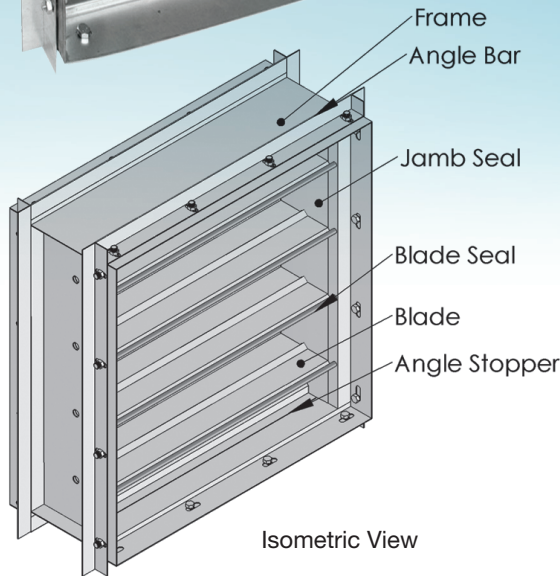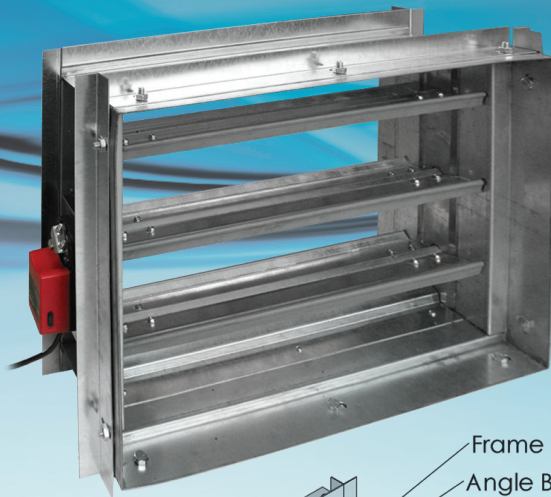# SD-T Smoke Damper

Tested and conform to 1.5 hours UL555S

SD-T smoke dampers are low leakage damper constructed with triple V-groove blades designed to be used in ducts that penetrate smoke rated barriers. The SD-T may be installed vertically or horizontally of a smoke barrier and is designed for use in systems with airflow in either direction with velocity up to 2000fpm and pressure up to 4" w.g.

Materials

Frame: Galvanized steel, 1.5mm thickness.
Blade: Galvanized steel, 1.5mm thickness.
Blade Seal: Silicone strip
Jamb Seal: Reinforced stainless steel plate
Bearing: Bronze bush pressed into frame.
Axles: Hexagonal bar mild steel.

Surface Finish

Mill galvanized

## Blade Action

Parallel blade

Blade Dimension Limits

• Maximum blade length = 1000mm
• Maximum blade width = 160mm

• Rigid 'triple-vee' blade design
• Linkages are concealed in the frame to prevent malfunctioning caused by improper installation.
• Vertical (wall) or horizontal (ceiling) installation.
• Closed by means of damper actuator.

Frame
Angle Bar
Jamb Seal
Blade Seal
Blade
Angle Stopper

Isometric View

SD-T Features

• Leakage rating Class II under UL555S classification.
• Blade edge seal of silicone strips seal up the gap between the blades and stoppers when the damper is fully close.
• Jamb seal of reinforced stainless steel plates seal up the gap between the blades and side frame when the damper is fully close.
• Blade edge seal of silicone strips could withstand temperature up to 250°C under ASTM D865 (70h)
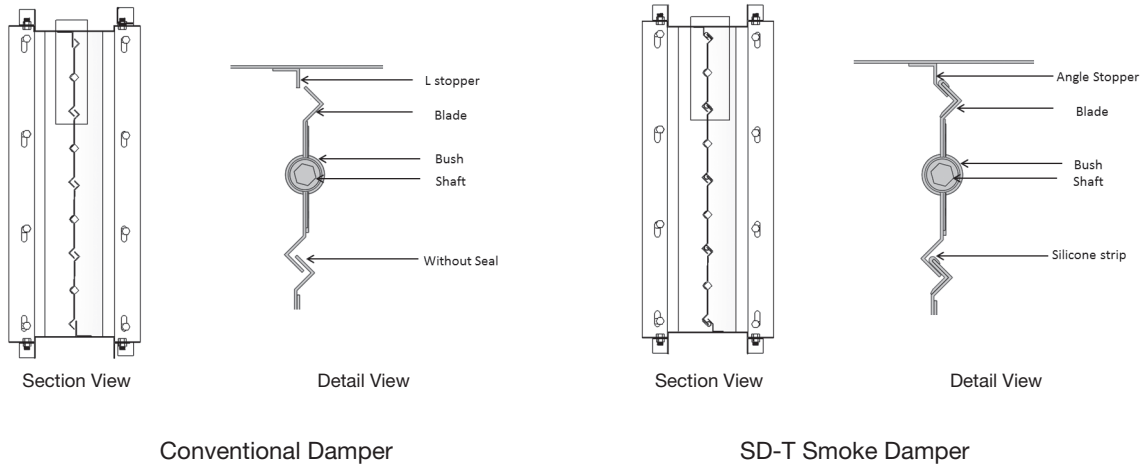
SD-T Construction Illustrations

Front View

Sectional View
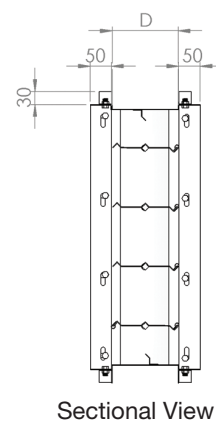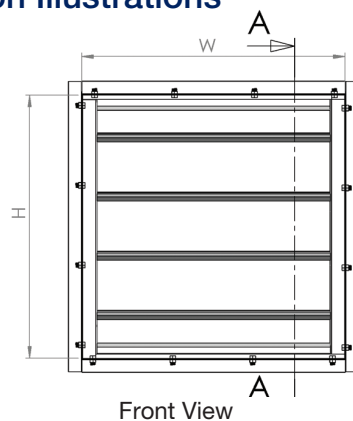
SD-T Smoke Damper

Comparison of conventional damper and SD-T smoke damper

| Section View | Detail View | | Section View | Detail View |

Conventional Damper   **SD-T Smoke Damper**

When the dampers are fully closed, there are still some visible gaps between the blades and the stoppers in conventional damper. SD-T incorporated blade seal and angle stopper to seal up the gaps. SD-T has also improved on its jamb seal by using reinforced stainless steel plate, which will not deform or vibrate in high pressure or when the blades are rotating. Hence the air leakage rate has been greatly reduced.

SD-T Performance Data

To determine pressure drop
1. Select the damper free area (ft²) based on width (W) and height (H) from the table below.
2. Given the air velocity and damper size, substitute the free area (ft²) into the formula below and get the pressure drop value.
   Please take note on the unit of parameters.

Height H (mm)	Width, W (mm)										
	200	300	400	500	600	700	800	900	1000	1100	1200
200	0.20	0.34	0.47	0.61	0.74	0.87	1.01	1.14	1.28	1.41	1.55
300	0.34	0.57	0.79	1.02	1.24	1.47	1.70	1.92	2.15	2.37	2.60
400	0.50	0.83	1.17	1.50	1.84	2.17	2.50	2.84	3.17	3.50	3.84
500	0.64	1.06	1.49	1.91	2.34	2.76	3.19	3.61	4.04	4.46	4.69
600	0.78	1.29	1.81	2.33	2.84	3.36	3.88	4.39	4.91	5.43	5.94
700	0.94	1.25	1.56	1.87	2.19	2.50	2.81	3.12	3.43	3.75	4.06
800	1.07	1.79	2.51	3.22	3.94	4.65	5.37	6.08	6.80	7.52	8.23
900	1.24	2.06	2.88	3.71	4.53	5.35	6.18	7.00	7.82	8.65	9.47
1000	1.37	2.29	3.20	4.12	5.03	5.95	6.86	7.78	8.69	9.61	10.52
1100	1.23	2.25	3.27	4.29	5.32	6.34	7.36	8.39	9.41	10.43	11.45
1200	1.34	2.45	3.57	4.68	5.79	6.91	8.02	9.14	10.25	11.36	12.48

SD-T Smoke Damper
Tested and confirm to UL5555

$$\Delta P = 2.75 \left(\frac{\dfrac{Q}{\text{Free Area}} - V}{4005} \right)^2$$

ΔP = Pressure drop (inch w.g.)
V = Duct Air velocity (fpm)
Q = Air flow rate (CFM) = Duct Area (ft2) X Duct Air Velocity (fpm)
* All data has been corrected to represent standard air at a density of 0.075 lb/ft³.
* All data has been generated in which the damper blades are fully open.
Example:
Given : Duct Air Velocity = 1000fpm
        Duct Size = Damper Size = 500mm (W) X 500mm (H)
        Duct Area = 2.69 ft²
Find: Pressure Drop
Q = Duct Area (ft²) X Duct Air Velocity (fpm)
  = 2.69 X 1000
  = 2690 CFM
Refer to the table above, free area for damper size 500mm(W) X 500mm (H) = 1.91 ft²

$$\Delta P = 2.75 \left(\frac{\dfrac{2690}{1.91} - 1000}{4005} \right)^2$$

ΔP = 0.0286inch w.g.
ΔP = 7.12 Pa

SD-T Leakage Test

Static Presure Drop	Leakage
Pa	L/s
250	16
500	35
750	56
1000	71

Above performance data was tested for size 1000 mm x 1000mm under negative pressure.

SD-T Order Code *Unit : mm*

Mode	Neck Size (W X H X D)	Connection Type (Left)	Connection Type (Right)
SD-T	1000mm X 1000mm X 150mm	Angle bar (A) Slip Joint (S) Flat Joint (F) Flange Joint for TDC (T)	Angle bar (A) Slip Joint (S) Flat Joint (F) Flange Joint for TDC (T)

Example: SD-T-1000mmX1000mmX150mm-AA