

# ASTEC ASPHALT STORAGE SOLUTIONS



# STORAGE SOLUTIONS

Astec has the answer

After asphalt paving mix has been produced, it is transported to a silo or silos to be batched into waiting trucks or stored for sale at a later time. Silo storage brings the economies of long production runs to the asphalt mixing industry. Whether you need the quick setup and mobility of a portable silo or the flexibility and capacity of a stationary/relocatable, several options are available depending on requirements at your plant.



## STATIONARY/RELOCATABLE ASPHALT STORAGE SILOS

Use the silos as a conventional surge bin during the busy time of day, and at day's end avoid time-consuming start/stop operations and begin filling silos while continuing load-out. The next work-day, begin selling mix right away from full silos. Nobody has to wait for mix. Uninterrupted production runs allow you to maximize equipment efficiency and reduce material waste. Incorporate multiple silos in your plant layout and you will be ready to meet customer needs for a number of different mixes. That's how Astec storage silos reduce operating costs and improve plant operating efficiency.

Astec hot mix storage systems come complete with drag conveyors, traverse conveyors, and batchers. Bucket elevators are available. Silo support structures are designed to meet the site specific design criteria at your location based on the current building codes in your area. Our structural engineering staff will design your foundations based on soil conditions at your site.

## PORTABLE ASPHALT STORAGE SILOS

Astec portable loadout systems combine several features in one useful package: drag conveying, surge or storage, truck loading and weighing. Astec thinks of everything when designing these units for our portable customers. Included hydraulic packs help make set-up in the field easy and fast, while load-cells ensure that each load is ticketed accurately.



### Long-Term Storage

Store mix longer with Astec long-term storage silos. To store mix without loss of quality, Astec silos are completely sealed to prevent mix oxidation, or premature hardening of the mix, which happens when the mix is exposed to air.



### Short-Term Storage

Maximize production capabilities with a short-term storage silo system. Engineered for maximum performance and years of reliable service, Astec short-term storage silos are made to withstand today's high production requirements.



### Self-Erecting Surge Silos

True overnight storage capabilities for portable plants. An optional oil-sealed gate and an enclosed silo top equipped with a grease seal can prevent oxygen penetration to allow longer-term storage. In addition, the silo and drag are erected together using hydraulic cylinders.



### Self-Erecting Bins

The self-erecting bin (SEB) for portable asphalt mixing plants is contained on one load. Astec technology assures trouble-free operation and simplified maintenance of the entire system. The SEB self-erects in less than 15 minutes.



# Long-Term Asphalt Storage Silo

Astec silos store mix for four days\* without loss of mix quality. That's true storage.



## Long-Term Silo Diameter and Capacity

Each capacity available in 12 ft. (3.66 meters) or 14 ft. (4.27 meters) diameter.

Capacities are based on 120 lbs/cu. ft. for mix (1.92 metric tons / cu. meter)

Tons	100	150	200	250	300 <sup>†</sup>
Metric Tons	91	136	181	227	272 <sup>†</sup>

<sup>†</sup> 14 ft (4.27 meters) diameter only

## Features

### 1 Drag Conveyor

The Astec drag conveyor is tough. Lined with hard alloy castings, and bottom-mounted tensioning, it is made to withstand the demands of asphalt production.

### 2 Batcher

Astec's innovative batcher helps eliminate mix segregation. It is designed to ensure that the quality of mix that leaves the drum is the same quality stored in the silos.

### 3 Work Platforms & Stair Cases

OSHA standard work platforms and staircases provide a safe environment for routine maintenance. An optional second staircase is available for the drag conveyor.

### 4 High Performance Insulation

Astec uses thick, high R-value, non-compressed insulation: 6" insulation on the sides and 12" insulation on the top

### 5 Mass Flow Load Out Technology

The steeper angle of the Astec cone allows mix to move by "mass flow," helping prevent mix build-up on silo walls. An insulated electric blanket surrounds the lower part of the cone, preventing excessive heat loss. Abrasion-resistant steel liners surround the cone to prevent excessive wear. Optional ceramic liners are also available for even greater protection.

### 6 Long Term Storage Mode

Astec silos store mix for four days\* without loss of mix quality.

In Long-Term storage mode, Astec silos are completely sealed from top to bottom.

The top seal of the batcher runs in rails that tightly wedge against a pump driven ring of grease while the exclusive design of the discharge gate completely seals the bottom of the cone

### 7 Strength and Longevity

Silo skins overlap providing further strength and longevity of the silos.

\* polymer modified, open-graded and SMA mixes excluded





## Keeping Mix Hot

Twelve inches of insulation at silo tops, four inches around the cone, and six inches along the cylinder keep the mix hot. Batchers are insulated as well, because uninsulated batchers are a major source of heat loss.

Two layers of stiff sheet insulation are staggered to eliminate heat-leaking seams along the silo cylinder. Astec uses thick, high R-value, non-compressed insulation.



## Fill Silos Without Segregating the Mix

The mix moves by drag conveyor or bucket elevator into a three-ton batcher atop the silo. When full, the batcher releases the slug of mix. Mix drops through the rapid-opening double-clam gate into the silo and flattens on impact. Astec's double-clam gates are not like conventional pinch-closed style double-clam gates. Astec's overlapping gates slice through material flow as the gate closes. This slicing action and overlapping gates result in better gate wear resistance when compared to pinch-closed style gates. The double gates also center the drop into the silo and form a flattened mix surface, which prevents mix segregation.

## Sealed Silos

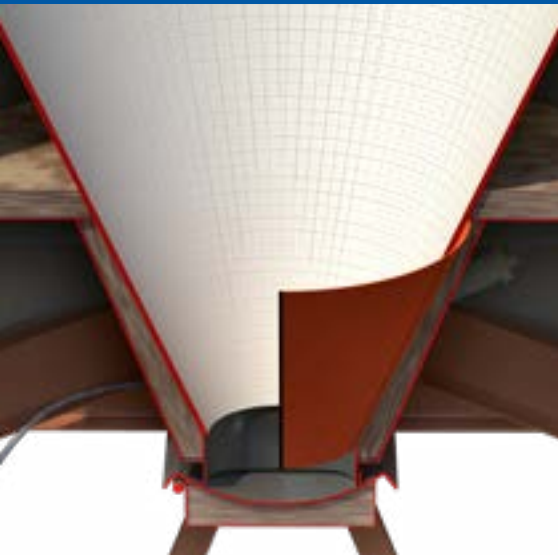
In storage mode, it is crucial to seal the silo. Oxidation, or premature hardening of the mix, happens in the silo when the mix is exposed to air. In storage mode, Astec silos are completely sealed from top to bottom.

## Top Seal

In storage mode, the cylinder-operated gate at the top of the batcher is completely sealed. The gate runs in rails which tightly wedge it against a ring of grease. This forms a tight seal and keeps air from entering at the silo top. When filling operations begin again, the gate is opened and remains open until filling operations stop. An air actuated grease pump replenishes the grease and ensures a continued, perfect seal.

## Bottom Seal

The exclusive design of Astec's discharge gate (U.S. patent #3,949,907) completely seals the bottom of the cone when the silo is in storage mode. The heated and insulated discharge gate closes to completely cover the cone opening. Oil is pumped into the gate to seal the bottom silo opening. The oil reservoir is located by the silo legs, and a motor-driven pump moves the oil from the reservoir into the gate. A sensor monitors the oil level in the gate and controls the pump. When the silo is taken out of storage mode, the pump is reversed and the oil is withdrawn from the gate.



## Silo Cone

### Cone Design Prevents Mix Segregation

Astec silo cones are taller, because they are built with a steeper angle than other brands. To achieve optimal mass material flow, Astec, with the aid of third party research, determined that the precise angle at which the entire column of mix evenly flows through the cone is 66 degrees. This steeper angle of the cone provides true first-in/first-out inventory rotation, there is no mix buildup on silo walls, and mass flow load-out minimizes mix segregation. Mass flow occurs when mix flows out across the entire silo cross-section and that only happens with the correct cone angle.

# Short-Term Storage Silo

Maximize production capabilities with an advanced short-term silo system.

Engineered for maximum performance and manufactured for years of reliable service, the Astec silo system is built to provide high efficiency at a low cost. These silos are made to withstand today's high production requirements and are stacked with features not found on competitive equipment.

System capacities from 100-ton single silos to 3,000-ton multiple silo systems. Custom arrangements can be configured for your requirements.

## Short-Term Silo Diameter and Capacity

Each capacity available in 138". (3.50 meters) or 150". (3.81 meters) diameter.

Capacities are based on 120 lbs/cu. ft. for mix (0.5 metric tons / cu. meter).

Tons	100	150	200	250	300 <sup>†</sup>
Metric Tons	91	136	181	227	272 <sup>†</sup>



## Features

### 1 Drag Conveyor

The large capacity Astec drag conveyor is 50" X 36.5" (127cm X 90.17cm). Lined with hard alloy castings, and top-mounted tensioning, it is made to withstand the demands of asphalt production.

### 2 Batcher

Features a built-in splitter to protect the leading edge of the gate and minimize maintenance. The splitter divides the flow of material as it drops to help reduce segregation.

### 3 Work Platforms & Stair Cases

OSHA standard handrail, walkway and checker-plate decking are standard on all short-term silos. The integral kick plate on the top deck eliminates spillage down the sides of the silo. An optional second staircase is available for the drag conveyor.

### 4 Silo Insulation

Industrial-grade insulation maximizes heat retention. 10" of insulation in the top deck and bottom enclosure, plus 5" running the entire length of the silo helps maintain mix temperature.

### 5 Reinforced Cone

The reinforced cone includes standard electric heat or optional hot oil heating. Optional ceramic full sheet AR or Hi-Tech premium cone liners are available.

### 6 Dual Clam Gates with Safety Gates

The dual clam gates on the silo allow for more even and accurate loading. Safety gates act as a backup to the clam gates. The safety gates can stop the silo from emptying out on a truck, helping prevent a serious accident.

### 7 Structure Support

Silos feature a bolt-on support structure. Heavy-duty steel beam legs, with cross bracing, offer structural integrity for all seismic zones. Steel beam legs are bolted on for ease of shipment.



## Transfer Conveyor

A horizontal traverse conveyor transfers asphalt mix from a drag conveyor or bucket elevator to additional silos. The traverse conveyor is equipped with motors and coupled to in-line, heavy-duty reducers.

The transfer conveyor features a strong, all welded, U-box frame that eliminates cracking potential and improves the structural integrity. The heavy-duty chain arrangement includes reinforced flights. High-chrome blend liners protect the floors and side walls from wear. A heated floor with insulated heat covers helps prevent material build-up during start-up and assists in keeping the floor clean. Includes return-run idlers and adjustable take-up assemblies.



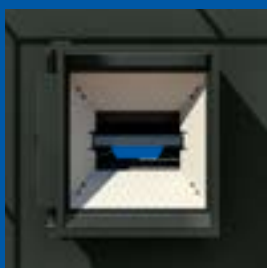
## Bolt-On Divert Gate

The transfer conveyor includes an exclusive bolt-on divert gate assembly with liners. No more welding gates to shafts inside of the transfer body. The divert gate is easily replaced by simply unbolting the divert gate from the transfer conveyor. This allows replacing the highest wear area on the transfer conveyor without welding or torching and without having to also take the transfer down to the ground. The divert gates are lined with wear resistant plates for added life and have an access door for clean out.

## Mix Level Indicators

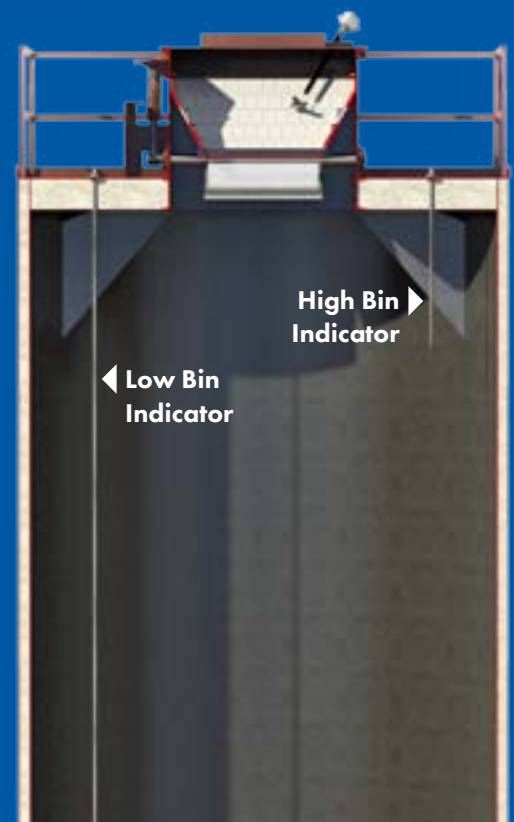
Each silo has low level and high level indicator rods that extend through the top deck. The design eliminates weak points and allows service of the rods from the deck.

The low and high level indicators measure mix level and communicate that information to the control house. The high level indicator signal prevents overfilling the silo. The low level indicator prevents running the silo completely empty so that when you load from the batcher you are loading onto material rather than the cone.



## Batcher with Built-in Splitter

The batcher features a built-in splitter to protect the leading edge of the gate and minimize maintenance. The splitter divides the flow of material as it drops to help reduce segregation.





# Self-Erecting Bin

The highly portable NTEP Certified Self-Erecting Bin (SEB) self-erects quickly. The super functional SEB package reduces the number of loads by combining several operations into a single unit: drag conveying, batching, surge, truck loading and weighing.

A thick, steel truck loading platform is part of the frame (competing bins usually need expensive concrete foundations). The SEB includes a drag by-pass chute with a built-in bulkhead. Two large hydraulic cylinders raise the SEB into position.



▲ FOUR-TON BATCHER



▲ LOAD CELL

## Features

### 1 Batcher

A five-ton (3.6 metric ton) batcher is installed at the top end of the drag conveyor. It collects the mix discharged from the drag conveyor. Segregation is minimized by dropping full batcher loads into the surge bin. Optional 3" of insulation is also available on the batcher to retain heat in the mix.

### 2 Smooth Flow Bin

Rounded bin corners prevent mix build-up in the bin, and steep walls on the load-out cone let material flow freely. For load-out, two radial gates open at the bottom of the bin. The large bottom openings provide fast truck loading. The unique Astec discharge gate design minimizes segregation. Insulation around the cone also enhances good flow, especially if you have to hold mix in the bin for a while. Heating for the cone is optional.

### 3 Bin Gate Cylinders

Bin gate cylinders are located on the end plates of the gates for greater efficiency. This provides operating stability to the operation of longer gate sections and more than doubles the force to open the gates while consuming less compressed air. The strong skirt beam and solid bent plate corner supports provide a rigid and stable framework supporting the surge bin hopper atop the load cell package.

### 4 NTEP Certified

The silo weighing system utilizing load cells is NTEP Certified to ensure accurate ticketing at load-out.

### 5 Optional Control Center

Pre-wired Control Center can be mounted on the frame of the SEB for simplified transportation.





# Self-Erecting Surge Silo

The NTEP Certified Astec Self-Erecting Surge Silo offers asphalt mix producers exceptional capabilities and advantages not found elsewhere. An optional oil-sealed gate and grease-sealed batcher provides industry-leading storage in a portable silo. A steeper cone angle helps achieve optimal mass material flow. The entire column of mix evenly flows through the cone thanks to the steeper angle of the cone. There is no mix buildup on silo walls, and mass flow loadout minimizes mix segregation in the cone. The silo and drag share a common chassis and are erected together using hydraulic cylinders.



## Features

### 1 NTEP Certified

The silo weighing system utilizing load cells is NTEP Certified to ensure accurate ticketing at load-out.

### 2 True Portable Storage Capability

An optional oil-sealed gate and an enclosed silo top equipped with a grease seal prevent oxygen penetration to allow longer-term storage. The oil-seal gate and grease seal batcher in conjunction with insulation provide true overnight storage capabilities. An optional electric heat blanket on the cone and gate is available for this full-insulated silo. 1/4" AR liners above and below the cone joint enhance longevity. Silo and batcher are both equipped with a set of level-indicating indicators.

### 3 Self-Erecting Surge Silo Drag

The 36" drag includes liners for durability. Optional electric heat helps ensure flawless operation at start-up and a bottom drop out chute accommodates bypassing when needed. For enhanced safety and maintenance ease optional stairs can be mounted to the drag conveyor. Remove grease points for greaseable bearings on drag are easily accessible.

### 4 Easy Set-up

A single set of multi-stage cylinders lifts the drag and silo into operating position simultaneously without the need of a crane. Large landing pads accommodate set-up on compacted dirt. Once in operating position, the truck drive provides a full 12 feet of clearance.













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