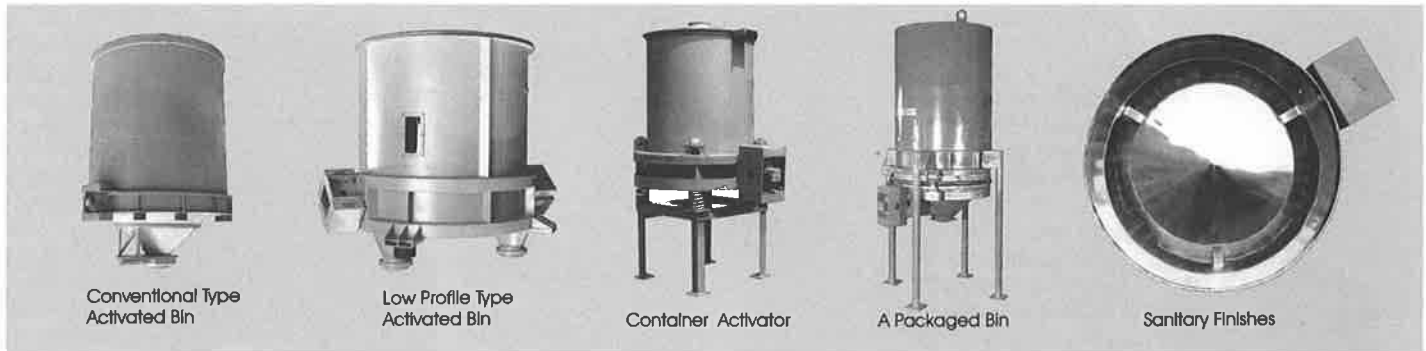


Activated Bins Container Activators Packaged Bins



The Activated Bin came into being in 1964 as a near desperate resolution to a repetitious, nagging problem with an 8 ft. dia. Bin Activator located in northern New Jersey. It was installed under a bin of the same diameter. The stored and discharged material was wet, finely ground chrome ore. While not fully realized at the time, it was the first encounter with a "thixotropic" type material. This means it changes its obstinate flow characteristics when it is vibrated to what would be likened to a "jelly" type compound. Consequently, if the bin was almost filled to its full 9 ft. of vertical wall height, the resulting hydraulic "head" effect kept "pushing out" the large inlet sock from its connections. In turn, the

chrome ore spilled to the floor below instead of oozing from its outlet. After trying various corrective measures without any success, it was decided to weld the 9 ft. high vertical cylinder directly to the inlet of the Bin Activator. The problem was solved because the inlet sock was eliminated.

Flexible socks and their connectors have been markedly improved since then. Ironically, the Activated Bin emerged to be beneficial for many different types of applications.

Container Activators were developed in 1972 in response to the need for discharging bulk solids received in reusable containers. Therefore, they came about from the normal course of expanding the use of the "Induced Vertical Flow" concept.

Packaged Bins appeared shortly after the introduction of the Bin Activator in 1962. Taking into account the vertical flow problems plaguing Industry at the time, purchasers wanted to place as much responsibility on the supplier as they could for the storing and discharging of a bulk solid. Over the years, this practice has diminished because of the improved knowledge and proven capability of Static Design Technology. Today, there are many qualified Bin and Silo Consulting Engineers that can be called upon for reliable, professional help in their design.

Activated Bins

Activated Bins vibrate as a complete entity. Consequently, they have full "command" of their stored contents. Bridging in the upper portion of the bin is avoided and they have the beneficial attribute of being "self-cleaning". The large inlet sock and skirt as used with Bin Activators are eliminated. The vibrating bin enables a better sanitary unit, vacuum and pressure ratings, dewatering, and the assurance of the complete discharge of its contents.

The applied vibratory action markedly reduces the stored material's "interparticle" friction, combined particle shear strength, and wall friction. Therefore, it vertically flows from the bin in conjunction with the forces of gravity.

Activated Bins are usually of mild steel construction, but stainless steel, as well as any needed liners, can be supplied. Internal and external surfaces can be provided with the quality of "finish" that's needed.

While these units can be supported from above by suspension cables, they are recommended to be supported from below. Solid rubber isolators mounted in compression are standard, but steel coil springs can be supplied if they are preferred.

For "loss in weight" applications or computerized inventories, load cells can be inserted under the Activated Bin's isolators.

By adding a top cover and the appropriate flexible connections at the unit's inlet and outlet, the Activated Bin can be completely sealed. This cover can either vibrate with the unit or be mounted stationary above it. View ports and quick opening access doors can be included in the vertical walls or the top cover. When necessary, so-called "rupture discs" can be provided to quickly exhaust potential internal explosions.

Either manual or air-operated gates are available for installation at their outlets.

Since gravity is the prime mover of the material, the vibratory drive system is of the "single input" or "brute force" type. It usually consists of one motor generating an essentially horizontal, "orbital" type stroke. When needed, two motors are used to develop a "helical" type of vibratory action. Operating frequencies can be 855, 1140, or more often 1710 CPM. The rotating eccentric weights installed on the motor are manually adjustable.

Activated Bins vibrate very quietly. Operating sound levels should be less than 80 dBA.

These vibrating bins are normally shipped as a complete assembly. For installation, they are lifted and set down on top of their provided isolation mounts.

If the discharge of the unit is of the "open drop" type, their operating procedure is near arbitrary. However, when they are coupled with a feeding device, they almost always will be "cycle" operated. An electric timer or a "starve switch" located at the inlet of the feeder below can be used to accomplish it.

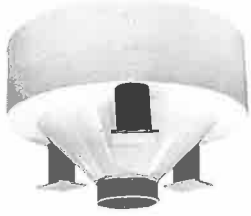
The vibratory exciters, solid rubber isolators, and flexible sock connections have many years of proven, productive, service life. Therefore, the maintenance requirements for any Activated Bin are minimal.

Standard size Activated Bins are available from 2 to 5,500 cu. ft. volumetric capacity. These volumes are based upon the vertical wall height being a maximum of twice the diameter of the bin. These units range from 2 to 15 ft. in diameter. Smaller or larger bins can be supplied on special order.

There are two different designs from which to choose. They are the "Conventional" and the "Low Profile" type.

Activated Bins: Conventional

Activated Bins are protected by U.S. Patent Nos. 4,774,893, 4,899,669, 4,960,229, and others that are pending.



3 cu. ft. -
2 ft. dia.



75 cu. ft. -
5 ft. dia.



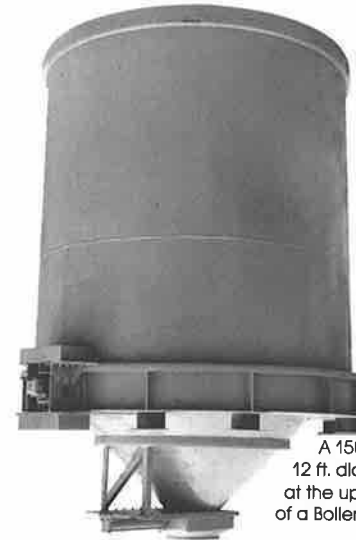
100 cu. ft. -
5 ft. dia. with
bolted access
door



2,000 cu. ft. -
12 ft. dia. Surge Bin with
two motors
for a helical
stroke action.
This design is
often used for
"waste type
fuels."



Polished sanitary finishes are
available for any Activated Bin



A 1500 cu. ft. -
12 ft. dia. Surge Bin
at the upstream end
of a Boiler Feed Circuit



300 cu. ft. -
7 ft. dia. with
ASME "dished
head" cover.
The motor's
rotating
eccentric
weights can be
seen.



500 cu. ft. -
10 ft. dia., 45°
slope, conical
cover, SS-304



800 cu. ft. -
10 ft. dia. with
ASME "dished
head" cover.



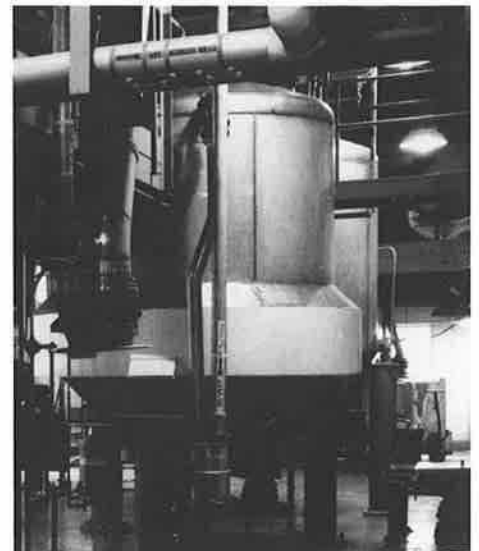
A 1500 cu. ft. - 12 ft. dia. Surge Bin at the upstream
end of a Boiler Feed Circuit



An installed Boiler Feed Train



A 30 cu. ft.
portable unit
complete with
an ASME "dished
head" cover.



An installed sanitary bin with a 50 PSI pressure rating
that is storing and discharging a volatile material.

Activated Bins: Conventional / Low Profile

Conventional

Activated Bins of this configuration have a vertical wall height combined with a conical transition down to the outlet. Usually, its slope is 45°, but it may be 60° when bulk solids that are extremely obstinate to vertical flow are being stored. Normally, they are vibrated by a single vibratory excitor. When the contained material is more difficult to discharge, two motors will be used.

Typical Applications: Conventional design Activated Bins can store and successfully discharge bulk solids of the Flake, Floodable, or General types which include those that take a strong "set" or are thixotropic. Some of these applications would be:

Batch weigh hoppers to ensure the entire contents discharge without leaving pockets of residue. The weighed batches of ingredients used in the first stages of glass making is a good example.

Vacuum and pressure rated bins including the proper flexible connections with their appropriate securing methods. Combined with "rupture discs", internal pressures to 50 PSI can successfully contend with bulk solids that can accidentally explode.

Self-emptying surge bins are often needed in the upstream end of Boiler Feed Circuits. The maze of "waste type" fuels create this necessity.

Metering bins as needed in Boiler Feed Trains. RDF, shredded rubber tires, wood bark, chips, shavings, and sawdust, plus waste-type coals such as gob, culm, and silt, are the typical fuels to be handled.

Non-contaminating bins that are often required for Food, Pharmaceutical, Nuclear Radwaste, or Munition handling applications. Internal surfaces with a polished type finish are usually needed.

Superior sanitary bins that lend to the "CIP" principle which involves "cleaning in place". Eliminating the large flexible sock and skirt associated with Bin Activators helps in this regard.

Bins for dewatering. Fill the bin with a slurry and the solids will precipitate to the bottom in accordance with a more efficient Stokes Law. Skim the liquid from the top surface and discharge the dewatered material.

Integral sludge bins for waste water treatment plants. Since there are no large flexible sock connections in the storage section, the sludge type material is safely contained.

Receiving hoppers for packaging machines. The discharge from the Activated Bin fills the cartons, bags, or other types of packages.



1200 cu. ft. - 12 ft. dia.
dual outlet,
Low Profile type



500 cu. ft. - 8 ft. dia.,
dual outlet,
Low Profile type

Low Profile

These Activated Bins eliminate the conical transition. They are always vibrated by two electric motors mounted diametrically apart and tilted to develop a "helical" type stroke action. This causes the contained bulk solid to convey in a circular path. Their internal baffles are usually inverted cones, but they can have other configurations to better suit the application.

Typical Applications: Low Profile type Activated Bins can be used whenever the stored material favorably responds to a circular conveying action. When compared to the "Conventional" unit, they offer these added advantages:

Multi-outlet Bins are more practical due to the circular conveying action. Either manual or air-operated gates should be installed at each outlet. The outlets are as needed, but the number seldom exceeds four.

Bins with minimal head room requirements are possible. Since the conical transition has been eliminated, this type of Activated Bin provides the greatest amount of storage in the least amount of height.

Multi-outlet Surge Bins for supplying two-different Boiler Feed Circuits that distribute fuel in opposite directions.

Container Activators

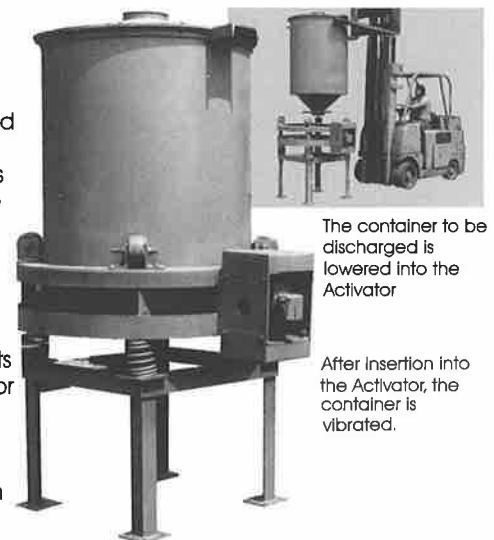
When rigid type "reusable" containers are being received, this Activator can be used to accomplish their discharge. It is designed to accommodate the specific container to be emptied. In most applications, the container is the same size even though the type of material being received varies. Ordinarily, they are square or circular in shape. The container is lowered into the Activator by means of a forklift or hoist. Round rubber rollers guide the container down into the Activator and its base supports its bottom side. After it is tightly wedged in the Activator, it is vibrated while being discharged. Usually, they are coupled with a feeding device, so they are most often operated on a "cycle". After the container has been emptied, it is lifted from the Activator and replaced with another.

When it is a large bag or a thin walled plastic container, a modified Bin Activator

set on compression springs receives and discharges it.

In either instance, no manual effort is required to fix the container to the Activator. It is simply dropped down into and lifted from the vibratory machine.

Activators are available in various sizes to accommodate the configuration of the reusable container. The vibratory action is essentially in the horizontal plane at a frequency that is usually 1710 CPM. The vibratory stroke is adjusted by changing the amount of rotating eccentric weights installed on the vibratory excitor. These units will almost always utilize the "single input" or brute force type of vibratory drive system. The operating sound level is normally less than 80 dBA. Provided they are in reasonably good condition, the applied vibration is not harmful to the container being discharged.



The container to be discharged is lowered into the Activator

After insertion into the Activator, the container is vibrated.

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Packaged Bins

The most complete line of vibratory machines for "inducing" bulk solid materials to vertically flow or convey

In some instances, it is preferred the Bin Activator, static storage bin, and the respective support structure be provided by a single supplier. To fulfill this need, the "Packaged Bin" is provided. They vary from small size portable units mounted on rollers to relatively large combinations.

The support structures can include safety ladders, floor grating, hand rails, and the like. The bin can be lined or of alloy steel construction. Gates, telescoping loaders to minimize dust, as well as the associated electrical control panel, can also be included.

Every effort is made to pre-assemble the respective components. This enables the "Packaged Bin" to be lifted from its transport and set into place with minimal field labor. Usually, bins to 12'-0" in diameter can be shipped as one integrated assembly. Larger diameters will probably require sectioning into acceptable size segments for over the road shipments.



A 12 ft. dia. by 15 ft. vertical wall height, 60° con-concentric, conical transition Storage Bin packaged with a 6 ft. Inlet dia. Bin Activator, air-operated outlet gate with a dustless, telescoping, truck loading chute and a free standing support structure complete with platform, hand rails, access ladders, and an operator's electrical control panel located at ground level.



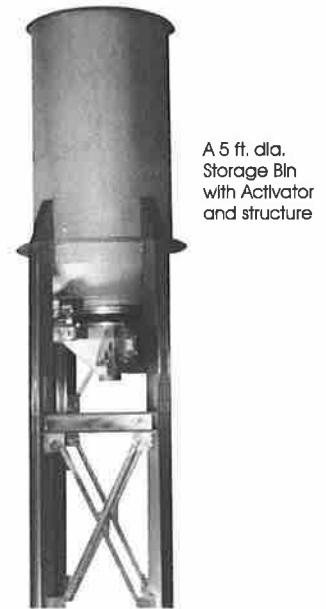
Polished, sanitary finishes are available for any "Packaged Bin".



A 6 ft. dia. by 18 ft. vertical wall bin with a 4 ft. dia. Bin Activator and support structure. The "package" was supplied as one assembly.



3 ft. dia. by 8 ft. vertical wall assembly



A 5 ft. dia. Storage Bin with Activator and structure



A portable "Packaged Bin". The Bin Activator is powered by an air motor because of the volatile characteristic of the material being stored and discharged.