

Recycled glass – the abrasive facts

Recycled glass for shot blasting

Traditional materials for on-site shot blast cleaning of steelwork are metal slags, olivine, garnet or even sand. However, the use of sand as a dry blast abrasive is an illegal practice as it contains crystalline silica which, when breathed in by an operator, can cause silicosis. Copper slag is the most widely used material and although it is a waste material it is all imported into the UK. Crushed glass has been shown to have comparable or superior performance benefits over many of the traditional materials.

Specifications



Both recycled container and flat glass have been used in shot blasting applications. The application is not colour sensitive so mixed colour recycled container glass can be used. The standard screening and metal removal techniques are sufficient to achieve the quality of material required for this application, however fine size reduction and classification are needed.

Typically the glass is supplied in 3 grades:

Coarse 1 - 3 mm
Medium 0.5 – 2.0 mm
Fine <0.7 mm

The product is usually supplied in 25 kg sacks or 1 tonne bulk bags.

Health and Safety



Glass below 5mm represents no special hazards; at this particle size no sharp edges are evident, although, as with other shot blast media, gloves are recommended when handling.

The main component of glass is silica sand. Crystalline silica can cause silicosis when inhaled but the glass manufacturing process destroys crystalline silica and all the silica is bound within the glass matrix. Therefore, unlike sand, it is safe to use and any dust generated is virtually free of crystalline silica and is classified merely as a 'nuisance dust'.

Properties of glass

Bulk Density	1,300 kg/m ³
Specific gravity	2,500 kg/m ³
Hardness	6 mohs

Typical Composition

<u>Component</u>	<u>Content</u>
Silica (SiO ₂)	73 %
Aluminium oxide (Al ₂ O ₃)	14 %
Sodium oxide (Na ₂ O)	14 %
Calcium Oxide (CaO)	10 %

Environmental Issues

Unlike other shot blast media, such as metal slags, glass contains no heavy metals which can have a detrimental impact on the environment, particularly on aquatic habitats. The environmental impacts of copper slag are coming under scrutiny as it contains significant amounts of copper and other heavy metal residues and the spent abrasive should be disposed of as a 'Special Waste'. Furthermore, some sources of olivine can contain trace quantities of asbestos.

Case Study – Caen Hill Locks, Wiltshire



Caen Hill Locks comprise 28 staircase locks within a distance of 2 miles. Beside each lock is a large pool, rich in wildlife, where canal boats wait their turn to use the locks. Since the locks were restored and reopened in 1990, British Waterways has had to repaint the lock arms and ground paddle stands annually. British Waterways needed a quality blast abrasive which could be used safely and effectively near to the canal to remove previously applied layers of paint. Glass blast abrasive was used due to the concerns of spent abrasive entering the canal and causing contamination.

The work was undertaken by Barnes Blasting Ltd, using medium grade blast abrasive. The work consumed 9.5 tonnes of glass abrasive, taking a two-man team 9.5 days to clean and repaint the 504 m² of steelwork. The glass easily removed residual paint and corrosion from the steelwork, leaving a clean, even surface for painting.

Suppliers of recycled abrasives

Wolverhampton Abrasives - Richard Paddison - Tel: 0114 254 0742

All Glass - Jim Walker - Tel: 01505 333 511

Krysteline - Stephan Michal – Tel: 08706 000033

Northern Cullet - Neil Atkinson – Tel: 01226 246 541

For more information - WRAP Helpline – 0808 100 2040

What is WRAP?



Creating markets for recycled resources

WRAP is a not-for-profit company in the private sector, backed by substantial Government funding from DEFRA, DTI and the devolved administrations in Scotland, Wales and Northern Ireland. WRAP is an organization that has been established to promote sustainable waste management. Further information on WRAP can be found on the WRAP website: www.wrap.org.uk.

Further information

For further information about recycling glass or other materials, the WRAP Helpline can be contacted on:

Freephone 0808 100 2040

This is one of a series of eight fact sheets covering various aspects of glass products and recycling. Further subjects include:

**An Introduction
Art/Craft Products
Filtration
Glass Processing**

**Aggregates
Container Manufacture
Glass Fibre**

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