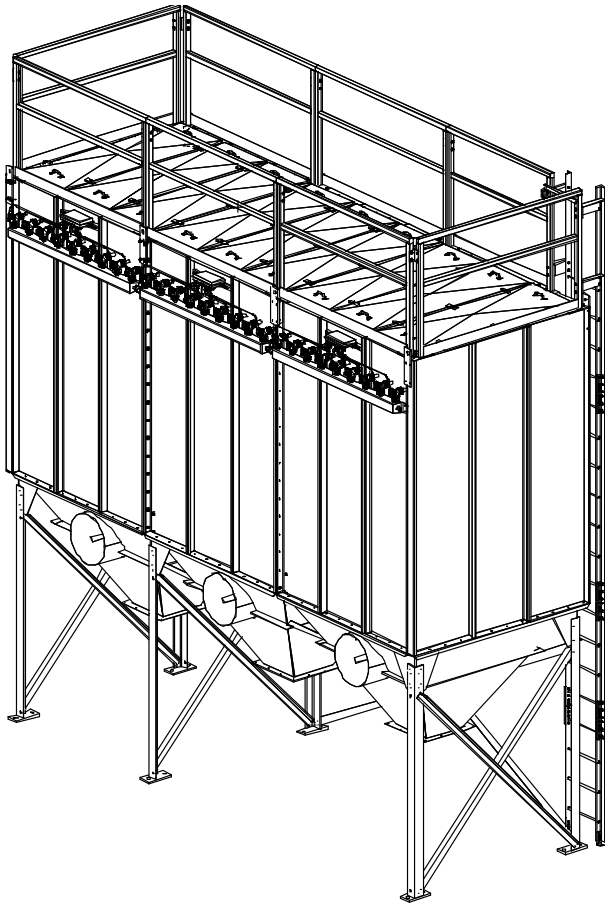
Modular Baghouse Collectors

Product Overview



The Modular Baghouse (MB) collector is a compact, self-cleaning, continuous pulse-jet unit used for the collection of airborne dust and particulate. Its simple, traditional, reliable design handles low- and high-volume dust collection applications in the most energy efficient manner. The inherent advantages of a Modular Baghouse include minimal moving parts, reduced maintenance costs, and the convenience of clean top-bag access to inspect, remove, and replace filter bags.

MB collectors feature a standard FLUENT™*-designed hopper inlet per mod (trough hoppers are optional (ACO); quick-disconnect blowpipes; round snap-in bags; and cages with polyethylene venturis. Railings, kickplates, platforms, and optional ladder and ladder/cage packs are designed in accordance with OSHA specifications. The standard available leg lengths are 8-foot (2.44m) and 10-foot (3.05m). Standard bag material is Dura-Life™. Options include 16 oz polyester felt untreated, glazed, or singed with PTFE membrane. The MB is typically sized for applications between 3,100 and 65,000 cfm (5,267 and 110,435 m^3/h).

The MB collector is available in two styles-MBT and MBW. The MBT allows walk-on top-bag removal, while the MBW includes a walk-in clean air plenum. The bags are serviced from the clean air side of both models. Unit model numbers describe the number and length of bags; for example, a 243MBT8 contains 243 bags, 8-foot long, with a top-bag removal design.

The MB collector is designed to ship on standard flatbed and double-drop trailer bed trucks. Most standard units do not require transportation permits.

The MB was introduced in 1999 using a modular design and FLUENT analysis software to create optimum upflow velocities (can velocities) and to optimize performance by the inlet deflector in the hopper. Equal bag spacing maximizes lower upflow velocities and reduces abrasion problems. Air turbulence in the hopper has been eliminated to reduce abrasion and avoid re-entrainment of dust.

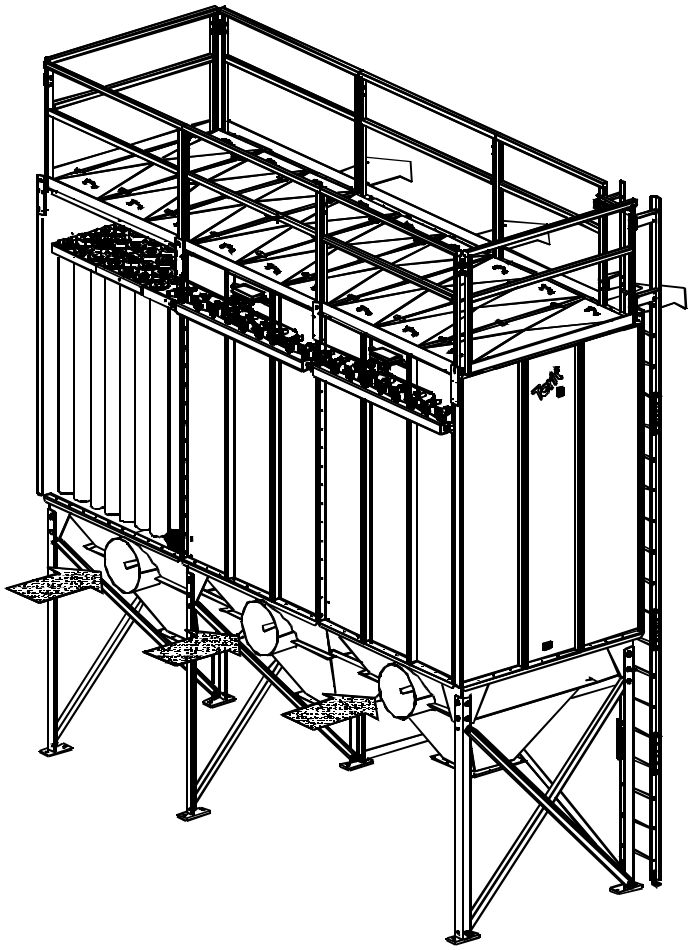
* FLUENT is a trademark of Fluent, Inc.

(08/04)

The MBT collector was the first standard Torit® unit designed in compliance with National Fire Protection Standards, NFPA 68 (1998 edition) for dusts with a K_{st} value of up to 200 bar m/s. For K_{st} values less than 200 bar m/sec, contact Applications Engineering. Explosion vented MB collectors no longer require separation or fire walls (as of November 2001) The MB price sheets indicate the number of standard explosion vents per collector. The MB collector uses NFPA compliant membrane-style vents.

Operation Explanation

Normal Operation: During normal operation, dust-laden air enters the MB hopper inlet section under the filter bags. The airflow must turn 90 degrees to pass through the dirty air plenum. The energy loss from turning and the reduced velocity in the hopper causes the heavier dust particles to drop directly into the hopper below. A standard inlet baffle helps evenly distribute the dust-laden air around the filters. The dust is collected on the outside surface of each filter bag, where it forms a cake that aids in filtering efficiency. Filtered (clean) air passes through each filter bag into the clean air plenum, where it is discharged through the clean air outlet.



Filter Cleaning: Filter bags are cleaned automatically and sequentially. Only one row of filters is cleaned per pulse. During the cleaning purge, the solid-state timer energizes a solenoid valve. This action causes the corresponding diaphragm valve to send a pulse of compressed air out into the blowpipe. The high pressure pulse enters the inside of the filter bag, forcing air backward through the filter. The collected dust is blown away from the outside surface of the filters. The dust falls into the hopper, where it is discharged into drums, screw conveyor, or rotary valve.

Application Summary

The Modular Baghouse is a good collector choice whenever the application has one, or more, of the following conditions: high loading (>2 grains/scfm), high moisture content, agglomerative dust, or low cost.

The target market for the Modular Baghouse is the process market. It is a very conservative market with very traditional behavior. These customers prefer the simple, true, and proven technology of a modular baghouse collector. The process market consists of many segments, and each segment includes several industries. These market segments consist of the chemical, mineral, food, wood, agriculture, industrial, pharmaceutical and other industries. Donaldson has considerable experience with baghouses in food/agriculture, industrial, mineral/metallurgical,

and wood. New opportunities exist in the chemical and mineral industries for such applications as material handling, crushing and grinding, spray dryers, mixing operations, and packaging.

The process market can be divided into five dust collection segments: bin venting, nuisance dust, receiving vessels, product reclaim, and high temperature collectors. The MB collector will most often be applied on nuisance dust applications. With custom modifications, the MB is suitable for high temperature applications up to 400°F (204°C). Specifically, the most common applications that baghouses could be used include material conveying, weigh stations, mixing tanks, bin vents, material grinding, and packaging.

The MB is a cost competitive economical baghouse solution. At air-to-media ratios greater than 8:1, the MB is very competitive with a base list price close to $1/cfm.

Sizing and Selecting

To properly select the right size MB collector for an application, the correct airflow velocities should be calculated based on the dust type and dust loading. The velocities that should be considered are (1) can (or interstitial) velocity and (2) filter velocity, better known as air-to-media ratio.

Can Velocity. Can and/or interstitial velocities are often overlooked, but are very important factors for upflow-type collectors. Can velocity (Vc) is calculated by dividing the air volume (Q) by the collector cross-sectional area (A), as in the equation, Vc = Q ÷ A. Interstitial velocity is similar to can velocity, but is calculated by dividing the air volume by the collector cross-sectional area less the filter bag cross-sectional area. It should be noted that the MB collector's FLUENT inlet design and bag spacing allows it to have lower velocity between the filter bags than competitive collectors.

Can velocity is important because it can be used to determine the ability of dust to settle out of a collector. Maximum can velocities are based on bulk density and interstitial velocity, and are provided in the Recommended Air-To-Media Ratio Guide.

Air-To-Media Ratio. The other velocity to consider is the filtration velocity, or air-to-media ratio. To determine the size of collector needed, calculate the square footage of filter area required with this formula: Required filter area = CFM ÷ air-to-media ratio. Once the required filter area is known, a unit can be selected. Each 8-foot (2.44 m) MB bag has 12.83 ft^2 (1.2 m^2) of filter area and each 10-foot (3.05m) MB bag has 16.04 ft^2 (1.49 m^2) of filter area. For the maximum recommended air-to-media ratio, use the Recommended Air-To-Media Ratio Guide, available through your regional sales office or Applications Engineering. The most current AMR guide includes maximum can velocities and toxicity reference. Hazardous dusts may require a HEPA afterfilter, at a minimum, for recirculation, or may not be recirculated depending on the dust and local regulations.

Features and Benefits

Features	Benefits
Walk-on housing design with clean top-bag access	• Easy and quick access to inspect, install, or remove filter bags • Reduces impact of OSHA's confined space requirements and permits
Walk-in housing design with clean top-bag access	• Limited exposure of maintenance personnel to dust • Maintenance personnel protected from environment during maintenance and bag changes
Welded, heavy-duty ribbed panel construction is computer-designed for optimum structural stability	• Provides longevity • Quality design to last a lifetime
Base modules are factory assembled and shipped in major assemblies	• Supports rapid field installation and minimum crane time
Multiple inlets on larger collectors	• Provide a more even airflow distribution
Minimal moving parts	• Reliable operation even under the toughest environmental conditions
Dura-Life media standard	• Longer filter life resulting in fewer change outs and lowering maintenance costs • Reduced pressure drop for savings on energy costs • Higher cleaning efficiency for fewer emissions
8' (2.44 m) long MB filter bags feature 12.83 ft^2 (1.2 m^2) of filtration area	• Smaller, more compact baghouse collector for the same airflow • MB 8-foot bag is equivalent to most 10 ft bags and handles higher airflow of up to 128 cfm per bag
10' (3.05 m) long MB filter bags feature 16.04 ft^2 (1.49 m^2) of filtration area	• Longer bag option provides more filtration area options to match customer needs
Snap-in bags and quick-disconnect blowpipes	• Tool free installation and removal of bags and cages • No loose parts
Venturi/cage assembly with friction fit	• Tool free installation of bag cages reduces maintenance time
Optimum bag spacing provides lower upflow velocities	• Reduces abrasion problems in more difficult applications
Computer-designed inlet deflector in hopper	• Reduces abrasion and eliminates re-entrainment of dust

Features	Benefits
Platforms, service railings, ladder and ladder/cage packs per OSHA specifications	• OSHA compliant construction provides optimum worker safety • Supported and requested by insurance companies
Designed to fit on standard flatbed trucks and trucks with double-drop trailer beds	• Allows shipping with common carriers • Allows lowest freight costs • No special transportation permits required
Vented housing construction is compliant with NFPA 68, 1998	• Ensures optimum worker safety • Firewalls no longer needed allowing the use of trough hoppers on explosion-protected units
72" clearance leg pack for trough hoppers option	• Minimizes field fabrication costs
Standard sprinkler access port	• Allows for customer installation of sprinkler pack if needed
Sprinkler pack assembly option with flood valve on pyramid hopper access cover option	• Provides flexibility and reduces field labor on systems requiring sprinkler systems