Multistage Centrifugal Blow/Exhausters
Hoffman has earned the reputation as a worldwide leader in centrifugal blower and exhauster technology. The reasons are clear: innovative design; precision engineering; responsiveness to customer requirements; an unsurpassed reputation for service, quality and value.

A closer look will affirm that Hoffman is serious about your continued satisfaction. Let us show you how Hoffman can meet your particular challenges and requirements in air and gas handling.

Impellers...The hidden performers. Does your application have tough performance requirements? No problem, given the extensive variety of aerodynamically engineered impellers available for all Hoffman Centrifugal units. Years of engineering refinements have resulted in high performance, high efficiency designs.
Hoffman Centrifugals: a History of Performance, the Assurance of Dependability

Since 1908 Hoffman Multistage Centrifugal Blowers and Exhausters have satisfied the demands for air and gas handling in commercial, industrial, municipal and environmental applications. This unsurpassed record of dependable and efficient performance makes Hoffman the right choice for continuous service – 24 hours a day, year after year.

The Hoffman family of centrifugals spans a complete range of capacities, from 100 to 45,000 inlet CFM, pressures up to 25 PSIG and vacuums to 18 "Hg. Each unit is custom-engineered for your specific operating system.

To ensure the right equipment for each application, Hoffman offers skilled technical support throughout the United States and around the world. Consult Hoffman for the nearest Representative to assist you with your process requirements.
Whether as a single unit, or operating in parallel, Hoffman centrifugals perform at thousands of industrial and municipal wastewater treatment operations around the world. Hoffman units hold a strong position in emissions control systems, as at this power generation facility (A). The centrifugal unit produces oxidation air for the flue gas desulfurization process (B). Providing constant pressure and variable volumes, Hoffman blowers meet the demands of sulfur recovery.

**Multistage for Multiple Industrial Applications**

- **Combustion**
  - carbon black production
  - fluidized bed incinerators.
- **Electroplating**
- **Forced Oxidation Blowers**
- **Gas boosters**
  - carbon dioxide
  - mixture digester gas
  - natural gas
  - nitrogen
  - propane
  - refinery tail gas
- **Landfill Methane Gas Recovery**
- **Process Air**
  - black liquor oxidation
  - can & bottle drying systems
  - fermentation
  - steel strip dryers
- **Pneumatic conveying systems**
- **Sugar conditioning drying systems**
- **Vacuum Systems:**
  - central/portable
  - cleaning/dust control
  - pneumatic conveying systems
- **Wastewater Aeration**
Quality Assurance - Performance and Testing

Hoffman's manufacturing standards, quality control and stringent testing capabilities ensure equipment is designed to perform under the toughest conditions. Standard procedures require that all Hoffman centrifugals be thoroughly inspected and mechanically tested prior to shipment. Hoffman measures and records bearing temperatures and bearing housing vibration levels in the vertical, horizontal and axial planes to verify these values meet or exceed Hoffman's rigid specifications. One very important aspect of each unit's construction is the dynamic balancing of the rotor assembly, which results in smooth mechanical performance of the complete blower assembly.

Proper alignment of equipment is the key to long-term performance. Hoffman utilizes state-of-the-art laser technology in our alignment, and provides field alignment procedures with each unit shipped from the factory.

Computer technology facilitates vibration monitoring by testing levels at each housing. Operation checks at run-in translate into trouble-free performance at the job site.

A final inspection of each Hoffman unit prior to shipment checks every detail— from mechanical integrity to conformity to specifications and job site requirements. The result: a centrifugal unit ready to perform upon delivery.

Gardner Denver’s manufacturing facility is fully equipped for conducting complete ASME Code Performance tests, overspin and dye penetrant inspections, sound level tests, casing hydrostatic tests, and signature vibration analysis.
The superior performance of Hoffman® Blowers and Exhausters is attributed to the design and quality features manufactured into each unit.

Centrifugal blowers have virtually no wearing parts. The rotating assembly consists of cast or fabricated (composite) high strength aluminum alloy impellers keyed and positioned on a polished carbon steel shaft. Each impeller is statically balanced independently, and the entire rotating assembly is dynamically balanced to assure smooth, vibration-free operations (not to exceed 0.28”/sec velocity when measured on the bearing housing at design speed).

Both cast and fabricated impellers are available in a variety of vane shape configurations, from full radial blade to full backward-curved blade types.
Lubrication

Hoffman compressors use either an atmospheric splash-oil or grease system for bearing lubrication. Generally those in the lower volume range (approximately 5000 CFM and below) are equipped with grease lubrication which affords a wide range of operation in temperatures of -20°F to 300°F. All units in this range can also be equipped with optional oil lubrication systems.

For compressors in the higher volume range, oil lubrication is the standard system. Whether supplied with grease or oil lubrication, Hoffman compressors are designed for an AFBMA-L10 life of 10 years or greater.

Certain Hoffman compressors, with air volume capacities to 45,000 CFM, are equipped with a special oil lubrication system which include an oil slinger (A) to circulate oil from the inner reservoir (B) through the bearing and return the oil to the outer reservoir (C). A constant oil level is maintained automatically at the bearing for optimum lubrication and maximum cooling. Oil foaming is negligible due to the dual reservoir design. An external constant level oiler is provided for additional oil capacity and to provide a visual indication of oil usage. All oil lubricated units include a sight glass for determining actual bearing housing oil levels.

Another attribute of the Hoffman unit's oil system is its ability to be interfaced with spray mist lubrication systems which are required by many end-users.

Each oil unit is run-in at the factory and drained of oil before shipment. The proper oil lubricant, supplied by Hoffman, must be added prior to start-up.
### Hoffman Performance Specifications

**BLOWER/EXHAUSTOR CAPACITY**

<table>
<thead>
<tr>
<th>Units</th>
<th>40</th>
<th>41</th>
<th>42</th>
<th>725</th>
<th>383</th>
<th>741</th>
<th>751</th>
<th>752</th>
<th>652</th>
<th>732</th>
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<tr>
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<td>0</td>
<td>100</td>
<td>50</td>
<td>150</td>
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<td>325</td>
<td>800</td>
<td>400</td>
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<td>1500</td>
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<td>2000</td>
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<tr>
<td>Minimum Flow (m³/h)</td>
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<td>2025</td>
<td>2220</td>
<td>3750</td>
<td>7500</td>
<td>8100</td>
<td>14200</td>
<td>16500</td>
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<td>24750</td>
<td>50000</td>
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<tr>
<td>Maximum Flow (m³/h)</td>
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<td>2220</td>
<td>3750</td>
<td>7500</td>
<td>8100</td>
<td>14200</td>
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<td>68000</td>
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<tr>
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<td>2220</td>
<td>3750</td>
<td>7500</td>
<td>8100</td>
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<td>50000</td>
<td>68000</td>
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<tr>
<td>Maximum Flow (m³/h)</td>
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<td>2220</td>
<td>3750</td>
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<td>15.2</td>
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<td>400</td>
<td>350</td>
<td>380</td>
<td>450</td>
<td>350</td>
<td>425</td>
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<td>380</td>
<td>350</td>
<td>425</td>
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**NUMBER OF STAGES**

| 10 | 10 | 8 | 7 | 9 | 9 | 11 | 7 | 10 | 8 | 10 | 7 | 7 | 5 | 7 | 5 |

**OPERATING SPEED RPM**

| 3450 | 3450 | 3550 | 3550 | 3550 | 3550 | 3550 | 3550 | 3550 | 3550 | 3550 | 3550 | 3570 | 3570 | 3570 |

**DESIGN FEATURES**

<table>
<thead>
<tr>
<th>Seals-air (felt)</th>
<th>Inlet</th>
<th>1-In/Out</th>
<th>2-In/Out</th>
<th>2-In/Out</th>
<th>1-In/Out</th>
<th>1-In/Out</th>
<th>1-In/Out</th>
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<tr>
<td>Seals-air (carbon ring)</td>
<td>Inlet</td>
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<td>2-In/Out</td>
<td>2-In/Out</td>
<td>1-In/Out</td>
<td>1-In/Out</td>
<td>1-In/Out</td>
<td>1-In/Out</td>
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<td>1-In/Out</td>
<td>1-In/Out</td>
<td>1-In/Out</td>
<td>1-In/Out</td>
<td>1-In/Out</td>
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<tr>
<td>Seals-gas (carbon ring)</td>
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<td>1-In/Out</td>
<td>2-In/Out</td>
<td>2-In/Out</td>
<td>1-In/Out</td>
<td>1-In/Out</td>
<td>1-In/Out</td>
<td>1-In/Out</td>
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<td>1-In/Out</td>
<td>1-In/Out</td>
<td>1-In/Out</td>
<td>1-In/Out</td>
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<tr>
<td>(gass) Purge/Inlet Gas Taps</td>
<td>1-In/Out</td>
<td>1-In/Out</td>
<td>1-In/Out</td>
<td>1-In/Out</td>
<td>2-In/Out</td>
<td>2-In/Out</td>
<td>2-In/Out</td>
<td>2-In/Out</td>
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<td>2-In/Out</td>
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<td>Std.</td>
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<td>Oil Lubrication</td>
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<td>Std.</td>
<td>Std.</td>
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<td>Gear Drive</td>
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<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>889 stg</td>
<td>7-11 stg</td>
<td>No</td>
<td>4-10 stg</td>
<td>5-8 stg</td>
<td>8-10 stg</td>
<td>5-7 stg</td>
<td>3-5 stg</td>
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<tr>
<td>Inlet (125# ANSI)</td>
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<td>6&quot;</td>
<td>6&quot;</td>
<td>6&quot;</td>
<td>6&quot;</td>
<td>6&quot;</td>
<td>10&quot;</td>
<td>12&quot;</td>
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<td>24&quot;</td>
</tr>
<tr>
<td>Outlet (125# ANSI)</td>
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<td>3/5&quot;</td>
<td>6&quot;</td>
<td>5&quot;</td>
<td>6&quot;</td>
<td>6&quot;</td>
<td>8&quot;</td>
<td>8&quot;</td>
<td>10&quot;</td>
<td>10&quot;</td>
<td>10&quot;</td>
<td>10&quot;</td>
<td>14&quot;</td>
<td>14&quot;</td>
</tr>
</tbody>
</table>

Air map data for Series 200 to 400 represents standard conditions at maximum speed allowed. Air map data for Series 510 to 2400 represents standard conditions at 60 Hz.

For data representing conditions other than these specifications, contact your Gardner Denver representative.

*2" male N.P.T. or 2 3/8" smooth O.D. *2 1/2" male N.P.T. or 2 7/8" smooth O.D.

- Standard equipment
- Optional equipment
Standard Hoffman Centrifugal Blowers and Exhausters range in capacities up to 45,000 CFM, with gauge pressures to 25 PSI or 18” Hg vacuum. Designed for operation with direct drive motors operating at 3600 RPM, (or 3000 RPM SoHz), these units are readily adaptable for use with steam turbines, gas engine/gear drives or V-belt arrangements.

To meet the requirements of various applications, these units may be piped in parallel for increased volume, or in series for increased pressure or vacuum. Air volume through the entire range of the centrifugal can be regulated by simple inlet valve throttling, or speed control when using a variable speed driver. Modular construction, various impeller combinations, results in a compressor which is custom-designed to meet the performance requirements of each application. These are general maps not to be used for selection. Contact your Hoffman representative for specific performance.
The design and features of Hoffman centrifugals make them outstanding performers as gas boosters, where safety and dependability are foremost concerns. In-leakage of air or out-leakage of process gas are controlled by use of a gas injection system which can be installed either at the inlet or discharge shaft end. This system injects a buffer gas into the closed chamber formed by the carbon ring package. Gas tightness is assured through extensive factory checks. Additional seal and casing testing during the mechanical run-in of the unit verify the integrity of construction.

Left: Many special features are available on gas units; these include injection piping, four carbon ring package and stuffing box.

Right: With special coatings for castings and impellers, Hoffman centrifugals can handle many acidic and caustic processes. Special materials such as stainless steel can be used for fabricated impeller construction.

Above: Balance pistons, standard on larger Hoffman units, reduce the thrust load on the thrust bearing for extended bearing life. Protective coatings may also be applied according to process requirements.
Specifications For Aeration Compressors

Air Compressors:
This specification covers:

a. compressors and electric motor drives.
b. all appurtenances described herein which are required for proper operation of the centrifugal compressors.

Performance and Design Requirements:
Each compressor will be capable of compressing _____ SCFM of air to a discharge pressure of _____ PSIG when operated at an elevation of _____ feet and 100°F air temperature with _____ PSIG inlet loss.

When volumetric capacity is reduced by at least 30%, each compressor under specified inlet conditions shall:

a. develop at least .5 PSI pressure above specified discharge pressure.
b. Not be in surge.

Horsepower shall not exceed _____ BPH when operating at the design flow and temperature. Blower shall operate at _____ ICFM without surging.

All compressors recommended will be based upon data previously established by tests in accord with the ASME Power Test Code for Centrifugal Compressors.

No exceptions to these requirements will be allowed.

Each compressor will be of the multistage centrifugal type, as manufactured by Hoffman Air & Filtration Systems, with outboard mounted bearing construction in which the impellers are keyed to a heavy ground steel shaft and supported by antifriction type bearings. Compressor will be of the type in which the diaphragm is cast integrally with the casing to assure optimum operating efficiency. Where the compressor shaft passes through both the inlets and outlet heads, carbon ring seals will be provided to prevent leakage and to assure noncontamination of the bearing lubricant. Seals will be replaceable without having to disconnect inlet or discharge piping.

Inlet and outlet connections shall be ASA 125 pound drilled and tapped flange pattern and be an integral part of the heads.

Each complete impeller assembly will be dynamically balanced to ensure mechanical operation with vibration not to exceed 0.28"/sec velocity when measured on the bearing housing at design speed. The compressor manufacturer will submit a certified test report attesting to the data and lack of dynamic balance and the accuracy achieved. Tip speed of the rotating assembly will not exceed 595 FPS and the first critical speed shall be at least 20% removed from its operating speed.

Each compressor will have two antifriction bearings which can be lubricated, inspected or replaced without disconnecting any piping or disassembling the compressor. Bearing will be sized for a minimum expected life of 10 years in accord with AFBMA B-10 standards.

Note 1
On the compressors so equipped, a balance piston will be integrally shaft mounted on the discharge end of the machine. Air leakage past the balance piston will be vented to atmosphere or returned to the inlet in an external return line. The balance piston will reduce the thrust load on the thrust bearing by 75%.

Each motor-compressor unit will be mounted on a common structural or fabricated steel baseplate and be furnished with a flexible coupling and coupling guard. Suitable resilient foundation mounting pads will be furnished.

To ensure availability of replacement parts, only those compressors whose normal standard of manufacture includes these features will be considered.

Accessories
Each compressor will be furnished with the following accessory items:

a. Suitable reinforced flexible connections to fit standard steel pipe for both inlet and outlet.
b. Cast iron, lever operated butterfly valves for inlet and outlet.
c. Cast iron check valve for discharge.
d. Dry type inlet air filter for 120% of design volume. Filter elements to be cleanable and replaceable.
e. Ammeter calibrated in both CFM and AMPS.
Accessories

Shown here are just a sample of the many accessories available to complement Hoffman blowers and exhausters. Control panels designed by Hoffman are available to monitor all aspects of system operation, such as surge, vibration and temperature. Custom panels incorporating various process controls or monitoring functions are also available. Most standard equipment required for proper system operation and performance is available directly from Hoffman.

Contact Your Hoffman Representative

Other Hoffman Products Available

- Centrifugal Vacuum Cleaning Systems
- Portable Vacuum Cleaning Systems
- Waste Handling
- Liquid Filtration

For additional information, contact your local representative or

Gardner Denver Blower Division
Hoffman Products Group