



# introduction

The Bulk Handling Systems Division of Portasilo Ltd, an integral part of Shepherd Building Group, is one of Europe's leading suppliers of plant for the bulk storage and handling of particulate materials. Exceptional in-house design and manufacturing capabilities enable clients to single source systems and components from Portasilo with considerable savings in efficiency, cost and time. For over 50 years Portasilo has designed, manufactured and installed a wide range of products and systems to match the technical requirements of bulk powder handling industry.

**Portasilo®**  
Bulk Handling Systems



Installations include storage, pneumatic and mechanical conveying, electronic batch weighing, recipe management systems, mixing and dosing. Industrial applications range from effluent and water treatment to food processing, from long-established construction industry and foundry requirements to emergent industries such as agro-chemical and pharmaceutical.

The Bulk Handling Systems Division is located at Portasilo's modern, purpose-built factory on a 40 acre site near York. From here a skilled and experienced team design, fabricate and deliver equipment all over the UK and for overseas use. Much of the production machinery has been designed and developed by Portasilo's own engineers for the production of jig-built, modular components for maximum flexibility in plant layout and cost saving. Equally experienced teams of engineers are available for installation and commissioning.

Portasilo is proud of its research and development expertise, and has justified that pride by pioneering many technical innovations within the bulk handling industry. The Company's design office is geared to provide solutions your bulk storage and handling and storage needs with the emphasis on 'optimum value engineering'. This means that the customer obtains the maximum efficiency and productivity from the minimum practical capital outlay. Portasilo provides international coverage and its design engineers will analyse and advise on the correct solution for any specific bulk handling problem. The company offers a complete service including design, manufacture, installation, commissioning and after care to match the precise requirements of each application.

A number of major bulk handling projects appear in the following pages to give an indication of the range and variety of applications undertaken by Portasilo Bulk Handling Systems.



## International Representatives

America - Holland - South Africa - Israel - Germany - Austria - Switzerland - Japan - Taiwan

**[www.portasilo.co.uk](http://www.portasilo.co.uk)**

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# Building Products

Portasilo provides bespoke solutions for clients requiring to store and handle particulate materials in bulk. The company draws upon fifty years of experience during which it has accumulated unrivalled expertise in the provision of cost effective solutions for all types of bulk handling systems; bulk storage, discharge systems, pneumatic conveying systems including: dense phase, lean phase and

vacuum, mechanical conveying, batch weighing, blending and dosing, bag and bin filling and emptying, SCADA systems, control and instrumentation, installation and commissioning and full lifetime care packages.



## PCI Construction

Increased throughput, high efficiency and stringent emissions criteria were achieved with a major storage, handling and batching facility for PCI Construction Systems. Portasilo's design, manufacturing and installation teams worked closely with PCI to meet their brief cost effectively. The Portasilo solution handled the majority of ingredients in bulk silos and transferred to the packing system by making use of the versatile *Portasilo Superflo* dense phase pneumatic conveying system. A complete SCADA based control system was installed as part of the project.

## Sika

Sika, a major manufacturer of concrete repair and grouting materials, selected Portasilo to design, manufacture, install, site wire and commission a technically advanced, PC-based colour graphics SCADA controlled system to handle a host of differing recipes at their Welwyn Garden city plant. This turnkey project was designed to achieve a minimum annual material throughput of 14,000 tonnes, with short batch times and high weighing accuracies.

## Armorex

Armorex chose Portasilo for their bulk storage and handling systems at a new powder handling plant at Lavenham, Suffolk. Portasilo was the only company to offer a dense phase pneumatic conveying system based on the *Portasilo Superflo* capable of handling Armorex's diverse range of ingredients, varying from cement to pea gravel and heavy metal oxides. Armorex benefited from dust free operation, minimum cross-contamination between batches and reduced staff requirements.

## Weber SBD

Portasilo provided Weber SBD with a single source solution for upgrading and extending production lines at their Ballyclare, County Antrim, wall systems and products manufacturing plant. The plant manufactures the brands Eglinton, Snowcem and ispo building products. The whole project was completed within the Client's tight programme timescales, including a narrow window of time during which the existing plant could be out of production.

# Building Products



Stelma - Ready-Mix, Dryplant.

## Clients

- | Armorex
- | Ash Resources
- | BICC
- | Blue Circle Cement
- | British Gypsum
- | BS Eaton
- | Buxton Lime
- | Castle Cement
- | Hanson
- | Lafarge
- | Mansfield Sand
- | Marley
- | Marshalls
- | Norcross
- | OMYA
- | PCI Construction
- | Redland
- | RMC
- | Rugby Cement
- | Saint Gobain
- | Sika
- | Stelma
- | Taylor Woodrow



## Huntsman

This adipic acid storage and handling system comprised an IBC container offloading station, two 50 tonne capacity stainless steel storage silos fitted with explosion protection systems, four receiving hoppers mounted above existing reactors, two lean phase pneumatic conveying systems, control system and electrical and mechanical installation. The pneumatic conveying systems are each rated at 20 tonnes throughput per hour.

## Colgate Palmolive

Colgate Palmolive commissioned Portasilo to provide a pharmaceutical quality installation to handle and store toothpaste abrasives at Salford, Manchester. Portasilo's system makes extensive use of stainless steel for all equipment that comes into contact with the abrasive dicalcium phosphate silicons and calcium carbonates. This included the silos, *Augerflo* discharger, *Portasilo Superflo* pneumatic conveying system and receiving and weighing vessels.

## Colin Stewart Minchem

Colin Stewart Minchem provide a milling and processing service to the chemical industry. As part of a new contract they installed two 500 tonne capacity Flourspar silos on to a new site in Ellesmere Port. The silos, manufactured by Portasilo Bulk Handling Systems included *Rotoflo* dischargers and tanker loading hoods, this combination ensured that the tankers could be filled at a rate of 50 tonnes per hour in a controlled – dust free environment.

## Henkel

Portasilo installed a complete bulk storage handling and conveying system at Winsford, Cheshire for Henkel Chemicals, manufacturer of sealants and adhesives, including the well known Solvite, Unibond, Nitromors, Pritt, Copydex and Gloy brands. The system is for handling a variety of materials used in the manufacturing process. It includes five 3m diameter silos, mounted on independent support structures, and five *Portasilo Superflo* dense phase pneumatic conveying systems.

# Chemical Industries



Borden Chemical UK - Urea Prill Handling Plant.

## Clients

- | Akzo Nobel
- | BASF
- | BICC
- | Borden
- | BP
- | Ciba
- | Colgate Palmolive
- | Colin Stewart Minchem
- | Courtaulds
- | Croda Colloids
- | Croda Kerr
- | Dupont
- | Henkel
- | ICI
- | Kalon
- | Sigma Paints
- | Smith Klein Beecham
- | Zenica



## **Courtaulds Acetate**

Portasilo Bulk Handling Systems supplied and installed five large silos for the storage and tanker filling of cellulose acetate. The material was transferred from the outlet of two main dryers and into one of the five silos by a pneumatic conveying system.

In addition to the main plant two further silos and a facility for filling big bags were added at a later date to provide intermediate storage and flexibility regarding final shipment.

## **Pirelli**

This contract for Pirelli Cables at Aberdare in South Wales included the supply of four aluminium silos each storing plastic granules for use in the manufacture of PVC cable insulation. The project also included the supply of three pneumatic conveying systems complete with diverter valves and filter systems to transfer the plastic granules from the storage silos to the process. A full control system and on site wiring were included as part of the project.

## **Montell**

This project involved the supply of eighteen aluminium silos, twelve of which are for the storage of the primary ingredients for the process. The remaining six silos were supplied for the final storage and tanker filling of the finished product. In addition to the project on the main site at Milton Keynes, further 69m<sup>3</sup> capacity silos have been supplied for use on several of their customer's sites.

# Plastics & Allied Industries



**Cabot** - Polyethylene Plastic Granules.

## Clients

- | Albright & Wilson
- | Beckton Dickinson
- | BP
- | Cabot
- | Courtaulds Acetate
- | Delta Cables
- | Dow
- | Dupont
- | Hubron
- | Huntsman Polyurethanes
- | Hydro Polymers
- | ICI
- | Ilford
- | Montel
- | Pirelli

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## Alanod

Alanod of Milton Keynes, a major producer of anodised aluminium coil and sheet, needed an effluent treatment facility that could cope with expanding factory output whilst meeting stringent regulations on outfall waste. This was provided by the quicklime slaking system jointly developed by Portasilo and Buxton Lime Industries. This well proven quicklime slaking package, using fine ground, highly reactive quicklime, has removed the need for a complex grit removal plant. High quality milk of lime is now produced and dosed automatically and extremely cost effectively.

## Avesta

Portasilo designed and installed this 40 tonne capacity hydrated lime system comprising a *Rotoflo* discharge valve feeding two flexible screw conveyors, each rated at 500 Kg/hr. The *Rotoflo* solution was selected to ensure accurate control while discharging to either conveyor. The equipment was supplied to ERG Lancy and was part of a waste treatment process at the Avesta stainless steel plant in Sheffield.

## Coleshill

Improved efficiency of treatment and compliance with EC emission regulations were achieved in a series of three contracts associated with the treatment and handling of sewage sludge, and ash from its incineration, at Severn Trent Water's Coleshill Waste Treatment Works. As a result of this successful programme, Portasilo was awarded another major contract at the Shell Green Sludge Incineration Facility.



# Environmental



Glaxo Smith Kline - Lime Slaking System.

## Clients

- | Alcan
- | Andritz
- | Anglian Water
- | Ano-Coil
- | Cleveland Waste
- | East of Scotland Water
- | Ganox
- | Glaxo Smith Kline
- | Hyder
- | Jones Environmental
- | Kvaerna Eureka
- | North of Scotland Water
- | North West Water
- | Northumbrian Water
- | Ondeo-Degremont
- | Purac
- | Quinn Glass
- | Seghers
- | Severn Trent Water
- | Southern Water
- | South West Water
- | Swiss Combi
- | Wessex Water
- | West of Scotland Water
- | Yorkshire Water



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# Flue Gas Treatment



## OSC Shell Green

Portasilo supplied OSC with a sand silo and a dense phase sand conveying system to inject sand into the fluid bed incinerator at North West Water's Shell Green sewage sludge incineration facility. In addition, a limestone storage silo and two variable rate, dense phase pneumatic conveying systems were installed to inject limestone into two flue gas streams to neutralise the ash contained within the gas. An electrostatic precipitator cleans the two gas streams before the air is allowed to dissipate into the atmosphere.

## Alcan

Reducing emissions from the smelter potline was a key objective for improving efficiency in the smelting fume extraction process at Alcan's Smelting and Power UK's aluminium smelter works at Lynemouth. Portasilo worked with Alcan on the first stage of a fume extraction system overhaul, to devise an efficient closed loop process and associated handling system. This illustrates Portasilo's commitment to developing improved systems and technologies in close co-operation with the end user.

## NNC Sheffield

The Company provided a turnkey solution for a new silo and outloading facility at the Sheffield Municipal Waste to Energy Plant for NNC. The silo is fully clad, trace heated, insulated and manufactured in a corrosion resistant alloy. This scheme is an integral part of the air pollution control system at the Clinical and Municipal incineration plant in Sheffield and handles ash and other waste products.

## Quinn Glass

Portasilo completed an environmentally efficient project for leading UK glass manufacturer Quinn Glass, at Derrylinn, Co Fermanagh, Northern Ireland. This involved a flue gas scrubbing system, comprising two 3.5m diameter silos and three lean phase pneumatic conveying systems, one of which was for high temperature operation. The equipment, which handles hydrated lime and precipitator ash, ensures that the factory fully complies with the latest, stringent European environmental protection legislation.



## Weston Super Mare

This processed dried sewage granule storage silo and discharge system was designed and built by Portasilo for Swiss Combi at Wessex Water's sewage treatment works at Weston-Super-Mare. The design included a full silo safety system including multi-point temperature monitoring, carbon monoxide detection, explosion venting and carbon dioxide inerting package. All these features have been developed by Portasilo to ensure a safe environment for the storage of this difficult product.

## Bran Sands

Portasilo has made a significant contribution to Northumbrian Water's £200 million Bran Sands effluent and sludge treatment plant, one of the world's largest sludge treatment projects. The first major contract was with Andritz AG, for a pneumatic conveying and storage facility for up to 1,200 tonnes of dried sewage in both granulate and pelleted forms. A further contract, with Entec was for a fully automated quicklime slaking system at the nearby Tees Estuary Environmental Scheme's Effluent Treatment Works.

## Pyewipe

Portasilo supplied dried sewage granule storage silos and mechanical handling equipment to Purac, for Anglian Water's Pyewipe Sludge Treatment Centre, Grimsby. The silos were fitted with *Rotoflo* dischargers to ensure a controlled flow of the material. Explosion relief hatches were installed with break wires to shut down infeed and outfeed equipment and spontaneous combustion was countered by installing multi-point temperature probes in each silo, linked to an inert gas flooding system specially developed by Portasilo.



## Fibrogen Glanford

Portasilo supplied and installed three meat and bone meal (MBM) storage silos for main contractor Redler at Fibrogen's Glanford Power Station, Lincolnshire as part of a new fuel intake system to allow the power station to burn MBM instead of poultry litter. Each 6.5m diameter silo was fitted with explosion relief panels, level controls and radar based continuous level measurement. Silo discharge utilises hydraulically driven sweep augers for variable speed operation to ensure the efficient outfeed of material.

## National Power

This reception, storage and handling facility for National Power at Blyth, Northumberland enabled stringent EC environmental directives for PFA disposal to be met. The installation includes six site-built 1,000 tonne capacity storage silos, in a purpose-built complex; fifty pneumatic conveying pressure vessels and 12 kms of conveying pipework. It demonstrates Portasilo's capacity to undertake complete single source contracts involving design, project management, installation, commissioning and civils work.

## Britannia Zinc

Britannia Zinc chose Portasilo for a project involving the storage, conveying and blending of various oxides with coal dust, at Avonmouth, Bristol. Both lean phase and *Portasilo Superflo* dense phase pneumatic conveying systems were incorporated. The installation is flexible enough to cope with any product, at whatever density required. This was achieved through use of the patented *Rotaflo* discharger, which ensured controlled, first in first out discharge.

## Industrial Latex Compounds (ILC)

ILC commissioned Portasilo to design, manufacture and install a bulk storage and handling plant as part of a new production facility at Middleton, Manchester, to produce carpet backing. Four 150 tonne limestone filler storage silos were provided, together with batch weighing equipment. A series of mechanical conveyors distribute the pre-weighed ingredients to the client's process.

# General Industries



Ferrybridge - Power Station.

- | Power Generation
- | Mining
- | Metals
- | Quarries
- | Glass
- | Cement
- | Steel
- | Ceramics
- | Petrochemical
- | Paper
- | Logistics
- | Foundries
- | Fabric



**Tate and Lyle**

Portasilo has a world class sugar handling and storage capability and is the leading manufacturer of large scale, conditioned, mass flow sugar storage systems. Three 2500 tonne capacity mass flow silos have been built for Tate and Lyle on their Silvertown site in London. The installation, which took place in a confined area within the centre of the working refinery, was manufactured on site from stainless steel. Mass flow from the silos was guaranteed using *Augerflo* dischargers. A further four 2500 tonne silos have been installed for the Taiwan Sugar Corporation.

**Coca-Cola / British Sugar**

An installation for Coca-Cola, forming part of an entirely new plant at Wakefield, West Yorkshire demanded an imaginative approach utilising the most cost effective equipment. A fully automated sugar handling system has been installed consisting of a 100 tonne capacity sugar silo complete with filter units, explosion relief vents, *Augerflo* dischargers and a triple lean phase conveying system, permitting a throughput of 66 tonnes/hour into the client's dissolvers.

**Nestlé**

A Bulk Handling System which ensured absolute integrity of the materials feeding the manufacture of Kit Kat bars was supplied for a new Nestlé manufacturing facility in York. Both flour and sugar are stored in these partitioned steel storage silos which were tailor made for this application, including cladding and insulation to help maintain material temperature during shutdown periods. Measuring 15 m x 4.5 m (diameter), these silos were among the largest ever delivered to site in one piece.

**Avebe**

Portasilo equipment plays a major part in the dockside storage and handling of farina starch, shipped from the European mainland for Avebe Starches, and used in food production and paper making. The two main 750 tonne capacity storage silos are 10 m in diameter and were site built. Material is fed from the silos via an *Oscillo* oscillating bar feeder which is designed specifically for handling coagulative materials. The installation is part of a new terminal on the Montrose Harbour Trust site for distribution of starch in Scotland and northern England.



Tate & Lyle - Sugar Storage & Handling System.

- | Sugar
- | Starch
- | Cocoa
- | Chocolate Crumb
- | Skimmed Milk Powder
- | Salt
- | Flour
- | Whey Powder
- | Soya
- | Semolina
- | Maize
- | Potato Granules
- | Wheat
- | Gluten
- | Fish Meal
- | Rice
- | Coffee Beans
- | Puffed Wheat

# Technical Services

Portasilo's renowned ability to design and build the most cost effective, tailor made bulk materials handling and storage systems extends to maintaining your plant throughout its working life. Portasilo's experience, resources and professionalism are available in lifetime care packages designed to keep your systems working at optimum efficiency throughout their working life.

Portasilo can plan and carry out your scheduled and unscheduled site maintenance, in line with production and environmental needs. In addition, a plant upgrade facility is available. This allows for modifications to be carried out to your plant, either for changing operating requirements or to comply with new legislation, efficiently and effectively and with minimal disruption to your process.



## Servicing

In addition to plant modification and upgrading, Portasilo Technical Services offers plant care and maintenance packages, including comprehensive Maintained Systems Plans to ensure optimum plant efficiency, year after year, whether equipment was originally installed by Portasilo or by other suppliers. In addition, Portasilo stocks a comprehensive spares inventory to ensure rapid response and minimum downtime during plant maintenance.

## Plant Upgrades

Portasilo Technical Services upgraded an existing hydrated lime silo for I.I.E.S. (Northern), to remedy inconsistent flow rates and blockages. This involved fitting a *Rotoflo* discharge valve to ensure consistent and controlled flow of material from the silo. The upgrade included two flexible screw conveyors - one for standby - for transferring lime into the mix tanks, and special conveyor outlet valves to avoid problems associated with the critical wet/dry interface.

## Control and Automation

Portasilo Technical Services can upgrade and enhance your existing plant to operate remotely via a SCADA based control system. Many remote installations, especially in the utility sector, require unmanned operation with monitoring and control being carried out offsite. Our in-house design engineers will assess your existing system and provide a solution to meet your ongoing requirements, whether you require a simple control upgrade or a new automation package.

Improved plant reliability, and an increased level of automation was achieved at Yorkshire Water's Thornton Steward Water Treatment Works, in the Yorkshire Dales. Portasilo Technical Services upgraded the existing lime mixing and conveying equipment. Central to the modifications was a new lean phase pneumatic conveying system with blower and dehumidification to replace an ageing powder pump system.

# Technical Services



All the skill and expertise you need

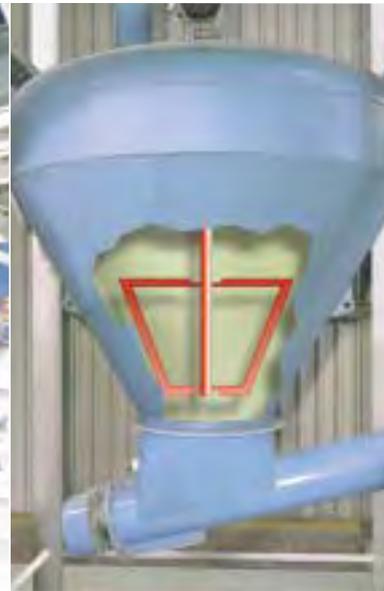
- | Spares
- | Servicing
- | Planned Maintenance
- | Plant Upgrades
- | Dust Control
- | Control and Automation
- | Silo Safety Systems

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# Mechanical Dischargers

Portasilo's in-house research and development programme has produced a range of mechanical dischargers, including the ever successful *Rotoflo* discharge valve, *Rotoflo* Low Profile discharger, and the *Rotoframe* discharger. These dischargers, available in both carbon steel and stainless steel, ensure the consistent and controlled discharge of difficult materials from storage vessels

from the most cohesive of powders to the most fibrous. With 50 years experience in the design and manufacture of storage vessels and discharge systems you can be assured that we have the necessary experience to select the most appropriate and cost effective discharger to suit your application.



## **Rotoflo Discharge Valve (RDV)**

The *Rotoflo* discharge valve can achieve complete and controlled discharge of powders and granules including very cohesive powders without incurring the complications of vibration and aeration. The discharger employs active shut off gates, which act as an isolation valve. This allows full maintenance of the unit even when the silo is full of material. Discharge rates ranging from less than  $1\text{m}^3 / \text{hr}$  up to over  $160\text{m}^3 / \text{hr}$  can be achieved from the five standard sizes in the range.

## **Rotoflo Low Profile Discharger**

The *Rotoflo* low profile discharger has the same benefits as the *Rotoflo* discharge valve, with the added advantage of being able to reduce the overall height of the installation. In addition the unit can be provided with multiple outlets to feed direct in to the process. Applications are operating with a 40:1 turn down in feed rates. This ensures accurate and precise control over discharge to meet the stringent demands of your process.

## **Rotoframe Discharger (RF)**

To complement the *Rotoflo* dischargers, the Rotoframe discharger is ideally suited for ensuring reliable discharge of cohesive powders, fibrous products and materials with a high moisture content, from hoppers and vessels. The unit, which can be easily retrofitted, is pneumatically operated and is controlled via a pressure monitoring system which ensures reliable discharge of even the most difficult of materials.

# Products



A Comprehensive Range of Products to Suit Your Requirements

- | Mechanical Dischargers
- | Vibratory Dischargers
- | Fluidisation Systems
- | IBC and Sack Handling
- | Mechanical Conveying
- | Pneumatic Conveying
- | Storage Vessels

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# Vibratory Dischargers

Portasilo provides bespoke solutions for clients with problems in the handling and storage of materials in bulk. The company draws upon fifty years of experience during which it has accumulated unrivalled expertise in the provision of cost effective solutions for all types of bulk handling systems; Bulk Storage,

Discharge Systems, Pneumatic Conveying Systems including: Dense Phase, Lean Phase and Vacuum, Mechanical conveying, Batch weighing, Blending and Dosing, Bag and Bin Filling and Emptying, SCADA Systems, Control and Instrumentation, Installation and Commissioning and Full Lifetime Care packages.



## Vibroflo Discharger

This unit, with its flange to flange connections, eliminates the problematic flexible sleeve fitted to more conventional vibratory bin dischargers. This removes the potential for catastrophic failure resulting in major powder spillage with all the environmental implications. With the *Vibroflo* discharger only the inner cone section is vibrated, ensuring that all the energy is put into the material, breaking bridges and preventing rat-holing. This feature causes minimal vibration to be

transmitted into the storage vessel body, reducing noise and the probability of structural damage. The unit can be supplied either round, square or rectangular in a range of sizes to suit the geometry of the silo or bin. This makes the *Vibroflo* discharger an ideal retrofit solution to your onsite discharge problems.

## Vibrocone Discharger

To complement the *Vibroflo* discharger the *Vibrocone* has been specifically designed to address the problems encountered when trying to fully empty a hopper. The *Vibrocone* is installed where segregation between materials is required or batch weighing is being undertaken in the hopper. The design is such that the cone angle of the hopper is retained. This ensures complete emptying with minimum force required and reduces cycle times, power consumption and fatigue damage.

# Pneumatic Conveying

Portasilo is one of Europe's leading suppliers of pneumatic conveying systems. A choice of vacuum, dense phase and lean phase systems all provide an environmentally friendly and efficient material transfer, using a clean air stream or if necessary and inert gas loop. Portasilo's pneumatic conveying systems have the advantage of being totally enclosed, ensuring a clean and safe environment.

This is essential for certain products such as those with a toxic, explosive or otherwise hazardous nature.



## Vacuum Conveying

Vacuum conveying technology has been used by Portasilo for pneumatically conveying materials, from plastic pellets to fine powders such as talc, for use in a wide range of industries. Each system is uniquely designed using standard modular components. These are chosen to suit your specific material characteristics. The systems can be manufactured from stainless steel, a combination of aluminium and stainless steel or from carbon steel to suit your individual requirements and can be suitable for free flowing, cohesive or explosive products.

## Lean Phase Conveying

Portasilo has pneumatically conveyed many types of materials using positive pressure lean phase conveying technology. These systems, including both high temperature and ambient applications, use low pressure to convey the products. Lean phase systems tend to have a lower phase density and run at higher velocities than dense phase conveying systems. This allows maximum flexibility in conveying rates and location of pipework and receiving vessels. In addition, they do have lower capital costs.

The lean phase pneumatic conveying system is a proven process, which is highly efficient in operation, with total reliability producing advantageous economic operating costs. Portasilo's lean phase pneumatic conveying systems are tailor made to suit individual requirements, thereby guaranteeing optimum operating conditions, while ensuring that the plant is designed for ease of operation and maintenance.



## Dense Phase Conveying

The *Portasil Superflo* dense phase pneumatic conveying system is manufactured in both stainless steel and mild steel, and is suitable for operation in many industries including food, chemical, environmental and building products. The system is capable of handling either a single material or a blend of materials over a range of 350 m at a rate of up to 100 Tph.

The system, with its unique online airflow monitoring system coupled with its in-built blending capability, ensures that you

consistently obtain the best from your process. In addition, the design life of the system is in excess of 1,500,000 cycles, typically 30 years in normal operational conditions making the *Portasil Superflo* system a "fit and forget" product.

The blending accuracy is such that typically the blend achieved is of a similar quality to that achieved within most ribbon blenders often making a dedicated blending machine unnecessary. This alone can significantly reduce the overall project costs.

The online airflow monitoring system constantly evaluates the effectiveness of the conveying process and adjusts the system to ensure that the optimum performance is maintained throughout the conveying cycle. This feature is fitted to all *Portasil Superflo* systems and allows for blended products to be conveyed effectively, and efficiently, at the same time as allowing the system to be more tolerant to product variation.

The online airflow monitoring also allows the system to adapt for differing conveying

lengths found in multi-destination conveying installations and automatically adjusts the conveying parameters to suit the selected destination, thereby ensuring the optimum conveying performance is achieved.

# Additional Products

In addition we can offer the *Augerflo* and *Osciflo* storage vessel dischargers together with aeration and fluidisation systems. Conditioners, humidifiers, sack and big bag filling and emptying systems further compliment the range. We also design and manufacture a range of storage silos to meet your requirements.

All of these products are available as part of an overall bulk handling scheme or as stand alone products for incorporation into your existing systems.



## Silos

Portasilo's standard silos are available in carbon steel, stainless steel and aluminium in a range of capacities from 10m<sup>3</sup> to 2500m<sup>3</sup>. Where possible the silos will be supplied shop built but the larger units will be supplied in sections for transport with final assembly on your site. All Portasilo silos are designed in accordance with the latest BSI, ISO, DIN and VDI standards where appropriate. These silos can also be supplied suitable for storing potentially explosive and hazardous materials.

## Augerflo

Portasilo's *Augerflo* screw dischargers are available in single, twin and multiple screw formats. These can be manufactured in both stainless steel and carbon steel and have been specifically designed to handle a wide range of materials and applications. Mass flow discharge of the silos and bins can be achieved when used in conjunction with the correct silo geometry.

## Osciflo

*Osciflo* dischargers offer a gentle controlled and adjustable discharge of materials from silos and bins. These units are designed to feed material through a series of oscillating square section bars. This action allows the discharge rate to be varied and also acts as a shut-off gate when material is not being discharged. The principle of operation is that the square bars slowly rotate backwards and forwards which induces movement in the product allowing discharge to take place.

## Aeration Systems

Portasilo manufactures and supplies a full range of aeration systems to actively promote the efficient discharge of powders from silos and hoppers. Aeration systems range from single *Siloflo* pads up to fully fluidised cone sections. The *Siloflo* systems are flush fitting, easy to install and can be fully maintained from outside the storage vessel. The units are available for industrial, food quality and high temperature applications.

# Single Source Solutions

Portasilo Bulk Handling Systems, your partner for single source solutions, can take single source responsibility for all aspects of your material handling project, including acting as principal contractor when required. This ensures the whole project is managed and completed, efficiently and effectively with minimum disruption to your process. Portasilo's in-house Project Managers, Design

Engineers, Quality Engineers and installation and commissioning teams ensure total control of the projects from civil construction through to final commissioning and take over, in line with our ISO 9001 accreditation and the latest environmental and CDM regulations.



## Total Project Management

Portasilo can take single source responsibility for all aspects of your materials handling projects - exercising total control on the customer's behalf. Close liaison is maintained with customer project teams to avoid delays and shorten contract timescales. Simplified communication speeds up technical problem solving, tightens project co-ordination and helps to achieve uniform standards. Capacity is available to implement changes to specification without incurring unnecessary time and cost penalties.

## Problem Solving by Design

Experienced and well qualified in-house design teams are available to design systems and components to solve even the toughest bulk handling problems. Customers benefit from access to proven, patented components and systems - many developed by Portasilo's in-house research engineers. Systems and components are designed on a modular basis for cost effective, bespoke installations.

## Control Systems

Portasilo offers control systems from small relay based systems to full SCADA control packages. Our own in-house engineers, who form part of the project team, ensure precise and accurate control of your process design. Electrical installation of the system can be incorporated in the total package ensuring a full single point contact for all of your electrical, control and instrumentation requirements.

## Installation

Portasilo installation teams, utilising our own engineers, will visit your site and install the whole of the plant and equipment required as part of the project. This installation will be carried out in line with the current CDM regulations. Portasilo can also operate in the role of principal contractor bringing together and co-ordinating all aspects of the installation, even areas not covered as part of our contract.

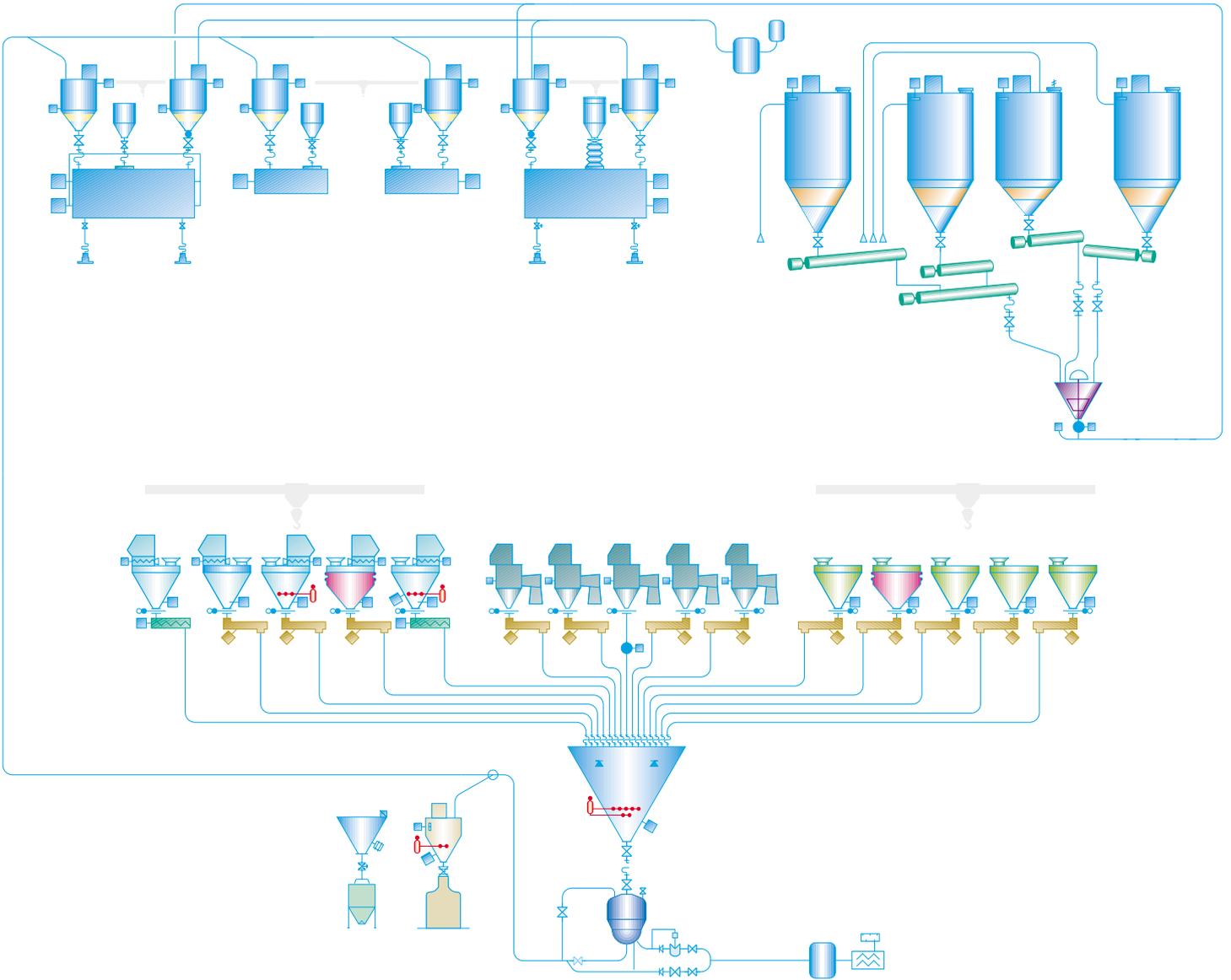
# Single Source Solutions



Hanson Pre-Mix - Floating Cement Barge, Canary Wharf.

- | Total Project Management
- | Design
- | Manufacture
- | Installation
- | Controls
- | Commission
- | Full Turnkey
- | Lifetime Care

# Typical System



## System Key for simplified schematic drawing - Armorex

 Augerflo	 Portasilo Superflo	 Rotoflo	 Vibroflo	 Big Bag Discharge Unit
 Rotoframe	 Big Bag Filler	 Tote Bin	 Vibrocone	 Vibrating Feeder
 Sack Tip Unit	 Siloflo	 Big Bag and Sack Tip Combination Unit		

# Other Literature



- | Superflo - Dense Phase Conveying Systems
- | Rotoflo Discharge Systems
- | Rotoflo Applications
- | Vibroflo Discharge Systems
- | Osciflo Feeders
- | Siloflo Aeration Systems
- | Standard Range of Silo Data
- | Case History Profiles

\* check our website for regular updates

*Augerflo, Osciflo, Portasilo Superflo, Rotoflo, Rotoframe, Siloflo, Vibroflo and Vibrocone are Trade Marks.*

\* Download PDF versions of the brochures from our website at [www.portasilo.co.uk](http://www.portasilo.co.uk)

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