

SHAPA

NEWS



DO YOU KNOW YOUR EXPLOSION RISK?

IEP Technologies have been providing market leading explosion protection solutions for over 60 years. International safety standards and guidelines legally require explosion mitigation and protection techniques to be put in place, however there is no “one size fits all” answer and the most effective solution will often be application specific.

Explosion protection systems are broadly divided into two groups:

- Active Explosion Protection
- Passive Explosion Protection

Active explosion protection systems rely on a detector of some kind – for example - pressure or optical, which then triggers an electrical circuit to cause the rapid actuation of an explosion protection device, such as an explosion suppressor.



In contrast, passive explosion systems rely on the pressure generated during the early stages of explosion development to cause a mechanical movement. For example, explosion relief vents open at a predetermined pressure to relieve the explosion pressure; the opening is caused by the explosion pressure itself.

NEW, IsoDisc™ Explosion Isolation

The IsoDisc™ is an effective, self-actuating and self-resettable passive device providing explosion isolation to applications such as inlets of mills or clean air ducting to interconnected equipment.





Louise Smallwood,
General Secretary, Solids Handling &
Processing Association (SHAPA)

PROGRESS, PARTNERSHIP AND PERFORMANCE

SHAPA Quarterly Roundup – Autumn 2025.

SHAPA is strengthening the solids handling industry through shared focus, collective action and continued development.

The past year has been one of meaningful progress, renewed collaboration, and sharpened focus across the bulk solids handling and processing community.

As we look ahead to 2026, our industry faces a landscape shaped by rapid technological evolution, global commercial pressures, and a growing expectation that manufacturers must not only deliver performance but demonstrate resilience, sustainability, and innovation in equal measure. Within SHAPA, these realities have not only informed our agenda, they have strengthened our collective resolve to champion best practice, foster capability, and support the long-term competitiveness of UK manufacturing.

Over the last quarter alone, our association has been active on several fronts: engaging with government-linked engineering bodies through our membership of the Engineering and Machinery Alliance (EAMA), building strategic partnerships, accelerating our digital transformation, and preparing the next generation of technical and commercial development opportunities for the sector. These efforts reflect a simple truth; our industry does its best work when it collaborates. When we share knowledge, challenges, and insights, we elevate the standard for everyone.

Strengthening the SHAPA Community
Membership remains strong, with 106 members

as we head towards 2026, including three new members in the last quarter - Rema Tip Top, Hadron Engineering, and Genesis Process Solutions. This continued growth reinforces the importance of a unified industry voice at a time when global supply chains and competitive dynamics continue to evolve.

During the past quarter, SHAPA has been present at some of our sector's key events - PPMA 2025, Resource & Waste Management Expo, BulkEx 2025, and various national engineering and machinery forums. These engagements ensure our members remain connected to major shifts in regulation, procurement expectations, and market opportunities.

The momentum behind our digital strategy is also picking up pace and the new SHAPA website - now in its final build stage - will not only modernise how we communicate but also enhance member visibility, offering richer company pages, dynamic news feeds, improved backlink opportunities, and greater ease of information sharing. In an era where digital presence directly influences commercial reach, this investment will serve our members for years to come.

Driving Skills, Knowledge and Best Practice
Learning and development are central to SHAPA, and 2025 included a programme of workshops, technical meetings, and cross-industry collaboration. Our recent sales workshop in Blackburn saw healthy demand from members, and our Technical and Marketing committees met at member company RHF Fans in Manchester this month too. Preparations are already

well underway for expanded technical learning opportunities in 2026, including the proposed ATEX Seminar Day and Introduction to Bulk Handling Day, both of which will leverage expertise from across the membership base. We're looking for member organisations who would like to get involved. Details have been shared in the recent Member Weekly Update E-Newsletters and anyone interested in taking part can contact me directly.



Further 2026 initiatives including a Marketing Workshop, an end-user survey, and deeper involvement with sector-specific associations, reflect our commitment to ensuring members not only stay informed but also stay ahead. The challenges of recruitment, training, and skills development remain some of the most frequently cited barriers to business growth, as highlighted once again by members during our recent Business Barometer survey discussions. Our priority is to ensure SHAPA continues to provide relevant, actionable support in these areas.



Responding to Market and Global Pressures

The conversations held at our autumn General Meeting echoed concerns that have been raised in other engineering and machinery forums nationwide. While enquiry levels remain robust, conversion times have lengthened, and market uncertainty continues to influence investment cycles. The rising prevalence of low-cost imported equipment remains a pressing issue for UK manufacturers, shaping both pricing dynamics and customer expectations. This topic has now become cross-organisational, with SHAPA collaborating with IMECHE and EAMA to look at how to engage with government to steer meaningful dialogue and advocate for fair and sustainable solutions for British industry.



In parallel, new government procurement approaches, the evolution of industrial strategy, and shifting support for export programmes are areas SHAPA continues to monitor closely. Insights shared by Paul O'Donnell, Alliance Secretary at EAMA during our latest General Meeting reaffirmed the importance of coordinated advocacy, particularly as opportunities in large-scale national projects and defence-related tenders become increasingly competitive and complex.

Celebrating Excellence Across the Sector

One highlight on the horizon is the **2026 SHAPA AGM & Solids Handling Industry Awards**, to be held at STEAM – Museum of the Great Western Railway in Swindon on 29 April 2026. This year's awards are sponsored by RHF Fans Limited and with expanded award categories, including two new additions: Engineer of the Year and Project of the Year - the programme has been designed to better reflect the diversity, talent, and innovation that characterises our sector today.

For 2026, the entry process moves fully digital, creating a smoother and more accessible route for members to showcase their achievements. From sustainability initiatives to groundbreaking technologies, from apprentice success stories to exemplary safety innovation, these awards remain a powerful platform to champion excellence and inspire future ambition.

You can enter the awards between 1st December 2025 and 21st February 2026. *Details of how to enter the Awards and to register for the AGM & Awards dinner can be found in the news section of the SHAPA website – www.shapa.co.uk*

A Sector Moving Forward Together

As we move toward 2026, several themes are emerging as central to our shared future. Digital capability, workforce development, value-driven innovation, and cross-industry collaboration are no longer optional - they are



essential components of sustained competitiveness. SHAPA's role, as ever, is to ensure our members have the intelligence, networks, and opportunities to navigate these changes with confidence.

For 2026 we're adding another speaker slot to our General Meetings, offering the opportunity for existing members to present. Information on registering your interest to present will be shared in the weekly newsletter and will be offered by ballot should interest be high.

We also introduced our quarterly Business Barometer at the Autumn General Meeting as a way of measuring opportunities and threats within the industry. This short anonymous survey will be sent out again before the Winter General Meeting in February and we encourage all members to take the time to fill this in.

All next year's planned activities signal a more connected and participatory SHAPA community - one where every member has a voice and a stake in shaping the direction of our collective progress. Our association has always thrived on the strength of its members. Your expertise, your innovation, and your willingness to engage are what make SHAPA an influential force within UK manufacturing. As we build toward another year of events, workshops, awards, and strategic development, I extend my thanks for your continued commitment to both the association and the wider industry.

The challenges ahead are real - but so are the opportunities. Together, through collaboration and shared purpose, we will continue to drive excellence in solids handling and processing, ensuring the UK remains a global leader in this critical field.

Key Dates for 2026

WINTER GENERAL MEETING - 11th February 2026

Moat House, Acton Trussell, Staffordshire

2026 AGM & SOLIDS HANDLING INDUSTRY AWARDS – 29th April 2026

STEAM – Museum of the Great Western Railway, Swindon

SUMMER GENERAL MEETING - 8th July 2026

Moat House, Acton Trussell, Staffordshire

AUTUMN GENERAL MEETING - 4th November 2026

Moat House, Acton Trussell, Staffordshire

To get involved or for more information contact Louise Smallwood – louise@shapa.co.uk, visit www.shapa.co.uk or follow us on LinkedIn @Shapa



SOLIDS HANDLING INDUSTRY AGM & AWARDS 2026



Export Award



Innovation in
Technology Award



Newcomer of
the Year Award



Company of
the Year Award



Apprentice Project
Prize Award

2026 AWARD CATEGORIES

Sustainability
of the Year Award



Innovation in Training
& Development Award



Innovation in
Safety Award



Project of the
Year Award



Engineer of the
Year Award



AWARDS CEREMONY

Wednesday 29th April 2026

STEAM: Museum of the Great Western Railway - Swindon

Visit www.shapa.co.uk for details on how to enter

For further information contact louise@shapa.co.uk

These awards are open to all UK registered member and non-member companies and institutions operating in the Solids Handling Industry. Shortlisted finalists will be notified in March 2026 and winners will be announced and presented at the awards ceremony on the evening of the 29th April 2026. Closing date for applications 21st February 2026.



Reflecting on a Remarkable Year at ISF

2025 has marked a milestone year for ISF. In November, the company was shortlisted in not one but two categories at the Yorkshire Post Business Awards: **Small Business of the Year** and **Business Leader of the Year for Managing Director, Iain Scott**. Although ISF did not take home the trophies on the night, reaching the finals in both categories is an achievement the whole team is rightly proud of – particularly given the calibre of companies and leaders represented across the shortlist.

For Iain, who founded ISF 36 years ago and has guided it from a one-man operation to a respected national engineering partner, being named a finalist in a category filled with some of Yorkshire's most influential and transformative business leaders was especially meaningful. *"To be in that company is an honour in itself,"* he said. *"It's a real reflection of what our whole team has built over the years."*

Celebrating a Quietly Powerful Contribution to British Manufacturing

ISF operates in a sector most people never see, but one the entire food supply chain depends on. From its base in York, the company designs, fabricates and installs bespoke machinery for the UK's animal feed milling industry. Every piece of equipment is produced in-house,



ISF Business Awards

giving ISF complete quality control and enabling its engineers to solve complex, site-specific challenges that standard solutions simply can't address.

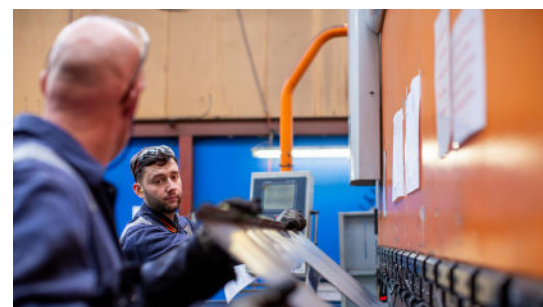
This commitment to craftsmanship, problem-solving and long-term partnership is one of the reasons ISF was shortlisted for Small Business of the Year. Over the last three years, the company has delivered sustained, healthy growth, strengthened customer relationships, invested in digital fabrication technologies and continued to refine leaner, more efficient manufacturing processes. Today, ISF employs a highly skilled 23-strong team, many of whom have been with the business for over two decades.

A Leadership Story Rooted in People, Purpose and Pride

Iain's nomination for Business Leader of the Year recognised more than commercial performance – it highlighted a leadership style shaped by integrity, resilience and a genuine commitment to people. His journey from a 16-year-old apprentice sheet metal worker to founder of one of the UK's leading feed mill engineering specialists spans more than five decades of quiet but significant industry contribution.

From the start, Iain built ISF on solid principles: quality first, people always, and relationships above transactions. Many of the company's long-standing customers have worked with ISF for decades; 95% of business still comes from repeat work. Internally, a culture of loyalty, mentorship and pride runs deep. Apprentices progress into leaders, expertise is passed down through generations, and every employee, regardless of role, is encouraged to take ownership of their craft.

This people-first approach has helped ISF navigate challenges from Avian Flu outbreaks to the 2008 financial crash and the COVID-19 pandemic. Each time, the company adapted without compromising its values,



ISF team in the workshop

whether diversifying into construction to protect jobs or turning its workshop into a PPE distribution hub during the pandemic.

A Year of Milestones, Momentum and Looking Ahead

Beyond the awards recognition, 2025 has been a year of progress and pride. ISF completed several major engineering projects, strengthened its apprenticeship pipeline with York College, and continued its unwavering commitment to quality, holding ISO 9001 accreditation for the 27th consecutive year.

As the business looks ahead, succession planning and next-generation development remain central to ISF's long-term vision. With a well-established leadership team stepping forward and a strong pool of apprentices coming through, the company is well positioned for the decades to come.

Proud, Reflective, and Ready for the Next Chapter

Although the awards night didn't end with a trophy, earning finalist positions in two competitive categories highlights ISF's impact, values and momentum. It reflects the dedication of a team that cares deeply about its craft – and the vision of a leader who has spent 36 years building something made to last.

ISF
01904 430005
sales@isfyork.com
www.isfyork.com



LEV Training

vent-tech

industrial environment control



BOHS accredited Qualifications provided by Vent-Tech

Vent-Tech are the only LEV Installation company in the UK accredited by BOHS to deliver training courses

Why train in LEV?

By law, employees need to be protected from harmful substances - one method for doing this is using Local Exhaust Ventilation (LEV) Systems.

The legal requirement (COSHH Regulation 9) requires all LEV systems to be tested by a competent person every 14 months.

The industry standard BOHS (British Occupational Hygiene Society) training courses that Vent-tech offer ensure that employees are protected and that legal obligations are met.



Courses we offer

- P600** - Methods for Testing the Performance of LEV Systems
- P601** - Thorough Examination and Testing of LEV Systems
- P602** - Basic Design Principles of LEV Systems
- P603** - Control of Hazardous Substances - PPE
- P604** - Performance Evaluation & Management of LEV Systems
- IP601** - International Proficiency Qualification. Examination and Testing of LEV Systems
- M200** - Basic Principles of Occupational Hygiene

Where are the courses held

We offer courses all over the UK to allow easy access for anyone wishing to attend. All our courses are also available to attend online. We even offer the option to run bespoke LEV courses at your premises. **For all the latest course dates, visit our website or call us today to discuss.**



Stephen Ryan

4 reviews • 3 photos

★★★★★ 12 weeks ago

Did my P604 course with them
And Adrian support, knowledge and delivery was outstanding.
A lot better than other training providers I had in the past.
I will only use Vent-Tech moving forward with the rest of my courses



Steve Ablett

10 reviews • 1 photo

★★★★★ 13 weeks ago

I recently attended the P601 course and I was thoroughly impressed with both the content and delivery. The course covered a significant amount of material, yet it was structured in a way that made even the more complex areas accessible and engaging. Adrian demonstrated deep expertise, breaking down challenging concepts and formulas into digestible sections while maintaining an interactive and supportive learning environment.

Despite the intensity of the content, the course was well-paced, allowing for thorough understanding and practical application. I left feeling confident in LEV Testing and inspection and would highly recommend this course to anyone looking to deepen their understanding in this topic.

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Business Park, Hawkfield Way,
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Vortex Global Announces Strategic Territory Realignment

Vortex Global is excited to announce a strategic realignment of its North American sales territories, effective October 1, 2025. This initiative enhances customer service by consolidating representation, ensuring partners manage the complete Vortex equipment portfolio in their designated regions. The changes involve key territories in Oklahoma, Northern Texas, Northern California, Western Nevada, and the Carolinas.

This realignment strengthens our commitment to providing customers with streamlined access to our full catalogue of dry bulk solids processing solutions. By partnering with experienced representatives who will now handle all Vortex equipment lines, we are improving technical support and creating a more cohesive customer experience.

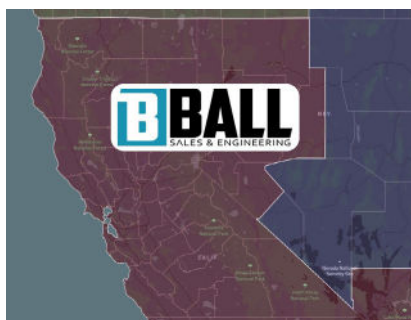
Shamrock Systems Inc. to Represent Oklahoma & Northern Texas



Vortex Global is pleased to announce that Shamrock Systems Inc. will expand its representation to include Vortex Loading Solutions in Oklahoma and Northern Texas. Shamrock Systems has been a valued Vortex representative for 37 years, consistently demonstrating deep technical knowledge and a customer-first approach.

Contact Shamrock Systems Inc.:
Phone: 1-888-557-4267
Email: sales@shamrock-systems.com
Website: shamrock-systems.com

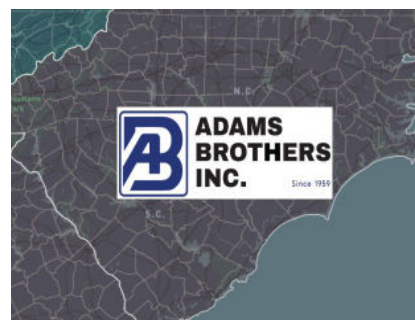
Ball Sales & Engineering to Cover Northern California & Western Nevada



In Northern California and Western Nevada, Vortex Global is proud to announce that Ball Sales & Engineering will assume representation for the entire territory. A trusted partner for 21 years, Ball Sales & Engineering has a reputation for industry expertise and a commitment to solving customer challenges.

Contact Ball Sales & Engineering:
Phone: 1-800-966-1127
Email: sales@ballengineering.com
Website: ballengineering.com

Adams Brothers Inc. to Manage North & South Carolina



Vortex Global has designated Adams Brothers Inc. as the exclusive representative for North and South Carolina. Having partnered with Vortex for 17 years, Adams Brothers Inc. has a deep understanding of our products and a strong record of serving the dry bulk solids industry across the Southeast.

Contact Adams Brothers Inc.:
Phone: 704-365-4255
Email: sales@adamsbrothersinc.com
Website: adamsbrothersinc.com

A Commitment to Enhanced Customer Service

This strategic realignment is a direct reflection of Vortex Global's commitment to engineering excellence and customer satisfaction. By consolidating representation with long-term, trusted partners like Shamrock Systems, Ball Sales & Engineering, and Adams Brothers Inc., we are creating a more efficient and supportive network for our customers.

We are dedicated to ensuring a smooth transition and appreciate the continued trust and loyalty of our customers. We look forward to serving the dry bulk handling needs across these key regions with the highest level of professionalism and expertise through these strengthened partnerships.

“Outstanding” New screw augers for AMG Chrome

Solids handling equipment maker, Ajax Equipment, has supplied AMG Chrome, a supplier of speciality metals, alloys & other materials, with two spare screw augers for an Ajax screw feeder to replace augers that has been in service for almost 20 years at the company's Rotherham, UK manufacturing site.

“We recently purchased two new screw augers from Ajax during a system refurbishment, and the experience was outstanding. From the moment we reached out to enquire about replacement components, their team were incredibly helpful and

knowledgeable, answering all our questions and guiding us through the best options for our needs. The screws themselves are manufactured to a high quality, and it's clear that Ajax takes pride in offering durable, reliable equipment. We highly recommend Ajax to anyone looking for high-quality equipment. They've earned our trust, and we will definitely be coming back for future equipment needs,” said Michael Channer, project manager at AMG Chrome.

Eddie McGee, managing director, Ajax Equipment, commented, “Each material has its own requirements, for example metal powders can be abrasive. Ajax works with each customer's bulk solid, performing material testing to develop a design that ensures reliable performance.”

For more information on Ajax Equipment's screw feeders call +44(0)1204 386723 or email: sales@ajax.co.uk



Innovative Air Solutions

Explosive dusts

Metallic dusts

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Chemical / Painting powder

Papers / Cardboard

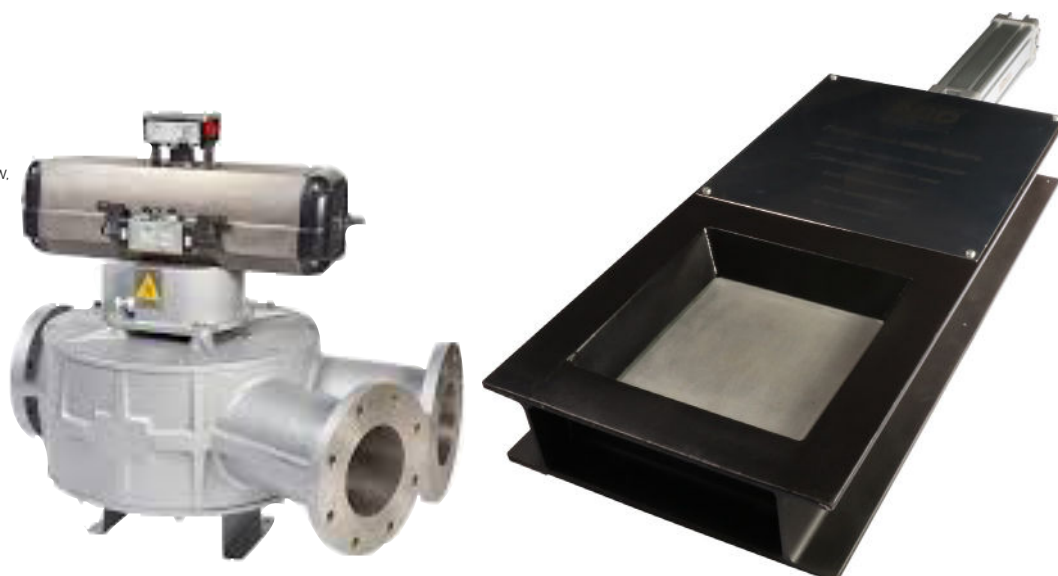
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By Ian Birkinshaw,
Technical Advisor



UNDERSTANDING VALVE TYPES IN THE BULK HANDLING INDUSTRY

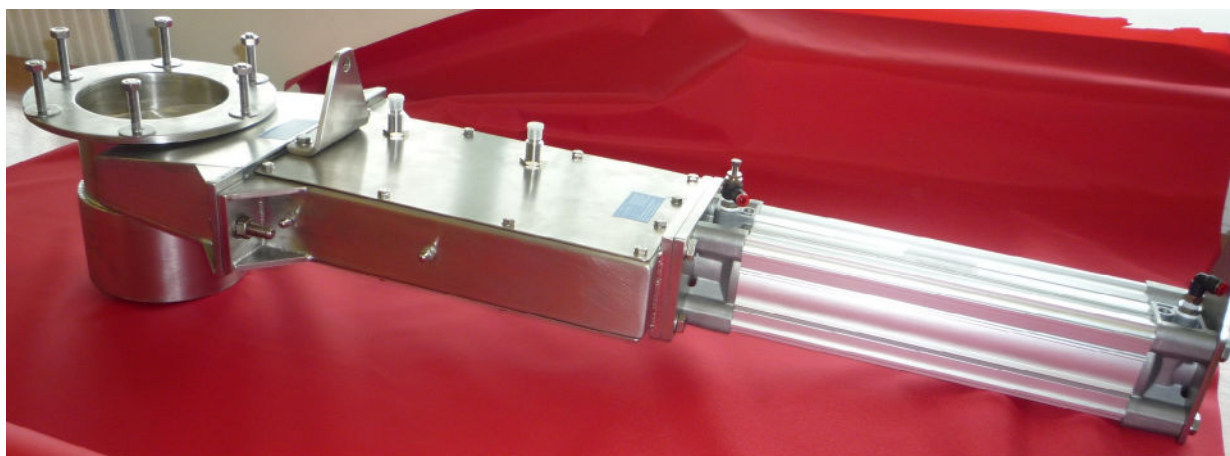
In the UK bulk handling industry, the choice of valve type plays a critical role in ensuring efficient, safe, and reliable material flow. Bulk handling systems manage the transport and control of dry powders, granules, and pellets across sectors such as cement, food, chemicals, and energy. The type of valve selected depends largely on the characteristics of the bulk material, the required flow control method and the operating environment. The most common valve types

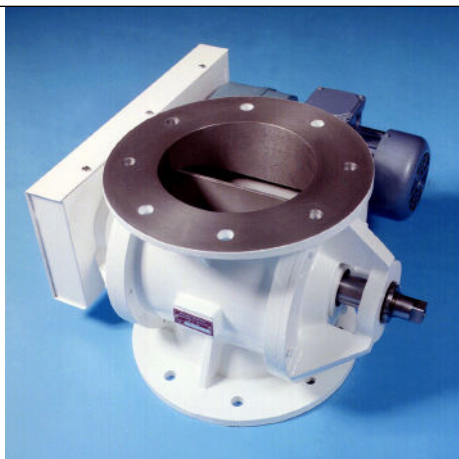
include slide gate valves, rotary valves, butterfly valves, diverter valves, and pinch valves each offering distinct mechanical designs and performance advantages.

Slide Gate Valves

Slide gate valves, sometimes called knife gate valves, are among the most widely used in bulk handling applications. They feature a flat sliding blade that opens and closes across the material flow path. These valves are ideal for on/off control of gravity fed or low-

pressure systems, particularly for handling powders and granular materials such as flour, cement, or plastic pellets. Slide gate valves are valued for their robustness and ease of maintenance. They are commonly fabricated from stainless or carbon steel and can include dust-tight seals to comply with environmental and health regulations. However, slide gates are less effective for precise flow control and can wear quickly if abrasive materials are handled without proper liners or coatings.





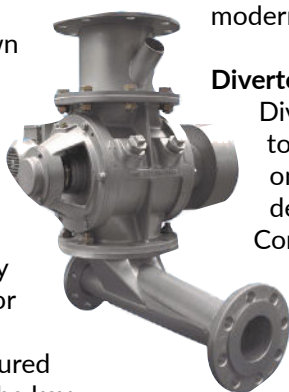
Rotary Valves

Rotary valves, also known as rotary airlocks, rotary feeders or blowing seals, provide both metering and airlock functions in process and pneumatic conveying systems. They consist of a rotating rotor within a housing, which traps and releases measured quantities of material. The key advantage of rotary valves lies in their ability to maintain a pressure differential between two areas of a process, making them essential in pneumatic conveying and dust collection systems. In industries such as food and pharmaceuticals, rotary valves are often precision engineered to meet ATEX and hygienic design standards. They are typically more expensive than gate valves but offer consistent feed rates and better control. Material selection is also critical: stainless steel and nickel-plated components are preferred for food-grade or corrosive applications, while cast iron models are very common in heavy industrial settings.

Butterfly Valves

Butterfly valves are lightweight, economical, and compact options for controlling bulk material flow in ducts, bins, and silos. They operate via a rotating disc that pivots within the valve body, allowing

for quick shut-off or throttling. Butterfly valves are particularly popular in low-pressure systems and gravity discharge chutes due to their simple design and ease of automation. While effective for fine powders and granules, butterfly valves are less suitable for highly abrasive or sticky materials, which can cause sealing or bridging issues. Nonetheless, their speed of operation and ability to integrate with actuators and sensors make them a preferred choice for automated process control in modern bulk handling plants.



Diverter Valves

Diverter valves are designed to direct material flow from one source to multiple destinations, or vice versa. Commonly used in chutes and conveying systems, they allow the routing of powders or pellets to different storage silos, mixers, or packaging lines without manual intervention.

Diverter valves come in several forms, such as flap-type, plug-type, or rotary diverters—each suited to specific material properties and pressure conditions. Diverter valves are often custom-built to meet process requirements, particularly in multi-line distribution systems. Their main advantage is operational flexibility, though they can be more complex to install and maintain compared to simpler valve types.

Pinch Valves

Pinch valves are designed for handling abrasive, corrosive, or fibrous bulk materials. They use a flexible elastomer sleeve that is pinched closed mechanically or pneumatically to stop material flow. Because there are no metal components in contact with the product, pinch valves offer excellent durability in harsh environments and are

easy to clean. In the mining and aggregates sectors, pinch valves are often selected for abrasion resistance and low maintenance requirements. However, they are not typically used for high-pressure or high-temperature applications.

Conclusion

Each valve type used in the UK bulk handling industry serves a specific operational purpose. Slide gates excel in isolation duties, rotary valves provide controlled feeding and airlock functions, butterfly valves offer compact and automated control, diverter valves enable flexible flow routing, and pinch valves handle abrasive materials with minimal wear. Selecting the right valve depends on the exact material characteristics, conveying method, environmental conditions, and maintenance considerations. As industries continue to prioritise efficiency, safety, and sustainability, proper valve selection remains central to achieving reliable and cost-effective bulk material handling operations.

As can be seen there are many differing processes under the global heading of process valves, this is where SHAPA can help, with its members many years of expertise through operating and providing valving solutions for material and solids handling processes you can be assured that SHAPA members have the right solution for your process. A quick visit to the Equipment Finder section on the SHAPA website www.shapa.co.uk will guide you through the different choices ensuring you have the right solution for your process needs.

For more information and assistance with all your solids and bulk handling requirements, visit the SHAPA website at www.shapa.co.uk or email your requirements to louise@shapa.co.uk where our members will be happy to help.



Slide gate valves, sometimes called knife gate valves, are among the most widely used in bulk handling applications.

THE LIFE AND TIMES OF AN INGREDIENT HANDLING SYSTEM

By Russell Davies, Principal Consulting Engineer of Systems Solution and Vice Chair of SHAPA

Contrary to popular belief, you can't just install, switch on and forget about an automated ingredient handling system. There are distinct phases involved with the design, procurement and maintenance that need to be considered for any system to operate continually at peak performance.

It is essential to invest some time and money in ensuring what is to be installed will be fit for purpose, taking into consideration material characteristics, environmental conditions and physical constraints within the facility, to name but a few.

Material characterisation probably stands out amongst all the considerations. Without knowing how an ingredient will flow, any process design is potentially flawed. This characterisation is generally neglected, as many clients are not prepared to evaluate the ingredients and most system suppliers will not incur the cost of doing so for fear of being uncompetitive.

More commonly, suppliers install fluidising pads and vibrators to encourage discharge from vessels and 'hope for the best' based on empirical data. There is substantial empirical data for ingredients such as flour, salt and sugar, but what about mixes of various ingredients, some of which may have high fat content or be highly hygroscopic? Is it worth guessing, only to find on commissioning the system simply blocks or operates well below the required conveying rate?

At this point it is too late, and the cost of potential modifications far outweigh the money that the material characterisation would have cost in the first place. At this stage there are financial implications to both the end user (under-performing system not achieving the ROI promised to the business) and the supplier, who may incur costs for modifications, replacement and financial penalties. Prevention is far better, and less costly, than cure.

Writing a comprehensive User Requirement Specification is essential, outlining the overall requirements, current experiences with similar systems (no point in re-designing the wheel) and any constraints, but not being too specific so as to limit the supplier's options. Suppliers are generally 'the experts' but need to understand the boundaries to work within.

For pneumatic conveying systems is vacuum better than blowing?

The decision should be based on the individual merits of each situation. Blowing systems generally have higher capacity and can convey over longer distances than vacuum systems, but temperature can be an issue as well as air or product leakage. Any reputable supplier should be able to evaluate the requirements and design a system based on the merits rather than their preferences.

Independent evaluation of suppliers' quotations is always worth considering as

many clients don't necessarily know the right questions to ask in which case they don't get the right answers. An upfront cost that may well pay for itself many times over, to ensure the fundamental concept is correct from the outset.

Once the system concept is agreed, POs placed, the system designed, engineered, installed and commissioned it can't just be left to operate without some tender loving care.

Preventative maintenance is essential to ensure any system operates continually at peak performance. If you don't schedule maintenance, maintenance will schedule itself, resulting in blockages, breakdowns and loss of production. Without a reliable ingredient feed systems the whole production process stops with the resulting loss of profit. This generally far outweighs the cost of any maintenance procedures. Ask yourself how much does it cost the business if we can't manufacture for an hour!

Ongoing annual inspections will minimise any down time by identifying potential issues and addressing them before failure. System performance gradually deteriorates unnoticed, but an annual inspection will identify step changes in performance. Again, prevention is far better and cheaper than cure.

System Solutions [Midlands] Ltd.
Tel: +44 [0] 7730 518-149
E-mail: rdavies@systsol.co.uk
www.systemsolutionsltd.co.uk

Modu-Kleen® Downdraft Series Dust Collector

The Modu-Kleen downdraft dust collector developed by Dynamic Air is an automatic self-cleaning dust collector that offers significant advantages over conventional dust collectors with regard to performance, efficiency, filter access, energy, noise, maintenance and space requirements.

With the Modu-Kleen downdraft dust collector, dirty air enters at the top of the dust collector housing and flows downward to the cartridge filters, improving the filtering process and the material-to-air ratio. Air velocities are much lower than those with a conventional dust collector, reducing the load on each filter cartridge and extending filter life. Cartridge filters are positioned horizontally, requiring less floor space, and making filter removal easier.

Personnel never have to enter the filter housing for general maintenance or for cartridge filter removal, making the process much safer and quicker. For fast and easy inspections, a large, quick-opening door allows maintenance personnel to closely inspect each cartridge when required and any single cartridge can be removed without disturbing adjacent cartridges. Because each cartridge filter has a unique built-in quarter turn bayonet mount, no tools of any kind are required for cartridge removal.



Dynamic Air Ltd.
Milton Keynes, United Kingdom
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www.dynamicair.com

[Read more here](#)

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for over 50 years

Showcasing our products
and services

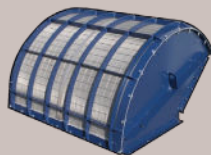
Our specialist industries

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- Biomass Safety
- Waste
- Cement Industry

www.explosionhazards.co.uk

Explosion Venting

Explosion venting devices limit the over-pressure and mitigate damage to process equipment by controlled venting of the excess pressure with or without flame to a safe area. ATEX explosion venting systems offer an economical, cost-effective means for explosion protection. We have the latest and best in explosion venting technology, over 50 years of practical design knowledge and up to date computer modelling.



Explosion Suppression

Explosion Suppression Systems are fast fire extinguishing systems that detect the explosion pressure in a protected plant and then mitigates the flame/pressure damage to an acceptable level. For the very best in explosion suppression solutions, view our full range of ATEX solutions.



Explosion Isolation

Most processes involve interconnection with associated vessels. To prevent propagation to other vessels, it is essential to apply appropriate explosion isolation devices to prevent flame, spark and/or pressure from transmitting to the other vessels. For the very best in explosion isolation solutions, view our full range.



Atex CO ACOM Systems

The Atex CO detection system uses advanced carbon monoxide (CO) sensors to detect early stages of powder combustion before a fire or explosion can be ignited.



Email: info@explosionhazards.com

CASE STUDY:

Cooler Replacement in the Animal Feed & Milling Sector

Problem

A manufacturer in the animal feed and cereal milling sector was operating a cooler system that had been in service for 25–30 years. The equipment was outdated and unreliable. It also generated excessive noise, causing complaints from neighbouring businesses. The project required a complete replacement to modernise operations, reduce noise, and deliver a future-proof solution, all within a strict timeline.

Impact

The ageing cooler created both operational and reputational risks:

- Operational risk: Obsolete equipment increased the chance of breakdowns, inefficiencies, and potential production downtime.
- Community impact: Excessive noise led to complaints from neighbours, threatening local relationships.
- Project complexity: The replacement involved structural reinforcement, floor replacement, mechanical installation, handling equipment, and craning of heavy machinery—all requiring careful planning to meet the required five-week shutdown.

Solution

GAME Engineering delivered a full cooler replacement, integrating customer-supplied equipment with in-house engineering expertise:

- Customer-supplied equipment: Cooler, pellet press, sieve, crumbler, fan, and cyclofilter.
- GAME-supplied equipment & works: Chain conveyors, discharge screw, supporting steelwork, bespoke aspiration ducting, access platforms, and chutework.
- Structural works: In-house fabricated steel, CE marked to Execution Class 2 for load-bearing structures, plus additional steel to strengthen the cooler floor.
- Mechanical works: Completed by 8 engineers working weekdays and weekends, totaling 2,500 hours.
- Craning operations: Pellet press lifted through the roof by GAME-appointed lift supervisor, trained signallers, and slingers.
- Shutdown coordination: Full line shutdown of Line 4 for approx. 5 weeks; customer carried out electrical and control software works.

Outcome

The replacement delivered a modern, quieter, and future-proof cooler system. Structural reinforcements and floor replacement improved durability, while in-house handling and mechanical works ensured the project was completed safely, efficiently, and on time.

For further information please contact [Game Engineering](#)





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FUEL - OXYGEN - IGNITION



By Tony Goodwin,
Managing Director of
British Rema

AN EXPERT GUIDE TO MILLING TECHNOLOGY

Tony Goodwin, Managing Director of British Rema, one of the UK's leading manufacturers of milling and grinding machines, discusses the importance of matching machine to application, particularly for short material runs or small particle milling.

Specifying the best milling technology for dry powder whether for minerals, chemicals,

polymers or metals, is not as straightforward as it seems. Customers must consistently achieve the right powder characteristics to ensure product quality and process performance whilst a host of variables - material type, sensitivity to heat, particle size distribution - will all influence which milling technology will best align with the process specification.

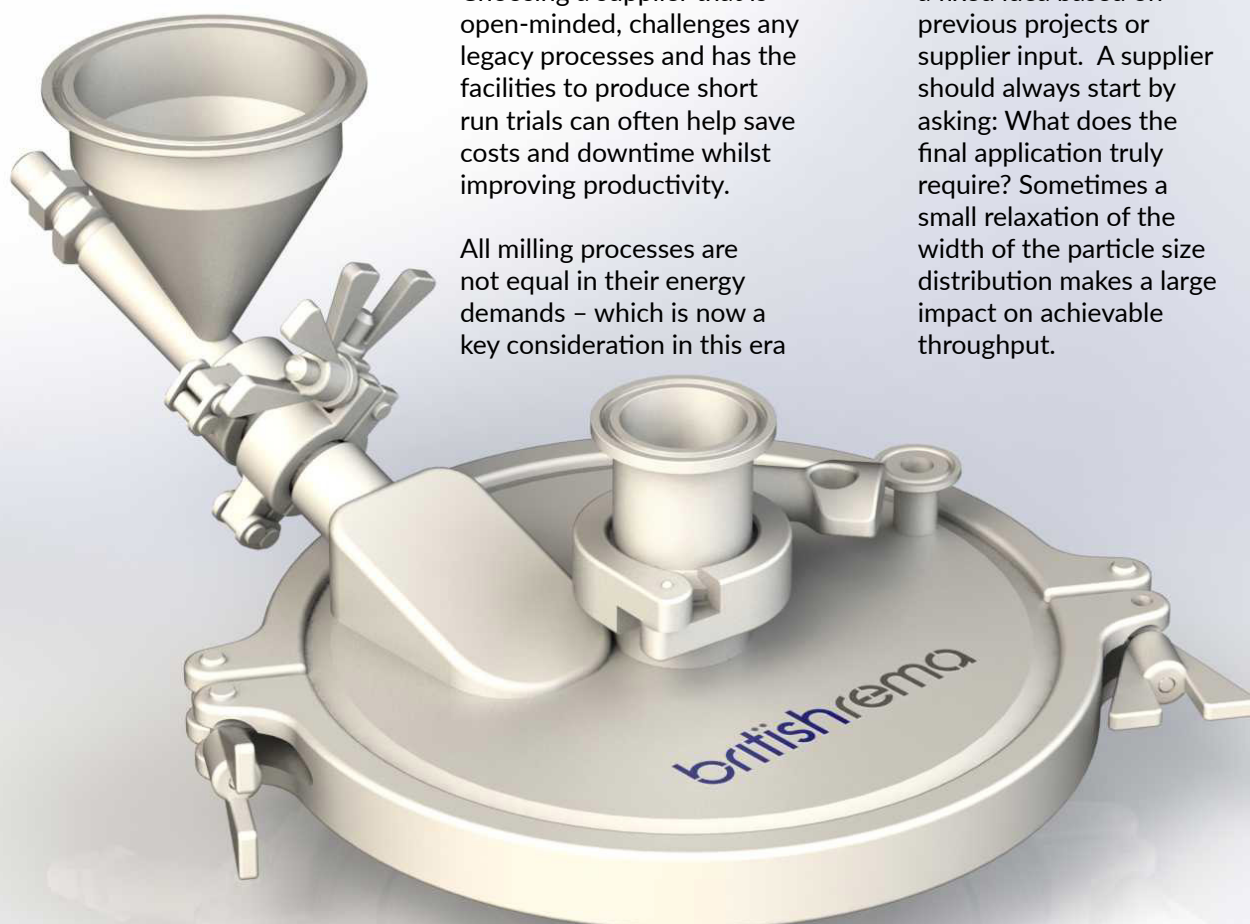
Choosing a supplier that is open-minded, challenges any legacy processes and has the facilities to produce short run trials can often help save costs and downtime whilst improving productivity.

All milling processes are not equal in their energy demands - which is now a key consideration in this era

of high energy costs. Giving careful consideration to the amount of input energy required per kilogram of process yield is now much more important from both a cost and environmental impact perspective.

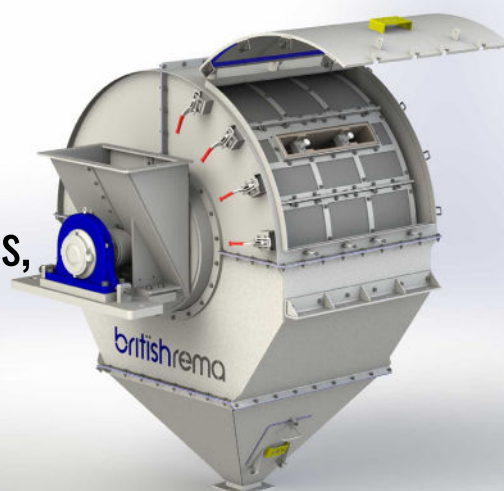
Classic pitfalls to avoid during specification

- Don't take the specification for granted: Many customers have a fixed idea based on previous projects or supplier input. A supplier should always start by asking: What does the final application truly require? Sometimes a small relaxation of the width of the particle size distribution makes a large impact on achievable throughput.





Specifying the best milling technology for dry powder whether for minerals, chemicals, polymers or metals, is not as straightforward as it seems.



- Don't over-specify: Sometimes industry standards are stricter than necessary, driving up processing costs. Slight parameter relaxations can enable much more efficient production, or even open up the use of entirely different milling methods that might be faster or more cost-effective.
- Don't presume the answer – test it. There is no substitute for running actual mill trials on the real material for a given application. What works in theory for one product format may fall short with another
- Always consider how repeatable physical characteristics of the feedstock can be maintained, especially if the process material is from organic sources. Any variation in hardness, moisture content etc., will likely require milling parameters to be adjusted in order to compensate for the effects on milling performance. Some

technologies can accommodate these shifts in the physical characteristics better than others. It is easy to find that you have a system that can only process feedstock within a very narrow range.

Consider all the technology options

The most common machines for dry material milling include:

- **Air Micronisers (Jet Mills):** Ideal for producing ultra-fine powders, particularly when starting with already fine feed. These mills use extremely fast air jets to cause particle collisions and size reduction, available in opposed jet and spiral flow configurations – the latter able to handle harder materials and offer close particle size control. Jet Mills are designed for throughputs of between 0.5kg and 2 tonnes per hour. Spiral Flow Mills are designed for throughputs of between 1kg and 100kgs per hour.
- **Rotary Impact Mills:** Sometimes called beater or hammer mills, these use high-speed rotors to impact particles against liners and themselves. They are suitable for materials up to 3 on the Mohs hardness scale and effective for medium-coarse to fine grades (beater & pin mills at the finer end, hammer mills at coarser grades) including

finished product of 500 microns and below. Rotary impact mills are widely used for reducing particle size in the chemicals, food, metal powders, minerals and plastics industries.

- **Classifier Mills:** These hybrid machines are a combination of impact rotor and precise classifier wheel for applications requiring tightly controlled particle size distributions. Classifier mills can also handle products with complex melting or softening points due to options for chilled or secondary air injection. They are used for throughputs of between 1kg and 6 tonnes per hour.
- **Ball mills and other tumbling mills (tube mills, rod mills and batch mills):** Used for robust, coarse or fine grinding across a range of mineral applications, especially where longer retention times or heavy-duty size reduction are required. Often used in cases where the feedstock is extremely abrasive – a limitation other milling technologies struggle to overcome.

Ancillary Services

It is always worth considering a manufacturer that has an in-house laboratory with expert lab technicians to complement core milling with classification, mixing, blending and drying solutions for pilot laboratory work (or even fully outsourced production). For

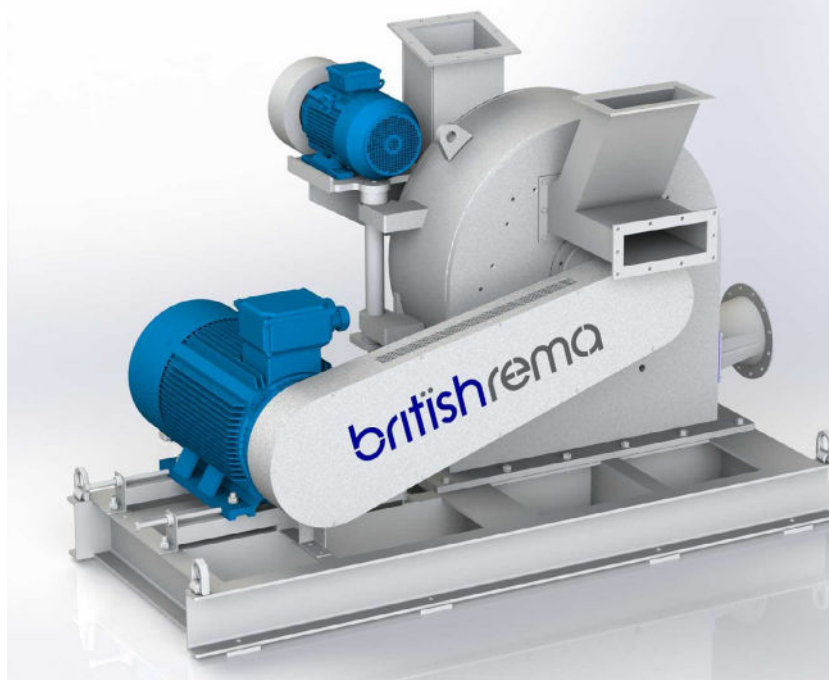


new products and trial runs, the service is priceless and ensures the customer can focus on his current business, whilst leaving new product developments trials to specialists.

More than just a machine

It sounds obvious, but for the best possible outcome it's important to choose a supplier who offers more than just the machine. Customer service and aftercare are givens perhaps, but the important on-going support for customers is not to be underestimated and a must to ensure efficiency and productivity. Suppliers that offer proactive servicing, with a knowledgeable parts team (and plenty of stock), engineers that can deliver scheduled maintenance or emergency repairs and a training team that can support in-house technicians will facilitate mill uptime not costly downtime.

It's often preferential from a production perspective to have the selected milling technology installed and commissioned as quickly as possible given pressures to return on the investment quickly; often this results in no time, budget or desire for the supplier to optimise the process. Just a few extra kilos processed per hour or a reduction of a few kilowatts of input power per kilo of production will shorten the return on investment and will continue to deliver savings for the



entire life of the asset...don't miss the opportunity to optimise your process.

The final word

Selecting milling technology is not simple. Carefully consider which technology is right for your business and engage with manufacturers that can deliver whole solutions and who aren't afraid to challenge the status quo, who will recommend solutions based on their long-term experience in manufacturing and contract processing – one that understands the complexities. A supplier that works until the best solution is found.



About the author

Tony has been MD of British Rema for approaching three years. Engineer by trade, he has previously worked in the powder technology and valve technology sectors, bringing experience that fits all the competencies of the British Rema brand.

Equipment selector guide

This information gives an indication of the particle sizes that may be achieved from the equipment.

Since materials and feedstocks vary considerably, this is only intended as a guide.

EQUIPMENT		MICRON SIZE														
		>500	500	300	200	150	100	75	45	32	20	15	10	5	3	<3
Air Micronisers	Opposed Jet Mill															
	Spiral Flow Jet Mill															
Rotary Impact Mills	Classifier Mill															
	Impact Mill															
Ball Mills	Batch Mill															
	Grate Discharge Mill															
	Screen Discharge Mill															



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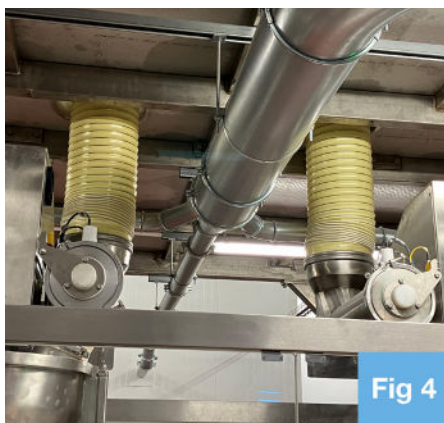
Sieve area stays cleaner with BFM® fitting - Fig 1



BFM® connectors last longer - Fig 2



Adjustable filling with BFM® flexi connectors - Fig 3



Adjustable filling with BFM® flexi connectors - Fig 4

BFM® FITTING:

How standardised flexible connectors helped Dry Powder Blending company

Allicio Nutrition Ltd upgrades 25+ connection points to BFM® fitting - improving health and safety, reducing changeover time and eliminating product leaks.

The Challenge

Flexible connectors of many shapes, sizes, materials and media are often used in the production process. This can cause operational challenges and limit optimisation.

Allicio Nutrition Ltd, a UK-based dry powder blending company, produces around 120 tonnes of nutritional products each week at one of its sites. They have around 35 different flexible connectors across 7 Customer Packed Goods (CPG) and Bulk Blending processing lines.

Regular product changes require a team of 3 to clean the lines between each product blend to avoid cross-contamination. When switching from allergens like dairy, a "full clean" is required. This takes around 4 hours for CPG lines and 12 hours for Bulk lines. During a full clean, each flexible connector is either removed for cleaning or replaced entirely. The connectors vary in size, shape and material but are mostly secured with jubilee clips that are time consuming to remove and re-attach. This means a large portion of the clean is spent on this activity. For example, on Bulk lines, it takes 2 team members 4 hours.

The jubilee clips provided a poor seal and often led to product leaks, increasing both dust levels and cleaning time. To compensate for potential leakage, an extra 2% of product was regularly added to each batch.

ProSpare's solution

In 2017, the site reached out to ProSpare, looking to make their process cleaner, safer, and more efficient by using BFM® fitting. BFM® fitting offers a dust-tight seal via a wide range of standardised BLUEBAND™ connectors and specially formed spigots, streamlining inventory and simplifying changes.

Over 8 years, ProSpare and Allicio have worked together to upgrade 25+ connection points to BFM® fitting. The Safety, Health, and Environment Coordinator told us:

"BFM® fitting has improved health and safety on site. At one point, our staff were required to wear masks due to dust levels. I'd say BFM® has directly contributed to the team no longer being required to wear masks. Standardising our flexible connectors has helped massively. BFM® is far quicker to changeover. It takes a quarter of the time to change BFM® connectors compared to ones with jubilee clips and only requires 1 staff member [instead of 2] - freeing the other staff to just focus on cleaning and reduce the time it takes. Time we spend cleaning, we aren't making money so reducing how long this takes is critical. There are no product leaks where BFM® is installed, further reducing cleaning time. Also, because there's no leaks, we no longer add extra product into the batch."

BFM® connectors last longer - Fig 2

The Seeflex 040E connector was one of the first installed around 6 years ago and is still in great working condition. This success was the catalyst for a wider rollout.

Sieve area stays cleaner with BFM® fitting - Fig 1

The previous breather and connector on the sieve did not seal effectively, resulting in regular product leaks and 4.5 hours cleaning each week. With BFM® breathers and connectors, there's no product leakage, cutting cleaning to 1 hour a week.

Adjustable filling with BFM® flexi connectors - Fig 3 & 4

The hoppers under the sieve connect to filling machines that move up and down to adapt to different packaging sizes. With a 3:1 compression ratio, BFM® 'flexi' connectors adjust to required lengths, whilst still providing a 100% dust-tight seal.

Allicio are next looking to upgrade the Bulk Blending lines with BFM® fitting Bulk Bag Loaders.

For more information, contact ProSpare Ltd - UK distributor for BFM® fitting:
Visit - www.prospare.co.uk
E-mail - sales@prospare.co.uk
Call - 01773 814008



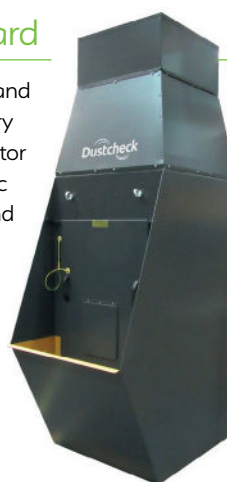
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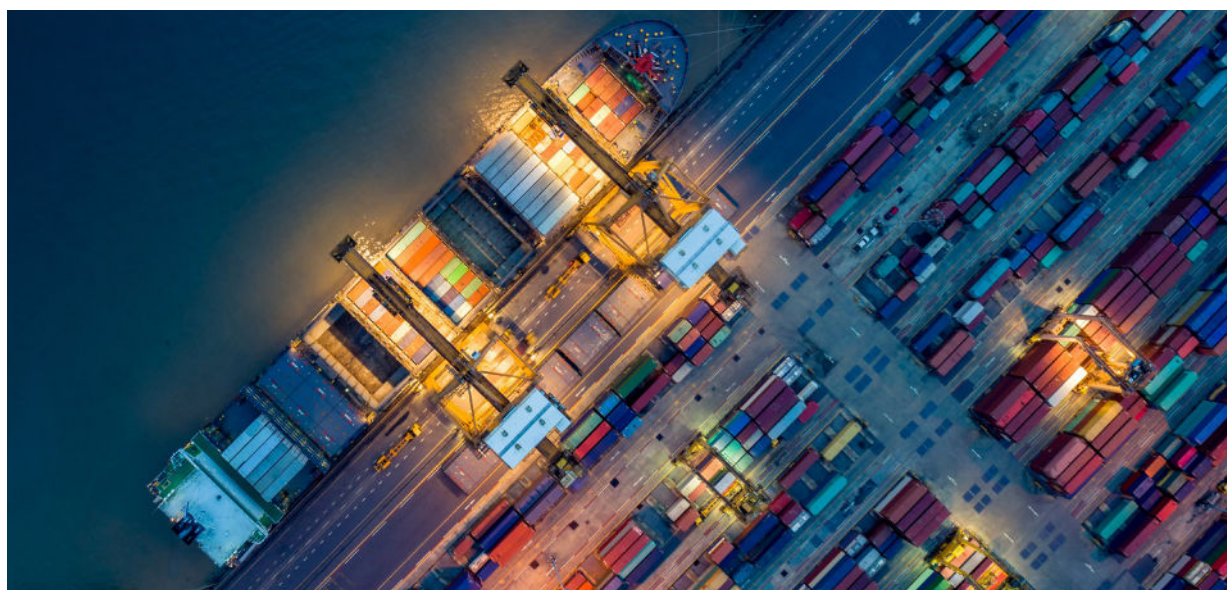
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By Ben Beattie,
Director at Forbeats

TOLL PROCESSORS CAN MITIGATE PROCESSING DISRUPTION

From pharmaceuticals and chemicals to food and beverages and plastics and rubber, the processing industry faces constant disruption from a wide range of challenges that threaten the ability to fulfil orders. Ben Beattie, Director of Forbeats, explores the impact on the sector and explains the role of toll processing in providing the expertise, capacity and facilities processors need to overcome shortages, delays and bottlenecks.



A catalogue of disruption

The vital role of the processing sector means that when disruption occurs, its effects are felt not just by other sectors, but by the multitude of end users who depend on its products. Delayed deliveries mean supermarket shortages, damaged reputations, contract cancellations and even put lives at risk.

Today, the processing industry faces a catalogue of challenges, many of them chronic. The prolonged Russian-Ukrainian war and the attacks on shipping in the Red Sea have led to shortages and delays, inflated shipping costs and a reduction in road haulage and ocean cargo capacity.

Businesses also have to contend with ongoing Brexit issues, like UK REACH. The increasingly complex regulatory landscape has resulted in additional bureaucracy, border checks and costs that impact delivery, cause bottlenecks and reduce profitability.

Natural disasters, many of them climate-related, are also having a profound effect. The increase in wildfires, flooding, droughts and major storms has had a devastating impact on raw material availability across many sectors, causing shortages, delays and price increases.

Most recently, businesses have had to deal with the threat of trade tariffs. Aside from their impact on import and export costs, processors have

to navigate their volatility, with duty rates sometimes changing with little notice. Fluctuations can impact everything from the affordability of raw materials to the competitiveness of a company's pricing.

An alternative supply chain

Shortages and delays are two of the most disruptive consequences of today's challenges, often resulting in bottlenecks that put deadlines at risk. Experienced toll processors, however, have alternative supply chains that enable them to circumvent these issues.

Through decades of working in the industry, they have established trusted relationships with other firms. The result is a network through which toll processors can reliably source delayed or scarce materials from other companies' surplus supplies.

Moreover, by maintaining a live database of surplus goods, contractors instantly know what is available and can procure it quickly.

This, combined with focused stock control, order forecasting and process and cost optimisation, enables processing to continue as scheduled.

Beyond countering supply disruption, these networks extend a toll processor's operational capacity and enable it to deliver an end-to-end solution. As a result, it can provide COMAH facilities, BRC accreditation, custom packing, repacking and labelling, administrative services, import and export clearance, warehousing and logistics, and batch traceability.

Moreover, by working with a single toll-processing partner that manages the entire manufacturing process, manufacturers can streamline their outsourcing burden, save time and eradicate inefficiencies.

Custom services for the processing industry

Experienced toll processors have the setup needed to ensure manufacturers can overcome



By working with a single toll-processing partner that manages the entire manufacturing process, manufacturers can streamline their outsourcing burden, save time and eradicate inefficiencies.





Robust quality management systems, together with ISO9001 accreditation, relevant expertise and fully equipped facilities, enable toll processors to handle materials across hazard classes and viscosities, ensuring processing, transport and storage are carried out to the highest standards.

disruption. In-house facilities will include specialist plant and equipment, while a highly skilled workforce is able to operate autonomously. Strict quality assurance, meanwhile, ensures high-quality, low-waste processing is carried out efficiently and safely.

This setup enables toll processors to provide the full spectrum of processing and chemical handling services, including the handling of hazardous chemicals, the creation of custom formulations, multi-ingredient formula blending, powder blending, liquid blending and kibbling.

Aside from processing, toll processors can also offer manufacturers a range of other bespoke services, which include re-packaging goods into specified container types and sizes and custom packaging options.

With regard to capacity, an end-to-end toll processor has the agility and flexibility to provide both one-off and continual processing and can do so at a global scale. This significantly reduces the pressure on manufacturers, enabling them to overcome bottlenecks and focus on other demands, such as sales and marketing.

Ensuring safety and regulatory compliance

Safety and regulatory compliance are key considerations when choosing a toll processing partner.



Their ability to handle all materials safely and in accordance with current regulations and Good Manufacturing Practice (GMP) standards is, therefore, essential.

Robust quality management systems, together with ISO9001 accreditation, relevant expertise and fully equipped facilities, enable toll processors to handle materials across hazard classes and viscosities, ensuring processing, transport and storage are carried out to the highest standards.

In addition, they will possess up-to-date knowledge of current regulations and best practices for all the processing and chemical handling operations undertaken, providing batch traceability,

sample analysis and detailed record keeping where required.

Furthermore, by utilising the multi-disciplinary expertise within their extended supply network, not only can toll processors ensure safety and quality, but they can also scale at speed, offering manufacturers greater agility and the opportunity to make economy of scale savings.

In an environment where supply chain disruption, market uncertainty and increasing regulatory demands look set to persist, toll processors can play a strategic role in the processing industry. With the expertise, resilience and agility to overcome disruption, they provide end-to-end solutions that ensure orders are fulfilled on time, cost-effectively, safely and to the highest quality.



About the author

Ben Beattie is Director at toll processing and contract management specialist Forbeats. He joined the company six years ago, following ten years in the golf hospitality industry.

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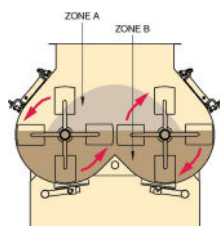


Figure 1

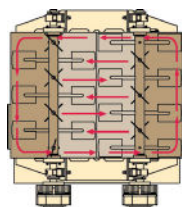


Figure 2

The Bella mixer consists of twin drums which have two counter-rotating agitators with specifically angled paddles. They overlap at the center and completely sweep the entire bottom of both mixer drums and allow it to be started under full load (Figure 1). The material in the mixer moves in a horizontal counterclockwise direction at the perimeter while simultaneously moving both left and right in the center (Figure 2). The material in Zone B (Figure 1) is in its normal gravimetric state as it is being moved and disbursed.

In Zone A, a weightless zone is created which effectively lifts the ingredients to an almost weightless state allowing them to move freely and randomly, regardless of particle size and

density. Thus, the two zones' interaction becomes highly efficient as every particle moves rapidly to a highly homogeneous mix, the key to the Bella Mixer mixing technology for fast, precise mixing.

The Bella mixer is available in stainless steel for food applications. Custom sizes, finishes and materials of construction are available upon request.

[Read more here](#)

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FILTERMIST LAUNCHES F SAVE TO HELP MACHINE TOOL OPERATORS CUT COSTS AND ENERGY USAGE

Filtermist Limited, one of the world's leading oil mist extraction specialists, has unveiled new technology that can help manufacturers significantly improve environmental performance by cutting machine tool energy use by up to 80%.

The Telford-based company, which supplies customers in more than sixty countries, launched its new smart system, F Save, at EMO Hannover. The technology optimises the operation of Filtermist oil mist collectors so the unit only runs when required, instead of operating continuously throughout a shift.

F Save works by using a sensor attached to the machine tool's coolant pump, which communicates with the F Save Hub. When the pump is inactive, the Filtermist unit automatically switches off. As oil mist is only generated when coolant is in use, this approach eliminates unnecessary energy consumption while ensuring operators remain fully protected from harmful airborne particles.

"Our research showed that some machines are only operational for around 20-30% of the working day," explained René Joppi, Managing Director at Filtermist. "If our unit runs constantly during this time, it wastes resources, increases costs and adds to a company's carbon footprint. With F Save, customers can cut energy usage by up to 80% and in some cases achieve payback in under three months."

Designed for fast, simple installation, F Save does not require electrical interfacing with the machine tool,

making it ideal for retrofitting. It also removes the risk of operators forgetting to switch extraction units on or off, maintaining clean and safe working environments.

Applications Engineer Krzysztof Kaszuba, who led the pre-study, noted that machine tools typically only cut parts for around half of their operating time. *"The rest is taken up by tool changes, part changes or similar activities. F Save prevents energy being wasted during these periods, offering a simple and effective way to cut energy use without compromising safety."*

Part of the Swedish-based Absolent Air Care Group, Filtermist provides a wide range of air extraction products and services for oil mist, smoke, dust and fume.

F Save is available now through Filtermist and its global distributor network.

For more information, please visit www.filtermist.co.uk or by calling 01952 290500.





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- Rotation control
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By Dan Baxter,
Material Handling Sales Engineer at
FEECO International

REQUIREMENTS FOR BULK HANDLING EQUIPMENT IN THE MINING INDUSTRY

Bulk material handling equipment acts as the circulatory system behind mining and mineral processing operations, transferring material around and throughout the mine and processing plant.

Bucket elevators, conveyors, belt trippers, and more, ensure continuity in the process of extracting, beneficiating, storing, and loading out the minerals that society increasingly depends on. As critical minerals continue to gain importance and bolster investments in the mining industry, handling equipment is in high demand, but not just any handling equipment is suitable when it comes to mining.

The demands placed on equipment at mine sites are unmatched; many mines run continuously for months at a time in remote locations, processing heavy, abrasive materials in extreme weather. As a result, material handling equipment intended for the mining industry requires an especially robust build beyond what's required of traditional handling applications.



Bucket elevator inlet



Conveyor head section (guarding and walkway visible)

Bulk Material Handling at Mine Sites

Bulk material handling equipment for mines is subject to some of the harshest operating conditions possible, with equipment expected to perform under the following conditions:

- Corrosive environments and materials
- Extreme weather
- Highly abrasive materials
- High tonnages
- Continuous extended operation
- Heavy loading

As with any facility, mine sites rely on various types of bulk material handling equipment to transport material around the site. The two most fundamental types are the troughed belt conveyor and the bucket elevator, with conveyors handling most horizontal or slightly inclined transportation and elevators lifting materials vertically.

At the most fundamental level, mine operators expect this equipment to meet two critical priorities above all else: safety and reliability.

Safety

With many potential hazards present, safety is the top priority for mine operators. This is true of all mine sites but is especially critical when sites are remote or lacking immediate access to comprehensive medical care.

The Mining Safety and Health Administration, or MSHA, sets forth a variety of regulations mines must comply with in order to continue operating, including regulations on bulk material handling equipment. Due to the heightened potential for danger at mine sites, MSHA regulations are generally more rigorous than those of the Occupational Safety and Health Administration (OSHA), which oversees other industrial settings.

Original equipment manufacturers (OEMs) must be familiar with MSHA requirements and capable of meeting them through guarding and component selection, protecting employees from pinch points, moving parts, falling components, and other safety hazards. For example, MSHA sets parameters on optimum heights for pull cord switches and requires "reach protection" around pulleys (in contrast, OSHA requires pulleys only be guarded, not protected from personnel reaching around guarding). These regulations can

differ by location as well, with Canada requiring full-length guards along the entire length of skirtboards in some settings.

Reliability

Reliability holds equal importance.

While the mining industry does not have formal regulations on component sizing or equipment build, mine operators expect their equipment to be reliable under harsh operating conditions. This requires a heavy-duty build of all components, often recognised with the unofficial designation of “mine duty” to ensure the equipment can perform reliably long term.

Mine-Duty Bulk Handling Equipment

The safety and reliability requirements of mine-duty bucket elevators, conveyors, and other handling equipment are achieved through several key criteria:

Safety Features & Guarding

A safe operating environment starts by minimising human-machine interaction where possible. Machine health monitoring technologies have made significant advancements in improving safety through minimised human interaction.

Where once conditions such as oil or bearing temperature and vibration had to be observed by a person, these items can now be monitored via sensors. Sensor feedback can all be monitored from the control room and can even alert operators remotely when parameters fall out of specification.

Guarding must meet or exceed MSHA requirements to protect personnel from pinch points and moving parts around various areas, including:

- Pulleys
- Idlers
- Drive or power assembly

components

- Skirtboards
- Sides of the conveyor (under certain conditions)
- Wheels on traveling equipment (shuttle conveyors and tripper cars)
- Gravity take-up assembly
- Walkways, platforms, and access ladders/stairs.

Beyond guarding, a variety of additional features can be incorporated to improve site safety as well.

Emergency-stop pull cords (e-stops) should be located at intervals along conveyor paths, as well as at both ends. Backstops or brakes should be incorporated on inclined belt conveyors to prevent rollback. Zero-speed switches, plugged-chute indicators, belt rip switches, belt alignment switches, and metal detectors, etc. can alert personnel of potential problems and can even be tied to shutdown logic to prevent escalation.

Explosion-risk features such as elevator explosion relief panels are also available for mines where combustion is a concern. Dust control measures such as pick-off points and proper sealing are also essential in these settings.

Materials of Construction & Structural Reinforcement

Robust build requirements play a role in both the safety and reliability of equipment in the mining industry, beginning with enhanced structural integrity and stronger materials of construction.

Structural reinforcements such as thicker steel plates, reinforcement ribs, gussets, and heavier weldments fortify frames, casings, chutes, and other components to withstand static and dynamic loads at high tonnages, as well as impact loading from large, coarse materials.

Mine sites will also often require Non-Destructive Weld Testing (NDT/NDE) to ensure welds are of the highest quality. This involves

the use of a certified organisation to inspect welds during manufacturing to ensure a safe product.

Abrasion-resistant (AR) wear liners such as AR400 or AR500 steel, replaceable ceramic liners, and chromium carbide overlays are useful in reinforcing high-wear areas such as feed chutes and diverters. Likewise, stainless steel or carbon steel with a specialty coating is often employed to protect equipment in high-corrosion settings.

Component Sizing and Selection

The heavier build, high tonnages, and impact loading associated with mining and mineral processing also require mechanical components to be larger and more powerful.

Bearings, shafts, take-up assemblies, belts, chains, idlers, drive assemblies, and the like, will all need to be sized and selected accordingly. In elevators this often includes the use of large-diameter head shafts, hardened sprockets, and high-torque drives with safety factors beyond standard ratings.

For conveyors, engineered-class pulleys for high-tension applications, impact beds in lieu of impact idlers, as well as CEMA D- and E-rated carrying and return idlers are common upgrades.

Maintenance and Serviceability

Remote location and the high cost of downtime associated with mine sites make simplified maintenance and serviceability essential.

Depending on site requirements and the characteristics of the material, this might mean external lubrication systems and easy-access service points, replacement liners or modular components, dedicated service bays, platforms and walkways, gallery enclosures, the use of gravity take-ups, and other modifications or customisations to streamline maintenance.



Bucket elevator with service platform, ladder with safety cage, and explosion vent panels (not yet installed)

Custom Engineering

High wind loads, uneven terrain, and a variety of other site- and material-specific challenges make each site's needs unique. Thus, handling systems require an engineered solution for seamless integration and smooth, consistent material flow with minimal interruption.

This is most evident in conveyors, which often require extensive custom design and structural analysis to ensure they can withstand environmental conditions (snow, wind, ice, and seismic loads), long-distance support spans, and the incorporation of walkways and platforms, etc.

Self-supporting super-capacity bucket elevators, a highly engineered upgrade on traditional structural steel-supported elevators, are the equipment of choice in extreme-capacity settings for outdoor environments or where structural steel is not otherwise available.



3D Rendering of a FEECO Self-Supporting, Super-Capacity Elevator

Sealing and Containment

Belt conveyors and bucket elevators in the mining industry are most often operating outside, necessitating protection of the equipment and material from the elements. Even those operating inside often require sealing and dust containment measures to protect personnel from particulate exposure.

Sealing and contaminant systems vary considerably according to the level of containment required. In general, dust pick-offs, weather covers, skirtboards, and seal welding are sufficient in most settings, protecting material from



Belt feeder with skirtboard and impact idlers

the elements, mitigating personnel exposure, and preventing material loss. Full-length welds can also be used to ensure a proper seal between fabricated parts.

Concluding Remarks

The considerable demands of the mining industry require safety and reliability to be engineered into every component of material handling systems, no matter the type. From guarding and switches to oversized drive assemblies, each component contributes to uptime and worker protection in the most challenging operating conditions on earth.

As no two mine sites are identical, miners must partner with an experienced OEM to engineer and manufacture equipment suited for the specific challenges of the site and material(s) being handled. Through proper safety features, heavy-duty build, custom engineering, and more, OEMs can help miners ensure maximum safety, uptime, and equipment longevity at their site.



About the author

Dan Baxter is a FEECO Material Handling Sales Engineer at FEECO International. Dan has over a decade of experience in performing engineering analysis and design of bulk material handling equipment and systems at FEECO. He holds a BS in Mechanical Engineering from the University of Wisconsin – Platteville.

Mixing at large-scale? Silverson can help!

You may be familiar with Silverson Machines range of laboratory and small-scale equipment. But, when it comes to large-scale mixing, Silverson has no equal.

Silverson Machines are proud to be known as the world leader in the specialised design and manufacture of large-scale rotor/stator mixers, with capacities of up to 30,000 litres. All our large-scale machines are individually built to order and constructed specifically to suit each customer's requirements.

One of Silverson Machines' unique selling points is the ability to scale up mixing equipment from the laboratory to full scale production models. Many mixer manufacturers offer high speed laboratory mixers that have no production equivalent. Silverson, on the other hand, offers the largest range of capacities from a single manufacturer, with all Silverson mixers manufactured

to the same precision engineered tolerances. As a result, scalable results can be achieved across the entire product range. As such, Silverson large-scale in-tank Batch Mixers possess all the qualities and flexibility of Silverson's medium range Batch models and work on the same mixing principle. But they include a number of additional and unique features.

Each mixer in the Silverson product range is designed and built to the highest possible engineering standards. For large-scale in-tank mixers these designs include specially balanced motors and the fitting of precision ground shafts which are finish turned in-house. This helps to ensure critical vibration free running which is essential at larger-scales. Quick release shaft couplings, split two-part downthrust propellers and hard-surfaced sacrificial shaft journal sleeves are just a few of the features designed to keep maintenance and downtime to a minimum.



Silverson Machines also offers a range of other large-scale mixers, such as the Silverson Duplex Disintegrator and the D2500 Disintegrator/Dissolver for solid/liquid mixing processes.

For more information, please [contact Silverson Machines](#).

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EXPERT ADVICE ON DUST & FUME CONTROL IS VITAL!

In a manufacturing, processing or handling environment it is, by the nature of the work, inevitable that dust, mist or fume particulates are produced and become airborne. The control of such particulates are governed in the UK by the Health and Safety Executive (HSE) and under the Control of Substances Hazardous to Health (COSHH) regulations.

The regulations are in place to protect the health of workforces and the surrounding environment. Prosecutions are made against those businesses who do not comply with the required control and measurements.

It is therefore important to ensure the control of hazardous airborne substances for:

- Legal compliance of your business.
- The health and welfare of your workforce.
- Care for your equipment and infrastructure.
- Protection of the environment.

The Legal Part

The Health and Safety at Work Act, specifically COSHH, states that a company's workforce

must be protected from hazardous airborne substances. When inhaled, swallowed or when in contact with the skin, these substances can cause an array of health issues which can be long term, or sometimes, unfortunately fatal. Because of these risks and requirements an employer must:

- Produce a **risk assessment** on substances produced from their operations. Special consideration should be given to potentially explosive dust.
- **Prevent or efficiently control** particulate exposure for employees to comply with Workplace Exposure Limits (WELs).
- Provide control measures in the form of a **Local Exhaust Ventilation** system, also known as a **dust & fume collector or extractor**.
- Ensure operatives have sufficient **training and information** in regards to the LEV systems – importantly being able to identify if the system is failing.

The HSE constantly champions the legal right for clean air for workers. Their website has undisputed information on legal responsibilities, best practice as well as tool box talks.

Process Particulates are more Hazardous than you may think!

Historical working routines and long serving employees can sometimes lead to a blasé approach to protection against substances produced as a result of certain processes. Continual exposure to some of the most common dust and fumes can lead to long-term chronic illnesses and respiratory diseases, including some terminal diagnoses such as cancer.

The below list is by no means exhaustive but gives examples and a stark warning of why dust & fume control along with PPE should be taken extremely seriously.



Industry/Process	Particulate Produced	Primary Health Issues
Mining, Construction & Stone Masonry grinding, chopping & drilling.	Respirable Crystalline Silica (RCS)	Silicosis – incurable lung scarring. Lung Cancer. COPD.
Welding, fabrication, forging and casting.	Welding & smelting fumes as well as fine metal particulates.	Lung Cancer. Neurological damage. Kidney Failure.
Woodworking, carpentry, furniture making	Wood dust & shavings (especially hardwood)	Nasal/sinus cancer Occupational asthma Skin & eye irritation COPD
Bakery	Flour, cereal and sugar dust etc.	Occupational asthma, rhinitis and conjunctivitis.

Cinch the Dust Collector and Mitigate Harmful Particulates

Hazardous airborne particulates are sufficiently controlled by a suitable dust extraction unit (LEV). Simplified – A dust collector works by capturing particulates at source, preventing release into the atmosphere. Drawn into the unit via negative pressure, the dirty air is then filtered or separated with the clean air being pumped back out and recirculated.

Different machines have different mechanisms to filter and separate, all dependent on the type of matter. Extraction systems are also available that provide easy waste collection, separation and storage.

Considerations on choosing a Dust Control System

Assessing the process, environment and the particulate type is key to providing exacting dust extraction. Focus should be fixed on:

- Size of Particulate.
- Volume of hazard.
- Level of carcinogenic or toxic values.
- Is the dust sticky, abrasive or moist etc.
- Airflow capacity and pressure required.
- Air recirculation requirements.
- Location and operation – space, noise, maintenance.

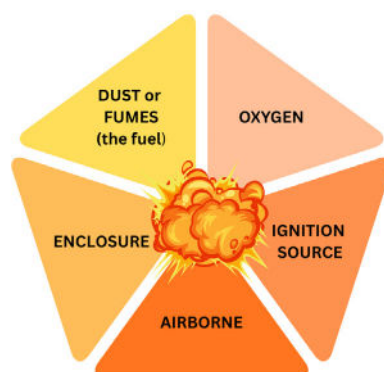
To ensure that all this is accurately measured and noted it is essential

to engage with an industry or occupational health expert. A physical site survey will be required, preferably when the process is active. Any further information that can be provided regarding operations will achieve a dust extraction system correctly tailored to operational requirements.

The ATEX Factor (combustible dust & fume)

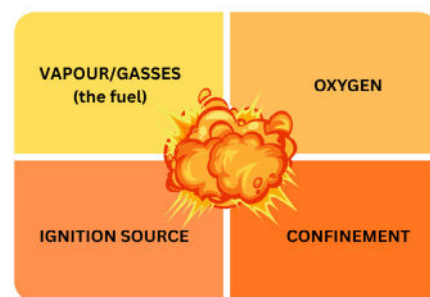
We have established that an accumulation of dust and fumes can be detrimental to health. However there is another, more instantly deadly factor to consider – the combustible nature of some dust and fumes.

Combustible Dust – When dispersed into the atmosphere fine dust particles can be at risk of ignition or causing an explosion. The danger is prevalent when five situations come together that will cause an explosion.



Dust Examples: Aluminium, wood, coal, plastic, rubber, textile fibres

Combustible Fume (Flammable Gases) - When these mix with air the result is the formation of an explosive atmosphere.



Fume Examples: Acetylene, Butane, Hydrogen, Propane, Methane

Protecting the Workforce and the Workplace

Due to the severe conclusion, if the combustion equation comes together, there are a set of directives in place to protect workers, reduce risk and to ensure safe operation of equipment used in explosive atmospheres. These directives are:

DSEAR – implemented for workplaces

This UK legislation (comparable to the ATEX 153 mentioned below) is legally enforceable. It requires an employer to:

- Identify dangerous substances and calculate fire and/or explosion risks.
- Put in place control methods including **dust and fume extraction** along with a good housekeeping regime.
- Indicate hazardous zones (see below for zone banding)

ATEX (Atmospheres Explosibles) – Applies to equipment

A European set of directives fostered by the UK aimed at the safe operation of equipment in explosive atmospheres.

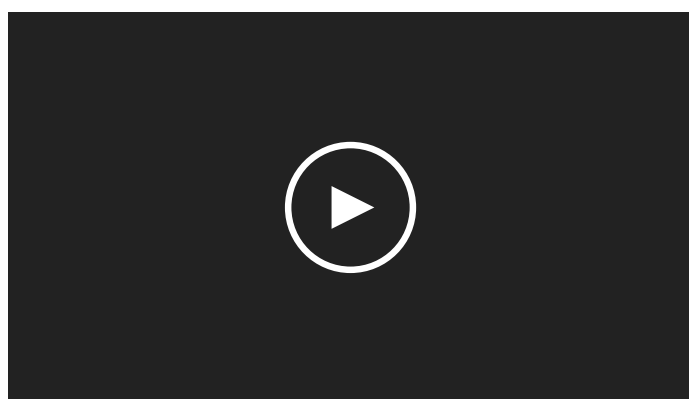
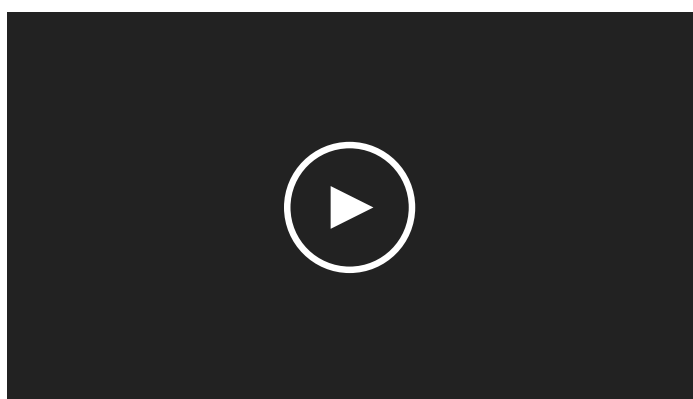
ATEX 153 (Worker Protection) - As DSEAR above.

ATEX 114 (Equipment Certification) – Strict safety standards for equipment that will be used in explosive atmospheres. The **DSEAR (ATEX 153)** and **ATEX 114 work alongside each other.**

A Quick Guide to Dust and Fume Zones

The identification of dust and fume zones is part of the DSEAR compliance and also plays an imperative part in the specification of a dust and fume collector.

	Zone	Description
ATEX Dust	20	Constant threat of explosive dust cloud formation. (i.e. inside dust filters)
	21	Probable risk (dust created by pouring, bagging, mixing.
	22	Low risk (general areas)
ATEX Fume	0	Constant threat (i.e. inside tanks etc.)
	1	Probable risk (spray booths etc.)
	2	Low risk, general areas)



Dust is also classified in accordance to its explosion strength.

Dust Classification	Severity	Example
ST0	No explosion	Non-combustible dust
ST1	Mild to moderate explosion	Wood, food, plastic dust.
ST2	Powerful Explosion	Numerous metal dust, Sugar.
ST3	Very Powerful Explosion	Reactive dust such as Aluminium and magnesium.

IMPORTANT - Your Responsibility & Explosive Particulates

Before engaging with a dust extraction supplier and discussing your requirement the onus is on you to have carried out – as per legislation – a DSEAR assessment. You will also have to identify the dust classification (ST) which may involve particulate testing. –

Armed with this information ensures the manufacturer will design- in ATEX features for safe operation, compliance and highly efficient dust & fume control.

Why ATEX compliance Matters for Dust and Fume Collectors??

Extraction systems are often required to operate in areas that have a grading of an explosive atmosphere. The filters will also handle, internally, dispersed, fine particulates within a confined space. This can be the perfect equation for a dust explosion. Because of this mix, ATEX certification for such equipment will be a legal requirement.

Examples of components to be ATEX approved where relevant:

- Fans
- Filters
- Panels
- Sensors
- Rotary Valves
- Explosion Vents
- Isolation Valves

A dust extractor must also be capable of handling the specific dust type (i.e. ST1 ST2)

Examples of Dust and Fume Collector ATEX design features:

- Roof mounted explosion venting
- Flameless venting
- Flame propagation valves
- Pressure shock resistant pipework
- Anti-static filter bags

“

Continual exposure to some of the most common dust and fumes can lead to long-term chronic illnesses and respiratory diseases, including some terminal diagnoses such as cancer.

What are the consequences of Non-ATEX compliance?



Invalidated insurance



Enforcement

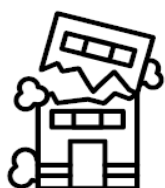


Legal Prosecution



Shutdown Notices

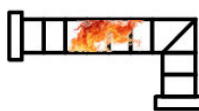
The Stark Results of a Non-ATEX Dust & Fume Collector Operating in an Explosive Atmosphere



Building destruction



Flash fires



Push burning material through ducting



Secondary explosions



Injury or potential death to personnel

Ultimately adhering to ATEX compliance is about protecting people's lives and averting business altering damage to buildings, equipment and stock.

To safeguard your business from the result of ATEX bad practice, when it comes to dust extraction requirements, be sure to engage with a manufacturer/supplier that:

- Understand combustible dust and fume hazards
- Have the experience to design systems according to zone and dust class risks
- Incorporate certified ATEX components where required
- Will supply certification.
- Provides project and after-project support

Protecting the Environment

Environmental Regulations

In the UK industries are governed by the EPR regulations on the control of industrial emissions, pollution prevention and protection of the environment.

Enforced in England by the Environment Agency (NRW Wales, SEPA, Scotland & NIEA, Northern Ireland) it requires the control of the release of dust, fumes and VOCs into the environment. Sectors governed include woodworking, solvents, metalworking, welding, cutting and sanding.

Businesses are required to control, with best available techniques (BAT), total particulates released into the atmosphere, preventing nuisance emissions, such as dust clouds, smells and smoke.

Dust and fume extraction is a necessity of ERP to control emissions in turn protecting the environment.

Energy Saving Systems and Waste Reuse

A well designed dust extraction system that encompasses energy efficiency with intelligent waste handling options can be an additional asset to sustainable and environmentally friendly operations.

Systems are available that incorporate a cascading fan or switched operation. Simply put, the smart performance monitoring of operational dust collection points (such as those provided on CNCs) will identify when it is not in operation. The number of fans operating will then be reduced, providing long term energy savings.

When choosing such an extraction system, attention should be given to whether a fan has simply been slowed down to save energy or switched. If switched, there will be remaining operational fans to ensure the HSE guidance of 18 m/s is met to prevent the build - up of particulates.

Waste not Want Not.

Sustainable use of some dust and mist waste products can be achieved with an extractor that can separate waste, sending it to a collection or storage point for re-use, conversion into a different product or indeed safer, more ethical disposal reducing landfill waste.

Dust & Fume Extraction Systems are a Non-Entity if not Maintained Regularly & Compliantly

The responsibility of dust and fume control compliance doesn't stop once a system has been chosen, installed and commissioned. To ensure the system continually offers up performance and compliance it is essential to put in place a rigorous testing and maintenance regime. If not - all the time, research and financial investment - will amount to nothing!

The regulations for LEV test & maintenance

Regulation 9 of the COSHH regulations requires LEV (Local Exhaust Ventilation) systems to be maintained in effective working

order and in good repair. It is therefore mandatory under both COSHH and HSE regulations that LEV testing should be carried out at no more than 14 month intervals. (The employer, manager or responsible person within an organisation is responsible to ensure a timely test and maintenance regime.)

The test should be carried out by a P601 engineer who will provide full reporting along with a remedial action plan so compliance can be maintained.

A solid LEV testing and Maintenance Regime Provides Many Benefits:

- Legal compliance to COSHH & HSE requirements.
- Enhanced health & safety for the work
- The maintenance of system performance and energy efficiency
- Operational cost savings minimising expensive breakdowns and emergency repairs
- Verification that the extraction system is still performing as per original specification

Good Dust & Fume Control is the Sum of Many Parts

Right from the start, to implementation and beyond, the decisions you make when choosing and operating dust and fume extraction can make an evidential difference. Between compliance and non-compliance. Prosecution and non-prosecution. Efficient and non-efficient. Protected and non-protected workforce and buildings. The right choices are paramount.

Step one of your dust and fume control compliance? To engage with industry professionals and certified manufacturers to guarantee the right dust and fume collector for your operations.



About the author

Dust Control Environmental was established over 15 years ago by owner/MD, Martin Gill. With a wealth of experience amongst DCE's teams of expert designers, engineers and installers allow them to supply bespoke extraction systems to suit specific requirements. This results in high performing, compliant systems aiding a safer working environment.

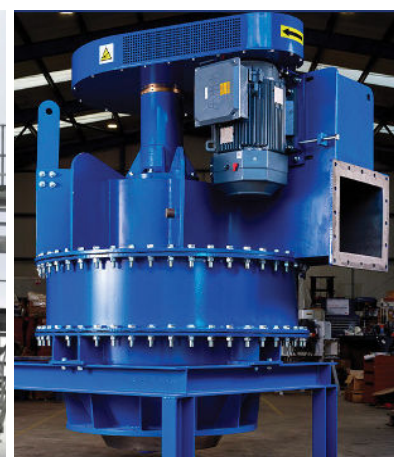
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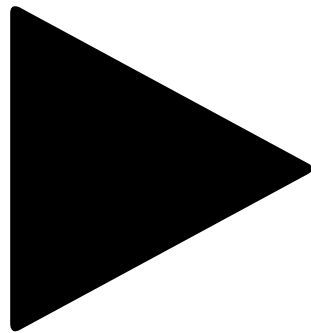
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