

# inBulk

## TECHNOLOGIES

### CASE STUDY



<b>Material</b>	Ground Granulated Blast Furnace Slag (GGBS)
<b>Location</b>	Tees and Scunthorpe (UK)
<b>Application</b>	Road Transport and Storage
<b>Bulk Density</b>	1100kg/m <sup>3</sup>
<b>Flow</b>	Appleby – Corus
<b>Date</b>	May 2005
<b>Unit</b>	20' H Type

In May 2006, **inBulk Technologies** demonstrated the advantages of intermodal bulk handling, with an opportunity to deliver a load of Appleby's Ground Granulated Blast Furnace Slag. (GGBS). GGBS is a cement substitute or additive to concrete and is formed as a by product of the steel making process.

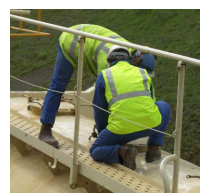
The ISO-Veyor used was the standard 20 H Type in carbon steel with a working volume of 25m<sup>3</sup>, maximum gross of 34,000 kg and a Tare of 4,125 kg. The H Type is also available in 30' or 40' dimensions, giving improved payloads for less dense materials. The ISO-Veyor was placed on a telescopic tri-axle skeletal trailer.

#### Loading

The ISO-Veyor was filled at the road silo loading facilities in Tees, where it was possible to load the 20ft unit with 29 tonnes of GGBS in 20 minutes. The ISO-Veyor is easily filled in a similar method to road powder tankers, via two filling hatches, located on the top of the unit.

#### Transport

The ISO-Veyor was hauled to Corus's Scunthorpe facility by road and left for five days to allow the material to 'pack down'. Transport of the ISO-Veyor could also taken place by rail, whereby the ISO-Veyor makes the majority or 'trunk leg' of the journey by rail and is then transferred to skeletal trailer for a final delivery to the clients silos. Similarly short sea or deep sea shipping can be achieved due to the standard ISO-frame design, allowing freedom of mode in the same way as box containers.



## Discharge

Following connection of the hoses to the compressor and the discharge line to the silo, the discharge sequence began. Offload/discharge took thirty-five minutes. Due to the reduced capacity of the compressor (1 barg – 15 psi), the discharge sequence took longer than normal. (with a higher capacity blower of 30 psi or 2 barg, discharge should take no longer than 25 minutes. ). The silo to be filled was at a height of 40 meters, (one of Corus's highest).

## Visual Inspection

On inspection of the inside of the ISO-Veyor, it was observed that approximately 200 kg of material remained on the floor of the tank. The hatch was secured once more and the ISO-Veyor was pressured-up another time. The residual material was quickly blown off and residual material was measured at less than 20 kg following 7 minutes of blowing.

## The GGBS project, illustrates several key benefits to the industry:

- Fully intermodal – Capable of any combination of road, rail or ship
- Easy to Fill – Can be filled in same way as road or rail tankers
- Easy to Handle – Standard ISO frame allows for standard container lifting equipment
- Easy Horizontal Discharge – Simple connection to 2 barg compressor provides discharge rate of 1 tonne per minute
- Provides flexible weatherproof storage and reduces dependency on silos
- Creates platform for driver controlled deliveries
- Eliminates multiple handling of materials

Overall ISO-Veyors minimise product handling, eliminates contamination, maintains product quality and also protects environment from accidental material spillages. Taking these factors together, ISO-Veyors can significantly reduce the requirements for intermediate handling, reducing the requirements for silo construction and dramatically enhances the overall efficiency of the supply chain.



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