

Centrifugal versus Continuous



In Centrifugal-Discharge type elevators, the material is dug out of the boot and discharged by centrifugal force.

They typically use a belt, operate at comparatively higher speed, and used when percentage and size of lumps are at a minimum.

Higher speed results in greater capacity in a smaller package resulting in lower cost per ton.

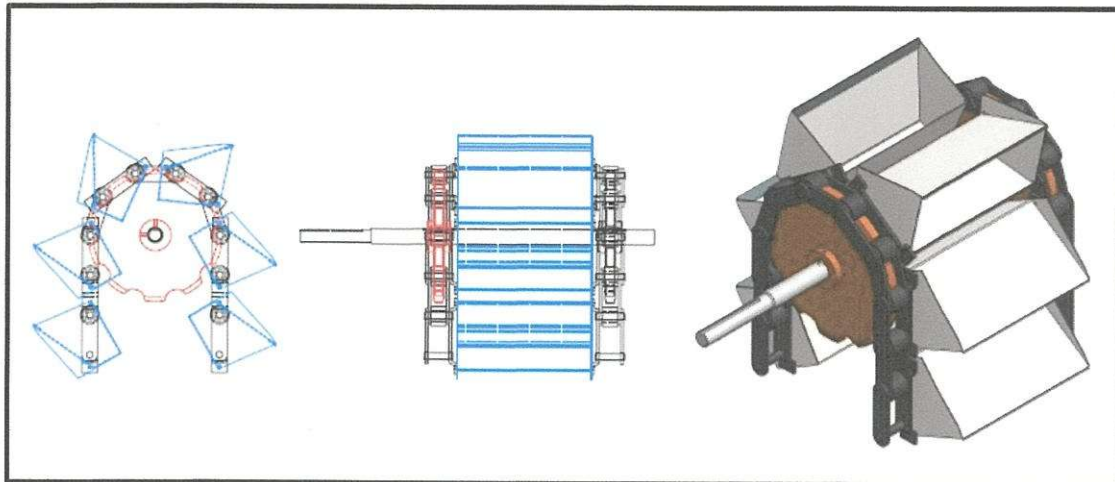
Speed is critical. Typically, 185 to 300 feet/minute. However, high speed Grain Legs speed is 350 to 750 FPM.

- Too slow and material will not fully discharge, resulting in material falling down the return run – known as Down-legging.
- Too fast and material will exit early and hit the hood at the wrong angle resulting in some material falling down the carrying run. For this reason, you cannot simply speed up the elevator to increase capacity.

Centrifugal versus Continuous

Continuous Discharge type elevators commonly used for conveying large lumps, pellets, and friable materials. The buckets are closely spaced together and loaded directly from the inlet chute. Discharge occurs by the bucket discharging across the back of the proceeding bucket, thus acting like a moving chute directing material into the discharge.

Speed is typically in the 130- ft/min range. Chain is preferred over Belt to avoid lumps from lodging behind the bucket as it passes around the head pulley, causing bucket bolts to pull through the belting.



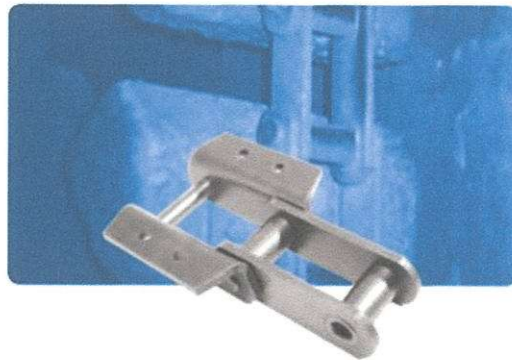
Belt versus Chain

Belts offer many advantages, including lower cost, smooth and quiet operation and low wear in abrasive applications. However, belt tracking is important.

Standard belts can be used up to 212 °F (100 °C) and high-temp belts up to 400 °F (204 °C). When temperature of the belt is likely to exceed 250 °F (121 °C) it is safer to use chain.

Belts can accommodate more than one row of buckets which is necessary for high-capacity applications.

- Chain is often used for materials with elevated temperature and material with over 10% of 2" lumps. Height of chain is elevator is limited due to the weight and strength of the chain ; typically 150 feet or less.



Head Section



Various types of liners are available to extend wear life: UHMW, AR Plate, Urethane, Ceramic Chip Urethane and Ceramic. Selection based on yearly throughput.

Boot Section



- Inlet with Tramp Metal Magnets, hinged for easy cleaning.
- Gravity Take-up
- Hand wheel for clean-out prior to installation.

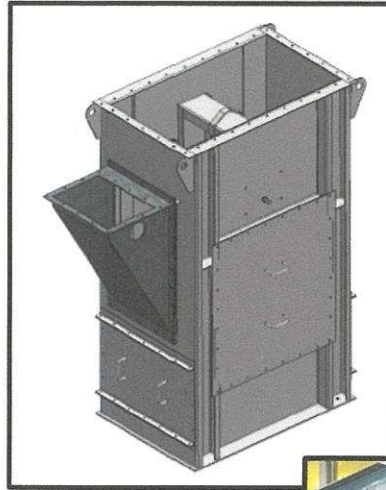


CLEAN-OUTS
MOUNTED IN U.H.M.W. GUIDES

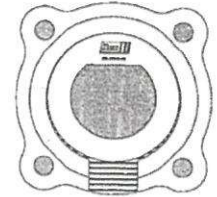
 **NORDSTRONG**

Take-up, Screw or Gravity

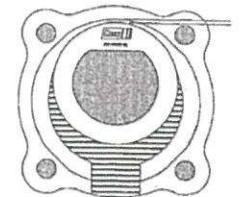
STANDARD ACME-SCREW TAKE-UP



Ni-Hard block and sleeve are shown below in unworn condition, positioned as they would be in service.



As wear occurs between the sleeve and block, clearance increases as shown below.



Replace block & sleeve when material left on flange is 3mm or less.



Gravity Take-up for Twin-Leg Casing



NORDSTRONG

Self Cleaning Boot or Minimal Material Retention in Boot



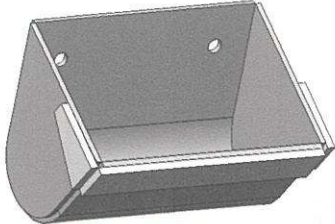
Curved Bottom with Head Take-up



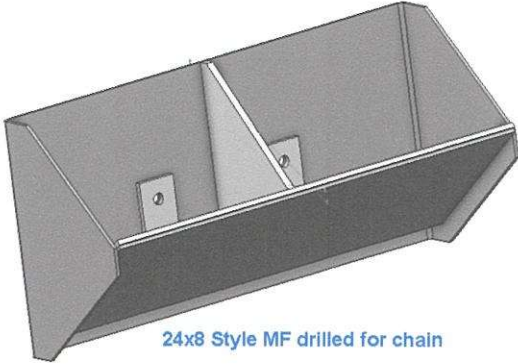
Boot on Pedestal with Cleanout Slide Gate. Requires a Head Take-up (not shown)

Boot can be installed on a concrete pedestal with clean up screw conveyor underneath.

Bucket Types



6x4 AA for Belt Elevator



24x8 Style MF drilled for chain

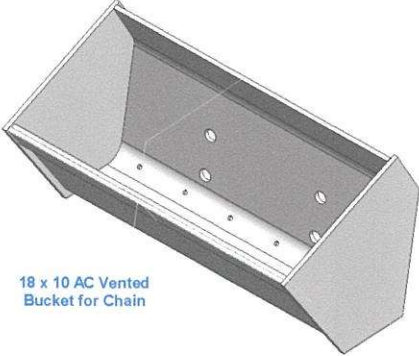


16 x 8 Style H for Super Cap Dual-Chain Elevator



CC-HD "Heavy Duty" Elevator Bucket

High Density Polyethylene



18 x 10 AC Vented Bucket for Chain



No. 1 Norway Flat Countersunk Head



Fanged



Pointed End Fanged

Hazardous Environment – Explosion Proof

Explosive Dust is the most common hazardous environment

NFPA 61 - Standard for the Prevention of Fires and Dust Explosions in Agricultural and Food Processing Facilities.

NFPA 68: Standard on Explosion Protection By Deflagration Venting

NFPA 664: Standard for the Prevention of Fires and Explosions in Wood Processing and Woodworking Facilities

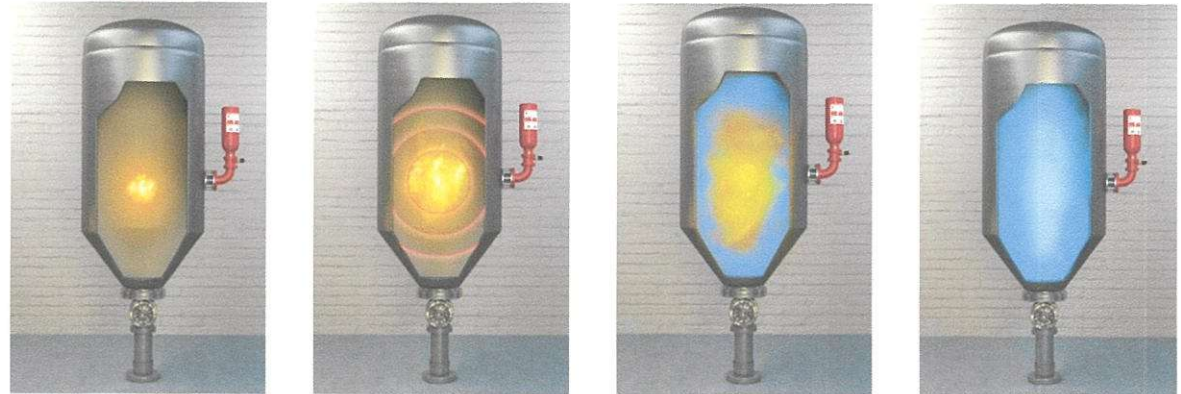
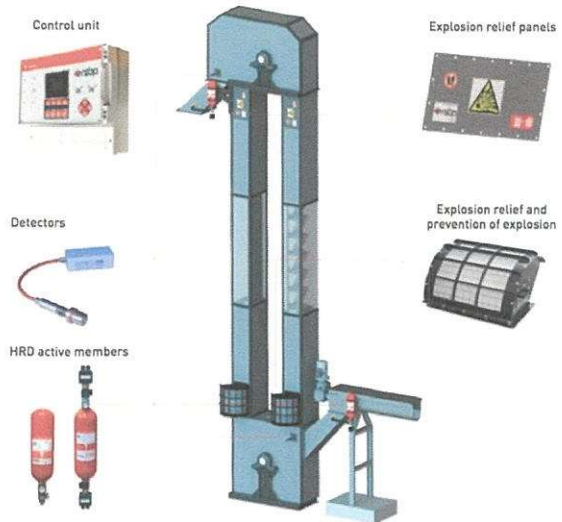
Elevator housings often use deflagration venting to relief pressure as it builds. Deflagration vents must be clear from personnel and cannot be used in confined spaces unless Flame Arrestors are installed over the panel. Maximum spacing is 20-feet. Vents typically deploy when an internal pressure of 3.5 kPa to 6.9 kPa (0.5 psi to 1.0 psi) occurs.

Electrical devices must be rated Class II Div. 1 Group G

Flame Resistant, Static Conductive & Oil Resistant Belting is required.



Explosion Suppression Systems



Sensors detect rapid pressure increase as flame propagation begins.

In a matter of milliseconds, the detector signals the controller, which provides an immediate impulse for opening of an HRD bottle valve (high rate discharge) and an extinguishing agent, e.g nitrogen, is released into the protected area to deplete the oxygen required for flame propagation that leads to an explosion.

Boot sections installed below grade commonly use active suppression system.