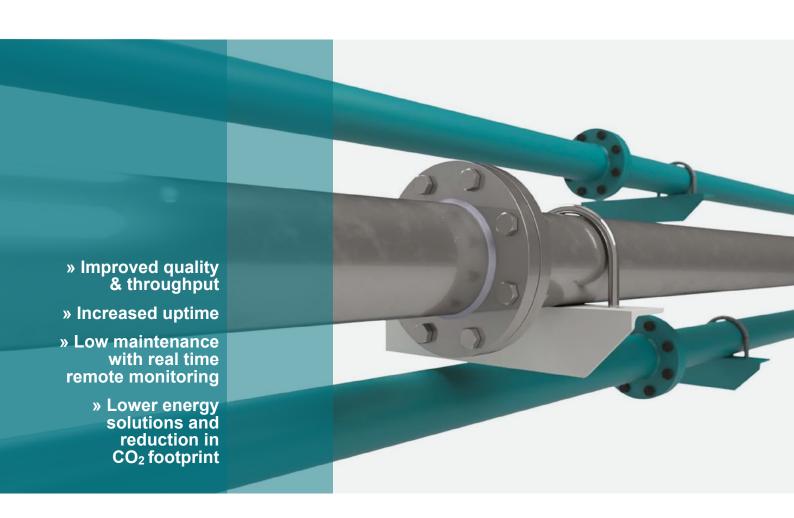


## Pneumatic Conveying Products and Solutions







## YOUR WORLDWIDE PNEUMATIC CONVEYING PARTNER

#### WE'VE GOT YOUR PNEUMATIC CONVEYING NEEDS COVERED

As industry leaders, our pneumatic conveying solutions cover all types of dense and dilute (phase) conveying. We have a comprehensive portfolio of intelligent and energy-efficient solutions and designs. Our products meet the unique challenges of all major Industry applications. Our range also incorporates pneumatic injection technology too.

#### **KEY INDUSTRIES SERVED**

- **» IRON AND STEEL**
- **» NON FERROUS METAL**
- » CEMENT
- » CHEMICALS
- » PERFORMANCE MATERIALS
- » RAIL SANDING

#### **OUR SOLUTIONS**

- » Dense Phase Conveying
- » Process Injection Systems
- » Performance Valves
- » Spares and Service
- » Refurbishment, modernisation and optimisation
- » Digital and remote support solutions
- » Testing and Innovation

## HOW WE ADD EXTRA VALUE

#### **KEY BENEFITS**

- » Significant increases in productivity
- » Environmental sustainability of the processes
- » High system availability, reliability and performance
- » Low operating costs and maintenance
- » Greater process control
- » Cleaner and dust free working environment
- » Cost savings through process efficiencies
- » Flexibility to integrate with existing and emerging technologies
- » Comprehensive aftercare service and spares availability

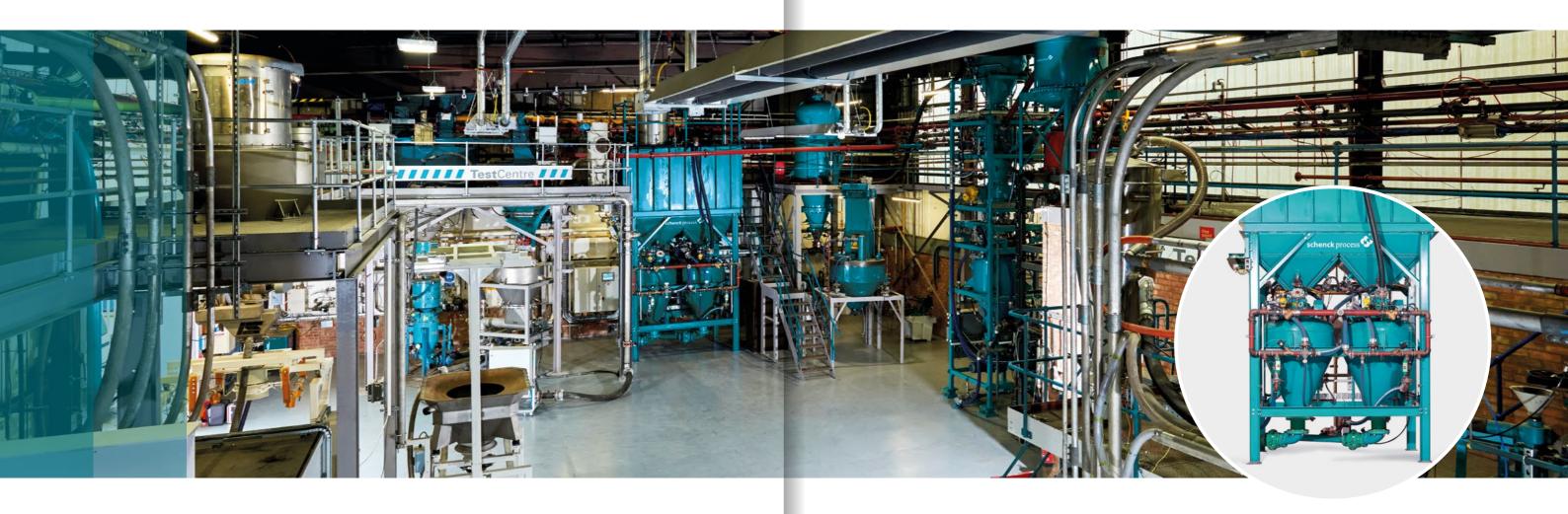
#### **SITE SUPPORT**

Our highly experienced engineering teams, will travel far and wide to provide a variety of services, including:

- » On-site engineering
- » Support with installation and operation
- » Emergency breakdown call-out
- » Repair and refurbishment
- » Upgrades and spare parts
- » System optimisation and re-commissioning

#### PROJECT MANAGEMENT

For the supply of new equipment, our project management teams become an extension of your business. From start to finish, our teams are dedicated to meeting your business goals.



## DONCASTER TEST & INNOVATION CENTRE

Schenck Process has a substantial material database of over 10,000 samples. Properties such as particle size, bulk density, moisture content, permeability, and flow behaviour have been characterised to choose the ideal conveying technology for the customers application. This is achieved using a variety of equipment available to customers who need help to solve problems and make optimisations to systems, including those of our competitors.

Our Test Centre has every type of pneumatic conveying technology available at industrial scale, so we can get it just right, first time. Few of our competitors can offer such an unbiased approach to finding the optimum, most sustainable solution to the unique requirements our customers have.

Our conveying distances can range between 5m up to 400m. We have a selection of different pipeline diameters available from 25mm to 125mm.

Whichever technology is used, our recommendations are based on the test findings, including power usage, conveying rate, particle damage or dust generation depending on your needs.

Send us some material, typically 2 to 3 cu.m in big bags or sacks, and we will do the rest.

The Test Centre also enables us to stay on the cutting edge of pneumatic developments. Before we introduce new products, product adaptations and software, we extensively test the concept and detailed operation.

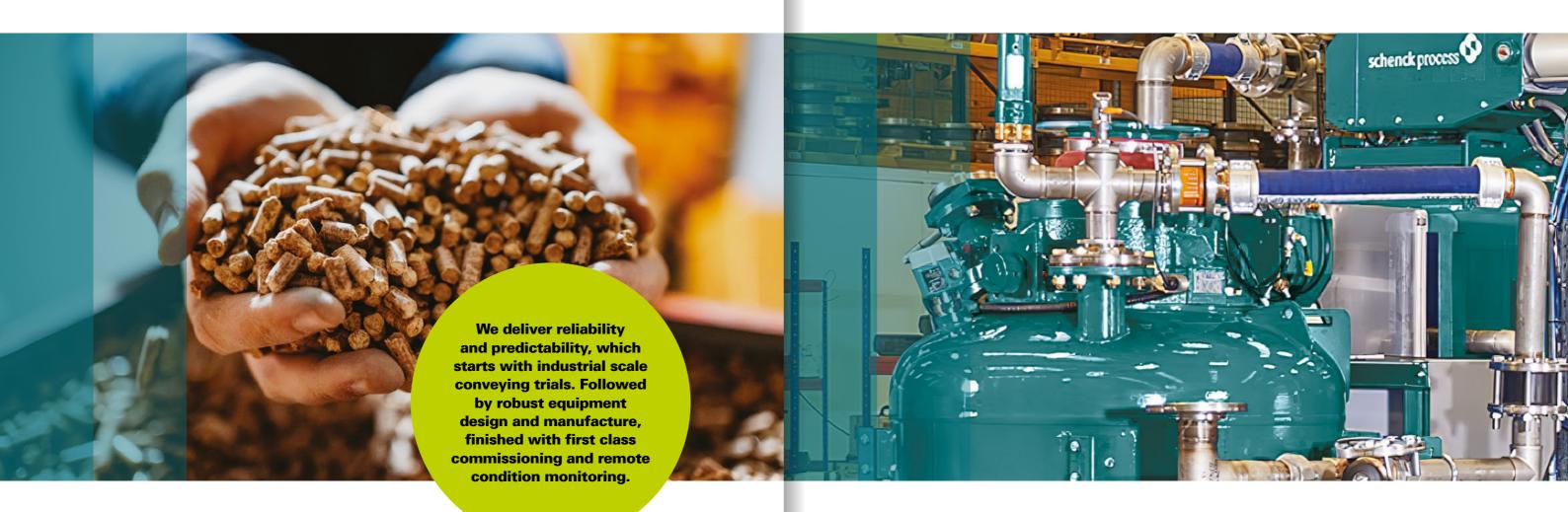
## INDUSTRIAL SCALE PNEUMATIC CONVEYING AND INJECTION TRIALS

Our extensive test facility in Doncaster UK, includes an impressive array of pneumatic conveying and pneumatic injection systems. Our customers are invited to supply materials which can be tested using either dilute, medium or dense phase technology in either positive or negative pressure configurations, in conjunction with a selection of pipe diameters, route configurations, transfer distance and throughputs.

Most site conditions can be accurately replicated using full size systems, including transfer distances up to 400m. We have the ability to convey against a back pressure up to 3-4 barg, to simulate pressurised processes.

#### **KEY BENEFITS**

- » You supply the material sample and we will test it for you
- » Database of over 10,000 samples compiled
- » System efficiencies and material degradation monitored to ensure best solution proposed
- » Minimise likelihood of overspend and delays
- » Also available to solve on site issues with existing and competitor's systems
- » Available remotely via livestream if you are unable to visit in person



## DENSE PHASE PNEUMATIC CONVEYING

Dense phase conveying is an energy efficient method of transporting materials through pipelines at very low and stable velocities to minimize degradation and equipment wear. Advantageous for abrasive or friable materials.

Schenck Process offers the complete range of technologies, from traditional dense phase systems between silos using batch vessel technology to continuous dense phase conveying into processes at pressure.

Our **E-Phase** systems offer low pressure dense phase conveying, typically suited to pelletised or granular products. We utilise intelligent algorithms to ensure the system performs in optimal transfer conditions.

#### **KEY BENEFITS**

- » Energy efficient and gentle conveying of bulk materials
- » Intelligent conveying solutions increase flexibility, reliability, uptime and efficiency
- » Very low product degradation
- » High throughputs achievable
- » Long conveying distances
- » Reduced equipment wear
- » Minimal maintenance



The **ProPhase** is the latest version of the well proven dense phase pneumatic conveying technology from Schenck Process.

- » Highly standardised and modular dense phase system, full flexibility of supply
- » The most reliable and energy efficient yet, bringing you benefits of maximum plant production coupled with minimum operating costs
- » Incorporating our Clyde Process ProDV Dome Valve the ProPhase can perform up to 250,000 cycles between minor services and up to 1 million between major ones
- » The performance of the **ProPhase** for a given application can be verified in our UK test centre, with conveying distances up to 260m, if required

#### Click to find out more

#### **KEY BENEFITS**

- » 40 years of continuous improvement for leading reliability
- » Energy efficient, rates up to 250 tph and distances up to 750m
- » Totally enclosed dust free
- » Very low pipe wear
- » Extremely low degradation of fragile bulk solids
- » Conveying pipelines from DN50 to DN300 and vessel volumes 0.23m³ to 6.2m³
- » Proprietary **PHASiQ** controller for fast start-up, or DCS / PLC integrated
- » CE / PED / ATEX / ASME approved

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## **ProStream PNEUMATIC INJECTION**

The **ProStream** range comprises of three different arrangements: continuous conveying with a lock vessel topping up a lower dispense vessel, continuous conveying with two dispensing vessels working alternatively into the same conveying pipeline, or batch conveying using a single vessel.

In each case, material is metered at the conveying and process pressure, into the conveying and injection pipelines, using either vertical axis rotary Multicell feeders, or **ProFlex** screw feeders.

A key part of the design is to ensure there is no significant pressure differential across the metering feeder, to ensure the typical wear problems of rotary valves, the leakage issues with screw feeders, and the limit on conveying pressures are all avoided. Providing the ability to feed to any process accurately, consistently, and smoothly.

#### Click to find out more

#### **KEY APPLICATIONS**

- » Metal concentrate injection, e.g. copper, nickel, tin
- » Fuel and sorbent injection, including granulated, pelletised, crushed and pulverised variants read more »
- » Crushed and screened e-scrap, and other processed recyclables
- » TSL furnaces, blast furnaces, flash furnaces, EAF carbon and lime
- » Alternative steel making processes, carbon capture, kilns, cupolas
- » Oxy-Fuel Burners

## E-Phase LOW PRESSURE DENSE PHASE CONVEYING

Highly efficient low velocity pressure dense phase conveying.

Dense phase usually means conveying materials at velocities in the region of **3 to 8 m/s** using air supply pressures in the region of **3.5 to 6 barg**. Systems such as these use pressure vessels commonly known as 'blow pots' to convey materials in batches, which fill and then convey sequentially.

For certain materials it is possible to convey materials continuously and dense phase using a rotary valve. In this case, the conveying velocities are also in the region of **3 to 8 m/s**, but the conveying pressures are lower and usually in the region of **0.7 to 1.3 barg**.

The benefits of low pressure continuous dense phase including very low levels of degradation and wear as you would expect, but also, even lower power consumption with savings of up to 35%.

This technology is known as **E-Phase** and can be used to convey monosize materials with good permeability, such as clean chippings, pellets, clean agglomerates and screened aggregates.

We can test and demonstrate E-Phase over distances up to 260m and welcome all our customers to try it!



## THE INJECTED DENSITY STABILIZER - CONIQ CONTROL IDS

The easy to install, with 'plug and play' functionality **CONiQ Control IDS** technology promotes sustainability credentials proven to deliver substantial economic benefits through reduced pipeline blockages. Plus increased throughput or reduced overall energy consumption and associated costs.

Clients using CONiQ Control IDS have achieved up to 40% reduction in energy consumption - lowering their energy costs - or up to 30% increase in conveying rates – resulting in increased production rates. The technology is especially suitable for pipelines conveying difficult to handle granular materials,



#### **How CONiQ Control IDS works:**

The technology can vary the injection air flow rate at any time and at any position along the pipeline, to manage all material plugs in the system simultaneously, when a plug of material is detected. As soon as the material is moved, the air volume efficiently switches to low flow. No other technology can do this.

Our patented **CONIQ Control IDS** can also be retrofitted to our competitor systems to potentially provide significant savings.



### **ProDV DOME VALVE**

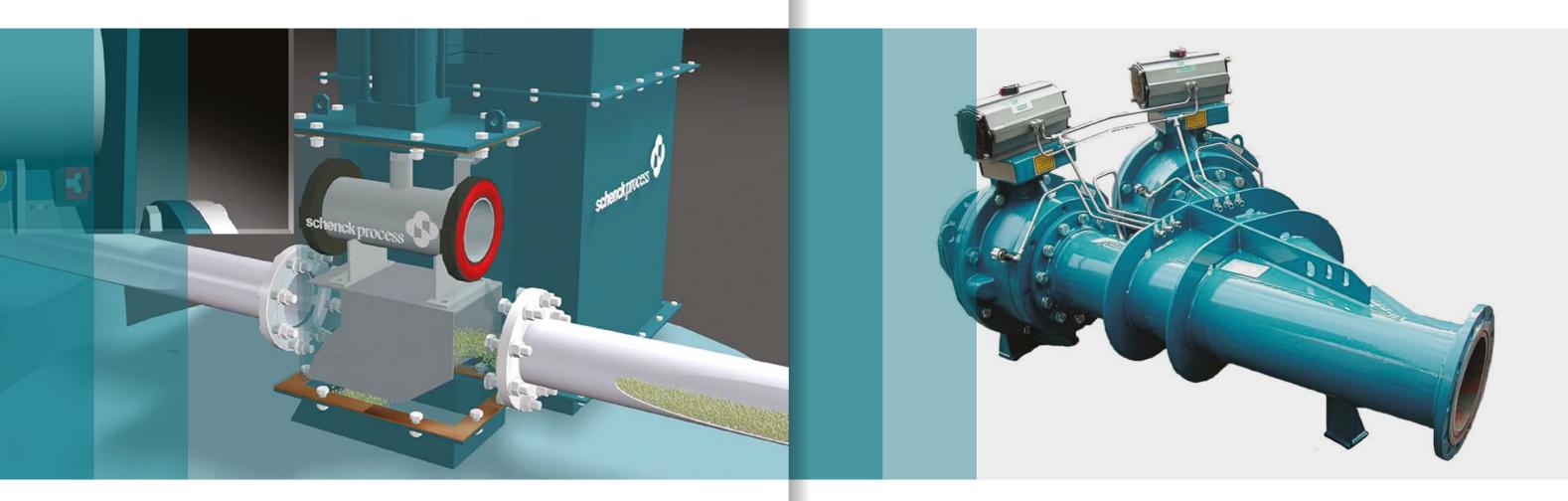
**ProDV** Dome Valves, part of our Clyde Process range – are proudly the original and most reliant. As the first Dome Valve launched to the market, its success and reputation has evolved into it becoming a critical part of an overall production process. Consequently, over time, other manufacturers have created adaptations of the original Dome Valve, as value-engineered, non-commodity alternatives. Thereby potentially impacting quality output and performance. Which is why Schenck Process are very proud of the long-standing integrity of the **ProDV**.

The operating efficiency of many material handling systems rely upon the original and world's best **ProDV** Dome Valve (also available as a Spheri Valve), currently installed in over 20,000 applications worldwide. Simple in design and low in maintenance, this high-performance valve is used throughout a wide range of industries and applications.

Click to find out more

#### **KEY BENEFITS**

- » ATEX Zone 20 Internal Compliant
- » 50 1000mm Diameter
- » Applications from Full Vacuum to 35 barg
- » Full bore material flow
- » Airtight sealing
- » Can close through flowing and some static columns of materials
- » Simple maintenance, with up to a million cycles between overhauls
- » Handles material temperatures up to 220°C. Specials to 750°C



### **DUMP VALVES & TERMINAL BOXES**

These form the termination of the pneumatic conveying transfer pipe and secure entry of the material into the chosen reception hopper.

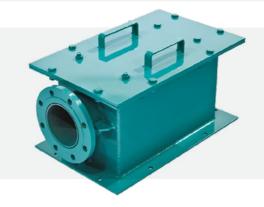
Dump Valves are used where several hoppers positioned in a series require selective feeding. They have two operating conditions, 'straight through' and 'dump'. In the straight through condition, a self inflating easily replaceable seal closes off the respective hopper inlet, allowing the material to be conveyed 'straight through' to the next available reception point.

Terminal Boxes are used at the end of a series of dump valves or where there is only a single reception point within the pneumatic conveying system.

Click to find out more

#### **KEY BENEFITS**

- » Easy to install
- » Different variants for extension or summation of load cell cables
- » Suitable for use in hazardous areas and severe environments
- » Highly resistant to aggressive media optional over voltage protection



### **ProDSV DOME SWITCH VALVE**

The **ProDSV** Dome Switch Valve is used to provide material routing, where for example, a system is delivering to more than one reception point. It allows the flow through its two outlets to be switched on or off independently, and offers the many high performance, long service benefits associated with the Dome Valve.

Click to find out more



#### **KEY BENEFITS**

- » ATEX Certified to Zone 20 Internals read more »
- » 50 500mm Diameter
- » Applications from Full Vacuum to 35 barg
- » Converging or diverging applications
- » Can have more than two outlets
- » Full bore material flow
- » Airtight sealing
- » Can close through flowing materials
- » Simple maintenance, with up to a million cycles between overhauls
- » Handles material temperatures up to 220°C. Specials to 480°C



Choose the PHASiQ standard control panel and save time and money.

- » Prewired, piped and tested with on board standard software, commissioning takes minutes.
- » Standard software provides many additional features that can be cost effectively developed in bespoke software.
- » Remote commissioning can be carried out over the Internet.
- » Powerful onboard data storage and trending features maximises the support that can be provided to customers.
- » Latest developments can be downloaded, facilitating optimisation and energy saving.
- Click to find out more

#### **KEY BENEFITS**

- » Optimise reliability and energy saving
- » Rapid commissioning and installation
- » Network or stand-alone operation
- » Client engineering minimised
- » Five dense phase conveying modes
- » Parameter management, allowing one machine to convey many materials
- » Powerful data storage facilitating data analysis and performance optimisation
- » Remote access and IoT ready
- » Atex Zone 22 version available
- » Optimise reliability and energy saving

# **CONIQ E-DENSE METER**

Pneumatic conveying systems use large amounts of compressed air, affecting performance over time, resulting in wasted energy, reduced conveying or product damage.

Very few systems are fitted with conveying air flow and pressure meters from new, so the loss of efficiency often goes unnoticed for long periods of time, costing money.

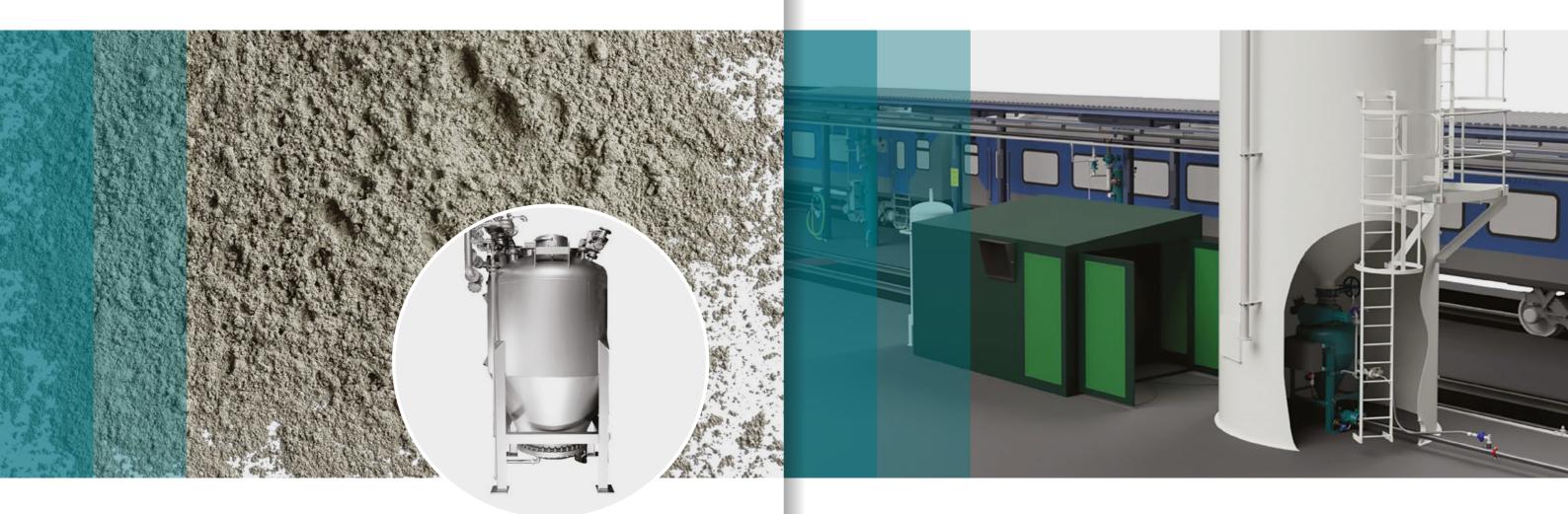
In our mission to improve the sustainability of our customers operations, we have designed the e-Dense Meter specifically to solve this problem, by continuously monitoring the condition of any dense phase pneumatic conveying system to allow for frequent re-optimisation by the customer or by our experts.

It can be installed permanently for long term condition monitoring and even closed loop control or used temporarily as a service and first setup tool, depending on the customer's needs.

#### **DESIGN FEATURES**

- » Design pressures from 0.5 to 7 barg
- » Suitable for conveying pipeline diameters DN50 to DN300mm
- » On board control panel has 4-20mA and network connectivity
- » Colour touch screen graphical interface easily configured
- » Data and trends stored on SD card

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### **PROPHASE TD PUMPS**

While similar to our standard bottom discharge **ProPhase** machines, the **ProPhase TD** has specific advantages in certain applications.

**ProPhase TD** Pumps are top discharge **dense phase conveyors** that have very stable and controllable discharge characteristics. This makes them the smart, energy efficient solution to convey fine fluidisable materials at high capacity (<250 tph) and over long distance (up to 2 km).

The discharge stability occurs because of a regulating effect from gravity. This means the **ProPhase TD** is also able to reliably convey granular or more challenging materials without using conveying pipeline air boosters typically used with bottom discharge dense phase conveyors.



#### **KEY BENEFITS**

- » Very high conveying capacities
- » Very high energy efficiency
- » Conveying distances up to 2000m
- » Can convey materials without pipeline air boosters
- » Very high reliability and availability
- » Low spares consumption



### **RAIL SANDING**

Most rail and tram networks around the world use sand to solve the problem of reduced braking performance and traction of the locomotive wheels when conditions are poor, for example in bad weather or during the autumn leaf fall. To do this, the trains and trams have sand boxes that dose the sand onto the track in front of the wheels, which means when the trains return to the depot the sand boxes have to be refilled.

To avoid personnel having to manually handle sandbags, or be exposed to spillage and airborne dust, Schenck Process has developed a pneumatic sanding system that can simultaneously re-fill numerous sand boxes using removable nozzles, each of which operates in a way that is similar to putting fuel in a car, including turning off when the box is full.

Click to find out more

Our **Rail Sanding** process is highly automated, with one person typically able to sand several complete trains or trams in a single service depot shift. The Schenck Process **Rail Sanding** product range is the leading UK designed sand filling system supported with an extensive PTS qualified service and commission team to ensure the optimum performance of the installation.























## **ROAD AND RAIL TANKER UNLOADING**

Unloading powder tankers pneumatically is often done using onboard blowers, where the drivers manually control the flow and distribution of the compressed air, which often results in varying discharge times, product quality and noise depending on driver skill and experience. During this process, the tanker diesel engine is also running causing carbon emissions directly in the plant.

To ensure consistent product quality, and to use compressed air energy from a centrally managed and increasingly sustainable land base source, Schenck Process offer an **Automated tanker unloading solution**.

A dedicated PLC and MMI provides the intelligence to control a skid or field mounted **air management module**, which includes actuated valves, flow control and pressure measurement,

to use the land based compressed air supply efficiently, consistently and safely.

The module also includes control of the tanker fill line valve, provides for other safety or process interlocks, and can communicate with a central control station or room.





### **TECHNICAL COMPLIANCE**

Compliance is one of the main routes to ensure the safety of personnel and environmental protection.

We design and manufacture all our products and routinely supply pressure equipment to internationally recognised standards including, EN 13445, ASME VIII, PD 5500, in accordance with PE(S)R SI/2016/1105 or PED 2014-68-EU and where required explosion management standards such as EN14460 and NFPA amongst others. All our pneumatic conveying systems are ATEX Type certified for Zone 20 internally (Cat 1), and Zone 22 externally (Cat 3).

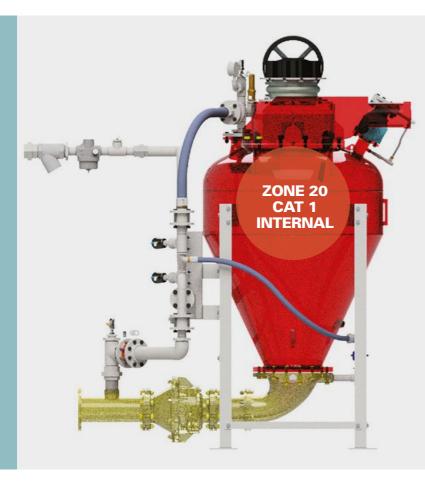
Many of our design, service and commissioning staff are CompEx trained to ensure safety standards are maintained during assembly, commissioning, and service.

We believe in demonstrating our commitment to upholding and enhancing our business standards, all of which rely on our people.

- » Our Quality Standards are ISO 9001 certified, with QAN extensions for ATEX
- » Our Environmental Standards are ISO 14001 certified
- » Our Occupational Health and Safety Standards are ISO 45001 certified

Staff are trained and certified for site work, including:

- » Safe Contractor audits
- » Achilles to work within the utility sectors
- » Personal Track Safety (PTS) for rail work



ZONE 22 CAT 3 EXTERNAL

### **ATEX COMPLIANCE**

Schenck Process take technical compliance seriously and have an expert in-house team for all aspects of CE and UK-CA, but especially ATEX as this concerns the risks of explosions and fires.

This team makes sure our staff are trained regularly, understand the regulations and follow best practice in the engineering of our products to ensure maximum safety.

Most of our products already have CE and UK-CA ATEX Cat 1 Type approval.

Schenck Process provides plant designers and operators with important advice and support in relation to project planning their equipment. One of the main advantages of our products for end users is the modular product structure. This allows the equipment to be adapted perfectly to the technical requirements of the operator.

All of our assembly plants have ISO 9001 and ISO 80079-34 Quality Assurance with the QAN module to permit the manufacture to the very highest safety standards.

This typically helps us avoid the common mistakes such as zoning inside conveyors and hoppers as Zone 21 (instead of zone 20) which often results in the selection of less safe, category 2 equipment.

The Safety of our customers is our top priority.



Click to see certification



### **AFTERMARKET**

#### **SUPPLY, SERVICES & MAINTENANCE**

From supplying new equipment, to keeping it maintained, through to performance optimisation and the supply of spare parts. Our dedicated UK based team are here to keep your processes working.

Plant failure can be prevented, the life of your plant can be extended considerably, positively effecting quality and process efficiency.

#### SITE SUPPORT:

- » On-site engineering and maintenance
- » Support with installation and operation
- » Emergency breakdown support
- » Remote digital troubleshooting and factory testing

Click to find out more

#### **TURN OLD INTO NEW**

- » Repair and refurbishments
- » Speedy supply of upgrades and spare parts
- » Life-time support for your machine

#### **PROCESS OPTIMISATION**

Whether it be a new plant or extension, a full-system, or product, we will drive greater efficiencies for you through:

- » Experienced project management
- » Design and technical experts
- » Reducing downtime using smarter, digital technologies
- » Testing your material and process through our dedicated Test & Innovation Centre



#### **BENEFIT FROM OUR CONSULTANCY EXPERTISE!**

We collaborate closely with you. Our service consultants digitally map your processes and start by creating a process analysis. Depending on your requirements, this will focus on either the complete process or individual parts of it.

Based on our analysis, we evaluate your processes. This includes appropriate recommended actions and concepts tailored to you and your plant. If necessary, our R&D engineers will get involved too. Be it minor adjustments or entire new developments, we provide tailored solutions to optimize your processes.

We implement the solution concepts we have produced with you to deliver efficient and highly reliable processes. And there's more. Using our digital innovations, we take preventive measures for you and therefore avoid costly repairs and prevent unscheduled downtimes

#### **SERVICE CATEGORIES**

All our services are intended to improve performance, increase service life and reduce your running costs.

- » Digital support
- » On-site services
- » Monitoring & preventing downtime
- » Repair & refurbishments
- » Spares & Aftersales support
- » Care of OEM technologies
- » Test & innovation centres

## SERVICE AND PROCESS SOLUTIONS CAPABLE IN ANY INDUSTRY

#### YOUR PROBLEM IS OUR CHALLENGE

Your number one objective is to reliably and efficiently operate capital equipment in your factories and process plants.

Naturally, you want to do this with minimal maintenance and operating costs. Sit back and look into the future with optimism!

Our service model is totally focused on your individual processes, ensuring that your goals are met and at the same time, the full potential of your plant is exploited.

Flexible, individual, effective. Adapted especially to your needs, we work with you to develop and implement your tailored service concept. No matter what the job in hand, we make suitable specialists available to you.

#### Click to find out more

#### **SERVICE SOLUTIONS**

- » Installation and commissioning
- » Technical product support
- » Spare parts and repairs
- » Field service
- » Fitness Check
- » Shutdown and emergency service
- » Warranty extension process solutions
- » Consultancy and process optimization
- » Inspection contracts
- » Modifications and upgrades
- » Condition monitoring
- » Maintenance contracts
- » In-house training



### **REFURBISHMENT SERVICES**

#### **ENJOY PEACE OF MIND**

The refurbishment service covers Dome Valve, Rotary Valves, Rotofeeds and others. It covers a fixed scope of work and includes all labour and parts. Additional items which come to light during the pre-inspection strip down, and which are outside the fixed scope of supply will be quoted separately prior to any work commencing.





#### **KEY BENEFITS**

- » Detailed inspection report issued prior to work commencing (inc total cost).
- » Stripped down, refurbished with new parts if required, repainted and tested prior to dispatch.
- » Wearing parts (seals and bearings etc) are always replaced.

### **CONDITION MONITORING IN REAL TIME**

CONIQ® CLOUD includes an easy-to-use Web-Dashboard which brings KPIs directly to any laptop, tablet or mobile phone with internet connection. Dashboards are linked to specific accounts, so that users get access to their private machines only.

#### **CONIQ® CLOUD SERVICE - SMART DEVIATION MONITORING**

#### TIME TO EXPECT MORE. **UNPREDICTABLE IS OVER.**

We give you more time to react - with CONiQ® CLOUD SERVICE. The smart digital service detects deviation from normal operation significantly earlier than before, It combines latest machine learning technologies with deep machine and process knowledge, providing specific dashboards, early warning indicators, and access to the fleetwide failure pattern database for fast corrective action.

Our service comprises of a data driven model, predicting normal behaviour based on historical data and current machine and process operation. Its new feature is how it handles the difference between measured and predicted values, reflecting the degree of deviation from normal operation. The algorithms do not merely monitor single values, but the correlation of all values, especially regarding the operation mode, the machine or process is currently in.

Click to find out more

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### A PERIODIC FITNESS CHECK

**ALWAYS PAYS DIVIDENDS!** 

The Fitness Check will provide a detailed report including comprehensive recommendations on how to improve the performance of all your equipment.

It includes customised test procedures of individual items of equipment, e.g. frequency analysis of screens.

As a result, you will get a detailed understanding of the status of individual production instruments and you will identify any requirement to make an intervention before damage – or worse still, a complete outage – occurs.

Using latest digital innovations, Fitness Checks include recommendations on how to improve efficiency and/or process accuracy, providing a boost to production quality and output.

#### THE PAY BACK PRINCIPLE

- » More uptime
- » More reliable processes
- » More efficiency

## GLOBAL COMPANY - LOCAL SUPPORT

#### **SCHENCK PROCESS**

Offering 140 years of unrivalled experience in material handling and processing, our teams stretch outside the UK, supporting customers worldwide – whilst also offering insights and capabilities for you to leverage. For businesses with multiple global locations, you can expect the same premium level of support and expertise, no matter the whereabouts.

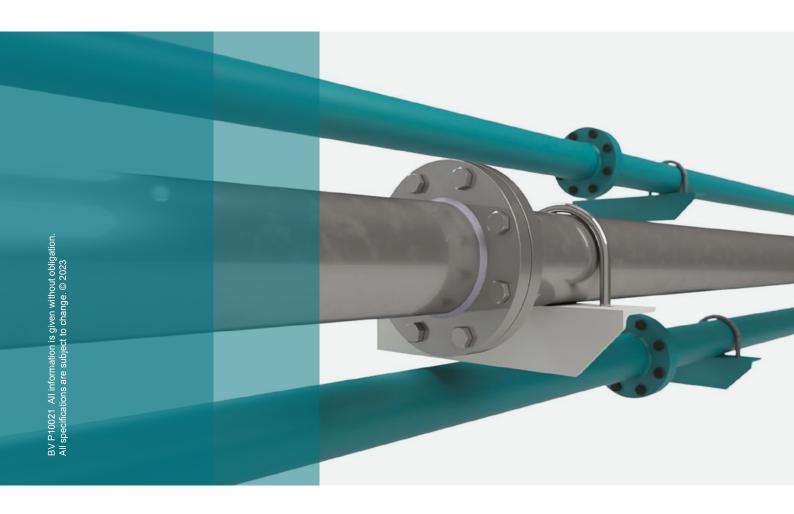
In addition to Schenck Process technologies and services, our offering and capabilities is broadened through dedicated brands, which we have continued to innovate and invest in. We have all your pneumatic conveying needs covered and comprehensive lifetime support for your peace of mind, keeping your downtime to a minimum and reducing your operational costs.

#### Let's make your processes work

We are the global partner who lives your process challenges with you. Our passion for always going the extra mile to deliver the best solutions means there's nothing we can't solve together.

Have you got a challenge for us?





# Your Partner

Please contact Schenck Process where you will be directly connected to an engineering expert.

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