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**Risk control**  
Manual Handling:  
MAC Tool



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# Manual Handling: MAC Tool

## Introduction

The obligation on an employer to assess the risks from manual handling has existed for over 30 years.

Assessing manual handling risks can be daunting, especially if the assessor is not familiar with more complicated activities of moving and handling in the workplace.

Varying standards achieved by employers in producing their risk assessment prompted the Health and Safety Executive, in 2003 to develop the Manual Handling Assessment Chart Tool (MAC Tool)<sup>1</sup> to assist employers.

The tool uses an observation approach to assist the assessor, looking at a structured series of factors that can have an impact on health and safety during manual handling activities.

The tool focusses on three aspects of manual handling; the processes of lifting and carrying a load, and the factors to consider when team handling.

Critical to the overall assessment is establishing how often the load must be moved.

## Traditional Approach

The original guidance published by the Health and Safety Executive in 1992 set out a framework based on looking at the following factors:

- Task
- Individual
- Load
- Environment
- Other (such as PPE)

The assessment consisted of a series of questions that an assessor can answer to build a picture of risk.

One potential drawback of this approach was the need for an assessor to appreciate how the responses to the questions contributed to the increased risk of injury.

## Assessment Pitfalls

The employer is dependent on the competence of an assessor in recognising the potential for injuries and poor lifting techniques can cause ill health.

An assessor working through the list of questions (in TILEO) does not have anything useful to refer to as they watch an activity to help them consider the significance of each factor.

The need for a more holistic and practical tool has been addressed by the MAC Tool.

## The MAC Approach

The tool is designed to help an employer address the most common risk factors in lifting and lowering, carrying and team handling. It was originally developed to help identify high-risk manual handling and directs the assessor to the factors that need to be modified to control the risks.

There are three types of assessment that can be carried out with the MAC Tool:

- Lifting operations
- Carrying operations
- Team handling operations

Each type of assessment is supported by an assessment guide and a useful flow chart to provide a score, and a scoresheet provided to record the results of the assessment.

There are separate tools for:

- Assessing pushing and pulling called the Risk Assessment of Pushing and Pulling (RAPP) Tool<sup>2</sup>
- Tasks involving repetitive movements and the risks associated with upper limb disorders there is a tool called the Assessment of Repetitive Tasks of the upper limbs (ART Tool)<sup>3</sup>

An example of a person-based manual handling risk assessment can be found in the Scotland NHS manual handling passport scheme<sup>4</sup>.

The tool uses a scoring system which is both colour-coded, and number based. For any factor under consideration the assessor can use a flowchart which includes examples to classify the risk as green, amber or red, and attribute an associated number which is recorded on the scoresheet.

When considering the combined load weight and frequency of operations an additional colour code of purple is used together with an associated number.

## MAC Tool Opportunity

The tool provides the assessor with a flow chart of factors to consider and an indication of levels of risk attached to those factors.

As this is an observational technique, the assessor can watch someone carry out the task in the workplace and record as they go, comparing what they see with the flow chart examples.

## Load Frequency

The first factor that the MAC Tool asks the assessor to consider is the load weight and the frequency of lifting/carrying.

### Lifting a load

A graph is provided in the MAC Tool to indicate the level of risk created when a person is lifting a load, taking into consideration both the weight of the load and how often they lift it. The graph indicates a range of acceptable weights, from up to 23kg lifted once per day reducing to 10kg every 5 seconds.

### Carrying a load

Where a person is carrying a load, it would typically already be positioned in the pelvic region, in the best position to support the weight of the load. A separate graph is provided for carrying a load. The graph indicates a range of acceptable weights, from up to 25kg lifted once per day reducing to 16kg every 12 seconds.

### Team handling

Where more than one person is lifting and carrying a load a separate table is provided. The table indicates a range of up to 75kg for up to four people to move.

## Lifting a Load

In addition to the question on load weight and frequency, the flowchart for lifting a load considers seven other factors, namely:

- **Hand distance from the lower:** the closer the hand is to the lower back the less force is required to keep the load in front balanced
- **Vertical lift zone:** the weight of the load has a bigger impact when a bigger range of vertical movement is involved
- **Torso twisting and sideways bending:** can mean the spine is not carrying the load equally
- **Postural constraints:** which could cause the person to bend or kneel losing the full contribution from their leg muscles
- **Grip on the load:** which may mean the load is slippery and a person to snatch at the load
- **Floor Surface:** which may not be dry, firm and clear and cause the person to lose their balance
- **Environmental factors:** such as excessive temperature, strong air movements and extreme lighting may cause to the person to lose their grip or balance

Each of these factors is scored green, amber, or red depending on the observation. The assessor is then able to visually see the 'hot spots' (the red and amber factors) with the lifting activity and identify control measures to address these risks.

## Carrying a Load

As before, in addition to the question on load weight and frequency which is different for lifting and carrying, the flowchart for lifting a load considers eight other factors.

While some are common to both lifting and carrying, additional factors for carrying are:

- **Asymmetrical torso or load:** which places forces on the spine more unevenly
- **Carry distance:** where a person is carrying and supporting the load for longer, they may become more tired and struggle to continue to carry the load
- **Obstacles on route:** such as doors and tripping hazards while carrying may cause the load to become unbalanced

Each of these factors is scored green, amber, or red depending on the observation. As before the assessor is then able to identify the 'hot spots' (the red and amber factors) with the carrying activity and identify control measures to address these risks.

## Team Handling

A common misconception by employers is that when a larger load heavier than 25kg is required to be moved then the number of people necessary is a multiple of individual capacity.

In addition to the question on load weight and frequency which is different for lifting and carrying, the flowchart for team handling considers ten other factors. While some are common to both lifting and carrying, one critical additional factor for team handling is:

- **Communication, co-ordination, and control of the activity:** without clear communication and instructions there is a potential for a person to attempt to make a movement which the others are not prepared for, resulting in more than one person being injured

## Score Sheet

The assessor records what they have found while doing the assessment on the score sheet, which provides space to identify further control measures, carefully considering the hierarchy of control set out in The Manual Handling Operations Regulations 1992 (as amended)<sup>5</sup>.

This record of significant findings would help anyone concerned about the activity to see what has been done to address the risks.

## Training

Where an operation retains a level of residual manual handling, the MAC Tool also provides a very useful resource to enable an employer to specify the type of manual handling training required.

Training should be relevant to the type of work carried out and should cover:

- Manual handling risk factors and how injuries can happen
- How to use mechanical aids provided in the workplace
- How to carry out safe manual handling, including good handling techniques
- Systems of work relevant to the worker's tasks and environment
- Practical work so that a trainer can identify anything the trainee is not doing safely and correct it

Beware of providing training which is too generic. The content of the training in good handling technique should relate to the specific tasks the employee must carry out.

## Health and Safety at Work etc. Act 1974

Every employer must consider the health and safety of their own employees<sup>6</sup>. Injuries or ill health caused by manual handling presents a significant and ever-increasing problem for many employers.

The goal of the employer is to provide a safe place of work, safe systems of work, and ensure individuals receive the information, instruction and training they require.

To assist the employer in identifying how these risks can be specifically managed, an assessment of risk is required.

## Risk Assessment

**The Management of Health and Safety at Work Regulations 1999**<sup>7</sup> expects an assessment of risk to be made by the employer and is seen as a high-level opportunity to acknowledge the risks that are present in the workplace.

**The Manual Handling Operations Regulations 1992 (as amended)** looks for the employer to consider specific factors more carefully such as:

- The nature of the premises and working environment
- The types of load weights and frequency of operations

- The individuals who can be expected to undertake manual handling including any personal factors such as pre-existing or developing medical issues
- The activities or tasks which present the opportunity to suffer injury or ill health

This degree of focus may not feature on a routine or generic risk assessment initially prepared under Regulation 3 of The Management of Health and Safety at Work Regulations 1999. This is because it requires the integration of specific information known about the individual which may change and evolve over time.

The MAC Tool provides the opportunity to carefully consider the more specific range of factors that the assessment must include.

## Managing the Risk

A review of the assessment of manual handling risks should consider:

- More effective Strategic Risk Assessment to anticipate and recognise the opportunity to avoid the risks
- Planning Stage Risk Assessments to ensure that resources deployed are proportionate to the manual handling risk
- The competence of assessors to recognise manual handling risks
- The use of the MAC Tool to allow specific details to be recorded relating to the manual handling operations
- Assessor training in the tools like MAC and RAPP Tools
- Timely reviews of risk assessments following new information from individuals with manual handling related injuries or ill health
- Clearly documented reviews of risk assessments

As with other issues, adequate training and supervision should be provided to ensure that staff understand the risks, the precautions that have been implemented in the workplace, and the need to report any incidents or concerns about manual handling operations.

## Time for a Review

It is never too late to check arrangements to ensure they remain effective in preventing harm from manual handling operations. This enables any problems to be identified and be dealt with promptly.

A robust policy for manual handling operations which clearly documents the process is also essential in protecting the reputation of the organisation and minimising the risk from manual handling operations.

## References

- 1 Manual Handling Assessment Charts (the MAC tool)  
<https://www.hse.gov.uk/msd/mac/>
- 2 The Risk Assessment of Pushing and Pulling Tool (RAPP tool) <https://www.hse.gov.uk/msd/pushpull/overview.htm>
- 3 The Assessment of Repetitive Tasks of the upper limbs (ART Tool) <https://www.hse.gov.uk/msd/uld/art/index.htm>
- 4 The Scottish Manual Handling Passport Scheme  
<https://www.gov.scot/publications/scottish-manual-handling-passport-scheme/>
- 5 The Manual Handling Operations Regulations 1992  
<https://www.legislation.gov.uk/uksi/1992/2793>
- 6 Health and Safety at Work etc. Act 1974  
<https://www.legislation.gov.uk/ukpga/1974/37/contents>
- 7 The Management of Health and Safety at Work Regulations 1999 <https://www.legislation.gov.uk/uksi/1999/3242/contents>

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## Further Information

For access to further RMP Resources you may find helpful in reducing your organisation's cost of risk, please access the RMP Resources or RMP Articles pages on our website. To join the debate follow us on our LinkedIn page.

## Get in Touch

For more information, please contact your broker, RMP risk control consultant or account director.

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