

## Aeration Conveying Equipment

**CONVEYORS ● BIN BOTTOMS ● LUMP TRAPS  
TROUGHS ● SILO PENETRATION ADAPTORS  
ROTARY THROTTLE & VERTICAL SLIDE GATE VALVES**



**ADIPIC ACID, ALUMINA, BENTONITE, BARIUM SULFATE, BAUXITE, CALCIUM CARBONATE,  
CALCIUM PHOSPHATE, CARBON BLACK, PORTLAND CEMENT, CLAYS, PULVERISED COAL, DOLOMITE,  
FELSPAR, FLOUR, FLOURSPAR, FLY ASH, FULLERS EARTH, GYPSUM, IRON POWDER, KAOLIN CLAY, LIME,  
PULVERIZED LIMESTONE, MAGNESIUM OXIDE, MAGNETITE, MAGNESITE, PULVERIZED ORES, PERLIGHT DUST,  
PETROLEUM COKE, PHOSPHATE DUST, PLASTIC POWDER, PVC RESIN, POTASH, POZZOLAN, PYROTOL,  
FOUNDRY SAND, SEMOLINA, SILICA, SODA ASH, SODIUM BICARBONATE, SODIUM SULFATE, STARCH,  
STUCCO, TALC, TEREPHALIC ACID, WHITING, ZINC OXIDE**

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Aerated bin bottom discharging into a conveyor with slide gate valves.



Aerated distribution box with four discharges.



Aerated lump trap with slide gate valve.

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## AERATION EQUIPMENT OVERVIEW

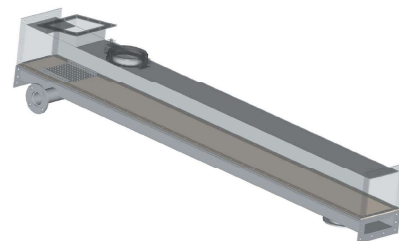
Under normal conditions a powder runs down a chute only when the slope exceeds the natural angle of repose of the powder. A fluidized powder however, runs down a chute which has an angle much less than the natural angle of repose of the powder. The principle of air gravity conveying involves the reduction of the natural angle of repose of a pulverized material to a fluidized angle which is slightly less than the angle of declination of the conveyor. This is accomplished by passing low pressure air through a porous membrane and into a bed of pulverized material.

A large variety of materials are handled on aeration conveyors regardless of their abrasive nature or bulk density. The only criteria is particle size and moisture. Generally, a product should have a particle distribution of 100% through a 20 mesh screen. It is possible to convey coarser materials provided there is a greater percentage of fine material to fill the voids. Free moisture content should be below 1%, however materials with higher moisture contents have been conveyed. With some materials, the characteristics of particles may make aeration impossible or uneconomical. A powder that can be fluidized usually possess the characteristic of flowing freely through the fingers, feeling clean and dry, and not flaky or fibrous.



## AERATION CONVEYORS

Aeration conveyors are used to convey products from point A to point B by using aeration and gravity. Minimum suggested conveyor angle is 8 degrees, but may be as low as 6 degrees depending on product material type. Turning boxes, headchutes, and distribution boxes are available to use in conjunction with aeration conveyors.

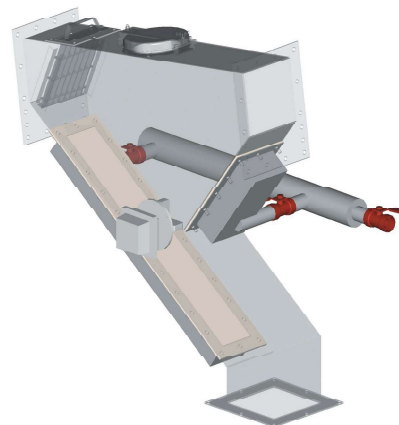


DCL offers a large selection of aeration conveyors from 6 inches [152 mm] wide up to 36 inches [914 mm] wide and conveying capacities up to 1000 cubic feet per minute [28.3 m<sup>3</sup>/min]. Conveyors also are available in a high top or low top design allowing for maximum flow rate or minimum head room depending on the application.



## AERATED LUMP TRAPS

Aeration lump traps are a ideal when large lumps are present in material. Lumps are generally created in the silo by moisture and are typically unacceptable for the consumer's vehicle being loaded. The lump trap eliminates large lumps by creating a gravity trap in-line with a aeration conveyor. This is accomplished by passing low pressure air through a overlapping configuration of porous membrane media and into the bed of the material being handled. Heavy lumps fall and are caught in the bottom of the lump trap which automatically empties using a level sensor accompanied by a series of slide gate valves.



DCL offers a selection of aeration lump traps from 6 inches [152 mm] wide up to 36 inches [914 mm] wide and conveying capacities up to 1000 cubic feet per minute [28.3 m<sup>3</sup>/min]. Lump traps also are available in a high top or low top design allowing for maximum flow rate or minimum head room depending on the application.



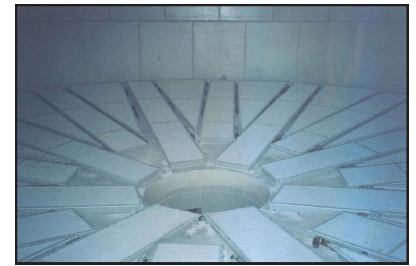
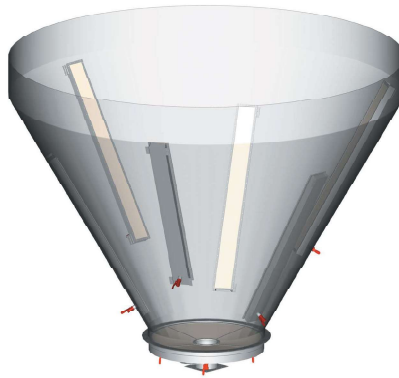
## AERATED BIN BOTTOMS AND TROUGHS

Aeration bin bottoms are used to promote consistent product withdrawal from large diameter flat or conical bottom storage silos.

DCL offers a large selection of aeration bin bottoms from 2 feet [610 mm] in diameter up to 16 feet [4.9 m] in diameter. Bin bottoms are also available with custom discharge configurations allowing for multiple conveyor runs from one silo.

Troughs are typically mounted inside the conical section of the silo and are equally spaced along a 360 degree pattern. However they can also be used in flat bottom silos and only require a 6 degree slope from the inner silo wall of the silo to the discharge point.

DCL offers a selection of aeration troughs from 6 inches [152 mm] wide up to 24 inches [610 mm] wide.



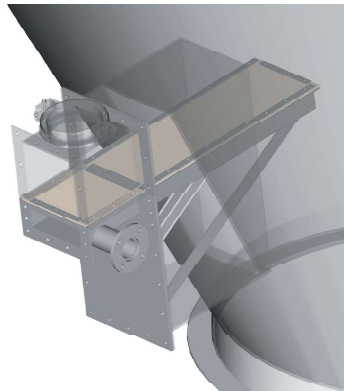
30'-0" diameter fully aerated flat bottom silo using aeration troughs.



## SILO PENETRATION ADAPTORS

Aeration silo penetration adaptors allow material to be withdrawn from the side of any silo. They can be easily retrofitted in the field to existing silos when silo bottom discharges are not possible.

DCL offers a large selection of aeration silo penetration adaptors from 6 inches [152 mm] wide up to 36 inches [914 mm] wide and conveying capacities up to 1000 cubic feet per minute [28.3 m<sup>3</sup>/min].



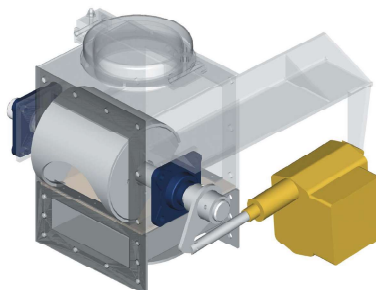
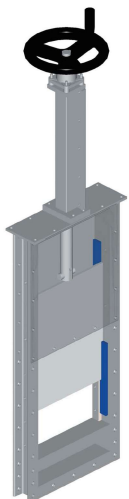
Vertical manual and pneumatic slide gate valve.



## FLOW CONTROL VALVES

Rotary throttle valves are an excellent means to control material flow while air gravity conveying.

The rotary throttle valve uses a rotary parabolic blade that allows for a low profile design that delivers precise flow control. A 4-20mA electric actuator is used to actuate the valve when real time infinite positioning is required. If real time infinite positioning is not required DCL uses a pneumatic actuator with a 3 position positioning package.



Aeration conveyor run.

Vertical slide gate valves are used in applications where a material flow shut-off is required in air gravity conveying applications. The vertical slide gate uses a Blanchard ground chamfered blade. Not only can it be used to shut-off material flow, it can be used as a flow control.

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