ASTEC

THE BAGHOUSE

For Hot Mix Asphalt Facilities


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Astec Baghouse For Hot Mix Asphalt Facilities.

Astec baghouses deliver superior performance and efficiency, while helping your facility meet the most stringent clean air standards. They remove particulates from the exhaust stream to efficiencies greater than 99.5%, and lower emission to less than one quarter of EPA standards.

It is the job of the baghouse to supply air to your facility and to remove exhaust and dust created by the aggregate drying and HMA mixing process. Astec baghouses reliably supply precisely the required amount of air for the most efficient operation. The air volume supplied to the aggregate drying process governs production capacity and efficiency of your facility.


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DOUBLE BARREL GREEN
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Whether you need the quick setup and mobility of a portable facility, the flexibility and operating capacity of a stationary, or something in-between — Astec baghouses can be configured for any of the three Astec facility styles.

STATIONARY

Stationary facilities provide a high degree of flexibility for customized layouts and special features. The stationary baghouse is supplied with steel legs to grade. The legs are anchored to your prepared concrete foundations.

RELOCATABLE

Modular construction and built-in steel foundations eliminate on-site fabrication and make setup of the relocatable baghouse fast and easy. Relocatable baghouses are delivered on steel plate foundations, ready to be set off on a paved site or concrete pad. Modules are designed for quick assembly.

PORTABLE

The Astec portable baghouse is designed as an integral component of the Six Pack® portable hot mix facility. Built-in running gear, high-rise air bag suspension and retractable plate foundations eliminate hassles. Portable baghouses are available in a range of capacities.

Astec supplies strong, well-built steel legs with its stationary baghouses.

Setup is faster and future facility movement is easier with a relocatable design.

The portable baghouse is built to move with integrated running gear.

Built-in, heavy-duty foundations speed setup in relocatable design.

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The complete Astec baghouse system consists of a primary dust collector (cyclone or inertial separator), an enclosed fabric filter structure (baghouse), and a draft package which includes fan, Variable Frequency Drive and duct work.

INERTIAL SEPARATOR

Inertial separators depend on rapid changes in both gas stream velocity and flow direction to remove coarse particles from the air stream. Using advanced modeling technologies and practical in-field experience, Astec engineers have been able to precisely set the internal baffles for efficiency comparable to the cyclone at a lower price.

CYCLONE

For the greatest possible efficiency, Astec cyclones use centrifugal force to sling particles toward the walls, where friction from impact scrubs the coarse particles from the gas stream. Fine particles, those below 75-micron, do not travel along the outer edge of the streamlines as do coarse particles. They will be vented from the cyclone and then ducted into the baghouse for capture.

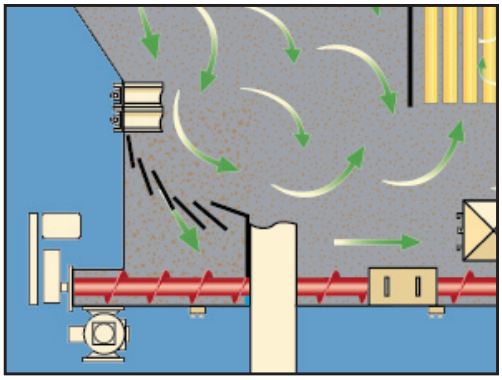
ASTEC FANS MAINTAIN STABLE AIRFLOW

The Astec exhaust fan maintains stable airflow over a wide range of operating conditions and is capable of operating at high differential pressures (up to 20-inch water column). The fan's backward-curved blade runs quieter and uses less power than other fan designs. The drives can be configured to be driven either by belts and sheaves or direct. Optional stack silencers are also available.

VARIABLE FREQUENCY DRIVE SAVES MONEY

The optional Variable Frequency Drive or VFD provides the smoothest and most linear airflow control with the lowest power consumption. A pressure sensor at the burner monitors air intake and controls fan speed to deliver the optimum airflow.

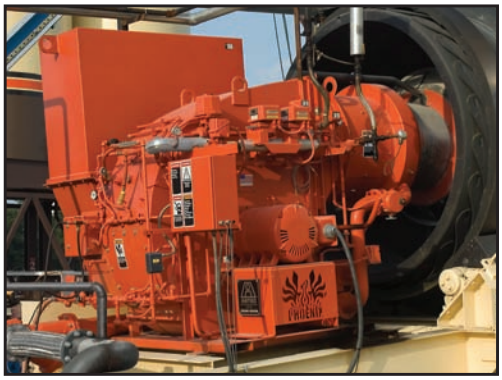
The VFD provides important efficiency benefits that reduce your operating cost by minimizing amount of air to heat, exhaust fan power consumption, gas velocity through the drum, dust through the baghouse, and air-to-cloth ratio while maximizing performance.



Astec precisely sets the baffles in the inertial separator to achieve better efficiency.

Use a cyclone to collect coarse fines and then return them to a mix.

The exhaust fan maintains stable airflow over a wide range of operating conditions.



A pressure sensor located at the burner end of the Double Barrel® drum/dryer monitors air intake and controls fan speed for optimum airflow.

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The design of an Astec baghouse collects coarse fines and small fines separately to minimize wear of baghouse components.

SORT PARTICLES BY SIZE

Astec primary dust collectors divide large and small fines and can be either horizontal cyclones or inertial separators. Generally, about 80% of fines gathered in the primary collector are larger than 200 mesh, while fines from the baghouse consist of about 80% smaller than 200 mesh particles. The coarse fines removed by the primary dust collector represent approximately 80-90 percent (by weight) of the total dust particles coming out of the dryer. These coarse fines can be immediately returned to the mix by means of a screw conveyor.

Since very few coarse fines enter the baghouse, it can collect small fines very efficiently. Removal of coarser fines in the primary collector also keeps you from exposing baghouse components to the heavier wear of large particles and your filter bags and other components last much longer.

REMOVE FINE PARTICLES

The gas stream exits the primary dust collector and enters the baghouse. Negative pressure in the clean air plenum pulls the gas stream through the filter bags. Fine particles entrained in the gas stream collect on the outside of the bags. The cleaned gas stream travels through the plenum and exits the baghouse through the exhaust stack.

PULSE JET CLEANING

The Astec baghouse automatically switches from filtering to pulse jet cleaning. During the cleaning mode, blowpipes direct bursts of compressed air into a few bags at a time. The shock and momentary back-flow produced by the compressed air pulse releases some of the dust from the bags, allowing it to drop into the hopper.

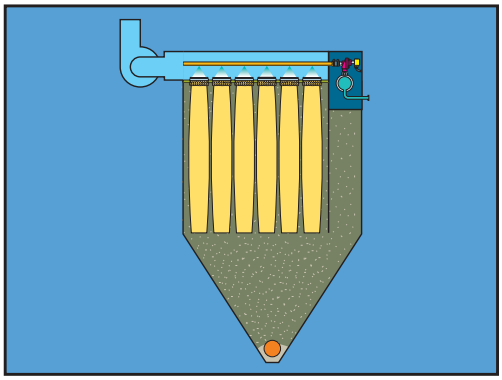
RETURN FINES TO THE MIX

With an optional variable speed air lock, you can choose what percentage, if any, of fine baghouse dust you want to mix with the larger primary collector dust to be returned to the mix. An optional blower or screw conveyor can be installed to divert baghouse dust to storage or disposal. Zero speed switches on all dust handling conveyors signal the operator in the event of a stoppage.

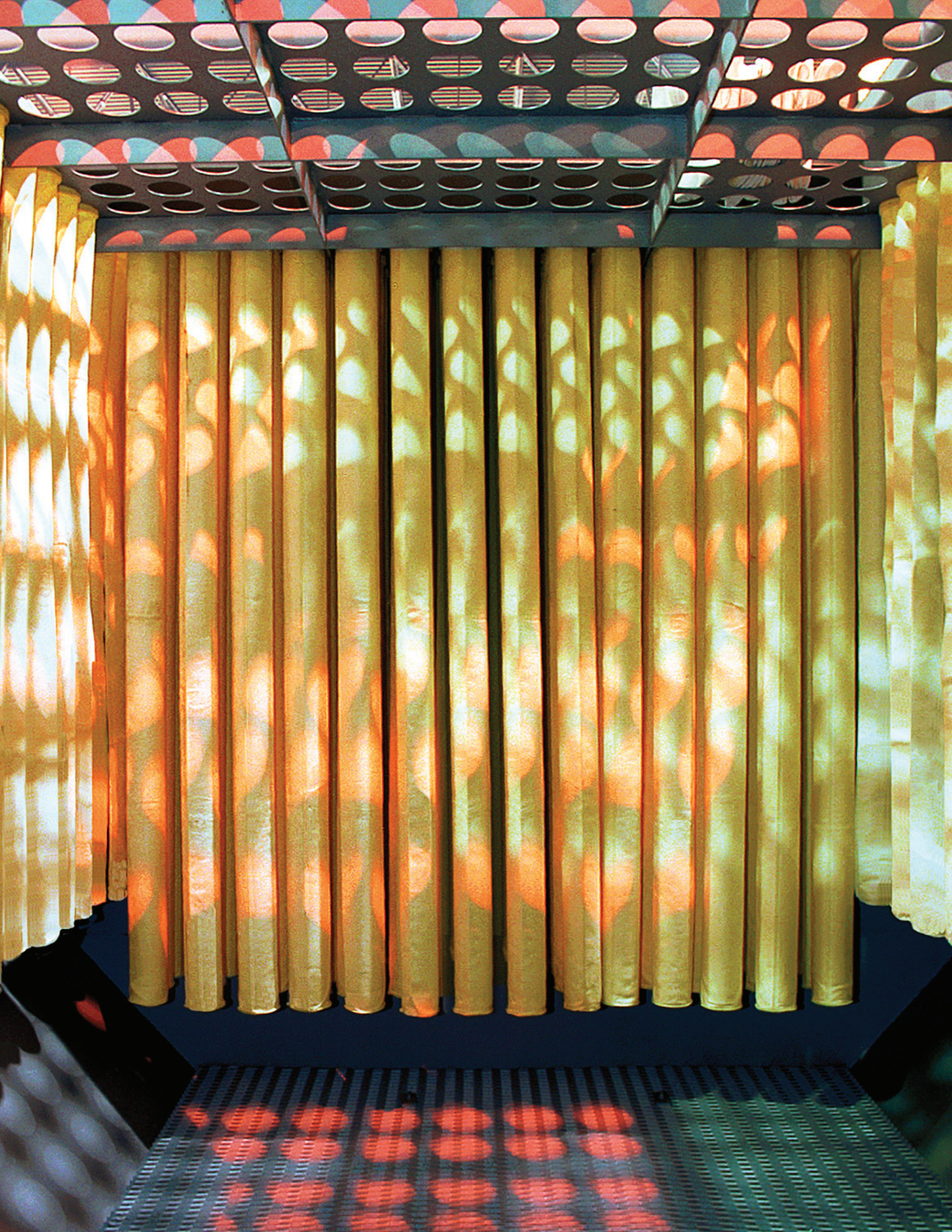
Fine particles collect in the bottom of the baghouse and are removed by the screw conveyor.

Fines can be returned to the mix as needed.

With pulse jet cleaning, no bags have to be taken out of service for cleaning.



The pulse jet system directs a burst of air into the bags to knock the collected dust loose.



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No one builds a better baghouse than Astec. That means you can count on efficient and reliable performance when you choose an Astec baghouse.

BAG MATERIAL

Thanks to better material, bags used in Astec baghouses do a more reliable job. Astec felt is made of 2-denier virgin aramid fiber with high density needling (2,500 penetrations per square inch). The bag material is specially made for Astec, with a guaranteed minimum density per square inch. Manufacturers using bags of lesser quality may claim the same average density, but their bags have thin and dense spots, which leads to less reliable filtering and faster bag wear. The density of Astec bags is consistent over the entire surface of the bag.

Astec offers P84® polyamide bag materials and Micro-denier bags in addition to standard aramid bags. Unlike standard aramid fibers, which are round in cross section, polyamide fibers have an irregular cross section. The irregular surface can be thought of as having many "hooks" on which to more efficiently entangle particles.

Micro-denier bags are made of the same type aramid fibers except they are smaller in diameter than the 2-denier and can be woven in an even tighter configuration to improve filtration of microscopic particulates for areas with high particulate emission restrictions.

CHOOSE YOUR MATERIAL HANDLING SYSTEM

Select systems depending on your operating environment. The choices for controlling material flow out of the baghouse include a range of rotary air locks with dust blowers or dust transfer screws.

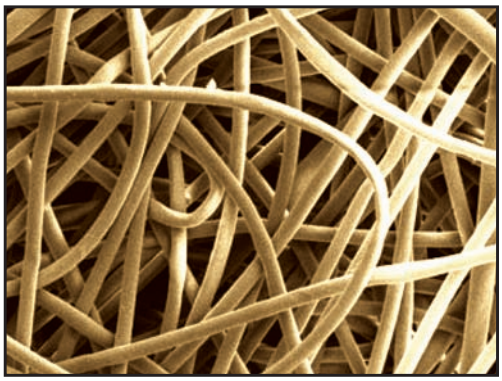
STORAGE AND METERING PACKAGES

Dust silos are available in sizes ranging from 350 to 900 barrels and equipped with Astec's mass-flow technology to assure precision metering.

Dust storage silo systems are either stationary or portable. Portable models have the option to include crane erect or hydraulic self-erection packages and permanent or removable running gear.

Bags made specifically for Astec guarantee reliable performance thanks to superior fibers.

The tube sheet separates the dirty and clean air plenums. The dirty air must pass through the bags.



The micro-denier aramid felt fiber is available for compliance with tight particulate restrictions.

Transfer collected dust to a silo until you are ready to return it to the mix.

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Like all Astec products, the baghouse is constructed of high quality materials to stand up to the demands of high production. An Astec baghouse also makes maintenance easy with well thought out access doors.

YOU GET MORE WITH ASTEC

The extra features you get with Astec make a real difference because they reduce maintenance and operating concerns and they improve efficiency.

Wear-sides of duct turns are made with 360 Brinell AR (abrasion resistant steel). Stiffeners strengthen baghouse walls and prevent flexing. Astec baghouses resist corrosion thanks to epoxy-coating on the inner surfaces of the baghouse and primary dust collector and plenum doors fabricated of stainless steel. Exhaust fan, motors and drives ship pre-assembled. All bags, blow pipes, manifolds, valves and solenoids are installed at the factory, saving you considerable time at setup.

LESS MAINTENANCE TIME AND COST

Key parts of the baghouse are simple to access and service.

Caged ladders lead to the top of the baghouse. Handrails are installed all around. Stainless steel lift-off covers let you easily reach bags. Snap-in bags are simple to change.

The dust screw on an Astec baghouse features a large screw shaft design with a reduced number of hanger bearings. On some Astec models the hanger bearings have been completely eliminated.

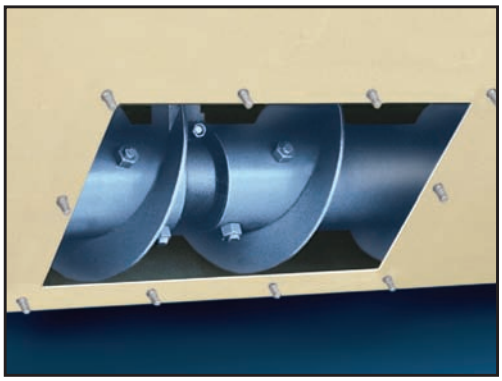
The hanger bearings on the longer dust screws are lubricated, long-wearing and operate quietly. Screws and bearings are conveniently reached through ground-level access doors at each bearing.

Single-hopper baghouses have clean out plugs at the bottom of the hopper. In the unlikely event of a blockage at the screw conveyor, these plugs can be removed and dust can be evacuated manually.

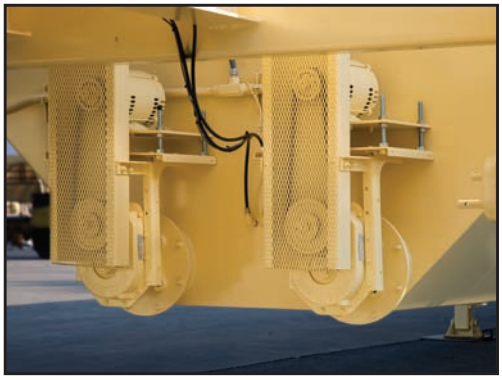
Hopper screw drive motors are mounted externally and are fully accessible from the ground.

Plenum doors on top of the baghouse are constructed of stainless steel to resist corrosion.

Maintenance is easily performed with well placed access doors.



The grease fitting on the hopper at the hanger bearing is very accessible.



Hopper screw drive motors are accessible from the ground.

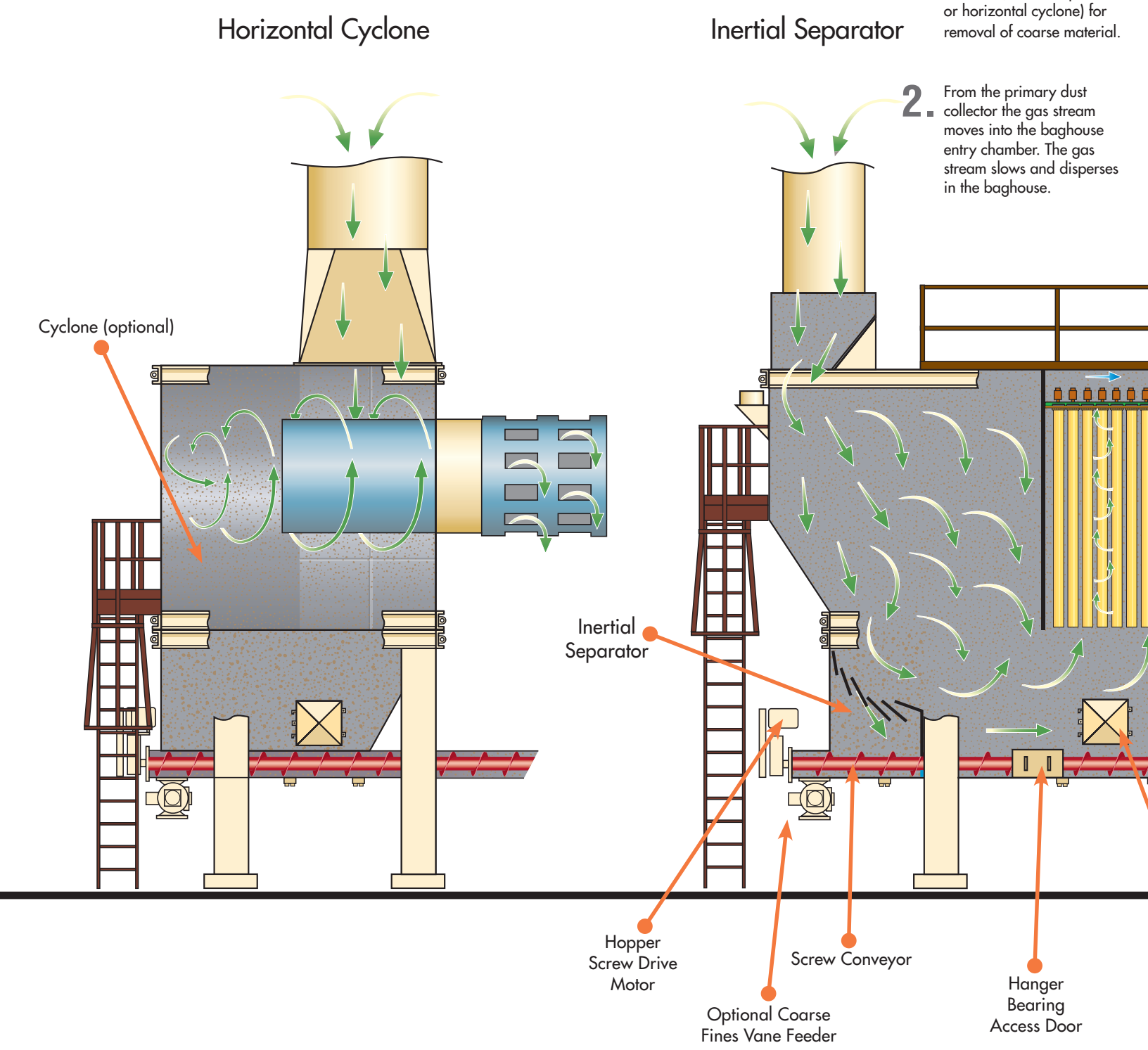
AIR FLOW

The Cleaning Process

Dirty Air → Clean Air

1. Gas stream exits the drum mixer or dryer through duct and enters primary dust collector (inertial separator or horizontal cyclone) for removal of coarse material.

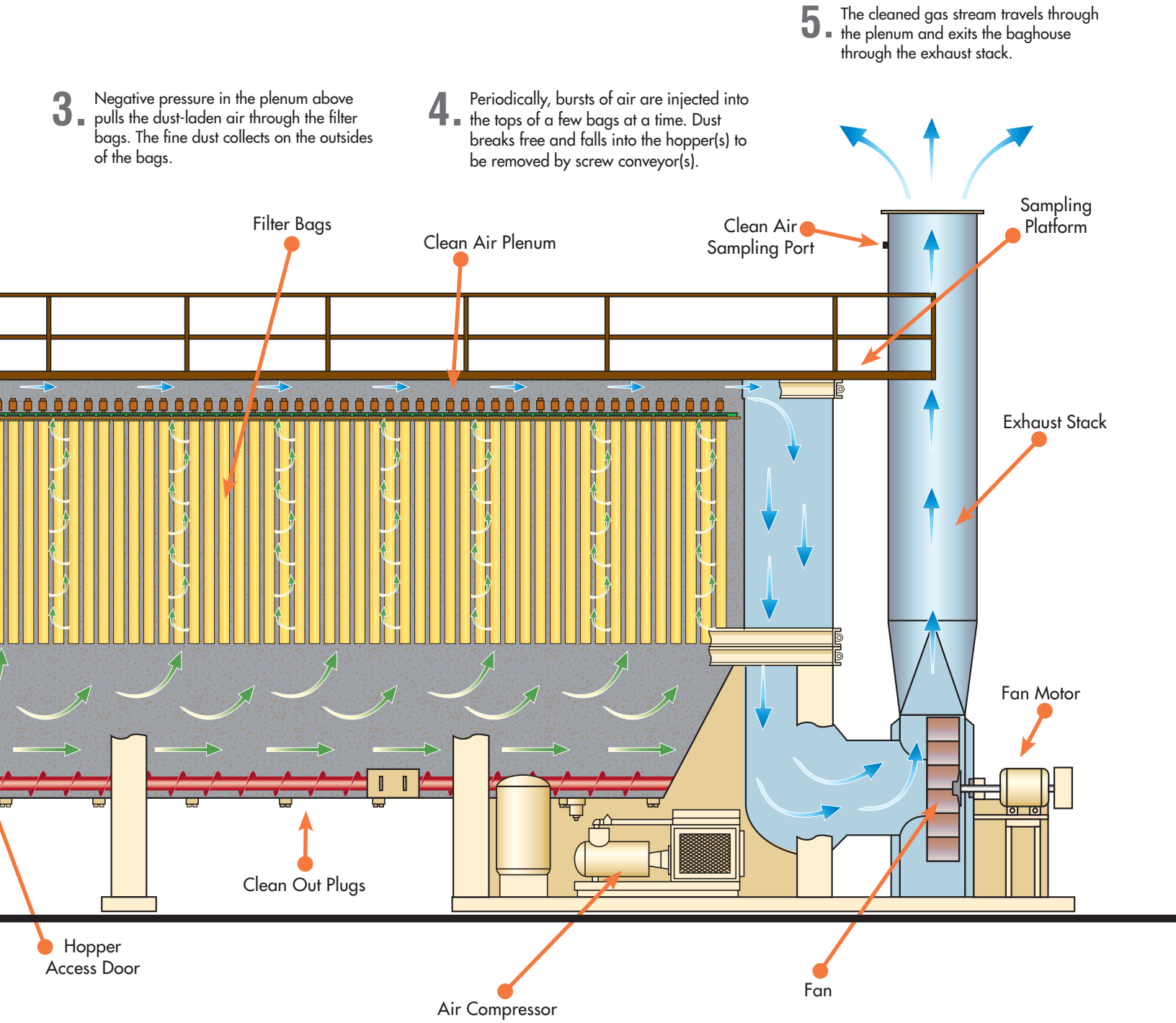
2. From the primary dust collector the gas stream moves into the baghouse entry chamber. The gas stream slows and disperses in the baghouse.



BAGHOUSE BASICS

Baghouses are the equipment of choice for particulate control of hot mix asphalt plants. The typical HMA facility baghouse consist of a fabric filter system enclosed by a steel structure. The basic technology of a baghouse is simple. The exhaust stream passes through the fabric filters before it enters the atmosphere. Dust does not pass through the felt walls and accumulates on the outside of the bags.

Today's baghouses routinely meet the most stringent emissions limits. Baghouses also offer economic advantages and better utilize the aggregate by returning dust to the mix instead of wasting it.



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