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Tyre and Rubber Industries Safety Action Group

HSE Health and Safety Executive

A Guide to the Safe Use of Knives in Tyre Manufacturing and Retreading

BTMA British Tyre Manufacturers' Association

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INTRODUCTION

The Health and Safety Executive (HSE) was involved in producing this guidance. HSE endorses the guidance, as it follows a sensible and proportionate approach to managing health and safety.

As part of managing the health and safety of your business, you must control the risks in your workplace. To do this you need to think about what might cause harm to people and decide whether you are doing enough to prevent that. This includes considering risks such as hand knife injuries. This process is known as risk assessment and is something you are required to carry out by the Management of Health and Safety at Work Regulations 1999; you will find more information in the Health and safety toolbox (www.hse.gov.uk/toolbox/index.htm).

The manufacturing and re-treading of tyres requires the use of some unique cutting tools which are specific to the industry. Hand knives and other cutting tools are pieces of work equipment and so the Provision and Use of Work Equipment Regulations 1998 (PUWER 1998) also apply to them. PUWER 1998 requires work equipment to be suitable for the task it is being used for and you will find further explanation in Safe Use of Work Equipment (see Further Reading). Your risk assessment will help you to decide the correct hand knife for the tasks you are undertaking in your workplace.

Outlined below are the actions that can be taken to minimise the risk of hand knife injuries, including how you could possibly eliminate them completely.

Hand knife injuries often happen when the knife slips during cutting or trimming. In most cases the blade comes into contact with the worker's other hand, causing a laceration to the hand and/or fingers. Injuries can also occur to other parts of the body, including the knife hand itself.

Step 1 - Elimination

Try to eliminate the use of hand knives and other cutting tools by redesigning the tooling or process to eliminate or reduce the need for cutting.

If it is not possible to eliminate knives completely then work through steps 2 to 7.

Step 2 – Specifying the right cutting tool

Where it has not been possible to eliminate the use of hand knives you will need to consider the right cutting tool for the task being undertaken. Trials should be conducted to establish which tool is most appropriate for each task. Once this has been done then specific tools should be allocated to individual tasks. Where possible cutting tools should be specified that have:

- Shortest blade to carry out the task.
- Retractable blades.
- Round ended blades where a sharp point is not needed for the work.
- Handles which allow a firm and comfortable grip.
- Handle guard.
- Left and right handed tools as required.

TABLE 1

CHARACTERISTICS OF KNIVES AND CUTTING TOOLS SPECIFIC TO THE TYRE INDUSTRY	
Cutting of raw material	The materials being cut present a high degree of resistance and as such a sawing motion may have to be used, combined with a firm grip and a moderate level of force. Knives such as catering/ butchery knives are normally appropriate. Knives should have the following characteristics: • Serrated knives can be used. • The blade should be rigid and should not flex. • The blade should be as short as possible to carry out the task. • The blade should have a non-slip handle.
Mill knives	The rotating material can have a high degree of resistance and a firm grip will be required. Knives should have the following characteristics: • The blade should be rigid and should not flex • The knife should be free of guards, bolsters or other protrusions which might catch on the material. • If serrated knives are used then the serrations should be small. • The blade should be as short as possible to carry out the task.
Fabric cutting	Commercially available knives are often not available and it may be necessary to manufacture specific cutting tools. Where bespoke cutting tools are used it is recommended that: • The design process involves workers, engineers and safety professionals. • Tools should be designed to cut away from the body. • Safety features such as the minimisation and/or guarding of the cutting surface should be incorporated. • Tool manufacture is undertaken by companies or individuals who are competent to do so. • The tools should be rigorously tested before being used in the workplace. • Employees are given appropriate information instruction and training that is specific to the bespoke tools that they use.

TABLE 1 (CONTINUED)

CHARACTERISTICS OF KNIVES AND CUTTING TOOLS SPECIFIC TO THE TYRE INDUSTRY	
Hot knives and scissors	• The blade should be rigid and should not flex • Serrated knives should not be used. • Ensure the handle is thermally resistant. • Avoid the presence of exposed rivets on handles. • Use thermally resistant gloves. • Control the temperature of the blade to the minimum required to achieve the cut. • Label the heating block as being hot.
Green Tyre and section cutting	Tyres will normally contain steel banding and are usually best cut with a saw. Some sections may be cut using a sharp knife with a short blade such as a 'Stanley knife'. A bolt cutter will be required to cut through the bead section of a tyre.

Step 3 – Ensure spare knives or blades are available

It is essential that knives and blades are always readily available so employees can use the correct tool for the job.

- Clearly indicate whether knives are issued to individuals or are allocated to workstations.
- Ensure that knives are sharp enough for the specific task but are not over sharp. This may be done by providing sharpening facilities at the workstation or always ensuring a supply of fresh knives/blades.
- The frequency of sharpening will be dictated by the nature of the task being undertaken.
- Centralising sharpening activities can be a way of ensuring consistent blades.

Step 4 – Provide safe storage for knives

It is important to prevent situations where cutting blades are left exposed when not in use. For instance, to prevent them from lying loose on the work benches/surfaces or where individuals carry them from one place to another.

- Knives should be stored in such a way as to ensure the blade is guarded e.g. through the use of racks, slots or boxes.
- The blade should ideally be guarded whilst it is stored. The use of magnets can mean that blades are unguarded and may fall if knocked.
- Consider lanyard use to belt / work station.
- Carrying knives should not be allowed except where it is sheathed or a scabbard is used.
- Scabbards should be of the correct shape and size for the knife that they hold.
- Provide used blade disposal points.

Step 5 - Specify the right Personal Protective Equipment (PPE)

Employers have duties concerning the provision and use of personal protective equipment (PPE) at work. PPE is equipment that will protect the user against health or safety risks at work. It can include items such as gloves, gauntlets and eye protection. PPE should only be used as a last resort, i.e. when all other ways to eliminate or reduce risks have been considered. When selecting PPE, make sure it's CE marked and suits the user in terms of size, fit etc. If more than one item of PPE is worn at the same time, make sure they can be used together, e.g. wearing safety glasses may disturb the seal of a respirator, causing air leaks.

When selecting the use of gloves ensure that the gloves do not reduce the level of grip and do not require extra force to be applied to maintain the grip.

Make sure that users of PPE are instructed and trained in its use and it is maintained, stored and cleaned appropriately and available at all times. Consideration should be given to the availability of spares and replacements.

As when selecting knives, conduct trials and invite the users' views on PPE. It is acceptable to have different PPE available for the workforce, provided it is deemed safe for the work and has been assessed as such. Users are far more likely to use PPE properly, if they help select it. Once provided, its use should be properly supervised if injuries are to be prevented. Never allow exemptions for those jobs which take 'just a few minutes'. Protective footwear which provides adequate resistance to slipping and protection against penetration from a dropped knife should be worn. Slipping while holding a knife could result in a serious injury and a dropped knife could easily penetrate sandals or soft-topped shoes.

Step 6 – Consider the working environment

The working environment can have a major impact on the safe use of hand knives. Good lighting, support for the item being cut and housekeeping are important factors in ensuring knife safety. Following these basic housekeeping rules may help to keep people safe when using knives:

- Make sure the floor surface is even and provides sufficient slip resistance.
- Provide containers for waste materials.
- Keep floors and work surfaces free of debris and production waste.
- Clean up spillages promptly.

Step 7 – Develop and deliver training

People need to be given adequate instruction in safe working practices, so that they are not a danger to themselves or others. This general rule is particularly applicable to the use of hand knives. The person training staff will also need to be competent. Training should cover:

- the general use, care and maintenance of hand knives (including typical accidents, cutting away from the body and the danger of blunt knives);
- what checks need to be carried out prior to hand knives being used and what to do if defects are found;
- the correct tool and PPE for each task to be performed;
- the correct way of working at any particular job and any safe operating procedures that need to be followed (e.g. the frequency of blade changes or the criteria for rejects);
- in-house company rules (e.g. on storage or carriage of knives).

Newly trained staff should be introduced gradually to high-speed production operations, if this is necessary to reduce the risk of injury. Each operator should be supervised until they are skilled enough to work safely at full production rates.

Step 8 - Checking and monitoring

As with any other tools in the workplace hand knives should be checked periodically to make sure they are safe to use and there are no obvious defects. The checks don't have to be complicated and could be as simple as the user checking the knife at the start of the shift to ensure it is functioning correctly and there are no obvious defects.

You may find that periodic monitoring of staff and hand knife use is helpful to confirm the hand knife systems you have in place are working or to identify where changes may need to be made.

It is possible that you will still get hand knife injuries once you have implemented the above steps. It is helpful to monitor the number of hand knife injuries, even minor ones, as this can indicate where problems may still exist or where there may be additional training needs.

Cutting tool suppliers

A number of suppliers offer surveys and advice to help with the selection of safer cutting tools. They also offer advice on appropriate PPE and some can offer 'train the trainer' training.

First aid

A serious stabbing injury can result in heavy external and internal bleeding, particularly if a main artery is punctured. Prompt first aid action could save a life. At least one person who is trained to deal with stabbing injuries and heavy bleeding should be available on site to provide first aid.

The role of senior management

The importance of senior management's commitment to the success of any new working arrangements is well known, and this is especially true when the attitudes of the workforce also have to be changed. The attitudes of senior managers will set an example for others to follow, and any hand knife initiative therefore needs their visible backing. Practical steps a director or senior manager can take include:

- launching the changes personally and making sure the workforce knows of your involvement;
- asking for regular progress reports;
- placing the issue on the management agenda;
- monitoring in-house hand knife injury statistics;
- asking staff about the use of hand knives/cutting tools when touring the factory;
- praising good practice and supporting disciplinary action for persistent offenders.

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FURTHER READING

Health and safety toolbox
www.hse.gov.uk/toolbox/index.htm

Safe use of work equipment. Provision and Use of Work Equipment Regulations 1998. Approved Code of Practice and guidance L22 (Fourth edition)
HSE Books 2014 www.hse.gov.uk/pubns/books/l22.htm

For health and safety basics see Health and safety made simple
www.hse.gov.uk/simple-health-safety/index.htm

For health and safety in tyre manufacturing and re-treading premises see HSE's rubber webpages
http://www.hse.gov.uk/rubber/

BS EN ISO 13998:2003 Protective Clothing. Aprons, trousers and vests protecting against cuts and stabs by hand knives.

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