JOYGLOBAL

Quarry, Aggregate & Minerals

Product Overview

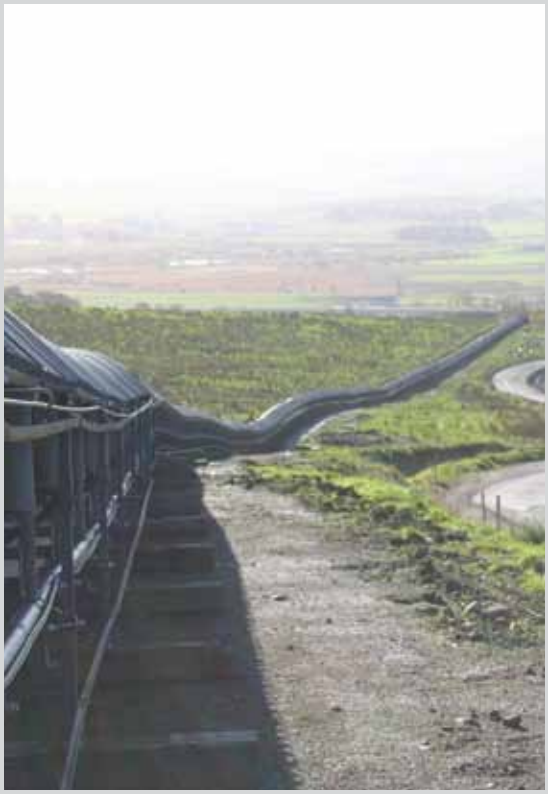
Joy Global has been instrumental in the development and application of belt conveyors for bulk handling for decades and offers global experience in the design, manufacture and supply of conveyor systems and components.

Joy Global engineers and technicians are ready to assist in the design of your conveyor system and provide full support during manufacturing, installation and commissioning. It is a total systems approach, which is being readily adopted by an increasing number of our customers.

The aim of Joy Global is to provide the lowest-cost, highest availability conveyor systems and to fully understand and satisfy your requirements by constantly improving our own design, manufacturing and commissioning technology, and being involved as a partner in the continuous improvement of the conveyor installation.

Facilities include manufacturing capabilities for drums, idlers and rollers, drives, winches, and conveyor structure. Design capabilities are available for power and PLC controls, monitoring and communications systems.

Joy Global offers a "Total Systems Approach" to the design, manufacture, installation, commissioning and operation of your conveyor system.



Project Capability

Joy Global is the leading supplier of conveyor systems to the UK aggregates, quarrying and minerals industries, supplying a diverse number of systems for our customers' unique requirements from the initial design stage through installation and commissioning.

The following are a few of our completed projects:

Project Example:
A major aggregates supplier operates a 2,000 t/hr ship off-loading, 25,000 tonne stockpile and 350 t/hr underground stockpile recovery system. The system is located on the river Thames to bring ashore sea dredged sand and aggregates. We were contracted to remove the existing system and to design, manufacture, supply, install and commission the new system.

Project Example:

A world leading supplier of clay bricks and tiles operates a 750 m long curved conveyor to bring 150 t/hr of clay from the quarry to the clay storage building. The 750 mm wide conveyor has 8 different curved radii along its length due to the need to stay within a distinct corridor of land passing between other properties.

The curved conveyor loads to an elevating gantry conveyor having a travelling plough unit to distribute clay inside the storage building.

Project Example:

A leading provider of port and waterways dredging and remediation services utilises a complete design, through to the commissioning contract, for a barge loading facility on the Grand Union Canal to deliver sand and aggregates from a quarry on to barges.

The conveyor is loaded via a receiving hopper at the tail end and runs for 415 m to the canal.

The complete conveying system was fully automated allowing for total control by the barge operator.

The conveyor passes from two access roads and crosses a river requiring a 25 m access bridge.

Field Conveyor Systems

Joy Global has designed a set of standard units that can be readily incorporated to provide complete conveyor system capabilities to transport sand and gravel, clay, limestone, waste, overburden, coal and other minerals/aggregates.

Industrial Drive Unit

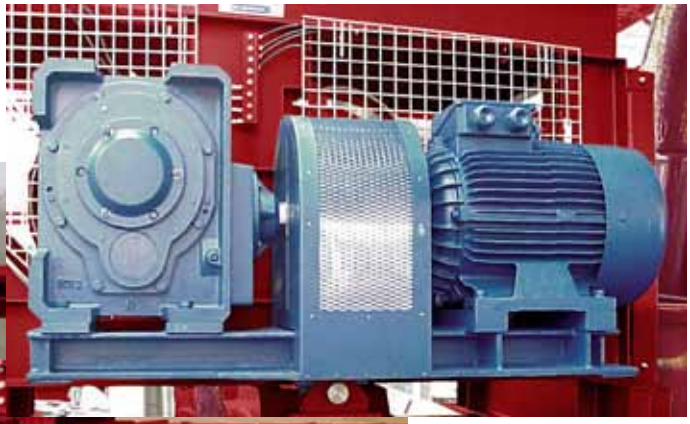
The drive unit features a robust fabricated frame fitted with a drive drum, a high tension snub drum to provide the required angle of wrap and a high tension delivery drum.

The drive drum is lagged with diamond pattern natural rubber. This increases the co-efficiency of friction with the belt, and allows the conveyor to run with lower belt tensions, increasing belt and belt joint life. For exposed locations and on long conveyor runs, we recommend ceramic lagging of the drive drum because of its higher co-efficiency of friction (optional extra).

All drive drums are mounted from split outboard bearing assemblies to facilitate ease of maintenance. The drive drum shaft is connected to the drum barrel using compression type connectors.

Motive power is transmitted to the drive drum by a shaft mounted power unit that incorporates an energy efficient EFF1 electric motor, shaft mounted bevel/helical gearbox and a fluid coupling. Shaft mounting the power unit directly to the drive drum eliminates any misalignment between the gearbox and drive drum, increasing reliability and reducing maintenance times.

The drive unit can be configured for double transmissions if required.



The cantilevered support for the non-driven delivery drum, mounted forward of the drive, allows the tail-end of the receiving conveyor to be positioned in-line or at right angles, directly below the delivery drum for a positive, spillage free transfer of materials. A totally enclosed head chute includes an adjustable deflector plate with a hardened steel liner.

A tungsten carbide multi-bladed belt scraper is fitted. The unit is fully guarded to the latest British Standards. All guards are galvanised and secured by screws that are removed from the outside.

Options: Ceramic lagging on the drive drum.
Centralised lubrication.

Tension Unit

The loop-tensioning unit includes a connecting section, an intermediate section and a winch section. Additional intermediate sections can be added if the conveyor length dictates.

A hand-operated winch, complete with a tension rope, achieves belt tension. The winch has a totally enclosed brake and is rated at 3,000 kg on the first rope layer. A tension indicator gauge can be provided to ensure that the system is correctly tensioned at all times. The moving tension carriage carries the low tension drum with twin rope sheaves. For long conveyors in a system, it is recommended that a gravity weight tower is incorporated. A grading section of structure is situated at the rear of the loop take-up unit and is made from a run of conveyor with extended legs to provide a smooth transition from loop height to the intermediate structure height. This section is appropriately guarded.

Return End & Receiving Section

The return box end is fitted with a drum mounted on outboard bearing assemblies and is totally enclosed by appropriate guarding.

The loading section is fitted with four heavy duty impact idler sets, two standard idler sets, two return rollers, a set of skirt plates and rubbers, complete with clamping flats the full length.

Replaceable steel wear plates are provided along the loading section and the back plate at the return box. A return belt plough complete with replaceable blade is provided at the front of the loading section.

General

All mesh guards are designed and manufactured to British Standards. All cover plates are galvanised and all fasteners are zinc plated.

Varitrough Structure

The Joy Varitrough structure is available with flexible carrying idler sets, whose troughing angle varies in relation to the weight of material on the belt.

- Strong, lightweight support stools and stringers are easily assembled and dismantled without spanners
- Good ground clearance below the return belt
- Good lateral clearance for belt

For standard structure and related components, see our Idler Sets, Rollers & Conveyor Structure brochure.

Stockpile and Reclaim Conveyors

Options include:

- Fixed Stackers
- Radial Stackers
- Radial/Elevating Stackers
- Trippers

Joy Global can offer solutions for stockpiling requirements from initial concept through installation and commissioning.

Radial Elevating Stacker

At its lowest height, this unit forms part of the conveyor line loading to a plant feed conveyor. It can be elevated and slewed to create a 7 m high stockpile if the processing plant stops.

Part of a complete system, this fixed stacker creates a stockpile of sand and aggregates for a UK operation.

A Twin Discharge Tripper

Creates a 25,000 tonne stockpile of sea dredged sand and gravel on the River Thames.

Curved Conveyors

If the conveyor route cannot be achieved in a straight line, then we have the ability to offer conveyors which can negotiate curved routes.

A number of such applications have now been successfully achieved in schemes as diverse as:

- Limestone from quarry to cement plant
- Gypsum from mine to rail loader
- Coal from open pit to lorry loading station
- Clay from quarry to brick making factory

This system brings clay from the quarry to storage prior to use in the factory.

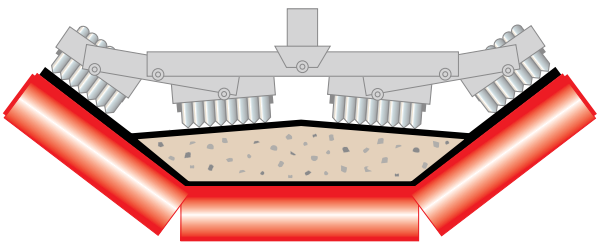
Shown above is a 1.87 km curved conveyor operating in the Scottish Borders, part of a 6 km system supplied to transport 1 Mt/y from an open pit mine to a lorry loading facility.

HAC

The HAC system has solved many steep angle conveying problems, up to and including vertical lift. The HAC system employs standard idlers and rolls and a simple but unique sandwich principle that overcomes the limitations typically encountered with other methods of vertical and high angle conveying.

As the HAC system uses standard belt and belt cleaning devices, it is not as susceptible to the problems associated with wet or sticky materials as are other systems.

Worldwide, the HAC system has proved extremely cost effective in a variety of applications. These include the lifting of sand, gravel, RDF, clay, excavated silts, ores, grain, coal and many more.



A 75 m vertical system lifting 750 t/hr of -127 mm size coal to the top of a rail car loading silo. Each of the 1,372 mm wide belts is powered by a 112 kw transmission.

JOYGLOBAL

P&H JOY

joyglobal.com

XS-5205-1-EN
0413