

How to reduce hand knife injuries

HSE information sheet

Plastics Processing Sheet No 12 (Revision 1)

Introduction

This information sheet is one of a series produced by HSE's manufacturing sector. It gives practical advice to anybody involved in managing the risks of using hand knives as a part of their work, eg managers and supervisors.

Hand knife injuries still account for a significant number of injuries according to trade association statistics for the plastics industry. They occur in all parts of the industry, including film production, moulding, extrusion and fabrication.

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). If you have fewer than five employees you don't have to write anything down. Hand knives 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 reduce 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.

What action do I need to take to reduce hand knife injuries?

The most reliable course of action is to eliminate the use of hand knives. Where this is not possible, more proactive control will be required. Work through each of the following steps for every task where hand knives are currently used:

Step 1 Elimination

Where possible, try to eliminate or reduce the use of hand knives from all or part of the task by:

- redesigning the tooling or process to eliminate or reduce the amount of trimming required;
- improving mould maintenance to reduce or eliminate flash;
- introducing different methods, eg cryogenic deflashing or vibrating bath and pebbles;
- automated cutting (such as a flying knife);
- using a safer cutting tool (deburring tool/scissors).

Once you have identified situations where it is possible to eliminate the use of hand knives it is likely there will still be some tasks left where hand knives will be used. Steps 2–7 outline what you should do to manage the risks of using hand knives in the workplace.

Where user trials are recommended, they are not a substitute for you assessing suitability for safe use. You should identify a suitable range of hand knives for tasks and the workforce can select from this.

Step 2 Specify the right knife

Where it has not been possible to eliminate the use of hand knives you will need to consider the right knife for the task being undertaken. It may be that in one workplace a number of knives will be used for a range of different tasks. Knife types can be broadly grouped as follows:

- **Group 1** – includes bladeless cutters, such as reel snails and disposable concealed blade knives that help to ensure that not only is the blade edge concealed, but also the remotest chance of injury during blade replacement is ruled out.

- **Group 2** – (concealed blades) are cutters designed to conceal the blade edge from the possibility of personal injury. These are cutters with changeable blades.
- **Group 3** – (fully automatic blade retraction) knives are designed to not rely on the operator to retract the blade. Knives that qualify for this category are relatively new and are sometimes called intelligent cutters. With these knives it doesn't matter whether the thumb slider or squeeze lever is held in the blade extend position; once the blade leaves the material being cut it automatically and immediately retracts into the handle.
- **Group 4** – (spring-loaded blade retraction) knives benefit from a spring-loaded blade, but it is a relatively weak spring. Once the thumb slider has extended the blade and the process of cutting has begun, the operator removes their thumb from the slider. The blade will remain engaged with the material being cut, but as soon as the blade leaves the material – whether by design or fault – the spring will immediately pull the blade back into the safety of the knife handle.
- **Group 5** – (manually-operated blade retraction) knives have to be manually retracted as well as manually extended. Therefore, if the knife is placed down the blade will remain exposed unless it has been retracted. In addition, if the blade leaves the cut because it has slipped, or for some other reason, the blade will remain exposed.

As well as considering the type of knife to use there are a number of other factors to consider when selecting a hand knife, including:

- the length of blade required to do the task: select the shortest blade needed to carry out the cut;
- the characteristics of the blade for the task being undertaken, eg blade hardness, depth, thickness, round-ended where a sharp point isn't needed etc;
- the reliability of the functionality of the blade, eg does the spring-retractable blade always retract when released?
- the characteristics of the blade holder including the construction material and durability, ie will it withstand the pressures of the cut it will be involved in?
- the ergonomics of the blade holder taking into account left- and right-handed users, the length of time the operator will be using it for, the position/ angle the cut will be made and how the blade is extended/retracted.

As part of selecting the right knife for the task you should involve potential users of the knives and conduct trials. Having done all this, specify the knife/ knives to be used for each task and withdraw any others currently in use, including employees' own knives brought in from outside.

It is perfectly acceptable to have different hand knives available to the workforce, provided they are all deemed safe for the work and have been assessed as such following user trials. Users are far more likely to accept a change in cutting tool if they are allowed some choice for each job.

Step 3 Ensure spare knives and blades are available

It is essential that spare knives and blades are always readily available if employees are to be able to use the correct tool for the job. You should have proper management arrangements for stock control and access. You also need to specify whether the knives are on personal issue or to be shared. It is often easier to have knives on personal issue to ensure employees always have the correct tools available for doing the job, rather than having to go searching for the correct tool or 'making do' with an inappropriate tool.

Step 4 Provide safe storage for knives/blades

It is important to prevent situations where knives are left lying on work benches/surfaces or where individuals carry them in their hands from one place of work to another. It is becoming more common for knives to be tethered using lanyards to a work station or to a belt if working at height, although the selection of knife in this instance must be carefully considered. Poor practice of leaving exposed blades on a work surface or allowing employees to wander with exposed blades has led to injuries. You should:

- provide suitable storage facilities, eg racks, slots, boxes etc adjacent to the place of work;
- allocate suitable belts or sheaths to employees who need to move around carrying knives;
- strictly enforce rules prohibiting the carriage of knives in the pocket or in the hand from one place of work to another;
- provide used blade disposal points, eg sharps containers or personal blade collection boxes.

Step 5 Specify the right 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, ie 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, eg wearing safety glasses may disturb the seal of a respirator, causing air leaks.

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.

Table 1 gives guidance on the possible selection of PPE for different parts of the body.

Table 1 Selecting appropriate PPE

Part of the body (type of PPE)	Typical materials
Hand (glove)	Leather, rubber, plastics, cloth and knitted fabrics and nylon-like polymers (eg Kevlar)
Hand/arm (glove, gauntlet, armguard)	Leather, rubber, plastics, cloth and knitted fabrics, nylon-like polymers (eg Kevlar) and chain mail
Torso/legs (aprons/leggings)	Chain mail and plate link and nylon-like polymers (eg Kevlar)

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.

Each person using a knife should have enough working space to move freely and allow them to operate in a safe manner without endangering themselves or others. Work surfaces should be set at a comfortable height for the individual to work at and the item being cut should be stable and well supported. Adequate lighting should also be provided.

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 (eg the frequency of blade changes or the criteria for rejects);
- in-house company rules (eg 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.

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 plastics manufacturing premises see HSE's plastics webpages
www.hse.gov.uk/plastics/

Further information

For information about health and safety, or to report inconsistencies or inaccuracies in this guidance, visit www.hse.gov.uk/. You can view HSE guidance online and order priced publications from the website. HSE priced publications are also available from bookshops.

This guidance is issued by the Health and Safety Executive. Following the guidance is not compulsory, unless specifically stated, and you are free to take other action. But if you do follow the guidance you will normally be doing enough to comply with the law. Health and safety inspectors seek to secure compliance with the law and may refer to this guidance.

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