

CONTENTS

01 News update

07 Containing particles, minimising dust

The experts at Volkmann examine the handling and containment of critical and toxic powders for a pharmaceutical client

08 The risks of combustible dust & powder handling

Rhiannon Grice, Business Development Executive at S3 Process explores the hidden risks of powder handling

10 How to handle hazardous materials and substances

From the laboratory to modern manufacturing environments, the experts at Hosokawa Micron explore what you need to know about handling dangerous substances

11 Safety first!

Jake Davis, Business Unit Leader for the Powder Handling product line at De Dietrich USA, discusses how to handle hazardous bulk solids and powders

12 Managing toxic powder risks through toll processing

The safe handling of powders is an increasingly complex challenge, but working with a toll processor can reduce risk and enhance safety, says Ben Beattie, Director of Forbeats

13 Understanding road powder tankers

An explainer from the EuroBulkSystems team and a personal tale from Colwell Transport Solutions

14 The backbone of processing

Buffer storage is essential to prevent stops and starts in production and operations

15 Up close and personal

60 seconds with Ajax Equipment's Eddie McGee

AD INDEX

Surplus Select	01
VanBeek	02
AJAX Equipment	03
Tuf-lok	04
Posi-flate	04
SSB Wagetchnik	05
Solimar	06
Dynamic Air	16

10 years in Birmingham for Minebea Intec

Minebea Intec is marking 10 years since relocating its UK head office to Birmingham.

Over the last decade, Minebea Intec, a manufacturer of industrial weighing and inspection technologies, has delivered innovative solutions for customers operating across a range of sectors, bringing performance, safety, and efficiency gains to production processes throughout the country.

Peter Walker, Country Manager UK & Ireland, said: "We moved to Birmingham when the industrial weighing division of Sartorius was sold to Minebea Mitsumi. As we had the choice to go anywhere, we did a lot of research and found that this location would be excellent for both our customers and our colleagues in Ireland due the cost and frequency of flights between Dublin and Birmingham. We only occupied the ground floor initially."



Walker continues: "We came away from an office of roughly 200 people and into one that had only 20, comprising of the industrial weighing team. We also had to incorporate quite a few new team members at the time too."

During the last 10 years, customer expectations have also changed. Walker explains: "They're looking

for more of a partnership now rather than just a piece of equipment. Customers today require a lot more supporting evidence to go with machines – things like sustainability documentation and credentials about our business and our accreditations. I think they really want to know that we're going to be there for the long haul to support them."

HAYER & BOECKER opens service centre in Turkey

HAYER & BOECKER, a global leader in packing, palletising and bagging equipment, has opened a new service centre in Turkey. The facility, Haver Service and Consumables Turkey, is in partnership with Ilka, the company's longstanding industrial packing supplier and representative in the region. The new location will reduce response times, strengthen customer relationships and consolidate service activities at the local level.

"No matter where our customers are in the world, it's important that they have access to fast service for their packing equipment needs," said Engelbert Köß, General Manager at HAYER & BOECKER Service. "Turkey is a rapidly expanding market. Packing operations need access to a reliable service centre in the area, so we came together with Ilka to make that a reality."

The expansion of HAYER & BOECKER's service footprint brings a local service option for customers in the area. The new location will have the full range of services, including consumables, OEM spare parts, operator training, repairs and performance upgrades, across the cement, building materials, chemicals and food industries. This new setup is supported by HAYER & BOECKER's global application and material testing expertise to match each product with the right packing solution.

Ilker Cavder and Kazim Sonmez will manage Haver Service and Consumables Turkey. Their local market knowledge and established customer relationships will provide support to HAYER & BOECKER's service teams.



Mesabi Metallics secures funding for iron ore mine and pellet plant

Mesabi Metallics has secured \$150 million (£128 million) from Macquarie Group, supporting the startup of its Direct Reduction (DR) grade iron ore mine and pellet plant. This falls in line with the USA's agenda to strengthen industrial supply chains and reduce reliance on imported raw materials.

This funding is in addition to an announcement in March of \$520 million (£445 million) from Breakwall Capital. The project is estimated to cost \$2.5 billion (£2.1 billion). It is hoped this development will supply the next generation of American steel-making in the cleanest and most efficient way.

Joe Broking, President and CEO of Mesabi Metallics, said: "Together, these transactions reflect growing confidence in the quality, scale and strategic importance of our project as we build a new American source of DR-grade iron ore to strengthen domestic steel supply chains and reduce dependence on imports."



MEET THE TEAM

- 

Publisher
PETER PATTERSON
T: +44 (0)208 648 7082
peter@woodcotemedia.com
- 

Group Managing Editor
ANAMIKA TALWARIA
T: +44 (0)20 3778 2398
anamika@woodcotemedia.com
- 

Assistant Editor
NATASHA ABRAMSON
T: +44 (0)20 3778 2398
natasha@woodcotemedia.com
- 

International Sales Manager
AYSELI SUNGUROGLU
ayseli@eurobulksystems.com
T: +44 (0)20 3778 2289

Subscription Rates
€80 for 6 editions per year.
Contact: Lisa Lee
T: +44 (0)20 8687 4160
marketing@woodcotemedia.com

Woodcote Media Limited
Kamp House
124 Middleton Road,
Morden, Surrey SM4 6RW, UK
www.eurobulksystems.com

No part of this publication may be reproduced or stored in any form by any mechanical, electronic, photocopying, recording or other means without the prior written consent of the publisher. Whilst the information and articles in EuroBulkSystems are published in good faith and every effort is made to check accuracy, readers should verify facts and statements direct with official sources before acting on them as the publisher can accept no responsibility in this respect. Any opinions expressed in this magazine should not be construed as those of the publisher.

Qlar opens new particle test centre in India

Qlar, a company for sustainable transformation of manufacturing processes, is opening a new test centre for reliable pneumatic conveying.

Customers in metals, cement and energy sectors will benefit from a 680-metre conveyor. The powerful facility enables realistic testing for dense-phase applications. Qlar has positioned it as a practical test infrastructure for material handling in demanding industries.

It can convey ferrous and non-ferrous metals to cement and fly ash. Parameters include particle size distribution, bulk density, flowability, air and energy consumption, as well as required pressures and flows. The parameters are measured under realistic operating conditions. Testing these different material combinations means that the air consumption – and therefore energy requirements – can be optimised in a targeted manner for individual conveying processes.

In the future, it should also be possible to examine performance materials and chemicals. The results of the tests are designed to support companies in the reliable design of their systems and provide a clear technical basis for project planning and evaluation.

Alongside technical development, the



efficiency of conveying applications is becoming an even stronger focus for manufacturers. "The demand for reliable conveying data is increasing worldwide," said Dr Jörg Ulrich, CEO of the Qlar

Group. "In addition to the existing test centre for material grinding, the pneumatic conveying tests offer our customers in Asia a testing environment that is unique in this form and size."

Ships pass blockade in Strait of Hormuz



Ships are reported to have transited the Strait of Hormuz, after two ships u-turned yesterday (13th April) due to the US blockade.

A Comoros-flagged bulk grain carrier has "appeared" in the waterway according to marine intelligence company Windward, after its communications went dark on 28th February, hiding its exact location. Despite the US blockade, a handful of ships are reported to have navigated the strait, heading towards the Gulf of Oman. Reports say that the US blockade does not cover vessels that are heading to non-Iranian ports.

UK Prime Minister, Keir Starmer, and French President Emmanuel Macron will co-host a summit on Friday 17th April with aims to reopen the strait.

Yesterday, two ships turned around, due to the blockade in the Strait of Hormuz. The boundaries of the blockade extend to the Gulf of Oman and the Arabian Sea, according to the US military. The US Central Command said: "Any vessel entering or departing the blockaded area without authorization is subject to interception, diversion, and capture."

The blockade is due to ongoing conflict and a failed ceasefire between Iran and the USA.

Optimize your process

-  Conveying
-  Buffering
-  Elevating
-  Dosing
-  Heating
-  Cooling



Van Beek designs and manufactures custom-built screw conveyor systems for bulk goods, ensuring seamless integration with a focus on hygiene, reliability, and 24/7 availability. Innovation, service, and knowledge-sharing drive us.

Meet Sisca, your 24/7 online engineer, ready to configure and calculate costs in real time.

WWW.VAN-BEEK.NL/SISCA

Naturally, our specialists are always on standby to assist.
T 0416 37 52 25
E info@van-beek.nl

vanBeek
THE STANDARD IN SCREW CONVEYING

Minebea Intec's load cell helps cut costs

Minebea Intec has developed the PR 6221 load cell to help alleviate the administrative burden of recording material flows. Designed to accommodate high loads, demanding environmental conditions and long-term stability, the product aims to help chemicals manufacturers keep control of their material flows, weigh accurately, and track data – helping them to compete more effectively and manage operations efficiently.

Minebea has also developed the Inteco load cell and matching mounting kits to use with silo scales. This enables reliable monitoring of the fill level and increase measurement stability even with large dimensions, lateral forces or dynamic loads.

Metso partners with BSF to expand German network

Metso is strengthening its German distributor network by appointing BSF Aufbereitungstechnik, a partner for recycling raw materials technology, as its exclusive distributor for West and South Germany. This expansion builds on BSF's existing Metso coverage in the Netherlands.

"BSF has had a fast start, and they have quickly established a strong track record in customer satisfaction as a Metso distributor. Their recognition as Newcomer of the Year reflects their excellent sales and service performance, as well as their ambition to continue developing their business long-term," said Carlos Padin, Vice President, EMEA Distribution Management at Metso.

"We are proud to take the next step in our partnership with Metso and to become the exclusive distributor for Western and Southern Germany. This milestone reflects the trust built over the past year and the strong commitment from both sides. Our focus remains clear: delivering outstanding service, technical expertise, and reliable support to our customers. We are excited to further strengthen the Metso brand in our regions and to continue investing in our team, infrastructure, and customer relationships. This is just the beginning, and we are ready to drive this partnership forward with full dedication," stated Ralph Phlippen, General Manager of BSF Aufbereitungstechnik.

The company was recognised as Newcomer of the Year at Metso's Distributor Days 2026, in Las Vegas, USA.



Malaysia orders first Siwertell unloader

Malaysia has ordered the first installation of a high-capacity, rail-travelling Siwertell ship unloader. Bruks Siwertell received the order from Westports Malaysia Sdn. The installation will handle soya bean

meal, wheat, maize, soya beans, and raw sugar.

Depending on material characteristics, the system offers a rated capacity of 800–1,000 tonnes per hour. In a press statement, Bruks

Siwertell said: "It establishes an important new reference deployment in Southeast Asia's port and dry bulk handling sector."

The system is due to be delivered by summer 2027.

Control Station collaborates with Dimension Software to improve loop feedback and operations

Control Station and Dimension Software are teaming up to help plant operators identify poorly performing control loops.

According to Control Station, industry studies suggest that 30–40% of industrial loops perform below optimal level and lead to a loss of production, increased energy consumption and inconsistent product quality.

The organisation claims that many companies struggle to translate diagnostic insights into coordinated operational improvements. The partnership between Control Station and Dimension Software aims to address this challenge by aligning complementary technologies that help engineering and operations teams move more quickly from issue identification to corrective action.

Control Station is a software-based solutions company optimising plant-wide loop performance. The company's leading CLPM solution PlantESP™ will integrate with Dimension Software's Asset Intellect™.

Due to Dimension's capabilities in operational intelligence software, organisations can pair their enterprise systems, with operational technologies, such as process alarms, IIoT and geo-spatial systems. This collaboration allows PlantESP diagnostics to identify poorly performing control loops that can be displayed within Asset Intellect dashboards alongside production, maintenance, and operational data. Engineering and operations teams can then evaluate control performance issues within their broader operational context and initiate corrective workflows directly from the Asset Intellect environment.

Yong The, Director of Business Development and Global Sales at Dimension Software, said: "Through our partnership with Control Station, we are able to offer customers a fully integrated and market-leading CLPM capability while continuing our mission of unlocking operational value from existing data and systems."

Felix Food Logistics acquires JM Navajas

José María Navajas, SL has been acquired by Spain's Grupo Pañalón through its company Felix Food Logistics. The company is a "benchmark carrier of bulk wine" among other bulk foodstuffs.

Felix Food Logistics stated: "Due to its location in Logroño, [JM Navajas] has been the benchmark carrier of bulk wine in Rioja for decades, operating throughout the Iberian Peninsula with a fleet of 30 tankers and as many professionals with enormous experience and commitment."

GO WITH THE FLOW



SCREW FEEDERS • LUMP BREAKERS • SCREW CONVEYORS • CONTINUOUS MIXERS • HOPPERS & IBCS • DRUM EMPTYING

AJAX

SOLIDS HANDLING SOLUTIONS FOR DEMANDING APPLICATIONS
+44 (0)1204 386 723 sales@ajax.co.uk www.ajax.co.uk

UK government to nationalise British Steel

The UK government is expected to nationalise British Steel from its Chinese owner, Jingye, in the coming weeks, according to The Financial Times.

British Steel operates the last two blast furnaces remaining in the UK. The Scunthorpe facility was transferred to government control in April 2025, after being brought back from bankruptcy by Jingye Group in early 2020.

The company was brought back under British government control to stop the risk of closure, after reports that the owner Jingye was planning to close the furnaces, risking over 1,000 jobs.

Business and Trade Secretary Peter Kyle said: "Making steel in the UK is vital for national security, critical infrastructure and the wider economy. Steel-making is a cornerstone of our modern industrial policy that deliberately focuses support for key industries, technologies, and strategically important sectors."

The UK government says departments should either use British steel or be required to provide a justification if the steel is to be sourced from overseas. The aim is to boost local manufacturing, while reducing reliance on imported steel.

Chris Ward, a Cabinet Office Minister, told The Guardian: "These reforms are about using the full weight of government spending to support British jobs, protect our national security and grow our economy."

Jingye Group initially asked for £1 billion (€1.1 billion) and the UK government offered £100 million (€114.9 million). According to the National Audit Office, the Department for Business and Trade spent £377 million keeping the Scunthorpe site open. Spending is expected to reach £615 million by June 2026, and it could exceed £1.5 billion by 2028 depending on future policy choices.

Metso releases Robotic Split Strip for copper operations

Metso has introduced a Robotic Split Strip that improves copper electrorefining operations. Known as Outotec®, the system separates the cathode sheets from the cathode plate in copper electrorefining operations.

Outotec® combines hydraulic control and robotics. It is a compact, flexible and efficient product with a smaller footprint and lower weight. It cuts down on larger mechanical structures and reduces the need for a high number of components – leading to spare part issues and high maintenance needs. The technology can be easily installed in new and existing plants, thanks to a modular design.

"The Robotic Split Strip introduces a compact and highly integrated design. Its advanced robot technology replaces several fixed mechanical functions, enabling flexible machine layouts and improved access for operators and maintenance personnel," said Peter Nord, Technical Product Manager at Metso.

BEUMER group and Fraunhofer Institute for Material Flow and Logistics partner on robotics



BEUMER group and Fraunhofer Institute for Material Flow and Logistics IML have begun a three-year joint 'Enterprise Lab' for the development of scalable platform for mobile robots (MR).

The partnership will serve as the technological basis for various mobile robotic applications, from sortation robots for parcel centres to smart baggage transporters for airports.

Taking place in Fraunhofer IML in Dortmund, BEUMER gains direct access to the latest research results and lab facilities, and Fraunhofer to develop products to market maturity.

"Instead of setting up an isolated island laboratory, we are using the Fraunhofer 'Enterprise Lab' as a tried and tested format for incorporating external cutting-edge research directly into our product development. Thus, we are enabled to significantly accelerate our mobile robotics projects and offer our customers innovative solutions even faster," explained Volker Jungbluth, Chief Technology Officer of BEUMER Group.

Gericke introduces GFS Gen3

Gericke has launched the Gericke Formulation Skid GFS Gen3, a new continuous manufacturing platform for the formulation of OSD (oral solid dosage). It is designed to speed up pharmaceutical production, making it simpler and safer.

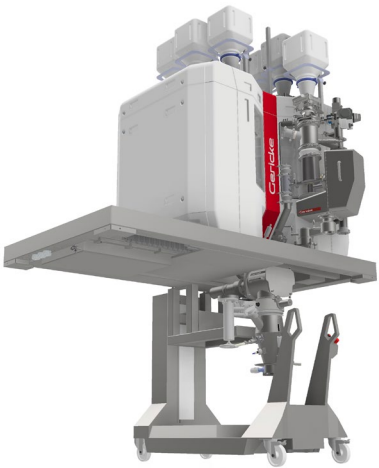
"At its core, GFS Gen3 reflects a different way of thinking about continuous manufacturing," said Bernhard Meir, Head of Continuous Manufacturing of OSD, Gericke. "We designed the platform so that containment, precision, and regulatory readiness reinforce each other – giving teams confidence as they progress, without unnecessary disruption."

The platform supports a single continuous manufacturing approach, keeping progress from early trials to long-term production in one platform architecture. This means pharmaceutical companies don't need to switch between different equipment, keeping up momentum and shortening the path between development to patient.

The platform keeps things simple, with a focus on consistency and reducing variability, supporting reliable performance over the lifecycle of a product.

To support safety, compliance and smooth production, GEN-3 incorporates scalable containment options such as basic dust control to advanced high containment solutions.

"We deliberately avoided designing a rigid system," added Bernhard. "GFS Gen3 supports controlled evolution over time – recognising that pharmaceutical manufacturing must be able to move forward without starting over."



Iron ore market recoups previous losses

As reported by GMK Centre, the iron ore market recouped previous losses during the period February 27 2026 to March 27 2026. During the past month the average price has risen to \$106.33 per tonne from \$101.53 per tonne in February.

In the beginning of March, the market reacted to supply concerns. Due to a dispute between BHP and China Mineral Resources Group (CMRG), restrictions had been placed on BHP shipments to China. The combination of geopolitical tensions, trade disputes and changing shipping routes, due to the war in the Middle East has caused additional

disruption, plus the risk of challenges in Australia due to Cyclone Narelle.

Due to the BHP and CMRG fallout easing, a shortage of BHP raw materials reduced in China. CMRG allowed traders to move previously banned BHP cargoes, easing supply panic, although disputes have still been ongoing between BHP and CMRG.

In the short term, the iron ore market remains volatile. Prices will be supported by supply disruptions due to the war in the Middle East and trade disputes in China, in addition to high energy costs.

TUF-LOK™ PIPE & TUBE COUPLINGS

Tuf-Lok ring grip pipe and tube couplings are rugged, heavy duty, self-aligning and self-grounded couplings with a high end pull. They can be used for almost any application where pipe or tube ends need to be connected. The Tuf-Lok self-aligning couplings install quickly and easily with little effort.

Features

- Self-aligning
- Self-grounding
- High pressure rated
- Full vacuum rated
- Stainless or mild steel
- Usable on thin or thick wall pipe or tube
- Low cost
- Reusable
- Absorbs vibration
- Externally leakproof



Tuf-Lok (UK)
Tel: +44 (0) 1706 822512
Email: sales@tuflok.co.uk • www.tuflok.com

Other Valves Fight Friction, We Designed it Out

Unlike other valves that seal with friction, Posi-flate's unique butterfly valve uses an inflatable seat to seal with air pressure. Thus it requires less torque and a smaller actuator, resulting in lower cost. Plus, the seat automatically compensates for wear, providing longer life. Some users have reported over six million cycles and the valves are still going strong.

- Less friction
- Low torque
- Low maintenance
- Lower actuator costs
- Longer valve life
- More reliable



posi-flate®
butterfly valves

Tel: +44 (0) 1908 622366
www.posiflate.com

UK to open largest plastic recycling plant

In a major milestone for the recycling industry, the UK is set to open its largest plastic recycling plant in Corby, Northamptonshire. The facility will work with the UK's largest supermarkets to recycle plastic into pellets ready to be used again.

EuroKey by Reconomy is set to be fully operational later this year. With the goal of processing 38,000 tonnes of plastic. It is a 12,820m² building, costing £20 million (€23 million). The site provides 30 new local jobs.

John Dhillon, Managing Director of Eurokey, said: "This is an exceptional milestone for our business and for the UK's plastics recycling industry. This facility will play a major role in increasing domestic recycling capacity and reducing reliance on virgin plastic by keeping high-quality material in circulation. It will also benefit the local economy".

The UK is heavily reliant on exporting plastic material due to the lack of domestic infrastructure capable of recycling material on a large scale.

In 2024, it was revealed that one UK council, Buckinghamshire Council recycled waste in countries as far away as India and Thailand.

The full-closed loop system will enable a change of stagnated circular economy in the UK. The EuroKey facility is located 10 miles from a storage facility in Kettering. It is hoped this will reduce export dependency, lower transportation costs and carbon emissions, and reduce reliance on virgin plastics.

Evonik launches Innovation Factory

Chemicals company Evonik is realigning its strategic research unit. The Evonik Innovation Factory operates as an entrepreneurial development unit, accelerating the transition of technological breakthroughs into industrial applications. It has a clear mandate: innovation with speed, market focus, and application relevance.

"We are aligning our innovation system to significantly shorten the time from development to market launch," said Christian Eilbracht, Chief Innovation Officer at Evonik. "The Innovation Factory is our promise to turn excellent research into tangible industrial progress – for both ourselves and our customers."

The heart of the new unit is a mandatory timeframe: each program is designed to be developed within an average of five years to the point where Evonik can transfer it to a Business Line – ready for operations and production.

"The Innovation Factory operates according to a clear principle: 'Building what's next.' To achieve this, Evonik will integrate its own expertise even more closely with external impulses from academia, startup ecosystems, and industry partners. This results in technically and commercially more resilient solutions that deliver

immediate industrial value and meet real market demands," said Axel Kobus, Head of the Evonik Innovation Factory.

The Innovation Factory focuses on areas where Evonik has already established strengths, and where customers urgently need new solutions.

One example is rhamnolipids: these highly effective yet exceptionally environmentally friendly biosurfactants are already used in cosmetic and cleaning products and offer many additional applications. Evonik is now pursuing this path, with a new portfolio of biopolymers that can replace fossil raw materials, and the development of anion exchange membranes (AEM), which are expected to play a key role in the green hydrogen economy in the future.

The Innovation Factory is an integral part of Evonik's global research strategy. It strengthens the company's global presence in leading innovation ecosystems – from Boston (USA) with the Cambridge Innovation Satellite for Life Sciences, to Singapore with biotech process solutions, and Shanghai (China) with membrane activities. Together, these sites provide access to new technologies, talent, and partnerships in relevant markets and ecosystems.



EVONIK INNOVATION FACTORY

Netherlands introduces truck toll for all domestic and foreign carriers

The Netherlands is introducing a truck toll on 1st July 2026. The toll applies to almost all Dutch highways and is applicable to domestic and foreign vehicles.

The toll has been introduced to make transportation sustainable and efficient. It is intended to stimulate investments in lighter and more environmentally sustainable vehicles. Part of the revenue will contribute to subsidies for improving the sustainability of the sector.

The new charge replaces the Eurovignette which was a single charge dependent on emission class, axles and duration. The Eurovignette is still applicable in some countries such as Luxembourg and Sweden.

Trucks in N2 and N3 categories with a maximum authorised mass exceeding 3,500kg must have an Onboard Unit (OBU) to pay the toll. The OBU will calculate the distance travelled. Distance is charged per kilometre.

The rate per kilometre is based on maximum authorised mass, the CO₂ emissions class, and in some cases the EU emissions class. The Netherlands has two options to obtain an OBU:

- EETS which works in other countries in addition to the Netherlands, which also implement a toll for trucks. OBUs from Germany and Belgium, Toll Collect and Satellic, will not apply in the Netherlands.
- NedLinq works for the Netherlands only. Many foreign trucks will already have OBUs, which service providers will be able to extend service for. Trucks without an appropriate OBU installed will incur a fine.

Coperion unveils RF400 roller feeder for electrode dry coating in battery manufacturing

Coperion has introduced the Coperion K-Tron RF400 Roller Feeder, an innovative new solution designed to enhance the efficiency and consistency of electrode dry material feeding in battery manufacturing processes.

As the demand for high-performance batteries continues to surge, manufacturers face increasing challenges to deliver the electrode blend precisely

and reliably into the calender gap in dry battery electrode coating processes.

The RF400 addresses these challenges by offering a state-of-the-art feeding system that provides consistent material distribution, reduces waste, and improves overall production efficiency. It uses a unique, advanced roller technology to ensure electrode dry blends can be deposited consistently

and uniformly, minimising variations that can lead to production inefficiencies. The combination of grooved feed roller and smooth scraper roller ensures gentle, consistent feeding without material bridging in the outlet, as well as uniform material distribution on the calender roller below across a coating width adjustable up to 400 mm. The RF400 is perfectly suited for use in laboratory and pilot scale production environments.

Designed with user-friendly controls and adjustable settings, the roller feeder allows operators to easily customise parameters for their specific applications. The RF400 is engineered for durability and reliability, ensuring long-term performance in demanding manufacturing environments.

"We are excited to introduce the RF400 Roller Feeder to the battery manufacturing sector," said Jay Daniel, Head of R&D Feeders and Feeding Systems at Coperion K-Tron. "This innovative solution not only enhances the efficiency of material supply but also supports manufacturers in meeting the growing demand for high-quality batteries. We believe the RF400 will set a new standard in the industry."

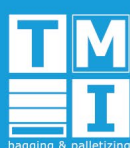


Complete bagging & palletizing solutions

From engineering to distribution

TMI — Engineering & Manufacturing
SSB — Distribution & Service

www.ssb-waagen.de
www.tmi-pal.com





LAXNESS raises prices for inorganic pigments, Microbial Control products

Specialty chemicals company LAXNESS is raising prices for its inorganic pigment products by up to 20% with immediate effect. The company is also increasing prices for a broad range of its Microbial Control products up to 30%, or more for selected products.

Microbial Control products include active ingredients, preservatives and disinfectants to protect materials and substances against spoilage caused by microorganisms.

This move comes in response to significantly higher costs in particular for energy, critical raw materials, and logistics amid ongoing geopolitical tensions. Despite intensive efforts to mitigate cost increases and maintain stable prices, an adjustment is necessary to ensure the long-term reliability and sustainability of supplies.

Customers will be contacted individually regarding the specifics of the price increase as it applies to their products or regions.

Metso launches Grate Kiln for iron ore processing

Metso is strengthening its position in pelletising with the Metso Grate Kiln. This system is engineered to produce premium-quality pellets that meet the demanding requirements of modern DRI and low-carbon iron and steelmaking processes, supporting customers' ongoing transition toward more sustainable processes.

Designed to ensure uniform mixing and heating, Metso's Rotary Kiln technology used in the Grate Kiln system delivers consistent pellets with excellent physical and metallurgical properties, including high cold crush strength, optimal porosity, low temperature breakdown, and strong reducibility characteristics.

"The Metso Grate Kiln system delivers exceptional plant flexibility with independent control of the grate, kiln, and cooler, allowing the processing of various ores and the use of solid and alternative fuels – including

biomass and hydrogen – supported by proprietary burner technologies," said Toby McCabe, Product Manager, Pelletizing and Green Steel at Metso. "The design ensures consistent, high pellet quality with superior physical and metallurgical properties suitable for both Direct Reduction applications and traditional Blast Furnace routes."

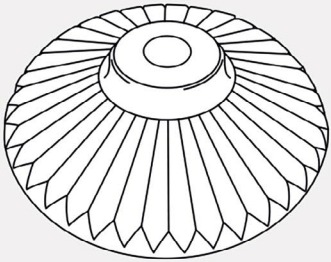
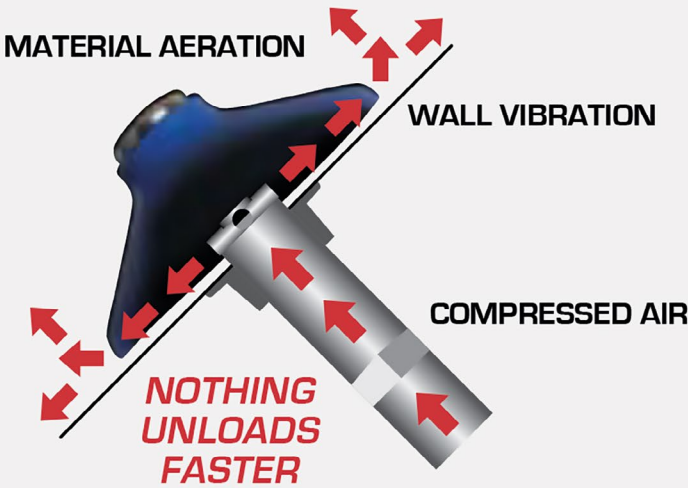
Engineered for optimal performance and low total cost of ownership, the Metso Grate Kiln system combines efficient process controls, advanced combustion technologies, improved heat recovery, and digital solutions to enhance safety, efficiency, and overall plant performance. The digital solutions for the Grate Kiln are designed to further improve process stability and product quality, while also reducing energy consumption. Typical improvements can include a several percent reduction in energy use and a more than 10% increase in pellet quality.



Keep Your Product Flowing



Proven Radial Ridge Design (2" & 4" diameter disks)
Free Engineering Support for Optimal Placement
Control Systems Available
Hi-Temp, Metal Detectable and Food Compatible Models
Fast Unloading with No Material Left Behind



Insist on genuine Solimar disks with the trademarked Radial Ridge Design

We Move a World of Dry Bulk Materials.

01 763.574.1820 | solimar@solimarpne.com | www.solimarpneumatics.com

Sign up online for our eNewsletter

Containing particles, minimising dust

The experts at Volkmann examine the handling and containment of critical and toxic powders for a pharmaceutical client

The requirements and demands for suitable containment solutions have greatly increased in industry in recent years. For example, more potent and more effective active ingredients are constantly being produced in the pharmaceutical industry which require closed and dust-free processes. The handling of these dangerous substances demands a high level of safety to protect the employees, the product and the production environment.

In the past, the employees had often been only equipped with a full-body protection suit and more or less worked in an open process. In doing so, the risk of contamination between product and the work environment was very high. Depending on the application, the process today is either integrated in an isolator (protective cover) or executed as a sealed and closed process facility to ensure a dust-free and safe work environment. Vacuum conveyor systems are especially suited for assignments in high containment due to the procedures in negative pressure ranges.

It depends on the product

The requirements for containment are always product specific and must therefore be redefined for every product. Internationally, as well as in general use, the terms OEL level or OEB class are used.

In the case of OEL (Occupational Exposure Level), the focus is on the maximum concentration levels permissible in a work environment. The specific OEL value and the product features (granule size and fluidity) play a significant role here in the design of the process unit. Not every containment system is suitable for every product.

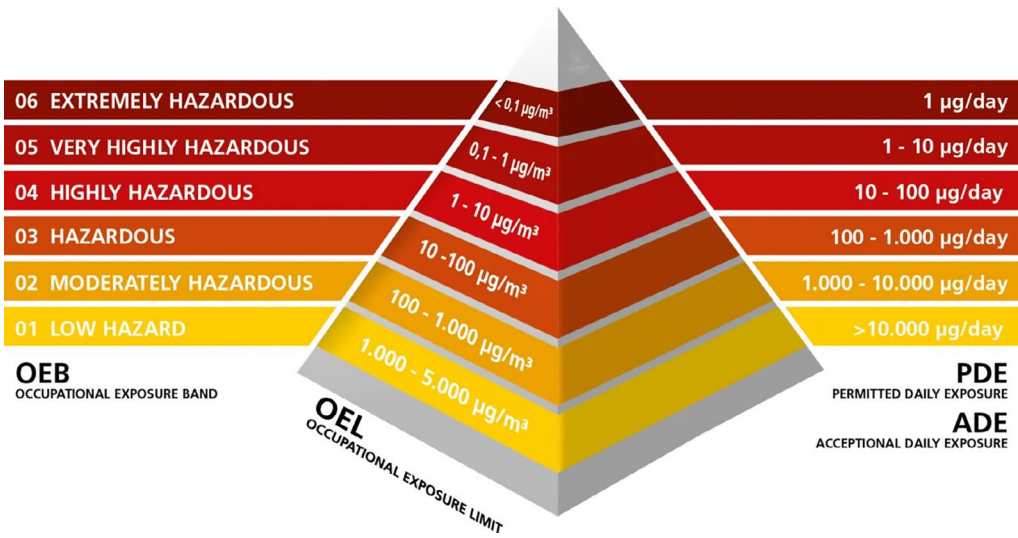
Pressure from the authorities

Other reasons for the growing demand for containment solutions are guidelines and regulations. The REACH regulation established a chemical guideline for all of Europe that addresses a classification of hazardous and harmful substances. REACH stands for the Registration, Evaluation, Authorization and Restriction of Chemicals. The manufacturers of chemicals and the operations of processing plants are then obligated to disclose information about how hazardous or harmful a substance is and how the user should handle it in order to protect oneself.

Double flap system for filling

The transferring and filling facility essentially consists of a product transfer compartment, an upstream material lock to insert the container, a filling compartment with integrated PPC 250, and a container station with a docked double flap system to fill containers with the product.

The containers with the ingredients are first positioned over a material lock in the transfer compartment. Using the integrated gloves in the transfer compartment, the operator opens the containers and, using a manual suction lance connected to the PPC 250, sucks the material found in the adjacent filling compartment. From here, the transferred ingredient is emptied into the docked container via the double flap. The container is placed on a weighing system to determine the required amounts. The emptied containers are fed through the side walls via foil ports. The harmless pharmaceutical excipients



Containment pyramid – courtesy of Volkmann

are sucked in through a second suction lance directly from the supply container outside the unit. The entire containment system fulfilled the required OEB 4 demands during the filling and the subsequent WIP cleaning and is suitable for dust-explosive powder (conforms to ATEX).



Design limit

A classic application of vacuum conveyors in the pharmaceutical industry is the unloading of fluid bed granulators and the subsequent filling of a downstream sieve mill. One of Volkmann's pharmaceutical clients asked if the company's PPC vacuum conveyor is suitable for a design limit of 1 µg/m³. To visualise these minimal dust concentrations, consider the following example: a small grain of commercial sugar that we use in our morning coffee weighs around 0.6 mg. The 600th portion of this sugar grain is allowed to appear in 1m³ of air within a maximum of eight hours to eliminate risk to employees.

It is not enough to be sealed

A sealed and closed process was required for this high containment assignment that should forgo the protective cover in the form of an isolator. In order to fulfil these high demands, Volkmann further developed and improved its hygienic PPC 350 vacuum conveyor, which is free of dead space, adding a second filter level (HEPA H14) and suitable isolation valves.

However, to be sealed is only a requirement for a complete high containment system. A second essential feature is the cleanability of the entire surface in contact with the product including the ports to the other process facilities in the closed WIP (washing in place) procedure.

In the first cleaning step, the entire facility is flooded with water; this especially applies to the contaminated conveyor hoses and process lines. Wetting the surfaces that come into contact with

the product first serves to pre-wash the separator tanks, filters and valves. Afterwards, the intensive cleaning begins with rotating nozzles and the repeated washing of the stainless-steel filter that is used as the primary filter here. The vacuum line after the primary filter and the second filter level (HEPA H14) could also be contaminated and is likewise cleaned. The WIP procedure executed here is very individual and depends strongly on the respective product, on the cleaning agents used and, of course, on the process.

Dust Emission Measurements as Proof

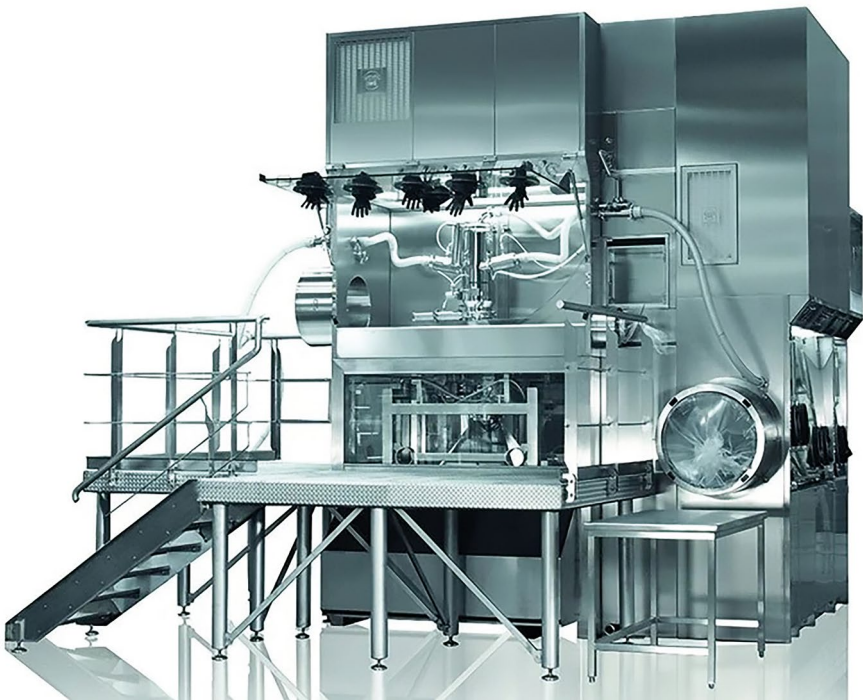
The containment level achieved by a process facility can only be verified by measuring the emitted particles. In a prepared clean room, the PPC350-CIP was tested under comparable conditions as in the later production. The test material used was a very fine-grained and dusty naproxen-lactose mixture that is very well suited for such tests and is frequently used. The test material was located in a transport vessel (IBC) that was docked through a double flap system on the feed hopper. The PPC350-CIP was mobile in a frame and likewise connected with an empty IBC by a double flap.

An expert team selected several statistically process-relevant measuring points for the test and placed the permitted air sensors with test filters for these measuring sequences there. These primarily record the situation in the direct surroundings of the measurement points while the person-related measuring point displays the cumulative, average burden of the operating personnel. The operator supervised the process during the measuring and changed the filled and emptied IBCs here. The conveying process was performed three times for a representative result, and each individual process was measured separately. The measurement itself was completed by special compact filter systems that were perfused by a defined amount of air with the aid of a small vacuum generator.

The measurement of the particle concentration not only occurred during the conveyor process exclusively in the IBC change but also during the cleaning and the subsequent disassembly of the vacuum conveyor.

The evaluation of the particle measurements in the laboratory yielded that the PPC350-CIP lay under the design limit of 1 µg/m³ in all three process steps and is therefore most suitable for this high containment application.

For more information, contact:
mail@volkmann.info
+49 (0) 2921 96040
https://volkmann.info



Loading under high containment conditions – © Weiss Pharmatechnik GmbH



Granules India gets VIA for Granules Life Sciences

Granules India has received a VIA (voluntary action indicated) FDA notification, for Granules Life Sciences. No regulatory action has been recommended, according to a company statement.

Dr Krishna Prasad Chigurupati, Chairman and Managing Director, Granules India,

said: "While receiving the classification is a step in the right direction, we recognize that quality is not a one-time milestone but an ongoing commitment. It will continue to remain a core pillar of utmost importance across all Granules sites, guiding our actions, investments, and culture every day."

The risks of combustible dust & powder handling

Rhiannon Grice, Business Development Executive at S3 Process explores the hidden risks of powder handling



Rhiannon Grice, Business Development Executive, S3 Process

Powder handling is critical in manufacturing, yet it poses serious risks. These include dust explosions, fire hazards, and occupational health issues. Such dangers can lead to operational downtime, costly fines, and, in severe cases, loss of life. Over 70% of industrial dust explosions involve common powders like flour or sugar, underscoring urgent safety gaps in combustible dust handling.

Understanding the ATEX challenge
Combustible dust is present in many industries:

- **Food:** Sugar, starch, and flour
- **Pharmaceuticals:** Vitamins, stabilisers
- **Chemicals:** Plastics, cellulose fibres

Explosive atmospheres form under specific conditions:

- Suspended dust particles
- Flammable gases or vapours
- Ignition sources like static discharge

Compliance with ATEX and DSEAR regulations is mandatory to ensure workplace safety.

Why powder handling matters
Inadequate control of dust risks can result in:

- Severe accidents caused by hybrid mixtures and dust clouds
- Legal consequences for non-compliance
- Operational inefficiencies due to equipment downtime.

The dangers of dust in powder handling
Powder dust presents critical hazards in industrial environments. Understanding the risks associated with its presence is essential for safeguarding operations and protecting workers.

Certain organic powders, such as flour, sugar, starch, and cocoa, as well as metallic powders like aluminium and magnesium, are highly combustible. When dispersed in air within confined spaces, these materials create an explosion hazard.

Organic Powders: Organic materials ignite easily because they contain carbon-based compounds. A single spark or heat source can trigger combustion.

Metallic Powders: Metals like aluminium have a low Minimum Ignition Energy (MIE), making them extremely volatile. Magnesium dust, for example, burns at high temperatures and can sustain combustion even in oxygen-depleted environments.

Amplified risk in confinement
Explosions are intensified in confined spaces, such as silos, hoppers, and mixers. The explosion pentagon (fuel, oxygen, ignition source, dispersion, and confinement) is complete in these settings, leading to devastating outcomes. For example, dust explosions in flour mills and sugar refineries have caused significant industrial disasters.

There are several ways to mitigate the risk of explosion in confined environments, such as:

- **Dust extraction systems:** Capture airborne particles before they disperse.
- **Inert atmospheres:** Replace oxygen with inert gases to prevent combustion. View our range of inerted milling and mixing systems on our website.
- **Regular cleaning:** Reduce accumulation of combustible dust on surfaces
- **Roller compaction:** Compress powder into granules to prevent dust.

Health risks
Industrial powders often contain fine particles that easily become airborne. Workers exposed to these particles face short- and long-term health risks:

- **Respiratory irritation:** Inhalation of powders can cause immediate issues such as coughing, throat irritation, and difficulty breathing.
- **Chronic conditions:** Prolonged exposure to certain powders leads to severe conditions, including:
- **Silicosis:** Inhalation of crystalline silica causes scarring in the lungs, leading to reduced lung function.
- **Occupational asthma:** Fine powders act as allergens or irritants, triggering asthma attacks in sensitive individuals.
- **Lung damage:** Accumulated exposure to industrial powders, such as coal or metal dust, contributes to pneumoconiosis ("black lung disease").

Health risks are particularly prominent in industries handling construction materials, food powders and pharmaceutical powders. Protective measures to prevent harm to workers include appropriate respiratory PPE, adequate ventilation systems and periodic health checks to detect early signs of issues.

Physics of powder handling
Understanding the physical behaviour of powders is essential to effectively managing these risks. A particularly key challenge is charge separation and ignition. When powders flow through pipes, hoppers, or containers, static electricity is generated due to friction between particles or between particles and surfaces. This phenomenon, known as triboelectric charging, is influenced by several factors:

- **Material properties:** Non-conductive powders and surfaces are more prone to charge accumulation.
- **Flow rate:** Faster flow generates more friction and higher charges.
- **Humidity:** Dry environments exacerbate static build-up since moisture helps dissipate charges.

Once enough static charge accumulates, it can discharge as a spark. If the energy of this spark exceeds the Minimum Ignition Energy (MIE) of a dust cloud or hybrid mixture, ignition occurs. MIE is the smallest amount of energy required to ignite a combustible dust cloud under specific conditions. It is typically measured in millijoules (mJ). For instance, finely powdered sugar has an MIE as low as 10-20mJ, making it highly sensitive to static discharges.

MIE is used to classify dust hazards and design safe systems by selecting appropriate equipment and mitigating ignition risks. Various factors can affect the MIE of powders. Smaller particles have higher surface areas, reducing MIE. Higher moisture increases MIE by reducing flammability. Reactive or fine metallic powders generally have lower MIE values. Crucially, the dust concentration must be within the explosive range for ignition to occur.

Explosion dynamics
Dust explosions follow a specific set of conditions described by the Explosion Pentagon (on the opposite page):

- **Fuel:** The combustible material (e.g. powders like starch, flour, or cellulose).
- **Oxygen:** Provided by air in most industrial settings.
- **Ignition source:** A spark, heat, or static discharge.
- **Dispersion:** The powder must form a dust cloud, where particles are suspended in air.
- **Confinement:** Enclosed spaces like silos, tanks, or rooms amplify the explosion by trapping pressure.

The explosion begins when an ignition source heats a particle of dust. The heat vaporises volatile components of the particle, which then ignite and create a flame. This flame propagates through the dust cloud, consuming fuel and releasing energy rapidly. The confined environment increases pressure, causing the explosion to intensify.

Hybrid mixtures
Hybrid mixtures are particularly dangerous. These are combinations of combustible dust and flammable gases or vapours. The gas enhances the dispersion of heat and flames, reducing the energy required for ignition and increasing the explosion's speed and intensity.

ATEX Dust Zone Classification		
ATEX Zone	Dust Presence	Typical Interpretation in Mixing
Zone 20	Dust present continuously or frequently	Inside mixers, hoppers, or powder induction systems
Zone 21	Dust likely during normal operation	Bag dump stations, powder charging points
Zone 22	Dust unlikely and short-lived	Areas surrounding powder handling equipment

Critical parameters in explosion risks

- 1

Explosion limits
The Lower Explosion Limit (LEL) and Upper Explosion Limit (UEL) define the concentration range of dust or gas in air that can ignite. Below the LEL, the mixture is too lean to sustain combustion; above the UEL, it lacks sufficient oxygen. Between these limits lies the critical range where explosions are most likely.
For combustible dust, the LEL depends on particle size, distribution, and composition. Finer particles have a lower LEL because they disperse easily and burn faster. Gas-powder combinations often have much broader explosion ranges than dust or gas alone.
- 2

Electrical conductivity
Static electricity is mitigated by controlling electrical conductivity:
 - **Conductive materials:** Pipes, hoppers, and containers made of conductive materials dissipate charges safely.
 - **Protective clothing:** Operators handling powders must wear electrically conductive garments to minimise static risks.
 - **Hose design:** Transport hoses must meet strict conductivity standards to prevent charge build-up.
- 3

Particle size and shape
Smaller particles present a larger surface area relative to their mass, making them more reactive. Irregularly shaped particles, such as fibres or flakes, can also exacerbate dispersion and ignition risks.

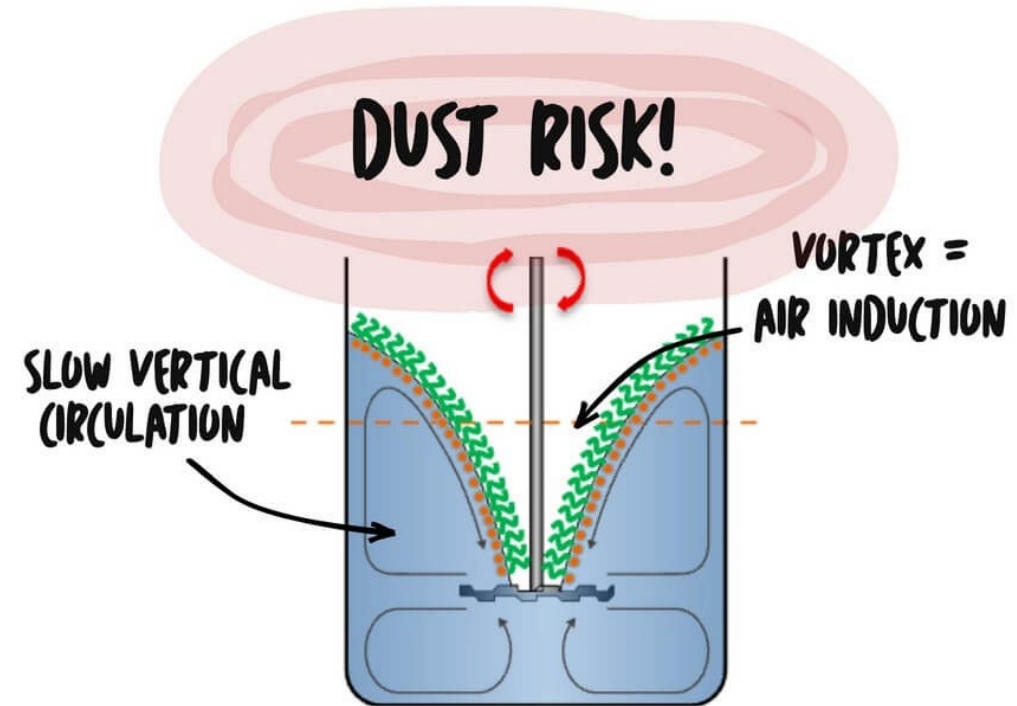
ATEX and equipment classifications
Ensuring the safe handling of powders in hazardous environments requires strict adherence to regulations and standards. The ATEX Directives and DSEAR (2002) outline essential frameworks for managing explosion risks in workplaces where dust or gas hazards are present.

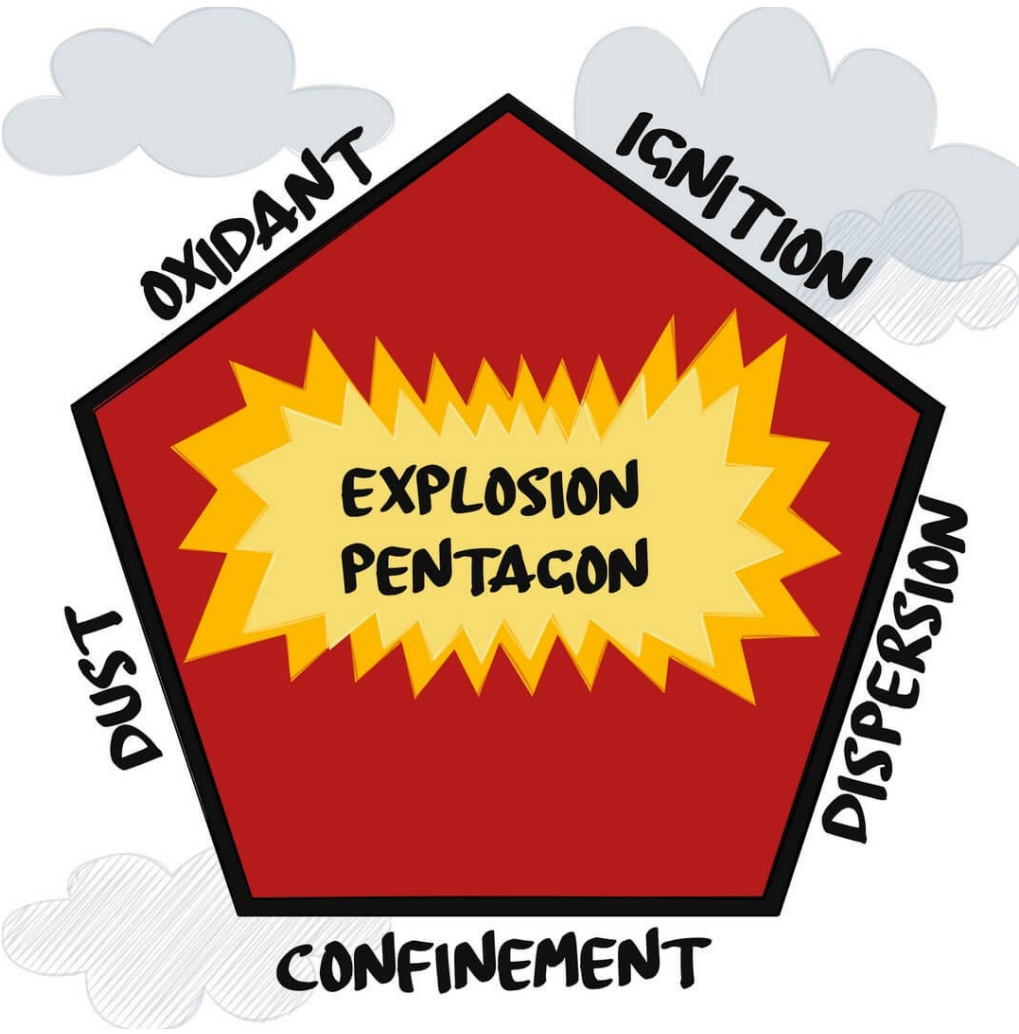
The ATEX Directives (Atmosphères Explosibles) govern the use of equipment in potentially explosive atmospheres across Europe. They classify hazardous areas based on the likelihood and duration of explosive dust or gas presence.

ATEX zone classifications
Hazardous areas are divided into zones to guide equipment selection:

- **Zone 20:** Explosive dust is present continuously or for long periods (e.g. inside silos and hoppers).
- **Zone 21:** Explosive dust is likely to occur during normal operation (e.g. around conveyors or mixing equipment).
- **Zone 22:** Explosive dust is unlikely but may occur under abnormal conditions (e.g. dust spill areas).

Ex-certified equipment
All equipment used in these zones must meet





The Explosion Pentagon highlights the conditions needed for an explosion. Understanding it is key when assessing hazardous ATEX zones

ATEX certification requirements. Components such as mixers, pumps, valves, and sensors are designed to prevent sparks or heat generation; operate within prescribed limits for temperature and electrical conductivity and; use sealed housings or inert atmospheres to minimise dust or gas exposure.

Compliance with ATEX ensures that industrial processes mitigate ignition risks in hazardous environments.

Powder addition hazards in mixing tanks

The process of adding powders to mixing tanks introduces significant risks. Ignitable dust clouds, hybrid mixtures, and static discharge hazards must be carefully managed to prevent accidents.

Adding powders from above the tank creates a suspended dust cloud in the air. When combined with flammable vapours above the liquid surface, this forms a hybrid mixture with a higher explosion risk. Hybrid mixtures are particularly dangerous due to their lower minimum ignition energy compared to pure dust clouds or vapours alone.

Powder addition in mixing tanks presents critical risk factors:

- **Flammable vapour layers:** Vapours form above volatile liquids, creating an ignition-prone zone. These vapours can mix with airborne dust to amplify explosion risks.
- **Static discharges:** Flowing powders generate static electricity due to friction. Without proper grounding, static sparks can ignite the dust cloud or hybrid mixture.

Key terminology

Powder handling involves the transport, mixing, dosing, and management of powdered materials in industrial settings. Understanding key terms is critical to maintaining safety and compliance.

- **Combustible dust:** Finely divided solid particles that can ignite when suspended in air at specific concentrations.
 - **Hybrid mixture:** Combustible dust combined with flammable gases or vapours, which heighten explosion risks.
 - **Minimum Ignition Energy (MIE):** The smallest energy, measured in millijoules (mJ), needed to ignite a dust cloud or hybrid mixture.
 - **Dust-ex classification:** Equipment designed to safely handle combustible dusts under ATEX directives.
- **ATEX:** European directives ensuring equipment safety in explosive atmospheres. Certification ensures compliance with explosion prevention requirements.
- **DSEAR (2002):** UK regulations mandating risk assessments and control measures for explosive atmospheres and flammable substances in workplaces.

To mitigate these hazards, facilities must:

- Use closed transfer systems to minimise dust cloud formation.
- Ensure equipment is ATEX-certified for explosive atmospheres.
- Implement grounding and bonding procedures to dissipate static charges.
- Regularly inspect tanks for ventilation and containment effectiveness.

Solutions to minimise powder handling risks

Innovative mixing technologies have emerged to address the hazards of powder addition in industrial processes. The Ystral TDS induction mixer offers a highly effective solution, combining safety and efficiency to minimise risks.

The TDS Induction Mixer uses advanced vacuum technology to integrate powders directly into liquids without forming airborne dust clouds or ignition zones. The mixer generates a vacuum in its mixing head, pulling powders directly under the liquid surface, avoiding interaction with flammable vapour zones. This prevents suspended particles in the air, significantly reducing explosion risks. Its robust design ensures effective mixing for liquids with varying viscosities and it is suitable for different tank sizes and mixing setups.

Ystral offers both inline and batch induction and dispersion solutions (the Conti TDS for in-line mixing or the Induction TDS directly inside mixing tanks) able to adapt to a wide range of industrial applications. The TDS is also ATEX-certified, meeting strict safety requirements for dust and gas Ex zones, ensuring compliance in hazardous environments.

This technology is ideal for sectors dealing with combustible dusts or volatile materials. It enhances both process safety and mixing efficiency, making it a preferred choice in food, chemical, and pharmaceutical manufacturing. Advanced equipment like the Ystral TDS induction mixer significantly reduces the risks associated with traditional powder handling methods. By combining safety and versatility, it represents a critical advancement in mitigating dust explosion hazards.

Challenges with traditional powder handling systems

Traditional mixing systems face several challenges when it comes to maintaining safety and hygiene in environments with combustible dust. Despite compliance with ATEX, certain equipment configurations can still present risks.

In environments with explosive dust, Dust-Ex Zones are clearly defined to ensure equipment meets stringent safety standards. However, certain conventional machines pose hidden risks.

- **Spark generation:** Equipment like flow-through valves with isolated conductive parts may generate sparks that can ignite combustible dust clouds.
- **Safety standards:** All machines must be certified for safe operation in hazardous environments, but failure to adhere to these standards can increase the risk of ignition.



Hygiene covers also present a challenge. While stainless steel covers are commonly used to improve hygiene and cleanliness, they create new challenges for equipment in explosive zones.

- **Overheating risks:** These covers can trap heat, potentially leading to overheating, which could invalidate Ex certifications.
- **Ventilation solutions:** Effective cooling systems or ventilation must be incorporated into sound insulation hoods to prevent temperature build-up.
- **Balanced design:** Proper design integration is necessary to balance hygiene, safety, and operational effectiveness.

Traditional systems, while widely used, face limitations when dealing with the complexities of hazardous environments. These challenges underscore the need for more advanced solutions, like the Ystral TDS induction mixer, which offer better safety and operational reliability. The next section will delve into the economic and operational benefits of adopting modern, safer equipment.

Recommendations for safer powder handling

To mitigate the risks associated with powder handling, especially in environments with combustible dust, it is crucial to adopt safer methods and maintain strict safety protocols.

Avoid pouring powders from above: Pouring powders from a height into mixing containers can create ignitable dust clouds. This practice increases the risk of accidental ignition. Instead, use controlled powder feeding methods, such as powder induction directly into liquid.

Use dust-free systems: Employ systems like suction mixers or enclosed conveyor systems that prevent the release of powders into the air, eliminating the risk of dust cloud formation.

Proper grounding and conductivity: Ensure all equipment, including hoses, containers, and protective clothing, is properly grounded and made from conductive materials. This reduces the risk of static electricity build-up, which can trigger ignitions.

Safety protocols: Establish clear safety protocols for handling powders, ensuring all staff are trained on the hazards and precautions specific to combustible dust environments.

Regular compliance checks: Regularly assess equipment for compliance with the latest safety standards, such as ATEX and DSEAR regulations. Ensuring equipment remains in good condition and meets safety requirements is essential for maintaining a safe work environment.

Implementing these recommendations and best practices will significantly reduce the risks of powder handling accidents, such as explosions and health hazards. Adopting advanced systems like suction mixers further enhances safety, offering reliable protection in hazardous environments. Regular maintenance and compliance checks are crucial to ensuring ongoing safety and efficiency.

For more information:

S3 Process represents a portfolio of leading powder processing technologies in the UK and Ireland, supporting manufacturers with the right equipment and expertise for their processes. Among our principals is Ystral, whose mixing and dispersing technology is referenced throughout this article.

For more information get in touch at info@s3process.co.uk or visit www.s3process.co.uk

Tri-Mer Corporation debuts industrial bag filters

Tri-Mer Corporation, manufacturer of wet and dry dust collection systems for industry, has debuted a new line of industrial bag filters for gas volumes up to 880,000 acfm.

Tri-Mer bag filters are suitable for the broadest range of dust types, loadings and flow ranges. Bag filter elements consist of a fabric bag, and a support cage which is mounted from the clean gas side. Filter elements fit precisely in the housing, providing a perfect seal against bypass without the use of screws.

Incoming gas flows through the textile filter from outside to inside; particulate is retained on the outside. A key advantage is fully

optimised distribution of the cleaning energy over the entire filter surface.

Tri-Mer bag filters are engineered for low mechanical stress on the filter fabric, a factor which contributes to long service life. Material options include PTFE and PTFE membrane, polyester needlefelt, Nomex, acrylic felt, fiberglass and Aramid felt.

The unique design of these vertical, circular bag filters accommodates filter lengths up to 30 ft. Filter elements are easy to handle and are supplied with split cages where indicated.

Tri-Mer bag filters are suitable for flow rates from 588 to 880,000 acfm. Higher dust loadings can be managed with pre-separation cambers.

How to handle hazardous materials and substances

From the laboratory to modern manufacturing environments, the experts at Hosokawa Micron explore what you need to know about handling dangerous substances

Understanding how to handle hazardous materials, no matter the industry, is crucial.

Modern manufacturing environments are facing increasing pressure to enhance safety and prevent contamination events. The recent EU GMP Annex 1, which came into effect in August 2023, is driving major operational changes in sterile manufacturing. Plus, pressures for more stringent ISO standards that protect workers and the environment have heightened consumer expectations.

These stringent regulations require manufacturers to adopt integrated contamination control strategies, increase documentation, and implement a more robust monitoring practice, which reveals the gaps in many manufacturers' existing systems, pushing for further modernised safety practices.

From pharmaceuticals and chemicals to FMCG and advanced materials, manufacturers must now integrate containment into daily operations and long-term strategies. Containment is no longer an add-on, but a necessity across all industries.

In this article, we aim to provide operators with an understanding of how to handle hazardous substances and materials in laboratory and manufacturing environments.

Managing chemical safety: lab-scale to industrial manufacturing

When it comes to handling hazardous or potentially hazardous materials, you must understand your materials and the hierarchy of prevention. Recent EU-OSHA worker protection legislation has established a hierarchy of prevention:

The hierarchy of prevention is as follows:

- Elimination and substitution are at the top of the hierarchy of control measures. Where possible, eliminate the use of dangerous substances by changing the process or product in which the substance is used.
- If elimination is not possible, substitute a non-hazardous or less hazardous substance for the dangerous one.
- If a substance or process cannot be eliminated or substituted, the exposure can be prevented or reduced by technical and organisational solutions. These are, for example, control of the emission at the source (closed system or local exhaust ventilation), or reducing the number of workers exposed to the dangerous substance, and the duration and intensity of exposure.

Practical handling, such as engineered design and containment controls, minimises substance release and protects workers when handling hazardous materials and substances. Additionally,

ensuring that the correct training, procedures, and communication are upheld supports your operators and working environments to meet the necessary regulatory standards.

These regulatory standards are crucial in minimising hazardous risks. According to EU-OSHA, employers must perform workplace risk assessments for dangerous substances and prioritise collective measures that tackle risks at source.

With these measures in place, what are the key safety considerations when handling hazardous materials?

Key safety considerations when handling hazardous materials

From establishing risk assessments and procedures to ensuring there are consistent hygiene and safety rules that are maintained by all members in the work environment, containment is effective. We've listed the top safety considerations that should be upheld in all sectors:

Risk assessments: According to the National Library of Medicine, "by mapping out credible incident scenarios (spills, leaks, reactions, fires, explosions), organisations can plan targeted engineering controls, emergency procedures and training that reduce both acute accidents and long-term health effects."

Additionally, establishing consistent risk assessments that are documented ensures that employers do not risk fines and legal repercussions. Without these structured risk assessments, danger could leave workers, products, and the environment inadequately protected against contaminants.

Consistent procedures, information, instruction and training: Once you have established a risk assessment with procedures in place, this training becomes consistent in behaviour. The ICC Council (International Certifications Council) reiterates this point, stating, "organisations that invest in ongoing hazmat training typically see fewer incidents, less downtime, and lower costs from injuries, clean-up and liability, because routine tasks are carried out consistently and correctly."

Personal protection equipment: It is generally accepted that PPE (personal protective equipment) should be the last resort when handling hazardous materials and substances. However, if you are using protective clothing, you should ensure that it has been properly inspected before use and that it fits correctly.



By law, using PPE is the last resort where exposure cannot be adequately controlled by other means." According to the EU-OSHA PPE standards, an employer shall:

- Ensure that employees receive PPE free of charge.
- Choose appropriate PPE depending on the risks.
- Specify the conditions of PPE use.
- Organise training sessions.
- Ensure suitable storage, cleaning, disinfection and maintenance.

This should be relevant to the types of PPE, such as:

- Protective clothing
- Hand and arm protection
- Foot and leg protection
- Eye and face protection
- Hearing protection
- Head protection
- Respiratory protection
- Personal fall protection
- Skin protection – barrier creams

Now that you understand the key safety considerations when handling hazardous materials and substances, you can see how each industry uses these materials.

Chemical industry

Chemical manufacturers handle a broad spectrum of hazardous materials ranging from flammable liquids and corrosive acids to toxic gases and highly reactive compounds. These substances are essential for synthesising intermediates, specialty chemicals, polymers, coatings, and pharmaceutical ingredients.

Common-Use Cases:

- **Catalysed reactions & batch processing:** Operators often work with solvents or reagents that are volatile or harmful when inhaled, requiring local exhaust ventilation and closed-system charging.
- **Powder handling:** Fine chemical powders can pose inhalation hazards, dust-explosion risks, or cross-contamination concerns. Containment solutions help ensure product integrity while protecting operators.
- **Corrosive & toxic substances:** Strong acids, alkalis, and toxic gases must be transferred, stored, and reacted within controlled systems to prevent leaks or operator exposure.

The chemical sector is heavily reliant on engineered containment, as small errors can lead to dangerous reactions, off-gassing, or environmental contamination.

Pharmaceutical industry

Pharmaceutical manufacturers handle materials that range from benign excipients to potent APIs (Active Pharmaceutical Ingredients) that require high levels of containment. As APIs become more targeted and powerful, the need for reliable containment has increased significantly.

Common-Use Cases:

- **Research & development labs:** Chemists and

formulation teams work with small quantities of potent materials, requiring high-containment isolators for weighing, dispensing, and testing.

- **Manufacturing potent & high-potency APIs:** These compounds may cause severe health effects at extremely low exposure levels, making engineered containment essential to maintain operator safety.
- **Solvent-based processing:** Many pharmaceutical reactions depend on volatile organic solvents that can be flammable or toxic, requiring careful ventilation and explosion-protected environments.

Effective containment ensures product purity, regulatory compliance, and operator protection throughout the drug development lifecycle.

Fast-moving consumer goods

While FMCG environments may appear lower-risk, they frequently use hazardous materials during production, cleaning, or packaging. These materials help deliver safe consumer products at high volumes.

Common Use-Cases:

- **Personal care & beauty products:** Aerosols, propellants, perfumes, and alcohol-based formulations often involve flammable or volatile components that require controlled dispensing and ventilation.
- **Food & beverage processing:** Although food itself may not be hazardous, the industrial cleaning chemicals used to maintain hygiene standards can be corrosive or reactive and must be stored and handled safely.
- **Packaging & disinfection:** Many facilities use powerful sanitising agents, adhesives, or solvents that must be contained to prevent exposure or cross-contamination.

Containment helps ensure workers remain safe while supporting consistent, high-volume production in tightly regulated environments.

Hosokawa Micron Ltd containment solutions

Hosokawa Micron Ltd provides secure and safe containment solutions with extensive experience delivering containment solutions across pharmaceutical, chemical, food, and advanced materials sectors.

From laminar flow booths for controlled containment and clean airflow environments, fume cupboards and cabinets that provide the safe handling of volatile and hazardous substances, to nuclear gloveboxes and specialised nuclear high-containment solutions for the nuclear industry.

Our proven expertise in designing systems that support operator safety, regulatory compliance, and process efficiency allows us to support projects from concept and testing through to full-scale implementation.

For more information:

Explore Hosokawa's containment solutions: www.hosokawa.co.uk

Brenntag announces Innovation & Application Centre in Shanghai

Brenntag, the global market leader in chemicals and ingredients distribution, has announced the opening of its new Life Sciences Innovation & Application Centre in Shanghai, strengthening its commitment to supporting customers and suppliers in China and Hong Kong with advanced technical capabilities and closer access to application expertise.

Liu Hua, President Brenntag Specialties China and Hong Kong, said: "The new centre in Shanghai allows us to work even more closely with partners across China and Hong Kong. As a collaborative innovation platform, it enables formulation development, application testing, and concept creation across Brenntag's Life Sciences portfolio, helping us translate ingredient expertise into practical solutions for the market."

Beauty & care applications

The centre supports the development of beauty and care formulations for a wide range of personal care and home care products. Equipped with formulation and testing capabilities, the facility enables activities such as emulsion structure analysis, surfactant foam performance evaluation, hair combing force testing, skin analysis, and laundry performance testing, while a laboratory-scale mixing system supports small-batch production trials and process validation for formulation optimisation.

Francois Bleger, Global President Beauty & Care, and President Brenntag Specialties APAC, said, "Through our new Life Sciences Innovation & Application Centre in Shanghai, we are strengthening our ability to develop Beauty & Care formulations tailored to the rapidly evolving needs. By working closely with partners across the value chain, we can accelerate innovation and deliver solutions that respond to emerging consumer trends."

Food & nutrition applications

The centre also focuses on Food & Nutrition application development, supporting key categories including ready-to-drink beverages, dairy, bakery, confectionery, and savory products. Through formulation development and tasting evaluations, Brenntag helps customers develop innovative product concepts that respond to changing consumer preferences and emerging health and wellness trends.

Kenneth Keh, Regional President Nutrition APAC, Brenntag Specialties, said: "With our new Life Sciences Innovation and Application Centre in Shanghai, we are strengthening our ability to support innovation in food and nutrition applications. The facility enables us to develop new concepts in areas such as sports nutrition, children's health, and healthy ageing, helping translate ingredient expertise into market-ready solutions."

Safety first!

Jake Davis, Business Unit Leader for the Powder Handling product line at De Dietrich USA, discusses how to handle hazardous bulk solids and powders



Jake Davis, Business Unit Leader for the Powder Handling product line, De Dietrich USA

In numerous industries, the movement and storage of bulk solids and powders are standard operations. However, when these materials are hazardous, the stakes become considerably higher. The mishandling of hazardous bulk materials can lead to catastrophic results, including explosions, toxic releases, and environmental damage. In this blog post, we'll dive into the best practices for handling hazardous bulk solids and powders, ensuring safety for both personnel and facilities.

Recognising the hazards

Before diving into safety protocols, it's essential to understand the risks associated with certain bulk solids and powders:

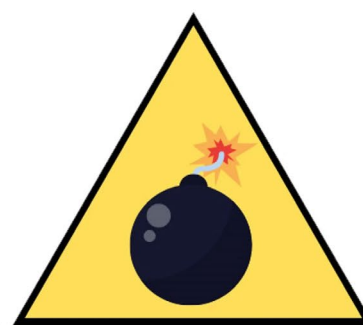
- **Combustibility:** Many powders, when suspended in air, can create explosive dust clouds. Examples include flour, sugar, and metal powders.



Combustibility



Corrosivity



Reactivity



Toxicity

- **Corrosivity:** Chemical powders that are basic or acidic in nature can attack and destroy metal and other fabrication materials used in conveying equipment. Examples of this can include the powder, granular, crystalline or flake form of compounds such as sodium hydroxide and acid salts.
- **Reactivity:** Some materials can react violently with other substances or even with air or water. For example, certain metal powders can ignite upon exposure to moisture.
- **Toxicity:** Some powders can be harmful or fatal if inhaled, ingested, or even upon skin contact.

Safety measures for handling hazardous bulk solids & powders

Following these general guidelines will ensure you are taking into account all the major safety aspects and best practices to keep your system and personnel from potential danger:

• **Comprehensive training:** All personnel should undergo regular training, ensuring they're aware of the risks associated with the materials they handle and the safety measures to mitigate these risks.

• **Ventilation and dust control:** Proper ventilation systems, combined with dust collection and

suppression mechanisms, can significantly reduce the risk of dust explosions and worker exposure.

• **Static control:** Static electricity can ignite a dust cloud. Ensure that equipment is grounded and consider using anti-static materials and tools.

• **Regular maintenance and cleaning:** Regularly inspect and maintain equipment. Avoid letting dust accumulate, as even a thin layer of dust can become airborne and create an explosive atmosphere.

• **Safe storage:** Store hazardous materials in well-labeled, sealed containers, preferably in designated areas. Understand the material's properties – some might require cool, dry environments, while others might need inert atmospheres.

• **Explosion protection:** Install safety devices like explosion vents, suppression systems, and flame arrestors in areas where dust explosions are a potential risk.

• **Personal protective equipment (PPE):** Ensure workers have access to and use the necessary PPE, such as respirators, gloves, and protective eyewear.

• **Safety data sheets (SDS):** Always have an up-to-date SDS for every hazardous material in the facility. The SDS provides vital information about the material's properties, potential hazards, and emergency response measures.

• **Emergency protocols:** Develop and regularly review emergency response protocols. This includes evacuation plans, first-aid measures, and emergency contact numbers.

• **Eliminate ignition sources:** Keep potential ignition sources away from areas where hazardous powders are handled or stored. This includes open flames, sparks, and hot surfaces.

Advanced technologies for safe handling

Additional safe handling measures can be taken using advanced technologies involving inertion and/or monitoring. By replacing the atmospheric air in a system with an inert gas like nitrogen, you can reduce the risk of combustion through the creation of an inert environment within the closed system. With regards to monitoring systems, modern sensors can be integrated to detect changes in temperature, pressure, or gas concentrations, providing early warning signs of potential issues.

Handling hazardous bulk solids and powders requires vigilance, knowledge, and a commitment to safety at all levels of operation. By understanding the risks and implementing stringent safety protocols, industries can ensure that they move and store these materials without compromising the safety of their workers, their facility, or the environment. Remember, with hazardous materials, always err on the side of caution!

Operator safety is a critical component to all De Dietrich solids handling solutions. Our Powder Pump, in conjunction with other components, can provide safe, reliable transfer utilizing dense phase pneumatic conveying.

For more information:

De Dietrich USA is a leading provider of process equipment, integrated systems, and engineered solutions to the bulk chemical, fine chemical, and pharmaceutical industries. Specialising in dense phase pneumatic conveying, De Dietrich provides custom engineered solutions to allow for the safe, contained transfer of powders, granules, and other dry bulk materials. Visit www.ddpsinc.com



BASF starts world's first production plant for 3D-printed catalysts

BASF has started up the world's first production plant for catalysts based on X3D® technology at its site in Ludwigshafen (Germany). With the commissioning of this facility, BASF is scaling the additive manufacturing of catalysts to an industrial level and strengthening its leading role in innovative solutions for the chemical industry.

Using X3D technology, catalysts can be produced with optimally designed geometries that combine high mechanical stability with an open structure. This significantly reduces pressure drop in reactors while simultaneously increasing the catalytically active surface area. As a result, customers achieve higher reactor throughput and improved product quality at substantially lower energy consumption compared to conventional catalysts.

BASF has been supplying X3D catalysts to production plants for several internal and external customers for many years. The technology is highly versatile and can be applied to a broad range of catalyst materials, including precious and base metal catalysts as well as various support materials. The new production plant in Ludwigshafen provides the foundation to make this technology more widely available and to shorten development and market introduction timelines.

In 2025, the Chinese-based fine chemical company An Hui Jintung filled their production plant with BASF's sulfuric acid catalysts O4-115 X3D. "The plant started up smoothly, and plant performance has significantly improved compared to before. Production achieved a record high, generating substantial economic benefits for our company. We will continue our collaboration with BASF to promote catalyst upgrades and replacements across additional units," said Eter Zhu, General Manager at An Hui Jintung.

"We are pleased that X3D technology already gives our customers a real competitive edge: We can supply catalysts tailored precisely to their specific chemical processes – quickly and in large quantities. At the same time, we help customers reach their goals, as our catalysts enable them to increase production performance while improving the efficiency of the raw materials they use," said Detlef Ruff, Senior Vice President Chemical Catalysts and Adsorbents at BASF. "I am truly excited to see these groundbreaking innovations and honored to take on the responsibility for a business that serves as a key enabler of chemical reactions," said Yaqian Liu, who succeeded Ruff on April 1.

Managing toxic powder risks through toll processing

The safe handling of powders is an increasingly complex challenge. Ben Beattie, Director of Forbeats, explores how working with a toll processor can reduce risk and enhance safety

As product formulations become more advanced, particularly in pharmaceuticals and speciality chemicals, the potency of active ingredients continues to rise. While these materials are valuable and performance-critical, many are also hazardous. Toxic powders present a particularly unique challenge – the particles are often invisible, airborne and capable of bypassing traditional protective measures, posing a risk to people, products and production environments.

While handling toxic powders has always carried inherent risks, these have intensified in recent years. Traditional open-handling methods, where operators relied heavily on personal protective equipment, are no longer sufficient for many high-potency materials. Today, best practice requires fully enclosed, dust-free systems that protect not only operators, but also the product and the wider environment.

In addition, the operational complexity of handling toxic powders demands a level of technical expertise and infrastructure that many manufacturers do not possess in-house.

Toll processors – offering purpose-built facilities, specialist equipment and highly trained personnel – are uniquely positioned to address these challenges, which is why toll processing is increasingly being adopted as a strategic risk-mitigation solution. By outsourcing the handling and processing of toxic powders to specialist providers, manufacturers can shift the most hazardous aspects of production to controlled environments designed specifically for safe and efficient processing.

Hazard containment

One of the most critical challenges in handling toxic powders is achieving effective containment. Even small amounts of airborne particulates can present serious health risks, particularly when working with carcinogenic or high-potency materials.

Toll processors are set up specifically to manage this. Their facilities are built around enclosed systems such as glove boxes and isolators, allowing materials to be handled without direct operator contact. Integrated dust filtration at bag dump stations captures particles at source. At the same time negative pressure environments prevent emissions from escaping into the wider workspace. Powder transfer is also fully contained, with pneumatic and vacuum systems moving material through closed pipelines rather than relying on manual handling, reducing both exposure risk and physical strain on operators.

The result is a cleaner, safer and more controlled processing environment. Dust-free systems protect both the facility and the surrounding area, and for sensitive materials, inert conditions can be maintained to preserve product stability. By working with a toll processor, manufacturers can move these risks away from their own operations and into facilities purpose-built to manage them safely.

Reduced capital investment

Developing the infrastructure capabilities for handling toxic powders requires substantial investment. Specialised equipment, including high-containment mills, precision mixers, sealed transfer systems and containment housing, represents a significant capital outlay.

Beyond equipment, facilities often require extensive modification or complete redesign to meet safety and regulatory standards, from advanced ventilation and explosion protection to cleanroom environments and waste management systems.

For many manufacturers, particularly those operating close to capacity, the cost and time required to implement this can be prohibitive. Toll processing removes this burden by providing access to fully equipped facilities without the need for capital expenditure. This enables manufacturers to scale production in line with demand, respond more quickly to changing requirements and bring products to market faster, all while minimising financial exposure.

Regulatory compliance

The handling of toxic powders is governed by strict regulatory frameworks covering environmental protection, worker safety, storage, transport and



Ben Beattie, Director, Forbeats

processing. Achieving compliance can be complex and resource intensive, as it requires detailed permitting, documentation and ongoing audits.

For companies operating internationally, this becomes even more challenging. Alongside evolving global standards, divergence between UK and EU frameworks has introduced additional layers of complexity.

Toll processors typically operate within established compliance frameworks and hold the certifications and permits required for hazardous material handling. These often include ISO 9001 for quality management, ISO 14001 for environmental management and access to COMAH facilities for higher-risk materials.

Working with a compliant partner significantly reduces the administrative burden on manufacturers. Many toll processors also support documentation, labelling, safety data sheets, audit preparation and batch traceability, helping to ensure compliance while reducing the risk of delays, penalties or reputational damage.

Contamination control

Maintaining product purity is a major challenge when handling toxic or high-value powders. Even minor contamination can compromise batch integrity, leading to costly losses and potential safety concerns. This is particularly critical in industries such as pharmaceuticals and food production, where contamination can have serious implications for both product performance and consumer safety.

Toll processing facilities are designed



to minimise these risks through controlled environments and disciplined process management. Fully enclosed systems prevent the ingress of external contaminants, while dedicated equipment or validated cleaning procedures reduce the risk of cross-contamination between products.

Expertise in specialised processing

Handling toxic powders requires a high level of technical expertise, as well as specialised training in containment procedures, hazard management and process optimisation. Recruiting and retaining people with this level of expertise can be difficult and costly.

Toll processors provide access to experienced personnel trained to manage high-potency and hazardous materials. Their expertise extends to operating advanced containment systems, optimising processing conditions and ensuring consistent batch quality.

By outsourcing to a toll processor, manufacturers can reduce labour costs, minimise training requirements and lower the risk of operator error, while benefiting from a level of expertise that would be difficult to replicate internally.

Networks and alternative sourcing

Ongoing supply chain disruption continues to place pressure on global manufacturing. Geopolitical instability in the Red Sea and Strait of Hormuz, alongside the war in Ukraine, has affected the flow of raw materials, energy and key intermediates. For industries reliant on global sourcing, this has led to

longer transit times, increased costs and greater uncertainty around availability.

Brexit has added further complexity to UK-EU trade, with divergence between UK REACH and EU REACH frameworks creating dual compliance obligations. Additionally, customs processes and tariffs have increased lead times and administrative burdens for manufacturers.

Toll processors can play a critical role in mitigating these challenges. With established supplier networks and access to alternative materials, they are often better positioned to secure materials and maintain continuity. Their ability to hold stock, source alternative inputs, and adapt production schedules provides flexibility that many manufacturers cannot achieve in-house, helping reduce the risk of disruption.

With material potency, regulatory scrutiny and supply chain volatility increasing, the question should no longer be whether to use a toll processor, but how to choose the right partner – one with proven technical capability, independently verified compliance credentials, and a track record of reliability.

By shifting hazardous operations to toll processing experts, manufacturers can focus on their core competencies with greater confidence, knowing that the most complex and high-risk aspects of powder handling are being managed safely, efficiently and in line with best practice.

For more information:

<https://forbeats.co.uk/>

Choosing the right road tanker for your product

From regulations to safety, the team at EuroBulkSystems has rounded up the key considerations you need to make when choosing a transportation partner

In the current shipping crisis (accurate at the time of writing), many eyes are turning to road transport. Is there a way to get the necessary grains, minerals – and of course, oil – out from the Strait of Hormuz via road? While the answer is yes – sort of – there are a number of considerations before a company can decide on this method to free their products from the Strait. For example, are there food-grade tankers available to transport your grain? Can there be an ATEX-certified one for any hazardous chemicals that need to be moved? While it's all technically possible, ultimately, this is not the most attractive method for cross-border freight, simply because the loads have to be so much smaller.

But with that all in mind, last-mile logistics is the perfect place for road tanker transport. So if you're lucky enough that your product is not currently sitting on a cargo ship going nowhere, read on for a breakdown of the key things you should consider when selecting a road tanker partner.

Food powder tankers

Food powder tankers transport edible products such as sugar, flour and starch. The most common material for a food-grade tanker is stainless steel – grades 304 and 306 in particular. Stainless steel is non-reactive with food ingredients, making it ideal to transport food powder products. It is durable, hygienic and resistant to corrosion from acids, salts and cleaning chemicals.

To be classified as food-grade, tanks must meet various national and international standards. Certifications from organisations such as the FDA (US. Food and Drug Administration) and EHEDG (European Hygienic Engineering & Design Group) are essential for inspections and penalties.

The surface finish of the tank is critical to food hygiene and safety. Polishing to a roughness average (RA) of 15 to 40 2B is widely acceptable

in food, chemical and pharmaceutical equipment applications, and incorporating electropolishing enhances corrosion resistance.

Cleanability is also key, and it's important to speak to a new supplier about their tank cleaning schedule. When tankers are passing through multiple locations and loading different products, cleaning procedures are vital to prevent cross-contamination.

Many food processes also require temperature control, so insulated vessels help maintain stability and product quality. This is something to discuss with your tanker partner if specific temperatures are required.

Powder tankers for construction materials

Usually made of aluminium or high-grade steel, these powder tanks are designed to withstand the abrasive nature of sand or cement powder. As with food powder tanks, the coating is important. A specialised polymer layer on the interior and exterior combats corrosion and resists chemical degradation while maintaining structural integrity. This protective shield isolates metal or concrete from moisture, aggressive chemicals, and oxygen. Preventing against corrosion also protects against leaks and product contamination, avoiding costly repairs and extending the tank's service life. Before going out to service, tanks are inspected, tested and certified – and then tested periodically in line with inspection schedules.

The safety regulations for construction powder tanks in the UK are governed by the Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations. It is your responsibility to inform your haulage partner as to the substances going into their tankers – and that means your site is also responsible for compliance with the right regulations and insurances.

Chemical powder tankers

There are various styles of tanker that can be made

suitable for chemical powders, so often the choice will come down to things like cost and availability. Typically, you will want to ensure that the tankers you're using have either been cleaned thoroughly – to avoid contamination risks – or that they have only been used to carry the same substance.

For example, high-cube tankers are usually around 30 cm taller than standard 20FT and 40FT containers; but exact specifications will vary between transport providers. The extra height makes these particularly suitable for lightweight or voluminous cargo. Tipping silo trailers can also be used for these less common applications – an inner tank lining can help protect your chemicals or other aggressive bulk materials.

Handling and transporting chemical powders run a whole gamut of risks, and you can read more about safe handling of toxic powders over on page 8 of this edition.

Silo/low-profile powder tanks

Silo tanks are pressurised and use gravity for the load and discharge of payloads, minimising the potential for contamination or loss of product. These tanks cater to a range of bulk solids, including cement, flour, chemicals and plastics, in fine granular or powdered form.

The loading/unloading operation of silo tankers can be pneumatic or electric-powered, with tipping powder tankers the most popular for their ease of loading. They can completely unload materials that don't flow easily, minimising manual labour and improving unloading times in construction, agriculture, and industry.

In contrast, manual tipping requires additional time and manpower – but can often be the cheaper option. They are also handy for applications where tipping is not feasible, such as on smaller sites.

Pneumatic tankers

Pneumatic tankers are specialised vehicles designed to carry powdered dry bulk materials compressed

air allows for the movement of materials through which pipelines, making unloading safe, fast and efficient. Unlike silo tanks that rely on gravity and conveyors, pneumatic tanks use compressed air to create a vacuum where the air pushes or pulls the powdered material into or out of the vehicle. The risk of spills or contamination is significantly reduced, and it eliminates the need for workers to manually handle powders, reducing health risks.

The compressed air is not actively used until loading/unloading, but the pressurised system helps maintain integrity of the powder during transport. Pneumatic tanks insulate against temperature, humidity, and moisture.

Further considerations

As well as the type of cargo and tank type, there are other considerations you need to think about when choosing the right tanker for your bulk solid product.

Tanker capacity can vary greatly, so you need to think about the volume of cargo you're moving. The fewer trips you need to make, the more cost- and time-effective your logistics will be.

Distance is another factor – not all road tankers are designed for long-haul driving. This is something to discuss with your logistics partner.

Safety is a top priority when it comes to transporting cargo. As well as the relevant certifications to transport your particular cargo, you may want to consider if your logistics partner has safety features such as anti-lock brakes, backup cameras, etc. Driver training is another key element to this, to ensure your cargo arrives safely to its destination. Anthony Colwell tells us all about his driver experience below.

Cost is, of course, an important consideration, and you will need to choose a tanker that is within your budget. But it's important to consider elements like safety and reliability when comparing quotes – don't just choose the lowest quote as you may find corners are cut to make the job profitable.

On the road: a driver's tale

What Colwell Transport Solutions' founder wants you to know before you book your next shipment

The start of my journey began when I first got involved in the powder tanker world in 1989 as an owner-driver based in Purfleet-on-Thames. At the time, major projects like the Channel Tunnel, the Dartford Bridge, and the development of Docklands were underway, so there was no shortage of work.

Moving into the powder tanker sector was a complete transformation. Before that, I was running up and down the country – from London to Newcastle – with fridge trailers, or dealing with roping and sheeting paper reels and bulk tipper work, often waiting hours at mills (and I won't even get started on that).

What stood out immediately in the tanker work was the independence. As the driver, you're responsible for both loading and unloading, which removes the need to rely on forklift drivers. This not only improves efficiency, but also allows for a much better working relationship with the customer. That relationship is key. The driver is, after all, the first representative of the company on site. Over time, trust builds – I even found myself socialising with customers in the evenings on occasion. This means you can have a bit more flexibility. Loads can be scheduled more smoothly throughout the day, rather than being dictated by warehouse delays.

For me, the fear of having my diesel stolen often kept me awake. Truck stops can be difficult places to rest – with vehicles constantly coming and going, engines running, and radios or phones blaring from nearby cabs at all hours of the night. This is when having a good customer relationship really is worth its weight in gold. With a good relationship, I could often park overnight onsite. That meant safety for me and my fuel, while the customer effectively had a night watchman – without any additional cost.

That autonomy as a driver can also lead you to have to make difficult decisions on behalf of a client. Refusing a delivery is very rare and would only occur under specific circumstances – such as when access to the site is blocked, or when conditions could cause damage to the underside of the vehicle. Another example would be if the delivery site is in such poor condition that the silo is venting uncontrollably from the top. In situations like these, responsibility ultimately falls on the driver.

Improvements have been made

The first major shift I experienced in the industry was the move from tipping tanks to belly tanks on the cement side. This was a significant improvement, making operations both safer and quieter. But even though belly tanks offer much better stability both on the road and on-site compared to tipping tanks, they do come with a compromise in ground clearance.

Over the years, further progress has been made, particularly in health and safety, as well as in the design of tanks and vehicles. We've moved from donkey engines to PTO-driven blowers, which has streamlined operations. Plus PTO-driven blowers have less risk of overheating because they don't need to be silenced to comply with noise restrictions.

Frustrations with the industry

I've had a great career in this niche of the transport industry. Despite recessions, banking crises, austerity, and COVID, it has provided me with a solid and rewarding livelihood.

However, my main frustration with the industry is its mindset. Too often, companies focus on undercutting competitors rather than negotiating fair rates that benefit everyone. This includes paying drivers properly and investing in good training and equipment. Instead, we're stuck in an unrealistic race to the bottom – one that ultimately harms the entire sector. For example, if a customer offers £300 for a load from A to B, my approach is to negotiate up to £330 – not drop to £280 just to win the job.

Up until around 2020, the powder tanker sector was a strong, specialised corner of the industry, known for high standards of training and well-maintained equipment.

Unfortunately, it now feels more aligned with general haulage, where driver turnover is high and long-term experience is rarely developed. The exclusivity and professionalism of tanker work have been diluted.

Another major concern is the lack of formal regulation around training and competence. Having been involved in training for some time, I strongly believe that operating and handling



Anthony Cowell, Founder, Colwell Transport Solutions

pressurised tanks – especially given the risks of hot components, whipping hoses, and disconnections – should fall under stricter regulatory frameworks such as the Pressure Systems Safety Regulations (PSSR) or the Provision and Use of Work Equipment Regulations 1998 (PUWER).

Over time, I've seen training standards decline, with knowledge often passed down informally from one driver to another – essentially hearsay. This is not good enough.

Mental health

For me, one of the biggest challenges is the constant stress of the unknown:

1. How long will I be on site?
2. Do I need to inform the planning office?
3. Will I be late for the next load?
4. Can I fit my break in?
5. Will I get loaded before they close?
6. Do I have enough tacho time?
7. Where will I stop tonight?
8. Will the truck stop be full – or worse, will my diesel be stolen?

The reality is, things can go wrong in any area of haulage. It's far from utopia.

Truck driving has changed – and so have the drivers. Years ago, a night out meant a walk to the

local chip shop and a pint in the nearest pub. Some drivers even played on darts teams at regular stops. It was a chance to share directions for the next job, talk about the boss, or just have a laugh about the day. Most importantly, it offered fresh air and a mental break from the job.

Today, trucks are more comfortable than ever. Cabs are equipped with TVs, microwaves, cookers, fridges, night heaters, and proper beds. All of that is great – but it comes at a cost.

There's no real escape from the truck environment. The problems of the day don't disappear; they stay with you in the cab.

However, there are various helplines that truckers struggling with their mental health can turn to, as well as a UK government Working Minds campaign to help promote more time for reflection. At the same time, truckers are considered 'lone workers', so human and social connection is key to maintaining a healthier balance. And it becomes all the more critical when you're transporting dangerous or critical powders to ensure you're in a good state of mind and both you and your cargo arrive safely.

For more information:

Visit colwelltransportsolutions.com



The backbone of processing: Silos

Buffer storage is essential to prevent stops and starts in production and operations

Silos are a critical component of the bulk processing industry. Used as intermediary storage, if silos aren't available, production can slow down as product supply is limited. Imagine a plant getting deliveries for sugar every day, with nowhere to store it. It would be impossible to effectively operate.

Silos began as agricultural storage before being adopted by industrial manufacturing and now becoming a key component in growing production chains. One alternative to silo storage is bagging, which has lower upfront costs and scales quite well. However, silos made from aluminium or stainless steel are more durable, require less maintenance and are more suitable as long-term storage solutions. Even more durable are silos built from concrete – though they often carry a higher upfront cost. As the needs of bulk processing supply chains grow, there has been a transition from the temporary bagged storage to a larger-scale silo solution.

Common types of silos

Tower silos are one of the most common types of storage. They can range massively in size, with diameters from 4 metres to 48 metres, and heights of 3m to 40m. Made from wood, steel or even concrete, tower silos are suitable for a wide range of applications and can fit into zones with minimal ground space, building tall instead. They're fully-enclosed and sealed design protects materials from exposure to moisture, pests, UV light, and air contamination – all of which can affect the quality of product. Materials are typically top-loaded, with gravity doing the hard work of compressing the bulk solids for maximum storage efficiency. Air slides or augers facilitate unloading from the bottom for fast, hands-free access, that doesn't require complicated machinery – a big win when training new workers. Tower silos are also particularly helpful when it comes to minimising waste and product loss, as loading and unloading can be precisely controlled.

A **hopper** is a funnel-shaped container typically used to temporarily store and discharge bulk materials in the short-term (though some plants might go for these longer-term). Unlike the huge dimensions of a tower silo, hoppers are smaller and can fit inside most facilities. A hopper bottom silo opens at the bottom, letting gravity do the discharge work. Materials flow smoothly downwards, and this design is especially useful for materials that may otherwise stick or form lumps during storage. This better flowability and ease of discharge is often a key winner for hoppers.

Square silos are modular which means they perfect for scaling up or down. If space efficiency is an issue, a silo bank is an option, with multiple square silos slotted together. Square silos often excel in structural strength and expandability compared to other types of silos.

Round silos are typically spherical – rather than cylindrical like tower silos. The round design helps withstand pressure from large volumes stored internally, and encourages circulation, which protects against humidity and mould. Discharge is easier compared to a square silo.

Logistics considerations

Once you've chosen the silo type that best fits your product and factory floor, you'll work with a fabricator to design the perfect specification. Silos are typically design with CAD software, constructed offsite and then transported to your plant once complete. This means manufacturers have better control over the fabrication, ensuring they meet your specific design requirements. A silo built offsite would typically be coated and inspected before being transported. It can take around one week for a simple silo to be built and up to four weeks for a complex ATEX design.

Transportation requires extra coordination between fabricator, end-user, and even local law enforcement. Silos qualify as an abnormal load, and may require a police escort or the closing of roads. This can add time and cost to your project – especially with the current lack of police availability. On-site silo erection is an option, but is usually done if the silo is too large to transport, or where access to the site is particularly difficult.

Steel silos are cut, rolled and welded together offsite, before being sandblasted smooth. An anti-corrosive primer and lining will be used based on your specifications. Before the silo is handed over, engineers test for leakage, vibration and load testing, and operational trials for material flow –

so you can be assured your product will be safe inside.

Concrete silos require a little more planning, and are more weather-dependent due to the complex concrete pours. These are more likely to be built in-situ, requiring extensive groundworks. However, concrete silos are often more durable, especially in the face of abrasive construction powders.

Maintenance

Once they're on your site, silos require maintenance to ensure a long operational life. This includes regular inspections of the weld joints, bolts, and paint coatings. It's also important to inspect functional systems, such as ventilation and dust collection systems.

Regular inspection and maintenance is also key to protecting against common hazards and ensuring product quality. Potential hazards include:

- **Toxins:** for example carbon monoxide from fermenting grain. Workers should wear appropriate PPE when handling bulk solids to avoid risk exposure.
- **Oxygen deficiency/enrichment:** workers cleaning a silo are at risk of unconsciousness if proper ventilation is not in place. This also protects against other risks, such as humidity.

- **Humidity:** condensation in metal silos could increase mould or fungal growth, impacting product quality and safety. Venting panels or proper insulation and sealing can help alleviate this issue.
- **Explosivity:** many powders, such as flour or dust, can ignite very quickly. Page 6 gives a comprehensive explanation on how to avoid this.

Plants are also subject to ATEX directives, establishing minimum safety requirements for workplaces and equipment used in explosive environments. Many food manufacturers don't realise that their factories are in fact subject to these requirements, due to the hazards posed by flour and other food powders. The ATEX Centre outlines the examples of combustible scenarios, which we delve into on page 5.

As well as regular maintenance, there are many protective measures that can be included in the silo design and fabrication to help minimise the risk of these hazards. Often, loading and unloading is also a key area where danger may occur. The right silo design will include protective measures such as load cells (preventing overfilling), slide valves and rotary valves to help control the discharge of the bulk materials.

Flowability

Key to silo maintenance is maintaining flowability of the product being stored. The flowability of powders is influenced by particle size, shape and moisture content. Smaller particles tend to have poor flowability due to inter-particle cohesive forces. Coarse particles flow more easily but have lower packing efficiency.

Increased moisture content can lead to liquid bridge formation, hindering powder movement and flowability. In particular, hygroscopic materials that absorb moisture easily can stick together and form clumps that prevent easy flow.

If material flows poorly, it may block the outlet, preventing the discharge of product and access to bulk materials. This can lead to operational and financial losses while the product is trapped – and perhaps even compromised, leading to waste.

Regular cleaning helps keep a silo unblocked and with good flowability.

Establishing end of life

The life of a silo depends on material quality, design and construction, usage and maintenance. If a silo has corroded, been improperly maintained, or has been used to the end of its life, then it's time for dismantling. This requires careful planning due to the impact of noise, the environment, and for the safety of workers.

For more information:

This article was written with the support of Shaun Goodwin, Managing Director, and Steven Dance, Principal Engineer, at Barton Fabrications. www.bartonfabs.co.uk



Specialist know-how: 60 seconds with Ajax Equipment's Eddie McGee

EuroBulkSystems hears from a stalwart in the processing industry



Eddie McGee, Managing Director, Ajax Equipment

Who are you and what do you do?

I'm Eddie McGee, Managing Director at Ajax Equipment. I lead a great team where we are all laser-focused on supplying equipment that helps companies handle and process bulk solids reliably, safely and effectively whichever the industry and wherever they are in the world.

Tell us a bit about your company and the services you provide.

Ajax Equipment, UK, offers over 55 years of specialist 'know how' in the design and manufacture of screw conveyors, mixers, feeders, and associated handling systems for powders, granules, and bulk solids. We support customers from concept and testing through to design, build and commissioning and beyond.

How did you get into the sector?

I started to learn about bulk solids handling when I studied for a MSc in Bulk Solids Handling at Glasgow Caledonian University. As a physicist trying to become an engineer, I was fascinated by how bulk materials behave; like a fourth state of matter. I admit bulk solids handling is a niche activity, albeit a global one of great significance, and once you see how critical it is to industry, it becomes a lifelong interest.

What's your favourite thing about working in bulk solid processing?

The sheer variety of my workdays. Every material behaves differently, so every project is often a new challenge. Providing solutions to such a variety of applications and ensuring there are no flow problems really drives me. Seeing the improvement in a customer's plant and processes is both personally and professionally incredibly satisfying.

How do you explain your job to someone outside of the industry?

I tell them we design equipment that makes powders and granules flow properly – the kind of hidden engineering that keeps factories running smoothly. I'll give an example where they can eat well-made granola all made by Ajax mixers!

What's been the proudest moment of your career so far?

Seeing Ajax reputation grow even more into a respected specialist supplier with equipment operating all over the world, and knowing our designs genuinely make a difference as they improve safety and performance for our customers.

What's been the biggest challenge you've seen or faced yourself in the industry?

Helping companies understand that bulk solids don't behave quite as predictably or simply as liquids or gases – and that poor design



Ajax's twin mixer, used for mixing foodstuffs, like granola



If you didn't work in this industry, what would you be doing?

Probably something rooted in science as long as it offered variety and pushed my problem solving capabilities – I've always been drawn to challenges that way.

What's your goal for the next five years?

To further strengthen Ajax's technical capability, expand our specialist equipment range, and support even more customers in achieving reliable, efficient bulk handling.

What advice would you give to your younger self?

Cultivate your curiosity and ask probing questions, spend as much time as possible trying to understand how materials really behave – it's the 'solid' foundation needed for proper bulk materials equipment engineering.

For more information:
www.ajax.co.uk

choices early on can cause years of operational headaches. Getting them to understand that at the plant procurement stage is sometimes more difficult than it should be, even if it should be a 'no brainer' if they really consider all the costs of ownership and the impact on operational effectiveness when production begins.

"I'll give an example where they can eat well-made granola all made by Ajax mixers!"

Closer look at granola by Ajax

Ajax uses material testing and over 55 years of experience to help food and confectionery producers take care of their ingredients during handling and processing. Whether you're storing cocoa powder, mixing cereal or mashed potato, feeding pork rinds, or breaking down noodle nests, Ajax works with customers to understand their material & process, ensuring our equipment delivers the quality required.

For example, Ajax's new twin mixer has been designed to provide gentle yet thorough mixing, ensuring a homogenous mix without compromising on the integrity of the ingredients. The mixer also features a profiled casing which ensures all the ingredients are mixed actively by the sweep of the screws, preventing any 'dead' areas where material could otherwise build up.

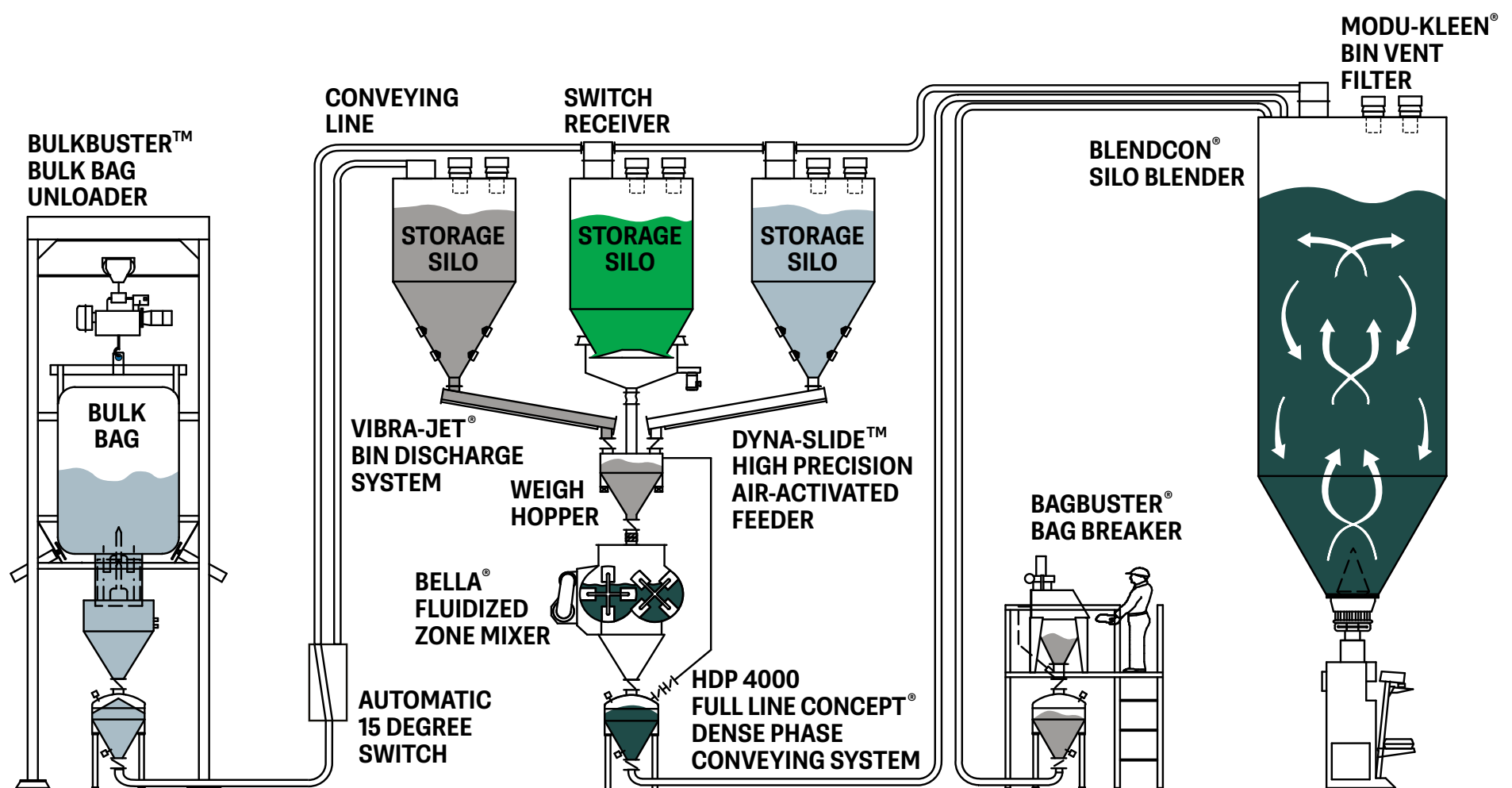
While cleaning is easy, as the highly polished mixer has covers giving great access to the internals, and the augers can even be withdrawn

from the machine from one end without disturbing the drive end arrangement. The mixer can be filled with water and cleaning fluid when its integrated blanking plate is fitted to the outlet. With the covers down, the mixer can be safely run as normal; the actions of the rotating screws are highly effective in helping to remove any remaining product.

This approach also helps producers adjust plant layout with their evolving demands. Recently, one of the world's leading food product manufacturers asked for Ajax's help in adapting a production line to pass through a metal detector. The plant's arrangement required the stainless-steel conveyor to be inclined at a steep angle, which, without careful consideration, could cause handling issues. By using a positive infed screw with specially selected flights, as well as optimising the screw's rotational speed, Ajax was able to ensure a reliable supply of material to an elevated position.



SOLUTIONS *that Power Success*



Who We Are

Dynamic Air has over five decades of expertise in designing and manufacturing pneumatic conveying systems and equipment for handling dry bulk solids. We are a leading provider of custom solutions for the handling of bulk materials for processing businesses across various industries.

Our Approach

We never take a cookie-cutter approach just to cut costs up front; we know that the right solution will save you money in the many years to come. Our tailored solutions involve thoughtful planning, meticulous engineering and precise manufacturing that optimize efficiency and productivity.

Dynamic Difference

At Dynamic Air, we set the standard for excellence in bulk solids handling. With a relentless focus on quality, reliability, and customer satisfaction, we deliver reliable, high-quality pneumatic conveying systems, equipment, and custom solutions that exceed expectations.



Dense Phase Transporter



DC-5® Air Saver Control



Bella® Fluidized Zone Mixer



Blendcon® Air Blending Head

DYNAMIC AIR®

www.dynamicair.com