## **Damper Advantages**

- Quick Build Products
- Construction
- Performance





January 2021



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.

Stock*	Next Day	3 Day	5 Day	10, 15 and 25 Day
ABD	CFSD-211, 212	BD-300	BR-10, 11, 12, 30, 31, 32, 40, 41, 42**	AMD-23, 33, 42, 42V
BD-90	CRD-1, 1WT, 501	CRD-1LP, 1WJ, 2, 2WT, 60	CRD-60X	AMS
BD-100	DFD-110, 150, 310, 350	FBH-23, 33, 43	EMV-11	HB-110, 120, 230, 240***
BD-320, 330	DFD-150x10, x12, x14, x16	FBV-23, 33, 43	FD-100, 300	HCD-120, 130, 135, 140***
CAD-10	DFD-210	GM-30 series	HB-110, 120, 230, 240**	HB-330**
CRD-1, 2	DFDAF-310, 330	IDHB	HCD-120, 130, 135, 140**	HBR-050, 150**
CRD-300 series	DFDR-510	SEDFD-210	HCD-220, 230, 240**	HBS-330, 331, 430, 431**
CRD-700	DFDTF-120	SEFSD-211	HPR-120, 230, 330**	HBTR-151
HAD-10	EM-10, 11, 12, 30, 31, 32, 40, 41, 42	SEVCD-23, 33	HSD-401	HCD-120, 130, 135, 140***
MBDR-50	ES-10, 11, 12, 30, 31, 32, 40, 41, 42	SESMD-201	ICD-44, 45**	HCD-220, 230, 240***
RAD	FD-110, 15 <mark>0, 310, 35</mark> 0	SSFSD-211	IDHE-0	HPR-120, 230, 330***
WB-10G	FD-150x10, x12, x14, x16	SSSMD-201	SEBR-10, 11, 12, 30, 31, 32, 40, 41, 42	HCDR-050, 150, 250, 350**
WD-90	FDR-510	WD-110, 120	SEFSDR-511	HCDR-351***
WD-100	FSD-211, 212, 213	WD-200, 210, 220	SESMDR-501	SSFSDR-511
WD-320, 330, 340	FSD-311, 312, 311V, 331	WD-300	SSDFD-150, 350	SSWDR-53
WD-410	FSDR-511, 512	WD-400, 420, 430	SSDFDR-510	VCDRM-50, 53
	GFSD-211, 212		SSFD-150, 350	
	IDHE		SSFDR-510	
	MBD-10, 10M, 15		SSFSDR-511	
	0DFD-150, 0FD-150		SSNM-10, 11,12, 30, 31, 32	
	OFSD-211, 212, 311, 312		SSSMDR-501	
	RBD-10, 15, RBDR-50		WDR-53	
	SMD-201, 202, 203			
	SMD-301, 301V, 302			
	SMD-401, 401EF, 401M			
	SMDR-501, 502			
	VCD-20, 23, 33, 34, 40, 42, 43			
	VCD-20V, 23V, 33V, 34V, 42V, 43V			
	VCDR-50, 53			

\* See CAPS<sup>®</sup> for sizes \*\* Unpainted \*\*\* Painted (limited offering)

### Construction



#### Frame

Each frame is built with four separate pieces of material and joined by our Tog-L-Loc® process with the following advantages:



Tog-L-Loc® **Beinforced** Corner

• Rigid frame - The joint has an equivalent thickness of 10 ga. (3.5mm) steel.

- Increased corrosion resistance As the Tog-L-Loc<sup>®</sup> 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, 90° 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

Channel

Frame

### Blades



- 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

- Constructed of heavy gauge extruded aluminum
  - · Lower resistance to airflow and increased strength

Double

Flange

Quick

Connect

 High velocity and pressure applications



- Extruded aluminum airfoil blades. with thermal breaks and insulated with polyurethane foam
- · Used in harsh environments/hightemperature differentials

### Variable Symmetric Blade Design (VSB)



Unbalanced Blade **Requires Higher Torque** 

Actuator Torque Airflow vorks with actuator

Balanced Blade Requires Less Torque

- 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.

Aluminum Airfoil

Single

Flange

(actuator side)

- Blade

Single

Reverse

Flange (opposite actuator)

- ICD Blade



### **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!



### 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/ft<sup>2</sup> or
- motorized damper is 4 cfm/ft<sup>2</sup>. (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/ft<sup>2</sup> 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/ft<sup>2</sup> 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/ft<sup>2</sup> @ 1 in. wg (Class 1A is only defined at 1 in. wg)
- Leakage Class 1 4 cfm/ft<sup>2</sup> @ 1 in. wg
  - 8 cfm/ft<sup>2</sup> @ 4 in. wg
    - 11 cfm/ft<sup>2</sup> @ 8 in. wg - 12.6 cfm/ft<sup>2</sup> @ 10 in. wg
- **Maximum Leakage** cfm/sq. ft. (cmh/sq.m) Pressure Model @ 1 in. wa @ 4 in. wa (.25 kPa) (1 kPa) VCD-23, 23V, 43, 43V, Class 1A Class 1 SEVCD-23 VCD-40 Class 1A Class 1 VCD-33, 33V, 34, 42, 42V Class 1A Class 1 VCDR-53 Class 1 Class 1 VCDRM-53 Class 1 Class 1



## Backdraft, Balancing, & Heaters GREENHECK





### **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, multizone or primary heating.

### **Control Dampers**





### **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/ft<sup>2</sup> at 1 in. wg (55 cmh/m<sup>2</sup>) 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 pressurebased 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**





### **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.



#### **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.
- 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.



### **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.

### **Heavy-Duty/Industrial Dampers**

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.

top quality, innovative air-

extra value to contractors

related equipment. We offer

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.









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### **Our Commitment**

**Building Value in Air** 

Greenheck delivers value

to mechanical engineers by

helping them solve virtually

comprehensive selection of

any air quality challenges

their clients face with a

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.





