

SOLID NEWS

ISSUE 21

The newsletter of **AJAX EQUIPMENT** - the **BULK SOLID** performer

AJAX EQUIPMENT: THE MOVIE

For over 55 years Ajax Equipment has been the trusted partner of companies handling & processing solids around the world. See for yourself our team's passion for producing innovative solids handling solutions that deliver outstanding performance in our new video at Ajax.co.uk, YouTube or on LinkedIn now!



SNACK HACK: ONE MIXER, MANY PRODUCTS

Ajax Equipment has supplied a leading snack producer with two stainless steel twin-screw mixers to increase production capacity. One of the mixers is mounted on a mobile stand which enables its height and angle to be adjusted to meet each product's plant configuration requirements, as well as helping to drain the mixer after cleaning operations.

"Food manufacture is one of the most demanding applications and this is one of the most feature-packed mixers Ajax has produced. Not only does it offer adjustable set-up, the mixer also includes hygienic construction with crack and crevice free finish, LynFlow™ screw flights and casing profile, quick release augers for ease of cleaning or product changeover, and heated jacket and augers to maintain an even mix temperature," says Eddie McGee.



AGITATING FOR MORE PRODUCTION

Sterling Pharma Solutions is using an ATEX-rated mobile agitated screw feeder from Ajax Equipment to provide a reliable feed of an active pharmaceutical ingredient (API). After conducting powder flow testing, Ajax developed the stainless steel agitated feeder's design to provide a reliable and controlled feed to downstream process. Powder is held in the agitated feeder's hopper section, featuring an ultra-smooth mirror finish, where the agitator promotes flow to the feed screw below without compacting the powder.

"AJAX designed a robust feeder to suit the requirements and communicated well throughout design, fabrication, testing and delivery," said Gerard O'Mahony, Mechanical Engineer, Sterling Pharma Solutions.



STEEL PRODUCTION GOES GREEN



When Binding Solutions Limited (BSL) was developing a plant for its technology to improve steel making, Ajax Equipment was selected to supply a feed system for a mix of iron ore and additives. Ajax's scope comprised buffer hopper, screw feeder and agitated screw feeder.

To provide reliable flow the hopper features a steep walled 'V' section, while the screw feeder below ensures the fullest extraction. Given the abrasive nature of the material, Ajax

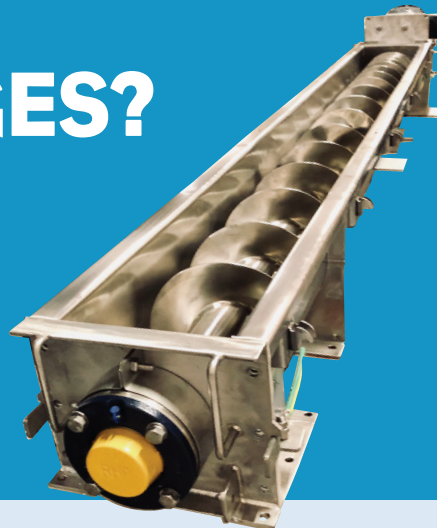
recommended that the screws were produced in a wear-resistant steel. For ease of maintenance, the agitated feeder's retractable screw and casing allow for easy access.

"BSL has been impressed with Ajax's innovative technical solutions, and we're confident that our partnership with them has helped us in our mission to advance and modernise the iron making industry," said Paul Wrathmall, Head of Applications Technology, Binding Solutions Limited.

CONVEYING CHALLENGES?

HOW TO MAKE SURE A SCREW WILL DO

Screw conveying is often thought of as a simple way of transferring materials from A to B. But without careful consideration of the material and application, performance can be easily compromised.

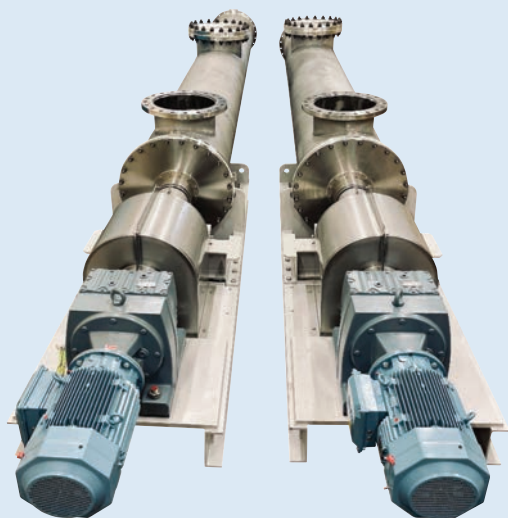


How Material Informs Design

Ajax always recommends beginning any solids handling project by learning about the material and its character, and screw conveying is no different. Conducting bulk density, wall friction and shear strength tests provides essential information for the design and will deliver significant value over the life of the conveyor.

Cohesive & Sticky Materials

Sticky materials are likely to build up, limiting the conveyor's effectiveness, if not properly considered in the design. For a pair of screw conveyors supplied to Indorama Ventures Quimica to handle a cohesive polymer powder, Ajax utilised LynFlow™ ribbon flights. Ribbon flights provide excellent powder transfer while preventing product build-up. The flight form also allowed process gas flow through the system.



Whilst wall friction affects the efficiency of axial transfer and is an important aspect for selecting a suitable transfer pitch, particularly when the conveyor needs to be inclined, some poor flow materials, such as damp salt, soon expose any 'standard screw' deficiencies, in some cases causing blockages which damage the machine and interrupt production.

When Ineos Salt wanted to improve transfer of salt from two driers to a tableting machine, Ajax was brought in to implement a new plant arrangement, providing a new inclined screw conveyor and collecting screw conveyor. The new layout, as well as some thoughtful design choices, improved process performance.

Waste & Other Irregular Materials

Although most materials have some degree of consistency in their condition, waste materials by their nature tend to be irregular and lack quality control. As a result, how they behave is highly variable which can make them challenging to handle. To ensure reliable performance the design must include greater tolerances in handling capability.

For a recent project transferring shredded waste as part of a process to produce circular chemicals, in addition to working with the customer to determine the material's needs, a trial conveyor was tested on site. This additional feedback helped to ensure the conveyor's design would accommodate the material's varied proportions and ensure no material could become trapped in the inlet or outlet or between casing and flights, jamming the screw.

Working with Plant Layout



Conveying Over Distance

Usually screw conveyors are only required to cover a few metres. Although possible, longer screws lead to a variety of design hurdles.

Ajax's longest screw conveyor to date is 28m, an unusually long distance to cover with a single conveyor and so required hanger bearings. At such lengths, the resultant stresses are often a source of issues including excessive loading or bending stress; even fabrication and installation 'trueness' can impact whether the screw catches

the conveyor's casing. However, these can be mitigated with careful design and attention to detail in manufacture. To ensure good performance in the 28m long screw, Ajax ensured that each screw section was very well aligned, and that the hanger, bearing and flight design worked well together to avoid any jamming or overload.

Transferring on an Incline

Although operating on an incline risks material falling back it is perfectly possible, however, beyond 30° it's worth considering a screw elevator. On an inclined conveyor for Johnson Matthey, Ajax included a range of features to ensure effective material transfer and mitigate any material fall back. Material testing by Ajax indicated stainless steel flights with a smooth finish would provide better slip and transfer than mild steel. In addition, screw geometry was selected with flights that compensate for the angle of operation. While to limit the impact of material fallback on effective transfer, each section of the screw conveyor's covers has a special profile.



Conveying Conclusions

Screw conveyors can provide positive transfer and total containment of product in a compact construction, with many variants in length, screw form and casing design possible. However, matching the design to the material being handled is essential for trouble free performance. Make sure you don't fall victim to the easily 'knowable' unknowns and talk to Ajax about testing!

FEED SYSTEM HELPS FILTER CAKE FLOW

Leading food and agricultural products manufacturer, Cargill, has installed a stainless steel buffer hopper and twin screw feeder from Ajax to handle filter cake. The system allows spent filter cake to be held as required and then promptly emptied at a consistent rate.



Ajax designed the handling system's vee-shaped hopper and twin screw feeder together to help ensure the smooth transfer of filter cake. Using a screw feeder below the steep hopper facilitates reliable flow.

"The Ajax team were great to work from first contact and then through design, manufacture and the FAT. They certainly know the technology and their products," said Gary Cotter, project engineer at Cargill.

SUBLIME HOPPER

Ajax Equipment has supplied research instrumentation producer, IGI Systems, with a stainless steel conical hopper with gas purge capability, as part of a prototype Sublimation System for a Low-Pressure Chemical Vapour Deposition application.

"It was a pleasure to work with Ajax. Their eagerness to engage with our needs and impressive solids handling expertise helped develop a practical storage solution for our system. The hopper's fabrication is of high quality, and we are very happy with the finished product," said Trevor Ingham, director at IGI Systems.

The hopper includes highly polished internal surfaces to enhance wall slip which promotes material flow.



ASK LYN...

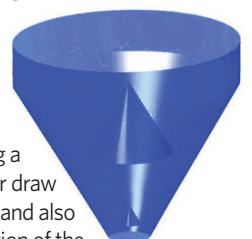


Q I put well-mixed powders in a day bin before packing off but the filled bags don't always have the right blend proportions in them - how can I solve this?

A Segregation occurs in many ways and it can affect the handling properties of the product, its value or its suitability for ultimate use. It occurs when there is some variation in the particulate nature of the product e.g. particle size and freedom for movement of the individual particles in a dynamic condition.

A common situation is the loading of a hopper from a single point where the contents of the vessel tends to build up as a growing, conical pile. Segregation occurs as fresh material slides down the surface of such piles in surges. During this process the larger particles tend to progress towards the periphery of the contents, whilst the fines are captured within the pile resulting in a 'Christmas tree' segregation in cross section. Unfortunately the order in which many vessels empty is to draw down preferentially from the region immediately above the outlet which, in this case will consist predominately of fines. A different situation arises with product that fluidizes readily as freshly deposited loose material adopts a level surface which the incoming stream penetrates, to displace prior material particularly as larger/heavier particles tend to penetrate further to displace smaller/lighter ones. This culminates in a reverse situation, with larger and denser particles tending to discharge first from a single point, discharge.

Whilst the solution will depend on your mix characteristics the general approach is to rectify single point filling of the bin e.g. by using a dispersing insert to spread the infeed to multiple points and how the hopper discharges e.g. installing a reverse cone insert (see pic) that creates an annular draw pattern stimulating a mix of central zone discharge and also drawing from the hopper walls regions. The inclination of the insert surfaces to the horizontal should be determined from wall friction tests (see <https://www.ajax.co.uk/powdertest.htm> for more info).



DIARY DATE

CHESFORD GRANGE HOTEL & CONFERENCE CENTRE, WARWICKSHIRE, UK

BULKEX
2025
14th & 15th OCTOBER 2025

Organised by the **Materials Handling Engineers Association**, BulkEx 2025 brings together the industry including mining, power, biomass, waste-to-energy and cement, etc

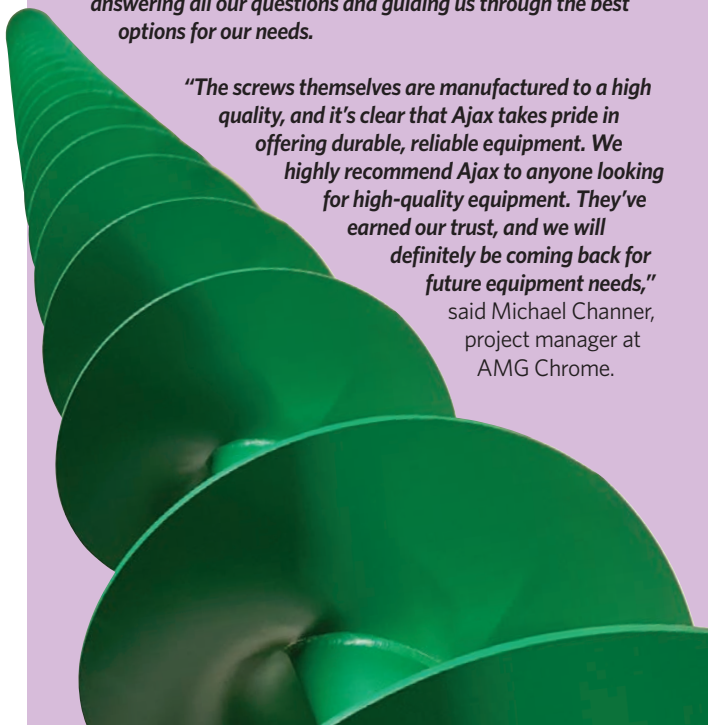
Register at: <https://www.mhea.co.uk/bulkex-25-conference/>

"OUTSTANDING" AUGERS FOR AMG

Speciality metals supplier, AMG Chrome, has recently returned to Ajax for two spare screws for an Ajax screw feeder which has been in service for 20 years.

"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.



QUADRUPLE LUMP BREAKER



Ajax's unique double twin lump breaker features four rotors to deliver a large active breaking area.

"It's testament to Ajax's approach to solving process problems and our manufacturing ability that this lump breaker offers such a substantial capability in a tight space, while incorporating a bifurcated hopper to provide flexibility to serve subsequent process streams," remarked Eddie McGee.

EXPORT GROWTH WITH SALFORD BUSINESS SCHOOL

Ajax is working with University of Salford to extend its global reach. Students will undertake an international consultancy project, with outcomes helping to shape Ajax's strategy as the business explores new opportunities and expands its market share. To launch the initiative, Ajax Director Mark Waters met with over 60 students to present Ajax and engage in a lively Q&A. Students explored the challenges, opportunities, and direction of the project, connecting academic insight with real-world business application.

Reflecting on the event, Mark said: *"The session was energetic and supportive; we look forward to their research outcomes."*



HIGH FLYING FLIGHTS

Ajax has invested in new flight forming machinery to provide an even wider range of sizes, materials and finishes.

"As well as our inhouse use we can now take Ajax's 'flights only' service to new heights, with full quality assurance, swift turnaround and a perfect fit every time!" announced Mark Waters.



We hope you find our newsletter informative and interesting. To provide feedback or find out more about Ajax's equipment and services contact Ajax today.

AJAX
SOLIDS HANDLING SOLUTIONS

**KEEP IN TOUCH
FIND OUT MORE**

Register for our e-newsletter
<https://www.ajax.co.uk/xform4.htm>

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