

## **REDUCING NOISE RISKS FROM 'KERBSIDE' GLASS COLLECTION**

This guidance has been developed by the Waste Industry Safety and Health (WISH) Forum to help control safety and health risks in the waste management industry associated with reducing noise risks from “kerbside” glass collection. This guidance focuses on reducing the noise risks associated with kerbside collection of glass for recycling. It is targeted at:

- Those who procure collection services and decide which collection methods to use
- Employers and managers with responsibilities for the operational aspects of glass collection
- Designers and manufacturers of glass collection equipment
- Buyers of such equipment

It provides guidance on assessing the risk, measures to reduce or eliminate the risk, and the appropriate use of personal hearing protection in circumstances where it is not reasonably practicable to reduce noise levels below prescribed action levels.

The Health and Safety Executive (HSE) was consulted in the production of this publication. It endorses the sensible, proportionate, reasonable and balanced advice to owners on managing the risk from this guidance during the waste-related activities as set out in the guidance.



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## 1. Introduction

This guidance is produced by the Waste Industry Safety and Health (WISH) Forum.

It focuses on reducing the noise risks associated with the kerbside collection of glass for recycling. It does not cover the bulk 'trade collection' of glass, although some of the principles outlined should be considered and could be used when carrying out such collections.

Workers carrying out kerbside collection of glass for recycling can be exposed to high levels of noise. It is highly likely that workers' daily personal noise exposures will exceed 85 dB (the upper exposure action value of the Control of Noise at Work Regulations 2005 ('the Noise Regulations')) and in some cases daily personal noise exposures may be as high as 100 dB.

Workers exposed to these levels of noise are at a high risk of developing **permanent, disabling** hearing damage. The law requires that employers must:

- Put in place technical and/or organisational measures to eliminate or minimise risks from noise
- Reduce noise exposure to the lowest reasonably practicable level

This guidance is aimed at:

- Those who procure collection services and decide which collection methods are to be used
- Employers and managers with responsibilities for the operational aspects of glass collection
- Designers and manufacturers of glass collection equipment
- Buyers of such equipment

## 2. Factors affecting the level of noise exposure

Workers collecting recyclable material from households can be exposed to noise from a number of sources, including the running noise of the collection vehicle and noise from any auxiliary equipment. However, the noise of glass being collected into dedicated receptacles is likely to be the main source of exposure. Examples include manually tipping glass into collection receptacles, such as:

- Troughs on a side loader vehicle
- Stillages on a collection vehicle
- Wheeled bins used as intermediate (slave) receptacles.

Levels of noise exposure for individual employees will depend primarily on the amount (volume/weight) of glass processed, and also on the speed of working.

## 3. Legal duties: the Noise Regulations

You must aim to eliminate or minimise risks from noise exposure so far as is reasonably practicable. Where any employee's daily personal noise exposure exceeds the upper exposure action value (85 dB), employers must use organisational or technical measures to reduce noise exposure to as low a level as is reasonably practicable.

Where daily personal noise exposures are found to be at or above 87 dB (the exposure limit value set out in the Regulations) you must take immediate action to prevent this level of exposure being exceeded again. Work should not continue until you can ensure that effective daily personal noise exposures are below 87 dB, through organisational and technical noise control measures and the use of personal hearing protection.

The Regulations place further duties in respect of personal hearing protection, information, instruction and training for employees, and health surveillance. Further information on the requirements of the Noise Regulations are found in *Noise at work: A brief guide to the law* and in *Controlling noise at work*.

## 4. Assessing the risks

Employers who carry out kerbside collection of glass for recycling must complete a risk assessment for noise if any employee is likely to be exposed to noise at or above the lower exposure action values. This should include an estimate of daily personal noise exposure of employees for comparison with the action and limit values set out in the Noise Regulations.

**Where glass is being collected and manually tipped or sorted into collection vehicles, employees will almost certainly be exposed to noise above the upper exposure action value. This means you will need to consider the control measures described here.**

Noise levels associated with glass tipping 'events' are shown in Table 1, with corresponding daily personal noise exposures for various numbers of events. The values in the table have been gathered from field studies of kerbside glass collection activities, and represent the noise level at the ear of the worker.

In this context, 'event' means the act of emptying a single kerbside container into the collection receptacle; it does not include the emptying of the trough into the body of the vehicle.

Further information is available in the Waste Resource Action Programme (WRAP) research report: *Noise exposure in glass collections for recycling*.

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A range of levels is shown for each type of event since the amount of glass in each container may vary, and the mix of materials in a container and the working method the employee uses (see Section 5.1) will affect the noise levels. The ‘typical’ value is considered to be representative of the activity.

The data in Table 1 is likely to be sufficient for you to estimate noise exposure based on your collection type and number of noise events each employee is exposed to in a day. If your operations vary significantly from those described you will need to estimate noise exposure using data from other sources, e.g. your own measurements.

**Table 1 Typical noise levels from glass collection activities and personal noise exposure based on number of events**

Glass collection type		Typical single event noise level ( $L_{AE}$ ), dB	Daily noise exposure $L_{EP,d}$ dB (noise exposure points*)			
			50 events/day	100 events/day	200 events/day	500 events/day
Co-mingled glass/ plastic/cans, sorted at vehicle	Collection to metal troughs on side loader vehicle	111 (range: 102–116)	83 (65)	86 (130)	89 (250)	93 (630)
	Collection to metal stillages on collection vehicle	110 (range: 98–114)	82 (50)	85 (100)	88 (200)	92 (500)
Glass only	Collection to metal troughs on side loader vehicle	117 (range: 111–119)	89 (250)	92 (500)	95 (1000)	99 (2500)
	Collection to ‘slave’ wheeled bins (glass only)	115 (range: 104–120)	87 (160)	90 (320)	93 (630)	97 (1600)

\* Noise exposure points provide a simple way of expressing personal noise exposure. Exposure points for individual tasks (e.g. for a given number of events) can be added together. 100 points is equivalent to the upper exposure action value – a daily personal noise exposure of 85 dB.

## 5. Measures to eliminate or reduce risks

### 5.1 Employers

**The Noise Regulations require you to eliminate noise risks, or reduce noise risks and noise exposures to as low a level as reasonably practicable. Consider the measures in the following paragraphs and implement them as far as is reasonably practicable.**

#### ***Alternative working methods***

Consider alternative working methods and collection strategies which eliminate or reduce the risks from noise. Remember that changing glass collection systems may have implications other than on the health and safety of employees. Methods of collecting glass that do not require the glass to be manually tipped or sorted at the kerbside will remove a significant source of noise exposure, and you should consider these when you are developing recyclable collection strategies.

Field studies suggest that glass-only collection can result in significantly higher noise exposures than co-mingled, kerbside-sorted collection using existing methods. It is likely that changing from glass-only to multi-material collection would reduce noise exposure for employees. However, kerbside-sorted collection is itself a significantly noisy activity and further measures to reduce exposure, such as those described below, would probably be required.

#### ***Choice of work equipment***

Where possible, choose equipment that produces the least amount of noise. Discuss noise with your plant/machinery suppliers, and take account of the likely noise levels produced under conditions of intended use.

Suppliers have a legal duty to design their machinery for lowest noise emissions, and to provide information on the noise emitted (see Section 5.2 below). Some recycling vehicles may be marked with sound power levels as required by legislation relating to environmental noise emissions. These noise values cannot be used to assess occupational noise exposure from vehicles in roadside glass collection. Suppliers should provide useful, representative noise information for users, based on a suitable noise test method, which may be of their own devising.

#### ***Modifications to existing work equipment***

Workers' noise exposure is dominated by glass-glass impacts, so the most effective modifications to work equipment are those that reduce impact noise (slowing the speed of collisions between glass items) or provide barriers to airborne sound.

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Some employers have reported success in lining collection receptacles with resilient material, and providing flaps that reduce the speed of glass as it enters the receptacle. Further information is available in *Noise exposure in glass collections for recycling*.

Tests under controlled conditions have shown that these types of modification when combined and used in conjunction with good practice working methods, can give reductions in overall noise level of 5–9 dB, when compared with standard metal collection receptacles. This represents a reduction in noise level of approximately 70–85%. Figure 1 illustrates design features that are likely to be effective in a reduced-noise collection receptacle.

Modifications of this type are likely to result in a slightly reduced capacity of collection receptacle, both because the volume of the receptacle will be reduced and because of the reduced amount of breakages.

Employers adopting these types of engineering control measures should ensure that such modifications are used and maintained (e.g. replace linings if they wear out, and make sure employees use any measures put in place).

## **Work rotation**

Reducing the number of glass collection operations carried out by an employee can also lower his or her exposure to noise. This method is not likely to produce significant benefits on its own, but may be a useful additional option. Reducing the number of operations carried out by 30% would lower noise exposure by approximately 2 dB. A 50% reduction would lower exposure by 3 dB.

## **Working methods**

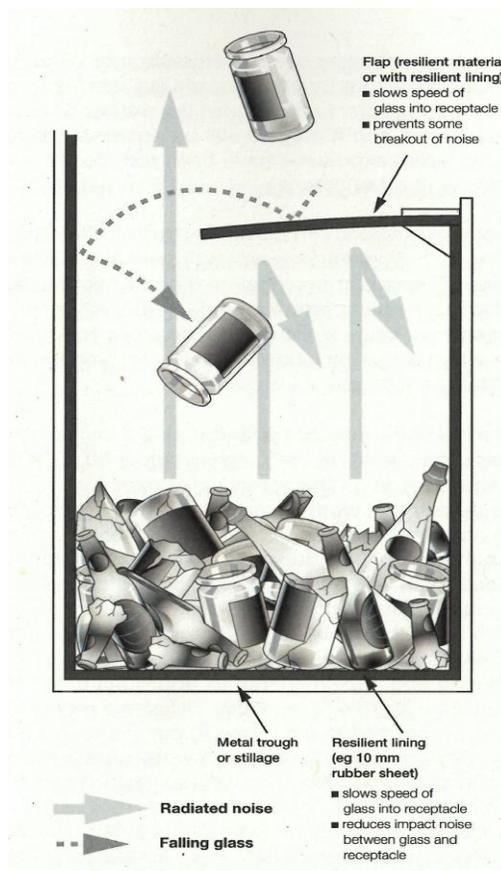
The working method adopted by employees can affect noise exposure. 'Fast' working (ie depositing glass to the collection receptacle in a rapid/forceful manner) produces generally higher noise levels than more controlled ('slow') depositing, particularly as the collection receptacle becomes fuller. Tests under controlled conditions have shown that the benefits of resilient linings and flaps on collection receptacles are not fully realised where a 'fast' depositing method is used.

Employers should instruct employees to avoid 'fast' depositing methods and ensure, through supervision, that they use recommended working methods for reduced noise exposure.

## 5.2 Suppliers

Suppliers of machinery for use at work have duties, under the *Supply of Machinery (Safety) Regulations 2008*, to design and construct machinery so noise emissions are reduced to the lowest level, taking account of technical progress and the availability of means to reduce noise at source. The supplier should anticipate the intended use of the machinery, and provide features in the design that aim to minimise the noise generated during use.

Where it is known that recycling collection vehicles and equipment will be used to collect glass and other materials liable to generate noise in their collection, this should be taken into account in the design. For example the engineering modifications to existing machinery described in Section 5.1 (and illustrated in Figure 1) will be equally applicable to the design of new machinery. Suppliers should provide information on the noise emitted by the machinery or equipment under conditions of typical use to inform potential purchasers of risks, and allow them to make decisions about whether the equipment is suitable.



**Figure 1 Design features of a reduced-noise collection receptacle**

## 5.3 Buyers

When buying machinery, ask potential suppliers about the design features incorporated to reduce noise, and whether they have information about anticipated noise levels during the activity. If they have carried out their legal duties, they will have this information readily available. Their answers may influence how confident you are that you will be able to carry out your work activities while fulfilling your legal duties to protect employees' health.

## 6. Personal hearing protection

Where employees' noise exposure is between the lower and upper exposure action values they must be provided with hearing protectors, if they ask for them.

Where employees' daily personal noise exposure exceeds 85 dB, they must be supplied with personal hearing protection, which must be worn fully and properly. Such exposures are very likely to be the case for kerbside collection of glass.

The law does not allow hearing protection to be used as an alternative to controlling noise exposure by other means (such as described in Section 5.1). It should be used to protect employees' hearing while noise control measures are being developed, and it may be still be necessary to rely on hearing protection after noise exposures have been reduced to as low as reasonably practicable through other means.

The working environment during kerbside collection presents a number of risks to safety, including working around moving vehicles and working on the public highway. The use of personal hearing protection can potentially increase these risks by masking important sounds, and by inducing a sense of isolation from the general working environment. Therefore you need to consider these issues, both when selecting personal hearing protection and devising systems of work. Consider the following.

- Choose hearing protection that reduces daily personal noise exposures to at least below 85 dB, ideally below 80 dB – the level of protection required depends on actual noise exposure
- Devise systems of work to make sure hearing protection is only worn during noisy activities and is not worn when it is not needed
- Assess the risk of introducing broken glass into the ear, and minimise it by selecting an appropriate type of protector and through systems of work, instructions and training

- Where it is not possible to avoid crossing designated roads, additional risks from the use of personal hearing protection can be minimised by considering and implementing, as appropriate, the following options:
  - Introduce a system of work that includes a requirement to remove hearing protection before trying to cross a road
  - In conjunction with the system of work highlighted in Sections 5.1 above, provide hearing protectors that are simple to remove and replace as required, for example canal caps or earmuffs
  - Provide 'level-dependent' (sometimes called 'amplitude-sensitive') hearing protectors which are designed to protect against louder noises, while permitting quieter sounds to be relayed to the wearer when noise levels are not high
  - Provide 'flat frequency response' hearing protectors which can, in some situations, improve wearers' ability to hear certain sounds such as speech, warning signals and other informative sounds
- In all cases, you must give employees using personal hearing protection information, instruction and training that should cover how to obtain personal hearing protection from you, its correct use and requirements for maintenance
- Employees should also receive training in any systems of work designed to facilitate the full and proper use of hearing protection in the particular working environment. This should be in addition to any other training about noise (see Section 8)
- You should provide appropriate supervision to make sure employees are wearing hearing protection, and that systems of work are being followed

## 7. Health surveillance

All employees whose daily personal noise exposure frequently exceeds 85 dB, or whose hearing is at risk, should be provided with health surveillance for hearing damage. This should include a baseline hearing check on first entering a noisy job, annual checks for two years, and then regular checks at three-yearly intervals. Further advice on health surveillance can be found in the HSE publication *Noise at work: Guidance for employers on the Control of Noise at Work Regulations 2005*.

## 8. Information, instruction and training

Workers must be given enough information and training to carry out their duties safely and effectively. Collection activities that could potentially expose workers to high noise levels should not take place unless those involved have been inducted and trained on safe systems of work (see Section 5.1) and are clear about the process to follow. This should include using personal hearing protection where appropriate (see Section 6).

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It is particularly important to consider the training needs and supervision of:

- New recruits and trainees;
- Young people who are particularly vulnerable to accidents;
- People changing jobs, or taking on new responsibilities;
- Workers for whom English is not their first language.

For more specific advice, see the HSE leaflet *Health and safety training: A brief guide to employers*.

## 9. Worker consultation and engagement

Involving and consulting your workers is essential in ensuring safe working practices in waste and recycling activities. Further information on worker involvement is available at [www.hse.gov.uk/involvement](http://www.hse.gov.uk/involvement) and in the HSE leaflet *Consulting employees on health and safety: A brief guide to the law*.

## References and further reading

*Control of Noise at Work Regulations 2005* SI 2005/1643 The Stationery Office 2005

*Noise at work: A brief guide to controlling the risks* Leaflet INDG362(rev2) HSE Books 2012  
[www.hse.gov.uk/pubns/indg362.htm](http://www.hse.gov.uk/pubns/indg362.htm)

*Controlling noise at work. The Control of Noise at Work Regulations 2005. Guidance on Regulations L108* (Second edition) HSE Books 2005 ISBN 978 0 7176 6164 0  
[www.hse.gov.uk/pubns/books/l108.htm](http://www.hse.gov.uk/pubns/books/l108.htm)

*Noise exposure in glass collections for recycling* Research project report R0T043 Waste Resource Action Programme (WRAP) 2012 [www.wrap.org.uk](http://www.wrap.org.uk)

*Glass recycling: Noise exposure from simulated roadside collection of recyclable glass: Follow-up measurements* RR651 HSE Books 2008 [www.hse.gov.uk/research](http://www.hse.gov.uk/research)

*The Supply of Machinery (Safety) Regulations 2008* SI 1597/2008 The Stationery Office 2008  
Published by the Health and Safety Executive 06/13

*Health and safety training: A brief guide* Leaflet INDG345(rev1) HSE Books 2013  
[www.hse.gov.uk/pubns/indg345.htm](http://www.hse.gov.uk/pubns/indg345.htm)

*Consulting employees on health and safety: A brief guide to the law* Leaflet INDG232(rev2) HSE Books 2013 [www.hse.gov.uk/pubns/indg232.htm](http://www.hse.gov.uk/pubns/indg232.htm)

*Glass recycling: Noise exposure from simulated roadside collection of recyclable glass* HSL/2007/21  
Health and Safety Laboratory: [www.hse.gov.uk/research/hsl](http://www.hse.gov.uk/research/hsl)

HSE website: [www.hse.gov.uk](http://www.hse.gov.uk)

HSE's waste and recycling website: [www.hse.gov.uk/waste/](http://www.hse.gov.uk/waste/)

Safety alerts for the industry: [www.hse.gov.uk/waste/issues.htm](http://www.hse.gov.uk/waste/issues.htm)

HSE's noise at work website: [www.hse.gov.uk/noise](http://www.hse.gov.uk/noise)

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The Waste Industry Safety and Health (WISH) Forum exists to communicate and consult with key stakeholders, including local and national government bodies, equipment manufacturers, trade associations, professional associations and trade unions. The aim of WISH is to identify, devise and promote activities that can improve industry health and safety performance.

## Further information

This guidance is issued by the Waste Industry Safety and Health (WISH) Forum to help control safety and health risks. 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. Some parts of the guidance represent good practice and may go further than the minimum needed to comply with the law.

This guidance is available free to download at the WISH web site. This publication is based on guidance previously published by the Health and Safety Executive (HSE) known as Waste 16, which was withdrawn in 2015. © Crown copyright 2013.

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