Damper Advantages

- Quick Build Products
- Construction
- Performance
Greenheck has a large damper offering available quickly. This chart shows the quick build models available by lead time. Keep in mind, all models available on next day, can be shipped in 3, 5, 10, 15 or 25 days.

<table>
<thead>
<tr>
<th>Stock*</th>
<th>Next Day</th>
<th>3 Day</th>
<th>5 Day</th>
<th>10, 15 and 25 Day</th>
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<td>BD-300</td>
<td>BR-10, 11, 12, 30, 31, 32, 40, 41, 42**</td>
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<td>HB-110, 120, 230, 240***</td>
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<td>DFD-150x10, x12, x14, x16</td>
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<td>VCDR-50, 53</td>
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</table>

* See CAPS® for sizes  ** Unpainted  *** Painted (limited offering)
Frame
Each frame is built with four separate pieces of material and joined by our Tog-L-Loc® process with the following advantages:

- **Rigid frame** - The joint has an equivalent thickness of 10 ga. (3.5mm) steel.
- **Increased corrosion resistance** - As the Tog-L-Loc® process doesn’t use heat, Greenheck damper frames have greater corrosion resistance by retaining the galvanized coating versus welding.
- **Optimal free area** - On all dampers that are 17 in. (432mm) high or less, Greenheck uses a low profile top and bottom frame section to maximize free area.
- **Square frame** - Using four separate frame components (top, bottom, and two sides), Greenheck’s Tog-L-Loc® process results in four sturdy, 90º joints. This ensures that each Greenheck damper is square and provides optimum performance in the field.

Frame Options
Five frame options are available:

- **Channel (standard)** - allows damper to be insert mounted into an opening or duct
- **Single flange or single reverse flange** - can be insert mounted or directly mounted to the wall or mating surfaces such as a plenum wall
- **Double flange** - when you are not sure which side you need a flange
- **Quick connect (VCD-43, -43V; ICD series)** - designed to match up to a TDC, TDF, or Ductmate connection

Blades
- **3V Blade**
  
  - Fabricated from a single thickness galvanized steel or stainless steel
  - Three V-type grooves running the full length of the blade to increase strength
  - Low to medium velocity and pressure applications

- **Steel Airfoil Blade**
  
  - Constructed of double-skin galvanized steel or stainless steel
  - Lower resistance to airflow and increased strength
  - High velocity and pressure applications

- **Aluminum Airfoil Blade**
  
  - Constructed of heavy gauge extruded aluminum
  - Lower resistance to airflow and increased strength
  - High velocity and pressure applications

- **ICD Blade**
  
  - Extruded aluminum airfoil blades with thermal breaks and insulated with polyurethane foam
  - Used in harsh environments/high-temperature differentials

Variable Symmetric Blade Design (VSB)
- **Blades are symmetric on their axis**
- **Combination of 4, 5, 6, and 7 in. (102, 127, 152, and 178mm) blade widths are used in a single damper**
- **Reduces need for closure strips which optimize pressure drop performances**
- **Damper can be mounted in either direction of flow**
- **Through extensive testing, we have determined using various blade sizes reduces required actuator torque, which reduces the size and quantity of the actuators required. This reduces first cost for the building owner and on-going electrical power consumption.**
Pressure Drop/Leakage

Pressure Drop Comparison
Greenheck compared the pressure drop data of a VCD-33 12 in. wide x 12 in. high (305mm x 305mm) versus a competitor's equivalent 12 in. wide x 12 in. high (305mm x 305mm) damper. Both dampers were installed in an identical system, which drew 2000 ft/min. of airflow through them. The results were dramatic!

![Pressure Drop Data](AMCA Figure 5.3)

Leakage
Three common code energy standards that pertain to dampers are:

**ASHRAE Standard 90.1** (2019 edition) states that maximum damper leakage at 1 in. wg for a:
- non-motorized damper is 20 cfm/ft² or
- motorized damper is 4 cfm/ft². (See Table 6.4.3.4.3 from ASHRAE Standard 90.1)

**California Title 24** (2019 edition) states that the dampers shall be certified in accordance with AMCA Publication 511 to have a maximum leakage of 10 cfm/ft² at 1 in. wg. The dampers have been tested and can open and close against the rated airflow and pressure of the system after 60,000 damper opening and closing cycles.

**IECC** (2021 edition) that outdoor air supply and exhaust opening be supplied with Class 1 motorized dampers with a maximum leakage rate of 4 cfm/ft² at 1 in. wg when tested in accordance with AMCA 500D.

Greenheck's volume control dampers meet the requirements of ASHRAE, California Title 24 and IECC.

*Leakage Class Definitions*
The maximum allowable leakage is defined by AMCA as the following:

- **Leakage Class 1A** - 3 cfm/ft² @ 1 in. wg (Class 1A is only defined at 1 in. wg)
- **Leakage Class 1** - 4 cfm/ft² @ 1 in. wg
  - 8 cfm/ft² @ 4 in. wg
  - 11 cfm/ft² @ 8 in. wg
  - 12.6 cfm/ft² @ 10 in. wg

*Maximum Leakage*

<table>
<thead>
<tr>
<th>Model</th>
<th>Pressure @ 1 in. wg (.25 kPa)</th>
<th>@ 4 in. wg (1 kPa)</th>
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<td>VCD-23, 23V, 43, 43V, SEVCD-23</td>
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<td>Class 1</td>
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<td>VCD-40</td>
<td>Class 1A</td>
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<td>VCD-33, 33V, 34, 42, 42V</td>
<td>Class 1A</td>
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<td>VCDR-53</td>
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</tr>
<tr>
<td>VCDRM-53</td>
<td>Class 1</td>
<td>Class 1</td>
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</tbody>
</table>
Backdraft, Balancing, & Heaters

**Backdraft Dampers**
Backdraft dampers are used in exhaust or intake systems to allow airflow in one direction, but prevent reverse airflow. These can operate by gravity or motorized.

**Relief Dampers**
A relief damper is a backdraft damper with adjustable start-open pressure. It is used for gravity ventilation and low-velocity systems. Counterbalance weights provide the ability to fine tune start-to-open and full-open operation.

**Balancing Dampers**
Balancing dampers are control dampers that regulate the flow of air but not intended for use in applications as a positive shut off or for automatic control. Balancing dampers are available with automatic adjustment, manual quadrants, or remote control with an actuator.

**Duct Heaters**
Duct heaters are used in forced air applications to provide standalone space heat or supplement existing heating systems. These are for comfort ventilation applications. Typical applications can include space heating, secondary heating, multi-zone or primary heating.
Control Dampers
Control dampers regulate the flow of air in the same manner as balancing dampers. The dampers can be used as a positive shut off or for automatic control. These can be controlled manually or with actuators. Face and bypass dampers are also available.

Insulated Control Damper
The ICD series was developed for applications where it is necessary to minimize thermal transfer and reduce condensation. The ICD series is AMCA Licensed for air leakage, air performance, and energy efficiency.

Face and Bypass Damper
Face and bypass dampers are used in applications where face and bypass dampers are needed either one over top of the other or alongside each other. The units are connected causing one damper to open and the other to close. Greenheck’s face and bypass dampers are IECC (International Energy Conservation Code) compliant with a leakage of 3 cfm/ft² at 1 in. wg (55 cmh/m²) or less.

Air Measuring Dampers
Greenheck airflow measuring dampers are available with either differential pressure-based technology or thermal dispersion technology. For most applications, either technology can be used. When specifications don’t call out a specific technology, the differential pressure-based AMD’s (Air Measuring - Pressure Differential) will be the most cost-effective solution. However, thermal dispersion airflow stations (AMD-xxTD’s) are better suited for applications where airflows below 300 ft/min. are consistently being measured.
Life Safety Dampers

Combination Fire Smoke Dampers
Combination fire smoke dampers perform the function of both a fire damper and a smoke damper. Building layouts and designs often combine fire and smoke rated partitions and barriers, requiring the installation of both a fire damper and smoke damper at the same location. These products are tested and classified in accordance with both UL 555 and UL 555S.

Smoke Dampers
Smoke dampers have two applications:
1. They may be applied in a passive smoke control system where they simply close and prevent the circulation of air and smoke through a duct or a ventilation opening in a smoke barrier.
2. They may be applied as part of an engineered smoke control system designed to control the spread of smoke using walls and floors as barriers and using the building’s HVAC system and/or dedicated fans to create pressure differences.

These products are tested and classified in accordance with UL Standard 555S.

Fire Dampers
All building codes require fire dampers to maintain fire resistance ratings of walls, partitions and floors when they are penetrated by air ducts and transfer openings. These products are tested and classified in accordance with UL Standard 555.

Ceiling Radiation Dampers
The ceiling radiation dampers are designed to protect penetrations through the ceiling membrane of fire resistive floor ceiling and/or roof ceiling assemblies. These products are tested and listed in accordance with UL Standard 555C.
Industrial dampers operate in industrial and severe duty applications. The dampers have heavy-duty flanged frames with several blade styles and pressure classes. Greenheck offers an extensive line of heavy-duty and industrial-grade dampers designed to provide a solution for the following applications:

- **Control** - control and shut-off applications
- **Isolation** - tight shut-off with very low leakage
- **Bubble Tight** - zero leakage applications
- **Backdraft** - one direction airflow applications
- **Pressure Relief** - damper opens when pressure exceeds the specified level
- **Tunnel Transit** - road tunnel and subway system applications
- **Smoke** - designed for smoke controls systems
- **Blast** - damper reacts to high-pressure shockwave to prevent system damage
- **Tornado** - damper closes during rapid pressure changes to prevent system damage
- **Shock and Toxic Gas** - meet requirements established by United States Department of the Navy
- **Custom Products** - Utilizing more than 65 years of heavy-duty and industrial damper engineering experience, Greenheck has designed and built custom dampers for many unique applications. If you’re having trouble finding a solution to your damper application, contact your local Greenheck damper expert for a custom solution.

**Building Value in Air**

Greenheck delivers value to mechanical engineers by helping them solve virtually any air quality challenges their clients face with a comprehensive selection of top quality, innovative air-related equipment. We offer extra value to contractors by providing easy-to-install, competitively priced, reliable products that arrive on time. And building owners and occupants value the energy efficiency, low maintenance and quiet dependable operation they experience long after the construction project ends.

**Our Commitment**

As a result of our commitment to continuous improvement, Greenheck reserves the right to change specifications without notice.

Specific Greenheck product warranties are located on greenheck.com within the product area tabs and in the Library under Warranties.