

TECHNICAL SPECIFICATIONS
MIDWEST VACULOADER®
INTERNALLY VENTED HOPPER
FEED DRY BULK FILTER MODULE

TO 1400TPH*

- MVL 37T 259 C
- MVL 37T 346 C
- MVL 37T 432 C
- MVL 43T 432 C
- MVL 43T 576 C
- MVL 43T 720 C
- MVL 54T 691 C
- MVL 54T 922 C
- MVL 54T 1152 C

SERIES
MVL/HO

TECHNICAL SPECIFICATIONS

MIDWEST VACULOADER®

Internally Vented Hopper Feed Dry Bulk Loading Module

DESIGN CRITERIA: The Vaculoader® Internally Vented Dry Bulk Loadout System was developed by MIDWEST to eliminate high maintenance dust piping for truck and railcar loadout systems. When used with a Paragon™ MV Series Internally Vented Retractable Bulk Loading Spout, Flattop™ Truck Loading Positioner or an MSPV or MRSPV Roundabout™ Rotational Spout Positioner, this system provides the user with the Best Available Current Technology (BACT) for dust free loading of dry bulk commodities. The MIDWEST Vaculoader® module places the internally vented spout and/or positioner under a negative pressure or vacuum reducing or eliminating fugitive dust.

DESCRIPTION: The MIDWEST Vaculoader® Dust Free Loadout Module is available in several models designed to meet loading requirements for most fine, granular or lumpy products. The MV Paragon™ Series Retractable Loading Spout allows the operator to raise or lower the discharge of the spout as vehicle traffic passes under the silo or loading point. When used with the (4) way Flattop™ positioner, single direction positioner or multiple direction Roundabout™ positioner the loading operator no longer is required to walk on the truck or railcar top to position the spout discharge in the vehicle, if the vehicle is not centered under the spout. This Vaculoader® System provides added safety for the loadout operator and increases vehicle traffic through the loading station by up to 75% if used efficiently. There is also no plugged dust piping to clean as the closed system places the vehicle and the MIDWEST loading system under a vacuum which is maintained during loading. Fugitive dust and product is withdrawn up and into the Vaculoader® filter module. Dusty air is filtered with only clean air being discharged from the Vaculoader® fan. Dust and cargo trapped on the filter media is automatically purged off and is recycled back into the vehicle being loaded. There is no loss of product to the environment, plant housekeeping is reduced and vehicles usually need no cleaning after loading is completed. The Vaculoader® System is available in top feed modules for direct withdrawal from a bin or silo and is also available with a hopper feed using a MIDWEST Airflo™ Air Gravity Conveyor, Multiflo™ screw conveyor, drag or belt conveyor. Consult factory for system design assistance.

MODEL MVL/HC 37, 43 AND 54 SERIES HOPPER FEED ENCLOSED AND OPEN VEHICLE LOADING SYSTEMS

FILTER MODULE: Constructed from ASTM A36 carbon steel welded and bolted components. Sealmaster™ top access door with Camloc™ "T" handles allows quick inspection of inside of clean air plenum without use of tools. Filter module construction includes two (2) large Sealmaster™ hinged doors providing inspection and maintenance access to filters. These hinged doors are robust molded polymer with 1/2" diameter endless "O" ring seal compressed in half round cavity molded into back side of door. All cast aluminum machined Sealmaster™ doors are also available for high temperature applications. All four corners are radiused to eliminate leaking at square corners. The Sealmaster™ filter doors are prehung in a heavy cast aluminum frame riveted and sealed to the filter module housing.

This rain proof construction is ideal for outside applications. Vaculoader® Filter Module can be installed using four hanger plates attached to each corner on top of clean air plenum or cast mounting pads located at each corner of bottom of module. Specify installation support system required. Air purging system with filter purging controls and clean air fan included. Air compressor and drier package available as are several other options. Vaculoader® Filter Modules available in optional materials of construction, eg; Class IA,IB, III, IIIA and IV.

FILTERS: Pleated filter cartridges are standard in this series Vaculoader® which results in low air to cloth ratios. Filter Cartridges are wide "V" pleat Polyflex™ spun bond as standard, other media available including Nomex, Gortex, or Teflon coated filters. Metal filter parts are galvanized or optional stainless steel (specify). Consult factory for other media. Magnetic blowout doors available for explosion proof (XP) hazardous areas. Contact factory for prices and additional information.

PRODUCT INLET(S): MVL/HC Hopper Feed Vaculoaders® are designed for product feed into the hopper assembly. Most common types of feed are with Airflo™ Air Gravity Conveyors, Multiflo™ Screw Conveyors, gravity chutes or drag or belt conveyors. This MVL/HC Vaculoader® Series could also have a top inlet feed for silo withdrawal as well as several hopper feed inlets up to (5), flanged to interface with various conveyor components. Contact factory for design assistance.

CLEAN AIR FAN: Available in air withdrawal capacities of 100 to 5000 CFM (Refer to drawing). Cast aluminum alloy fan housing standard, includes direct drive motor with static and dynamically balanced cast aluminum machined impeller. Fan motors are standard TEFC enclosures with mill and chemical duty and (XP) motors available. NOTE: Fan rotation must be correct or efficiency will drop by 60 percent. Arrow on fan indicates proper rotation.

FILTER PURGING SYSTEM: Automatic sequential filter purging system includes factory adjusted timed compressed air sequential purging of filters and pressure differential gauge. NEMA 4 controller located on fan side of the Vaculoader® filter housing. Heavy duty NEMA 4 purging valves and air accumulator included. Purging system wired to not purge if Paragon™ Series loading spout discharge is not firmly seated in vehicle hatch. This feature allows fan to remain on between vehicle spotting. NOTE: Applies to Paragon™ MV Series loading spouts with slack cable limit switches. Air purging system prepiped and prewired as standard. Purging air must be dry instrument air with no moisture. Contact factory for explosion proof (XP) electrics.

CLASSES OF CONSTRUCTION AVAILABLE:

Class I	*Abrasive Fines (High-density AR cross-linked polymer) to 176° F and -40° F
Class I(FG)	*Abrasive Fines (Same as Class I except White Food Grade)
Class IA	Mildly Abrasive Granules (A36 carbon steel)
Class IB	*Contamination Free Fines and Pellets (6061 T6 aluminum)

Class II	Abrasive Granules (250 BHN AR steel)
Class III	Stainless Steel Product Flow Area only (304 furnished as standard, 316 available)
Class III(FG)	Food Grade Products (Same as class III with ground and polished welds)
Class IIIA	Stainless Steel all Fabricated Metal Components (304 furnished as standard, 316L available)
Class IIIA(FG)	Corrosive or Non-Contaminate Food Grade Environment (Same as Class III A with stainless steel fastings)
Class IVA	High Temperature 177° F to 400° F
Class IVB	High Temperature to 1000° F
Class V	Abrasive Lumps High Impact (400 BHN AR steel)
Class V A	Abrasive Lumps High Impact (400 BHN AR steel Venturi, with integral rockbox to reduce wear)
Class V T	Abrasive Lumps High Impact (Trinten™ Hard Coat)

*(NOT AVAILABLE)

PAINT: Mechanical Clean with (3) mils white two part epoxy standard. Consult factory for optional paint systems.

ASSEMBLY: **Vaculoader®** modules are factory assembled prior to shipment with filters shipped loose. Consult factory for module stackup drawings and drawings for other **MV** internally vented system modules, i.e.; **MV** series loading spouts, positioners and other internally vented components.

ESTIMATED MECHANICAL FIELD ERECTION: One (1) work day (8 hours) after existing equipment has been removed and new equipment prepared for installation. Power lifting equipment and safety precautions recommended.

ELECTRICAL INSTALLATION: Four (4 hours) estimated with power within 7 ft, with all prewiring done by **MIDWEST**.

FIELD SUPERVISION: Erection and/or start up and commissioning assistance is available from **MIDWEST** at a per diem cost. Consult factory for prices.

INSTRUCTION MANUAL: **MIDWEST** provides two Installation Operating and Maintenance Manuals, one shipped with equipment and one forwarded to the Purchasing Department at time of shipment. Additional copies can be purchased at additional cost.

CAUTION: Many dry bulk products contain explosive dust. **MIDWEST** offers explosion proof (XP) electrics as an option for all electrical components and PLC controls. Intrinsically safe barriers are also available for hazardous areas. Consult factory for additional information and pricing.

OPTIONS AVAILABLE:

PREWIRING: Purging valves and prewiring of purging controller included as standard. Optional prewiring of pneumatic vibrators, spout positioner (if applicable), and retractable bulk loading spout including all accessories, is available. Refer to individual **MIDWEST** Technical Specifications for details or contact factory. Electric motor prewiring to common junction box also available.

MOTOR PREWIRING: **MIDWEST** can prewire **Vaculoader®** fan motor and loading spout drive motor to an independent NEMA 4X or (XP) junction box. NOTE: Usually applies to

multiple equipment stackups consisting of loading spout and positioner or **Vaculoader®**. **MIDWEST** supplied motor controls (MCC) are also available.

MOTOR CONTROLS,(MCC): Electric motor starter(s) can be provided for the **Vaculoader®** fan, spout positioner and the **Paragon™** Series Retractable Bulk Loading Spout. NEMA 4 or 4X enclosures standard, NEMA 7/9 (XP) available. NOTE: MCC located on fan side of **Vaculoader®**.

AIR COMPRESSOR DRIER: Complete 80-100 PSI air compressor and desiccant drier system with receiver all mounted on skid for field installation available from factory. This piped and prewired system is designed to provide peak efficiency for **Vaculoader®** purging, pneumatic silo withdrawal valves or gates and air vibrator system. Consult factory for air volume required for specific application. Specify if motor starter and drier control or vented enclosure is required.

AIR DRIER (ONLY): Desiccant, 26 SCFM, @ 80-100 psig with -42° F dewpoint. Note: located on side opposite fan.

FILTER MODULE BLOWOUT DOOR: Designed to release quickly, relieving pressure caused by an explosion. Magnetically held door is a static design and includes no moving parts except hinges. NOTE: **Not UL Approved**

PHOTOHELIC PRESSURE DIFFERENTIAL SYSTEM WITH GAUGE:

This system is supplemental to the timed sequential purging system and overrides the timed sequential purging system if the pressure differential between the dirty air side and clean air side of the filter system reaches a preset pressure. In effect, the filters will purge automatically if the timed sequential purging system is out of adjustment. For **Vaculoaders®** only and with **Paragon™ MV** Series Retractable Bulk Loading Spouts with **Sealtite™** Sealing Cones, the pressure differential signal is used to open the optional pneumatic air relief damper to allow outside air into the clean air plenum when **Sealtite™** Sealing Cone is closed. This prevents spout ring "dancing" and possible damage to loading spout flexible outer spout.

PNEUMATIC AIR RELIEF DAMPER: (**Paragon™ MV** Series loading spouts with **Sealtite™** Sealing Cone). This cast aluminum damper opens when signal is sent by optional photohelic P/D system or slack cable system when loading spout is removed from vehicle hatch and as **Sealtite™** Sealing Cone closes off loading spout discharge. This allows **Vaculoader®** fan to continue running between vehicles being loaded. Damper is designed to close when optional Slack Cable Limit Switches on loading spout make contact as **Sealtite™** Sealing Cone opens after making contact with vehicle hatch.

ACCESSORIES AVAILABLE:

NOTE: Accessory items are shipped in kit form to be field installed however, are factory installed if **MIDWEST** prewiring option is purchased.

FILTER REGULATOR WITH GAUGE: Including brass maintenance valve with lockout feature. Available for installation on **Vaculoader®** accumulator to supply filter purging system with properly regulated dry compressed air. 1" NPT all models of **Vaculoader®** except **MVL 54** series which uses 1.5" NPT. Note: Compressed air must be dry instrument -42 degree dewpoint.

AIR VIBRATOR KITS: Three (3) or (4) pneumatic piston type air vibrators located on sides of the **Vaculoader®** hopper to vibrate loose product from the inside surfaces of the hopper

during or after loading. Normal operation is for operator to raise spout discharge 1" above hatch (enclosed vehicle loading) and engage vibrator system with **Vaculoader®** fan on. Vibrators are controlled by a 120 VAC NEMA 4 solenoid valve located on the top of the unit near the compressed air accumulator for accessibility. One solenoid valve is capable of servicing the **Vaculoader®**, positioner (if applicable) and the **MV Series** bulk

loading spout. Air regulator, lubricator recommended as air vibrators operate at peak efficiency regulated to 6 CFM @ 35 to 45 PSIG. Vibrator tubing and fittings available as a kit or factory installed if prewiring option is purchased.

REGULATOR - LUBRICATOR: Pneumatic, for vibrator system, .5" (1/2) NPT or .75"(3/4) NPT as determined by **MIDWEST**.

Technical specifications are subject to change without prior notification

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EQUIPMENT INDICATED IN SOLID COLOR IS INCLUDED IN THIS TECHNICAL SPECIFICATION.

EQUIPMENT OUTLINED IS AVAILABLE. CONSULT **MIDWEST** FOR DETAILS.

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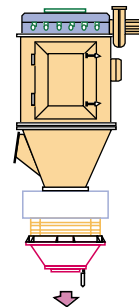
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TECHNICAL DATA

VACULOADER® MVL/HC SERIES

INTERNALLY VENTED LOADING SYSTEM MODULE

BULK MATERIAL DATA

PRODUCT	TEMP	DENSITY (PCF)

SCREEN ANALYSIS

<input type="text"/> %	<input type="text"/> IN/MM	<input type="text"/> %	<input type="text"/> IN/MM
<input type="text"/> MICRONS	MOISTURE CONTENT	<input type="text"/> %	

MODEL	STANDARD		OPTIONS (2.0)	CFM	NET WEIGHT WITHOUT FAN	
	MEDIA AREA	MEDIA (1.5)			LBS.	(KG.)
<input type="checkbox"/> MVL/HC 37	346	519	692	<input type="text"/>	551	(250)KG.
<input type="checkbox"/> MVL/HC 37	461	692	922	<input type="text"/>	626	(285)KG.
<input type="checkbox"/> MVL/HC 37	576	864	1152	<input type="text"/>	680	(309)KG.
<input type="checkbox"/> MVL/HC 43	540	810	1080	<input type="text"/>	730	(332)KG.
<input type="checkbox"/> MVL/HC 43	720	1080	1440	<input type="text"/>	790	(358)KG.
<input type="checkbox"/> MVL/HC 43	900	1350	1800	<input type="text"/>	880	(400)KG.
<input type="checkbox"/> MVL/HC 54	778	1167	1556	<input type="text"/>	990	(450)KG.
<input type="checkbox"/> MVL/HC 54	1043	1565	2086	<input type="text"/>	1079	(490)KG.
<input type="checkbox"/> MVL/HC 54	1296	1944	2592	<input type="text"/>	1208	(549)KG.

Classes of Construction Available:

- Class I **Abrasive or Corrosive Fines:** (High-density AR Cross-Linked Polymer) Temperature Rating: to +176 F, -40 F. Product Flow Area.
- Class IFG **Abrasive Fines:** Same as Class I except White Food Grade Polymer.
- Class IA **Non-Abrasive Fines:** A36 Carbon Steel Product Flow Area.
- Class IB **Contamination Free Fines and Pellets:** Aluminum Construction 6061-T6 Castings, Extrusions and/or Machined (spun).
- Class II **Abrasive Granules:** 250 BHN AR Steel, Product Flow Area.
- Class III **Corrosive Fines, Granules, Soft Lumps:** Stainless Steel Product Flow Area, 304 SS, 316 SS, 316 L (2B or 4B) available (specify).
- Class III FG **Food Grade Products:** Same Construction as Class III with Ground and Polished Welds.
- Class IIIA **Corrosive or Non-Contaminate Environment:** Stainless Steel Fabricated Components 304 SS, 316 SS, 316 L 2B and 4B available (specify) Non-Product Flow Area.
- Class IIIA/FG **Corrosive or Non-Contaminate Environment:** Same as Class IIIA with Stainless Steel Fastenings. Non-Product Flow Area.
- Class IVA **Hot Materials:** Temperature of Product being loaded, 177 F to 400 F, High Temp Rhinoflex™ Flexible Outer Spout "Orange" Color.
- Class IVB **Hot Materials:** To 1000 F, Rhinoflex™ Fiberglass, "White" Color.
- Class V **Abrasive Granules and Lumps with Sharp Edges:** High Impact 400 BHN AR Steel.
- Class VA **Abrasive Granules and Lumps with Sharp Edges:** High Impact 400 BHN AR Steel with Rock Box. Applicable to Loading Spout Venturies or (NSP) Inlet Transitions Only.
- Class VT **Abrasive Lumps and High Impact:** Triten™ Hard Coat.

CAUTION: Many dry bulk products contain explosive dust. Midwest offers explosion proof (XP) electrics as an option for all electrical components and PLC controls. Intrinsically safe barriers are also available for hazardous areas. Consult factory for additional information and pricing.

Important

Loading capacities are based on product bulk density of 60 PCF fines and 12 FT/SEC vertical entry velocity. Variations in density and lump size will affect loading capacity. Variations in entry velocity and trajectories other than vertical product entry could cause premature wear in product flow areas. Midwest recommendations for classes of construction are based on product samples supplied.

Accessories

- Pneumatic Maintenance Valve with Lock Out Feature, Filter Regulator. (Purge) 1.0" NPT
- Air Vibrator Kit: Vibrators (2 or 4)
- Solenoid Valve NEMA Volts , .5" NPT
- Pneumatic Regulator, Lubricator (Vibrators) .5" NPT

Options

- Prepipe "A" Purging System, Filter Regulator
- Prewire, Prepipe "B" (2) Vibrators
- Prewire, Prepipe "C" (4) Vibrators
- Motor Prewiring: NEMA for Motors, Fan Side
- Motor Controls (MCC) NEMA
- Base Support Pads (4)
- Floor Support System IN
- Support System: (4) Hanging Support Plates (Alternate to Base or Floor Support System)
- Photohelic Pressure Differential System, NEMA
- Intrinsically Safe Barrier (For NEMA 7/9 XP 120V or 220V ! Phase Applications) Barriers
- Explosion Proof (XP) Electrics (Fan Motors)
- Explosion Proof (XP) Electrics (Purge Controller)
- Fan Motor, Mill and Chemical Duty
- Special Paint:

Air Withdrawal Guide

REFER TO APPROPRIATE VACULOADER® DRAWING OR SPOUT DRAWINGS FOR AIR WITHDRAWAL RECOMMENDATIONS AND GUIDE. CONSULT FACTORY FOR VERIFICATION.

*Based on 60 PCF fines. Add air gravity conveyor aeration and 50% of silo aeration air if applicable.