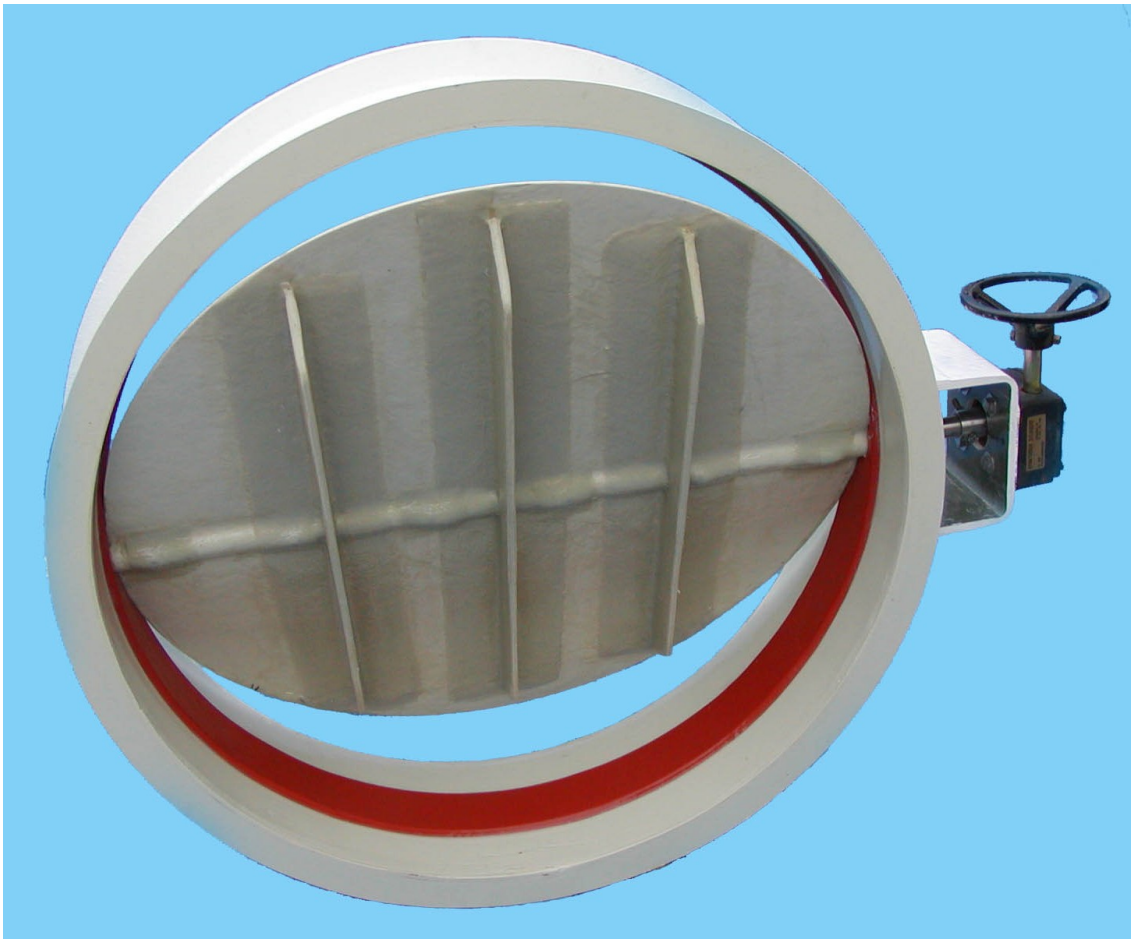
Daniel Mechanical Company
1939 West 11th Street Ste. E
Upland, CA 91786

Phone: (909) 982-1555
Fax: (909) 982-1855
www.danielmechanical.com

*DanELAST**

ZERO-LEAKAGE AIR ISOLATION FRP DAMPER



*Patent Pending

DanELAST ROUND FRP ZERO-LEAKAGE AIR ISOLATION DAMPER

DANIEL MECHANICAL COMPANY offers precision-engineered fiberglass reinforced plastic zero-leakage ***DanELAST*** isolation dampers utilizing only high corrosion resistant parts for air movement and controls. Zero-leakage ***DanELAST*** dampers are fire retardant, corrosion resistant, and UV protected. All components are designed with replaceable parts that are easily disassembled for maintenance. The blade shafts are constructed of custom-milled, solid 316SST metal. Daniel Mechanical Company's zero-leakage ***DanELAST*** damper utilizes a specially formulated elastomer with corrosion resistance equal to and/or superior to EPDM, Hypalon, and even Viton.

No circumferential blade seals are required to achieve a full shutoff of the zero-leakage ***DanELAST*** isolation damper. This is largely due to the innovative design and expert hand craftsmanship of each key part. By constructing the unitary FRP blade to exact tolerances and without a commonly used circumferential blade seal, the weakest part of the damper is eliminated, thus improving its reliability. No blade stops are utilized, decreasing the pressure loss across the damper when in the full open position. Each zero-leakage ***DanELAST*** damper is factory tested to operating pressures exceeding 30 inches w.g. Leakage rates are tested using AMCA 500-D procedures, and the certified ratings are authorized by AMCA.

The zero-leakage ***DanELAST*** damper blade is operated using a hand-wheel driven worm gear operator. Pneumatic, electric, or chain-wheel type operators are optional. Long life Teflon bearings and extensively tested molded plastic bushings accessible from the exterior of the damper require minimal maintenance and ensure unrestricted movement of the rotating shaft. All metal parts in contact with process air stream are at a minimum 316 stainless steel and may be manufactured of more exotic metals such as Hastelloy-C and Titanium.

Zero-leakage ***DanELAST*** dampers enhance safety by providing greater isolation of process air during shutdown of low pressure exhaust system duct lines conveying hazardous air streams. When dealing with confined space entry conditions, use of zero-leakage ***DanELAST*** isolation dampers may reduce safety risks caused by contaminant air leaks.

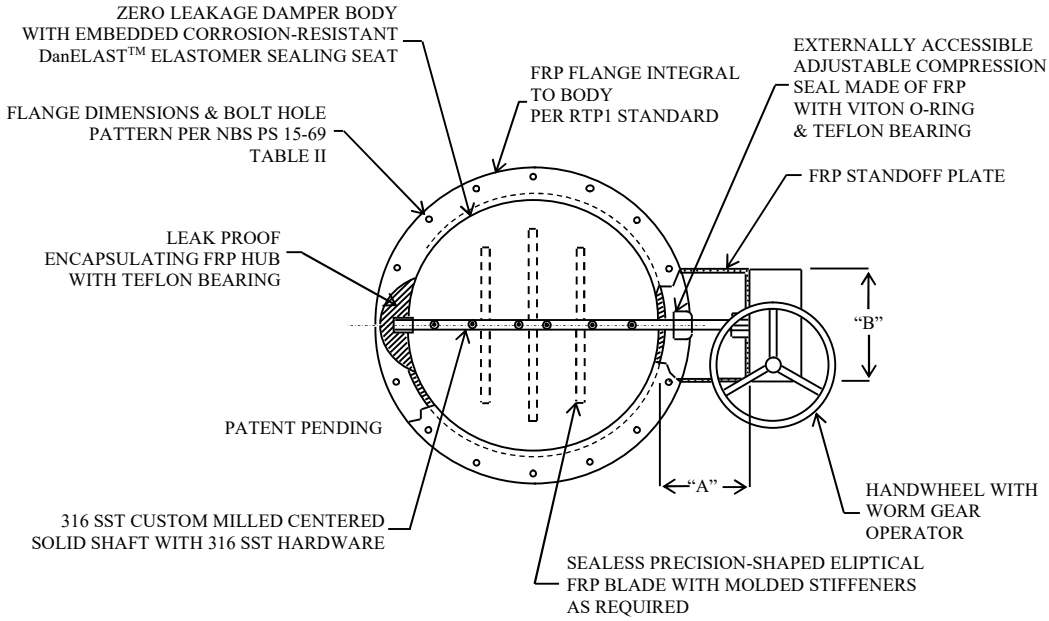
Zero-leakage ***DanELAST*** isolation dampers require far less maintenance, are more durable, and outperform conventional butterfly dampers.

Zero-leakage ***DanELAST*** dampers range in sizes from 4-inch diameter to 120-inch diameter.

STANDARD CONSTRUCTION

FRAME—Vinyl ester resin fabricated to ASME/ANSI RTP-1
FLANGE—NBS PS 15-69-3.4.7 ¾" thick, hand lay-up integral to body per ASME RTP-1-2000 Standard Fig. 4-7.
BLADE—Vinyl ester resin similar to damper frame. Unitary construction with no circumferential seal or backstop, having a calculated percent deflection of L/360
STIFFENERS—Same material as frame and integrally molded to blade
SHAFT—316 SST with nuts, bolts, and washers (FRP encapsulated if required)
SHAFT SEAL—Externally adjustable compression type with FRP housing and Viton O-ring
BEARING—Teflon
OPERATOR—Worm gear with hand wheel, chain wheel, pneumatic, or electric actuation
GEL COAT—Paraffinated, with ultraviolet inhibitor
COLOR—White unless specified otherwise
MAXIMUM TEMPERATURE—200°F
MAXIMUM PRESSURE—30" w.g.
MAXIMUM LEAKAGE—Zero cubic feet per minute per square-foot of cross sectional area
LUBRICANT—None required

DanELAST ROUND FRP ZERO-LEAKAGE AIR ISOLATION DAMPER DETAIL DRAWING



TOP VIEW

NOTES:

1. ALL KEY PARTS ARE DETACHABLE AND EASILY REPLACED WITH SPARE PARTS.
2. DAMPER SHALL BE FULLY OPERATIONAL AT TEMPERATURES UP TO 200° F.
3. DAMPER HAS A LEAKAGE RATING OF ZERO CFM @ 30" W.C.
4. ALL METAL PARTS IN CONTACT WITH PROCESS AIR STREAM ARE 316 SST. MORE EXOTIC METALS SUCH AS HASTELLOY-C AND TITANIUM ARE OPTIONAL.

DanELAST ROUND FRP ZERO-LEAKAGE AIR ISOLATION DAMPER DIMENSIONS

SIZE	FLANGE THICKNESS	FLANGE O.D.	BOLT CIRCLE DIA.	BOLT HOLE DIA.	# OF BOLT HOLES	BLADE THICKNESS	AXLE DIA.	"A"	"B"	DAMPER WIDTH
4"	¾"	8 3/8"	7"	7/16"	4	3/8"	¾"	5"	6"	6" ±
6"	¾"	10 3/8"	9"	7/16"	8	3/8"	¾"	6"	8"	6" ±
8"	¾"	12 3/8"	11"	7/16"	8	3/8"	¾"	6"	8"	6" ±
10"	¾"	14 3/8"	13"	7/16"	12	3/8"	¾"	6"	8"	12" ±
12"	¾"	16 3/8"	15"	7/16"	12	3/8"	1"	6"	8"	12" ±
14"	¾"	18 3/8"	17"	7/16"	12	3/8"	1"	6"	8"	12" ±
16"	¾"	20 3/8"	19"	7/16"	16	3/8"	1"	6"	8"	12" ±
18"	¾"	22 3/8"	21"	7/16"	16	3/8"	1 ¼"	6"	8"	12" ±
20"	¾"	24 3/8"	23"	7/16"	20	3/8"	1 ¼"	6"	8"	12" ±
24"	¾"	28 3/8"	27"	7/16"	20	3/8"	1 ¼"	7.5"	8"	12" ±
30"	¾"	34 3/8"	33"	7/16"	28	3/8"	1 ¼"	7.5"	8"	12" ±
36"	¾"	40 3/8"	39"	7/16"	32	½"	1 ¼"	7.5"	8"	12" ±
42"	¾"	46 3/8"	45"	7/16"	36	½"	1 7/8"	7.5"	8"	12" ±
48"	¾"	54 3/8"	52"	9/16"	44	½"	1 7/8"	7.5"	8"	12" ±
54"	¾"	60 3/8"	58"	9/16"	44	½"	1 7/8"	10"	8"	12" ±
60"	¾"	66 3/8"	64"	9/16"	52	½"	1 7/8"	10"	8"	12" ±
72"	¾"	78 3/8"	76"	9/16"	60	½"	1 7/8"	12"	12"	18" ±

SUGGESTED SPECIFICATIONS FOR ROUND FRP AIR CONTROL DAMPERS

Dampers are installed as shown on plans and per specifications. Damper frame shall be of one-piece construction with a resin rich interior corrosion barrier having a minimum thickness of 100 mils. A structural wall shall consist of alternate layers of chopped strand mat and woven roving to conform to ASME/ANSI RTP-1 and NBS PS 15-69. The overall glass and resin content shall be 40% and 60% by weight, respectively.

The fiberglass flange dimensions shall be per NBS PS 15-69 Table 2 for dimensions and bolthole drilling pattern. The flanges shall have a minimum thickness of 3/4 inch and shall be constructed integral to the cylindrical body of the damper, using the hand lay-up technique per ASME RTP-1-2000 standard Fig 4-7. The distance between the faces of the flanges shall be 6 inches for dampers having a diameter size of 8 inches or less. For all other damper sizes, this distance shall be 12 inches long. The damper blade and stiffeners shall be fabricated using the same resin as the damper frame. The damper blade shall be of unitary construction having no detachable parts or circumferential or wiper blade seals. Damper blade shall be designed to prevent over-rotation without the use of backstops located anywhere in the air stream. 316 SST blade shaft shall be continuous, centered, and custom-milled to fit the operator. Both the damper blade and shaft shall be fully detachable from each other and readily disassembled from the damper body for easy repair or maintenance.

Damper shall have an FRP structural stand-off bracket integrally laminated to the exterior of the body for mounting a worm gear operator.

Damper shall be provided with a self-lubricated hand-wheel driven worm gear operator, as manufactured by:

1. Dynatorque, or equal

Operator shall be sized according to required operating torque. Operator shall be coated with corrosion resistant epoxy. All metal parts exposed to the air stream shall be 316 SST. All zero-leakage dampers located at elevations exceeding 6'-6" above finished floor shall, in addition to the hand wheel, be equipped with chain wheel sprockets and appropriately sized chain lengths, as manufactured by:

1. Babbitt, or equal

Chain wheel sprockets shall have integral chain guides to prevent "gagging".

Annular *DanELAST* corrosion resistant elastomer sealing seat shall be embedded in the damper body to achieve zero leakage.

Exterior surface of damper shall contain UV inhibitor, and be gel coated or painted with color to match existing ducting.

FRP dampers shall be tested for pressure drop and leakage in accordance with AMCA Standard 500-D. AMCA 500-D leakage tests shall be performed by AMCA certified testing facilities. The leakage rate shall be a maximum of 0 C.F.M per square-foot of cross-sectional area at 30-inches w.g. pressure. The test results shall be submitted for review and approval by the Engineer. The zero-leakage damper shall bear the AMCA seal.

Approved manufacturer of zero-leakage isolation damper shall be:

1. Daniel Mechanical – Model: ***DanELAST 303***
2. Or equal

CERTIFIED RATINGS AUTHORIZED BY AMCA

Damper Diameter	Torque inch lbs.	Leakage Class	Blade Fixed Open	
			ΔP (in. wg)	CFM
4"	66	1A	-	-
12"	891	1A	0.11	1,983
24"	486	1A	0.264	20,550
36"	360	1A	0.03	14,072
48"	464	1A	-	-
54"	630	1A	-	-
60"	866	1A	-	-
72"	360	1A	-	-

Daniel Mechanical Company certifies that the Model 303 dampers shown herein are licensed to bear the AMCA Seal. The ratings shown are based on tests and procedures performed in accordance with AMCA Publication 511 and comply with the requirements of the AMCA Certified Ratings Program. The AMCA Certified Ratings Seal applies to air performance and air leakage ratings.
Test method is per AMCA Standard 500-D-98 Figures 5.3, 5.4 Alternate-6.3, 5.5, & 5.6, 6.5. Data are based on a seating torque of chart listed in-lbs applied to hold the damper in the closed position. Air leakage is based on operation between 50°F - 104°F.