Bin Dischargers

Carman's gyrated Bin Discharger uses one heavy duty vibratory motor which imparts an elliptical stroke pattern in a horizontal plane. The motor normally operates at 1500 cpm, with up to 1.5mm stroke.

This motion produces a shear plane between the bin bottom and the bin discharger. When combined with Carman's 30/60 cone design, all but the most difficult materials will be induced to flow.

APPLICATIONS

The typical undercut gate application is:

Loading rock and raw ore from loading hoppers into haul trucks.

BIN FLOW PROBLEMS:

Hopper outlet is to small - Hopper depth is too great - Hopper slope is too flat

Bin flow problems, including bridging, ratholing, and segregation, are usually related to one or more of the following conditions.

Bridging:

Bridging is a no-flow condition in which thepressure of the stored material on itself results in a "bridge" or "arch" formation in the finor the hopper section of the bin.

Ratholing:

Ratholing is a condition in which the stored material does not slough into the central flow stream for discharge and instead forms a core. Problems associated with ratholing are flooding, substantial variation of density in product, and eventually no-flow.

Segregation

Materials with varying particle sizes have a natural tendency to egregate during freefall into a fin. Larger particles concentrate in the periphery, fines migrate to the centre. When withdrawn through astatic hopper, fines tend to discharge first and coarse materials last.

ACTUATORS

The actuators available for use on undercut gates are:

- Hydraulic cylinder
- Air cylinder
- Electric linear actuator

SEALS

Seals are generally not applicable to undercut gates.

CARMAN BIN DISCHARGING SOLUTIONS

A properly sized Carman Vibrating Bin Discharger can economically eliminate bridging, ratholing and segregation. Installed on a bin, a Carman Vibrating Bin Discharger increases the size of the hopper outlet and reduces the effective depth of the hopper.

Eliminate Bridging and Ratholing

The Carman Vibrating Bin Discharger eliminates bridging and ratholing by increasing the effective hopper outlet size and reducing the hopper depth which reduces pressure against the hopper walls

Eliminate Segregation

By increasing the hopper outlet size and reducing the depth of the hopper, the Carman Vibrating Bin discharger creates uniform flow throughout the bin, remixing stored material as itdischarges.

Increasing hopper slope requires expensive bin modifications that will sacrifice storage capacity or increase overall system elevation.

Maximize Hopper Volume

With identical elevations and bin diameters, a 60° bin with a 1.5m

Carman Vibrating Bin Discharger provides 130% more hopper volume than a 70° mass flow bin design.

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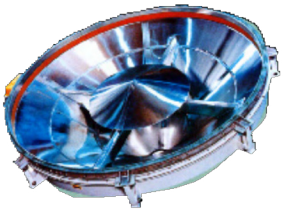
Bin Dischargers

HMA MATERIALS HANDLING

FOUNDRY INDUSTRY

3m diameter Bin Discharger is one of four handling prepared foundry sand in a major Midwestern foundry.
Its flexible Senotex lining provides a slick, abrasion and corrosion resistant wearing surface which eliminates sand build-up.

FOOD INDUSTRY



Model 12GBD Bin Discharger assures positive discharge of spray-dried dairy product. FDA-approved design includes easily cleanable polished stainless steel surfaces, sealed pressure cone and white nitrile flexible connectors.

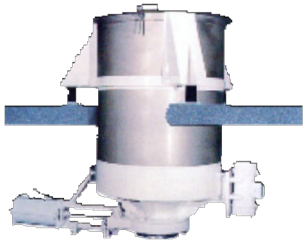
DUAL DISCHARGE

This model 4GBD Bin Discharger with dual discharge simultaneously transfers flour to separate pneumatic transfer systems in a large bakery. FDA-approved white nitrile flexible connectors and white epoxy on interior and exterior surfaces meet FDA standards for bakery operations Double stainless steel drawbands prevent leakage even when handling fine products such as flour.

DUAL DISCHARGE

Incinerated hazardous waste is stabilised and neutralised by mixing with hydratedlime before disposal.
This 1.5m diameter Model 5GBD Bin Discharger discharges - 300 mesh hydrated lime at a constant density to volumetric feeding equipment.

GLASS AND PLASTIC INDUSTRIES



Finely ground, difficult-to-handle minor ingredients and additives are stored and discharged at high rates to downstream "loss in weight" feeding equipment using a self-contained Model 3GBD storage bin. Large diameter outlet assures high discharge rates while in volumetric mode. Pneumatically operated gate assures positive shut-off for accurate feeding in the gravimetric mode.

CHEMICAL INDUSTRY

3.05m diameter electrically heated and insulated Bin Discharger eliminates problems which occur during start-up and shut-down when handling hot products in a wet atmosphere. 150˚C skin temperature eliminates condensation and the sticking and flow problems which result when product build-up occurs.

CHEMICAL INDUSTRY

Munitions plant uses portable 4' diameter storage bin with Bin Discharger for movement of volatile products form one process to another. System can be transported using integral lifting lugs or forklift brackets. Safe operation is assured by use of an explosion-proof motor, vented support legs and non-vibrated stationary discharge valve.

GRAIN AND WOOD INDUSTRIES

Fibrous materials interlock when stored. This model 6GBD Bin Discharger includes a specialsteep-angle pressure cone that penetrates deeply into stored product. This eliminates bridging by permitting direct transmission of vibration.

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