With the use handling aids, some manual handling is retained but bodily forces are applied more efficiently, reducing the risk of injury. For example, a trolley, sack truck, or pallet truck can greatly reduce the effort required to move a load around site. Likewise, a hoist can support the weight of a load, leaving the handler free to control its position.

Reducing load sizes, improving their shape, clearly marking their centre of gravity and load weight, and reducing the frequency of lifting, can significantly reduce the overall risk associated with manual handling.

It is impossible to avoid all manual-handling operations in the construction industry and this applies to the installation of plasterboard, which relies heavily on manual handling activities. No single universal solution exists to improve risk control, but a number of different strategies may usefully be implemented to suit differing scenarios.

The following recommendations cover measures that employers and workers should consider to control risk of musculoskeletal injury when handling and installing plasterboard:

**Provide mechanical assistance:** There are steps the industry can take to avoid or reduce the amount of manual handling to control risk of injury. A variety of handling aids and devices exist that will reduce the amount and / or severity of manual handling workers must perform.

However, caution is advised when introducing any new handling aids into the work environment, as operators must be trained properly in their use. The introduction of handling aids needs to be assessed and monitored, to ensure that new risks are not introduced.

It is recommended that equipment first be hired for a trial period to determine whether it is suitable for individual company and user requirements.

**Provide safe systems of work:** Safe systems of work detail the procedures to be followed during the construction phase, including the need to consider manual handling. It is vital to consult those employees that carry out the work, or with detailed knowledge of the activity, so that the system of work produced is effective and practical as well as safe. Involving employees in the process helps them to understand why this level of control has to be established and maintained.

**Reduce weight of loads:** Reducing weight of the plasterboard will further improve its handling characteristics. Although many of the boards handled can be easily lifted either alone or in teams, handling becomes problematic when: loads are handled above head height; there are limited opportunities for rest after handling heavier loads and; inappropriate / poor handling techniques are adopted and operators have not had appropriate training.

**Label loads:** Items often do not have weights indicated on them; therefore workers may not be able to perform a dynamic risk assessment (i.e. suitable to the prevailing conditions). Items should be labelled appropriately, clearly identifying the product and its weight (both individual board and pallet weight).

It may also be possible to differentiate load weights that are suitable for individual lifts from those where team lifts are required. This will help across the supply chain, particularly with assessing risks to employees involved in handling.

**Team handling of plasterboard:** Team handling is an effective way of reducing the physical burden of manual handling. The results of the MAC assessment suggest significant risk reductions can be made; as load weights less than 35kg would present a low level of injury risk, and loads of 35kg-50kg would present a moderate level of MSD injury risk when two people are lifting the load. (It is important to note that the capacity of a two-person lift is less than the sum of their combined lifting capacity).

Any boards weighing more than 50kg will present a high level of MSD injury risk, even if handled by two individuals. It should be noted that it is common practice to carry boards in pairs, face to face, so even lighter boards may give rise to high levels of risk in these circumstances.

**Provide training in manual handling for all workers:** This should be a matter of immediate concern for construction sites where large quantities of plasterboard are handled. Workers should be trained in handling techniques, both for individual and team lifts.

The training should be tailored to the needs of the worker, covering the specific manual handling tasks they will encounter, the planning

of lifts and the use of handling aids appropriate to their environment. Training should cover communication to ensure a coordinated approach to team handling, especially considering the often-frenetic nature of the work environment.

**Increase task variety:** Where possible, avoid having workers perform the same task for the duration of the day by rotating teams and individuals. Workers should rotate to a job with different risk factors after performing high-risk operations, as this will provide recovery time.

Regular short breaks in work are a better means of avoiding fatigue compared to infrequent longer breaks and, where possible, a flexible approach to timing of work breaks should be adopted.

Provided the tasks involved are sufficiently different in character, job rotation can also be effective in avoiding the onset of fatigue as a result of prolonged use of the same muscle groups.

**Improve communication between stakeholders:** Effective communication and sharing of information within the industry including; architects, quantity surveyors, product suppliers, and site managers may help to reduce the risk of musculoskeletal injury from manual handling as key industry stakeholders share information on good practice or successful interventions in reducing the risk of manual handling with others in the industry.

A summary of the specific recommendations made for each of the tasks is presented in **Table 1**.

Good housekeeping is recommended for all tasks with the aim of:

1. Minimising the risks of slips and trips when handling.
2. Improving footing when handling.
3. Ensuring enough space is available to handle safely without compromising posture.
4. Enabling handling aids such as trolleys to be used.

## Further reading and references

- An investigation into the use of plasterboard manual handling aids in the GB construction industry and factors helping and hindering the practicability of their application (RR812 Research Report) HSE, 2010: [www.hse.gov.uk](http://www.hse.gov.uk)
- Reducing plasterboard manual handling, Construction Occupational Health case study COH05: [www.hse.gov.uk](http://www.hse.gov.uk)
- Manual handling and lifting: [www.british-gypsum.com](http://www.british-gypsum.com)

## Further information

HSENI  
83 Ladas Drive,  
Belfast BT6 9FR  
Helpline: 0800 0320 121  
Email: [mail@hсени.gov.uk](mailto:mail@hсени.gov.uk)  
Web: [www.hсени.gov.uk](http://www.hсени.gov.uk)

**Table 1: Summary of the specific recommendations made for each of the tasks observed**

Tasks	Recommendation for risk reduction
<b>Loading out</b>	<ul style="list-style-type: none"> <li>• Use of mechanical aids: Where possible mechanical aids, such as cranes, lifts and trolleys should be used to transport the pallets / stacks of plasterboard as close to where they are required as possible</li> <li>• Avoid handling up stairs: Creating access routes (e.g. through floors or external openings) for the movement of plasterboard can reduce the need to adopt awkward postures when handling</li> <li>• Planning: A safe system of work should be developed to reduce the level of MSD risk individuals are exposed to, which should consider how the plasterboards are going to be delivered to the area where they are required</li> </ul>
<b>Cutting and measuring plasterboard</b>	<ul style="list-style-type: none"> <li>• Avoid cutting boards on edge: This would eliminate the need to squat or kneel in front of the plasterboard, reducing the strain placed on the lower limbs and the amount of twisting and bending required to find a suitable working position</li> <li>• Use trestles to raise working height: Raising the working height that the boards are measured and cut at will improve the posture of workers, as they will spend less time in a forward stooped posture</li> </ul>
<b>Lifting and handling plasterboard</b>	<ul style="list-style-type: none"> <li>• Reduce dimensions of board: Reducing the dimensions of plasterboard will improve its handling characteristics</li> <li>• Reduce the weight of loads: Many of the boards can be easily lifted; however handling becomes problematic when loads are handled above head height and there are limited opportunities for rest</li> <li>• Use of mechanical aids: Where possible mechanical aids such as ceiling lifts and adjustable props should be used to alleviate the burden associated with holding the board above head height</li> </ul>
<b>Ceiling installation</b>	<ul style="list-style-type: none"> <li>• Improve handling postures: Reducing the dimensions of the plasterboard will improve its handling characteristics</li> <li>• Reduce the weight of loads: Many of the boards can be easily lifted; however handling becomes problematic when loads are handled above head height and there are limited opportunities for rest</li> <li>• Use of mechanical aids: Where possible mechanical aids such as ceiling lifts and adjustable props should be used to alleviate the burden associated with holding the board above head height. They can help reduce the amount and duration of forces applied during manual handling operations</li> <li>• Increase job rotation: Plasterboard installers generally work in pairs with one cutting and measuring and the other fixing the plasterboard. Job rotation and job enlargement may be useful in breaking the monotony of highly repetitive tasks</li> <li>• Examine the drills used: Workers use drills to fix plasterboard for a large part of the working day and are likely to benefit from having lightweight, low vibration drills to help minimise the amount of muscle fatigue. Furthermore, cordless drills would reduce the risk of tripping associated with mains supply drills</li> </ul>