

# **DELTA**

## **RUSKIN**

**Curtain  
Type  
Fire  
Damper**

All Fire Dampers are manufactured by  
Delta Pyramax Co., Ltd in Hong Kong  
under license by Ruskin (USA)

# Company Profile



**W**ith an idea and a commitment, Delta Pyramax Co., Ltd was founded in 1982. The idea was to improve the human living and working environment with worldwide sourcing. The commitment was to provide the highest quality, technology and most economic value products to our customers. Developed 20 years age, this philosophy is still the fundamental operating principle of Delta Pyramax today.

Delta Pyramax had most experience on following: Fire & Smoke Protection System; Energy Saving System; HVAC System; Waste Water Treatment System; Air Cleaning & Filtering System; Environmental Acoustic System...etc. Most of our products are leaders in the market. The focus of Delta Pyramax has always provided excellent customer service. Whether it's in the initial design phase, during construction, or after project completion, our salesmen deliver expert customer support.

Through active membership and participation, Delta Pyramax is a member of the following association: Hong Kong Registered Ventilation Contractors Association in 1992; The Fire Protection Association in 1994; The Hong Kong Air Conditioning & Refrigeration Association Ltd in 2002. Delta Pyramax is committed to supporting our product groups and worked with product manufacturers to develop product performance, testing standards, certification & guidelines for the best customer value.



The Hong Kong Federation of Electrical and Mechanical Contractors Limited  
Membership No.:0140



The Hong Kong Air Conditioning and Refrigeration Association Limited  
Associate Member



Federation of Hong Kong Industries  
Membership No.: A9150



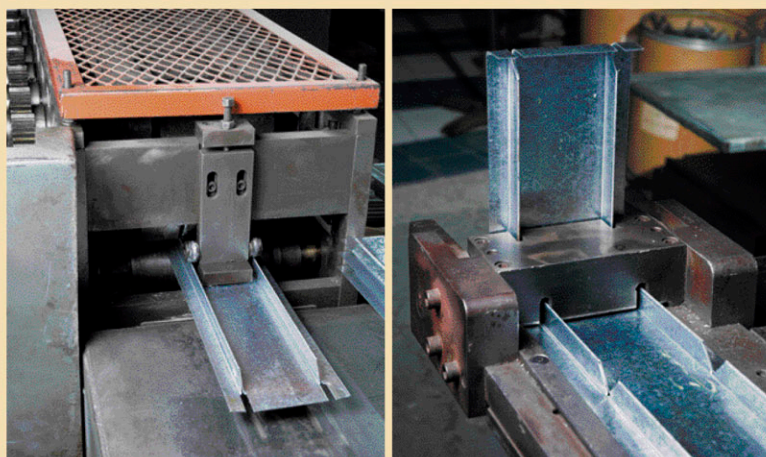
Hong Kong Fire Protection Association  
Membership No.: C0007



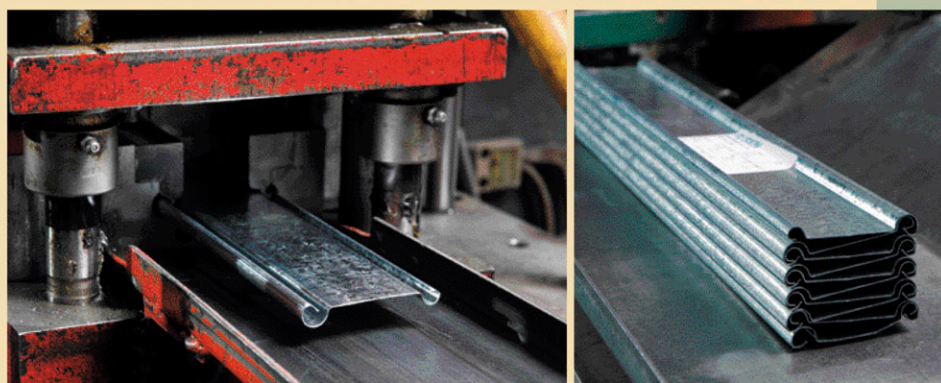
Hong Kong Registered Ventilation Contractors Association  
Membership No.: M-003

# Production

**R**uskin curtain type Fire Damper is made in Hong Kong. With the computerized production process, it is more accurate in size of fire damper and it is quick to produce and to deliver.

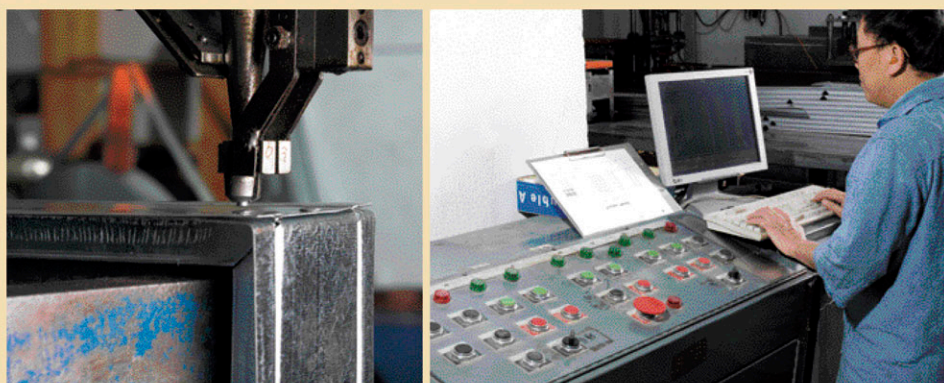


- Frame Processing



- Blade Processing

- Blade with Label



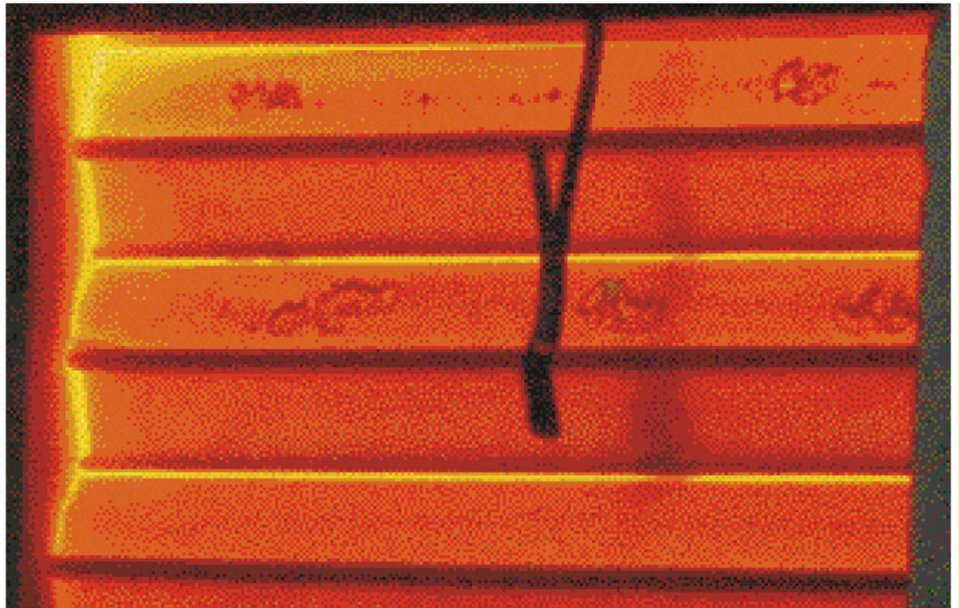
- Rivet-fix Processing  
Rivets are air-tightened fixed on frame.

- Data Entering to Computer



# Curtain Type Fire Damper

- Style A
- Style B



## Specification of Fire Damper:

### Fire Damper (Curtain Type)

All fire dampers for this project shall be folded continuously interlocked blade curtain type and shall be:

1. The fire damper manufacturer shall have at least 10 years experience for local licensee units.
2. All curtain-bladed dampers with approved proprietary make construction and mounting method shall be approved by recognized testing authority, giving the required FRP value equivalent to the structure it penetrates.
  - **Acceptable standard includes,**
    - BS476: Part 20 (for integrity only)
    - Underwriters Laboratories Inc. (UL) 555
    - Product Conformity Certification
    - ISO 9001: 2000
    - ISO 14001: 2004
3. Constructed of min. 24 gauge galvanized steel blades, with parts in contact with moving blades during closure of damper well protected against corrosion.
4. Anchored securely to fire partition, installation shall be specified in accordance with the damper manufacturer's instruction.
5. Operated by fusible link set to release 68°C unless otherwise specified.
6. Damper sleeve or casing shall be factory assembled and according to relevant approved recognized standard.

Material / Type	All Stainless Steel	Partial Stainless Steel
Blade	304 / 316 Stainless Steel	304 / 316 Stainless Steel
Frame	Stainless Steel	Stainless Steel / Galvanized Steel
Sleeve	Stainless Steel	Galvanized Steel
Spring	301 Stainless Steel	301 Stainless Steel
Omega Spring	Coated Steel	Coated Steel
Blade Lock	316 coated Galvanized Steel	Galvanized Steel
Fusible Link	Standard Fusible Link coated with Wax	Standard Fusible Link
ETL	Standard ETL coated with Wax	Standard ETL
Rivets	Coated self piercing rivets OR 316 Stainless Steel blind rivets	Coated self piercing rivets
Welds	Touch up with 316 paint	Touch up with Zinc rich Paint

**Fire Rating: 4 hours integrity tested to BS476: Part20: 1987**

#### Standard Construction:

- Frame : 0.8mm (22 gauge) Galvanized Steel
- Blade : Material:  
0.6mm (24 gauge) Galvanized Steel  
Action:  
- By Spring  
- By Gravity closure upon fusible link release
- Fusible Link : Temperature rating 68°C
- Air flow rating : Dual direction Air Flow

#### Sleeve Construction:

Optional factory mounted sleeve: 1.0mm (20 gauge) Galvanized Steel

#### Damper Size:

- Minimum : 100mm x 100mm (W x H)
- Maximum : **Single Section:**  
1200mm x 1100mm (W x H)  
900mm x 1800mm (W x H)  
**Multiple Section Assembly:**  
2700mm x 2400mm (W x H)

#### Mounted Options:

- Vertical : [V] - vertical mounted, gravity operated  
[W] - vertical mounted, spring operated
- Horizontal : [H] - horizontal mounted, spring operated

#### Remark:

- I. For damper size over 2700mm x 2400mm, factory mounted sleeve is NOT available.
- II. For vertical installation over 2700mm x 2400mm, additional steel mullion is required. Please consult us for details.
- III. Closure spring is grade 301 stainless steel, constant force type.

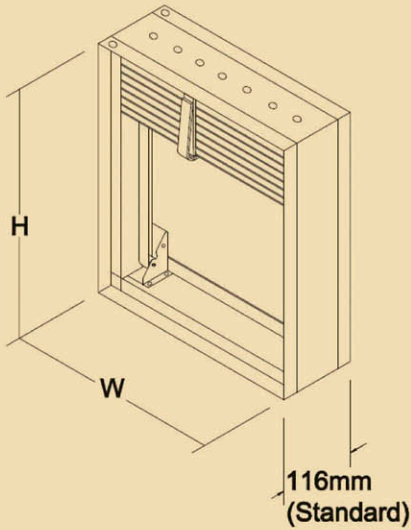
#### Optional Construction:

- 304 stainless steel blade with G.I. frame & G.I. sleeve
- 304 stainless steel blade with 304 stainless steel frame & sleeve
- 316 stainless steel blade with 316 stainless steel frame & sleeve

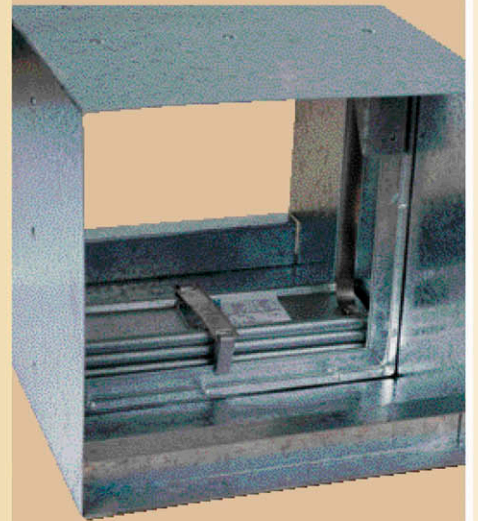
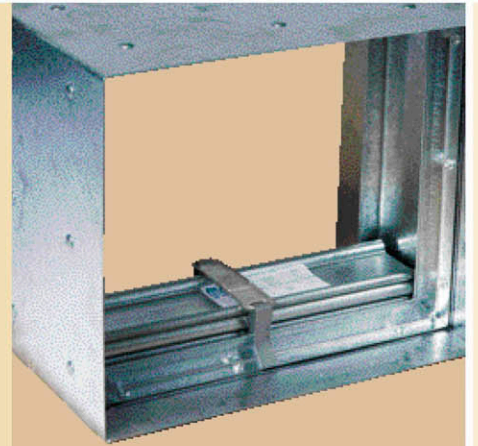
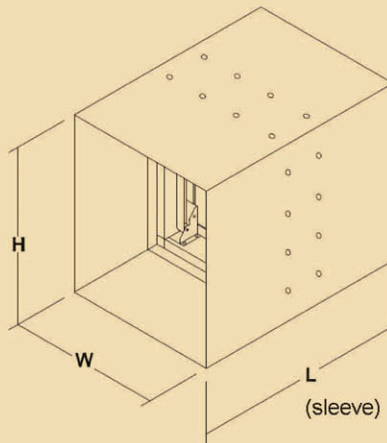
## STYLE A

### Blades Housed INSIDE Airstream

Style A with spring



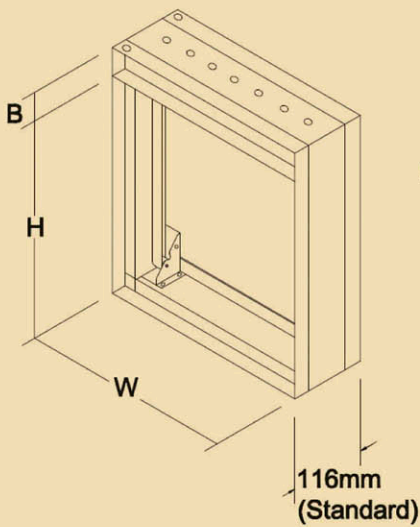
Style A with spring and sleeve



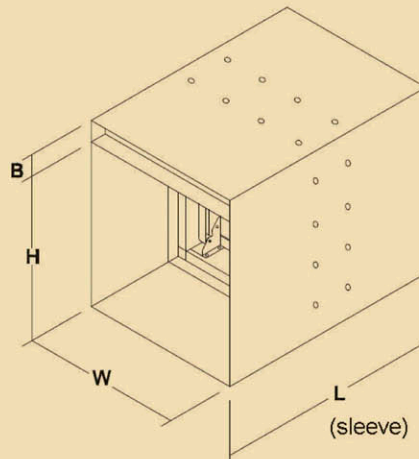
## STYLE B

### Blades Housed OUTSIDE Airstream

Style B with spring



Style B with spring and sleeve



H(mm)	B(mm)
100-324	44
325-574	70
575-824	95
825-1025	120

Remark:  
The action of fire damper with no spring is by gravity.

## Performance Data for IBD STYLE A

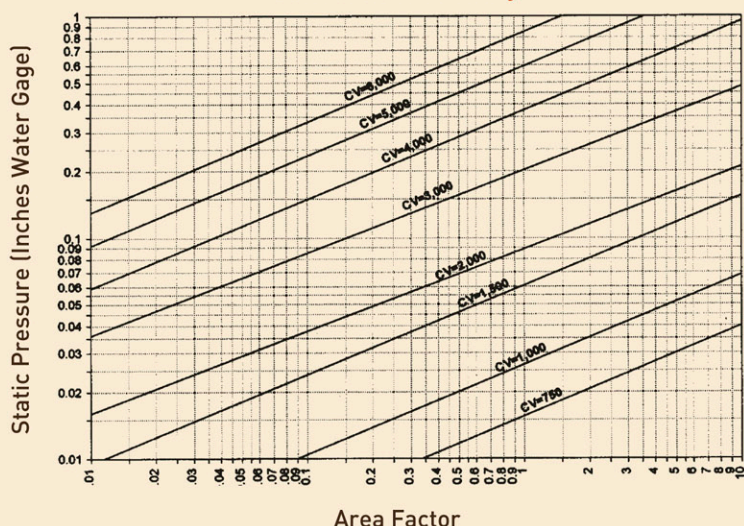
### To Determine the Pressure Drop:

1. Determine area factor for the damper based on the duct width and height (A x B) using the appropriate chart based on damper style.
2. Find the conversion velocity (CV) by multiplying area factor for the selected size damper by flow rate in CFM.
3. Locate the area factor at bottom of the pressure drop chart. Move up the chart to the appropriate conversion velocity (CV) line. From the intersection point, move left to pressure drop at left side of the chart.

Area Factor Table

Ht. D/B	Width - Dimensions A															
	6	12	18	24	30	36	42	48	54	60	66	72	78	84	90	96
6	8.33	3.57	2.27	1.64	1.30	1.14	.943	.820	.725	.649	.588	.546	.505	.469	.433	.407
8	5.88	2.56	1.61	1.19	.943	.806	.675	.595	.526	.472	.427	.397	.365	.337	.314	.292
10	4.55	1.96	1.25	.917	.719	.625	.526	.459	.403	.360	.324	.306	.280	.258	.240	.225
12	3.57	1.52	.971	.709	.562	.485	.410	.355	.313	.281	.254	.236	.217	.201	.187	.175
16	2.63	1.14	.719	.526	.417	.360	.305	.263	.232	.208	.189	.175	.162	.149	.139	.129
20	2.08	.901	.571	.420	.331	.286	.242	.210	.185	.166	.150	.140	.128	.119	.110	.103
24	1.75	.746	.474	.348	.275	.237	.201	.174	.152	.136	.122	.116	.106	.099	.092	.086
28	1.49	.637	.406	.298	.235	.203	.172	.149	.131	.117	.106	.099	.091	.084	.078	.073
32	1.30	.555	.355	.260	.205	.177	.150	.130	.115	.103	.093	.087	.080	.074	.068	.064
36	1.14	.488	.311	.227	.180	.155	.132	.114	.100	.090	.081	.076	.070	.064	.060	.056
42	.971	.417	.265	.195	.154	.133	.113	.097	.086	.077	.069	.065	.060	.055	.051	.048
48	.855	.366	.233	.171	.135	.116	.099	.085	.075	.067	.061	.057	.052	.048	.045	.042
54	.758	.325	.207	.152	.120	.103	.087	.076	.067	.060	.054	.051	.046	.042	.040	.037
60	.685	.293	.186	.137	.108	.093	.079	.068	.060	.054	.049	.046	.042	.039	.036	.034
66	.613	.264	.168	.123	.097	.084	.071	.062	.054	.049	.044	.041	.038	.035	.032	.030
72	.565	.242	.154	.113	.089	.077	.065	.056	.050	.045	.040	.038	.035	.032	.030	.028

Conversion Velocity



# Performance-Pressure Drop

Notes:

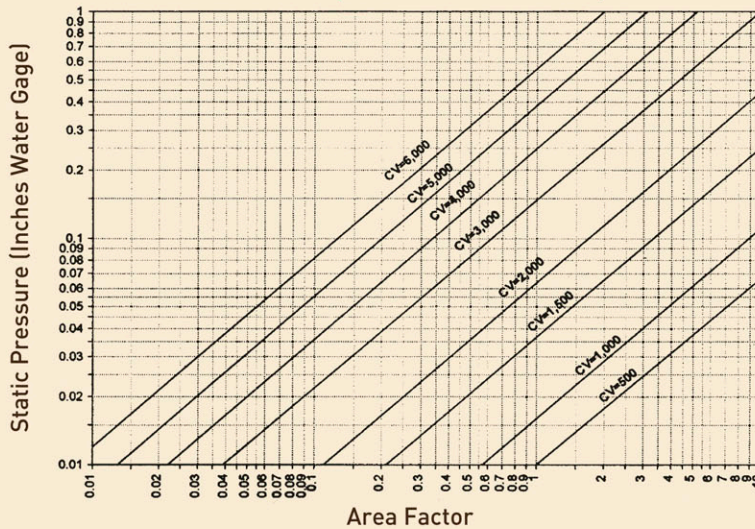
1. Ratings are based on AMCA Standard 500 using test set up apparatus figures 5.3 (damper installed with duct upstream and downstream).
2. Static pressure and conversion velocities are corrected to .075 lb./cu. ft. air density.
3. For installations where damper is not installed in ductwork such as return air from ceiling plenum through fire damper into return air shaft, multiply static pressure drop obtained from the table below by  $2.8 + \sqrt{1 \div \text{AREA FACTOR}}$

# Performance Data for IBD STYLE B

Area Factor Table

Dim. B	Width - Dimension A																			Dim. B					
	6	12	16	20	24	28	32	36	40	44	48	52	56	60	64	68	72	76	80		84	88	92	96	99
6	6.10	2.85	2.08	1.67	1.37	1.18	1.02	909	813	.741	.676	.625	.578	.541	.505	.476	.448	.426	.403	.385	.366	.351	.336	.326	6
8	4.41	1.96	1.45	1.15	.952	.813	.709	.629	.581	.513	.489	.433	.402	.375	.349	.329	.311	.294	.279	.266	.254	.243	.233	.226	8
10	3.46	1.52	1.11	.877	.730	.621	.541	.481	.431	.392	.358	.330	.307	.286	.268	.252	.236	.225	.214	.204	.194	.186	.178	.173	10
12	2.84	1.22	.901	.714	.588	.503	.439	.389	.350	.317	.290	.267	.248	.232	.217	.204	.192	.182	.173	.165	.157	.150	.144	.140	12
16	2.10	.885	.649	.516	.427	.365	.318	.282	.253	.229	.210	.194	.180	.166	.157	.148	.139	.132	.125	.119	.114	.109	.104	.101	16
20	1.66	.689	.510	.405	.334	.286	.249	.221	.198	.180	.165	.152	.141	.131	.123	.116	.109	.103	.098	.093	.089	.085	.082	.079	20
24	1.38	.566	.420	.332	.276	.235	.205	.182	.163	.148	.136	.125	.116	.108	.101	.095	.090	.085	.081	.077	.073	.070	.067	.065	24
28	1.17	.483	.356	.283	.234	.199	.174	.154	.139	.126	.115	.106	.098	.092	.086	.081	.076	.072	.069	.065	.062	.060	.057	.055	28
32	1.02	.420	.310	.245	.203	.173	.151	.134	.120	.109	.099	.092	.085	.080	.075	.070	.066	.062	.059	.056	.053	.050	.048	.046	32
36	.907	.370	.274	.217	.180	.153	.134	.118	.106	.097	.088	.081	.076	.070	.066	.062	.059	.056	.053	.050	.048	.046	.044	.042	36
40	.815	.332	.245	.194	.161	.137	.120	.106	.095	.087	.079	.073	.068	.063	.059	.056	.052	.050	.047	.045	.043	.041	.039	.038	40
44	.740	.301	.222	.176	.146	.124	.108	.096	.086	.078	.072	.066	.061	.057	.054	.050	.048	.045	.043	.041	.039	.037	.036	.035	44
48	.677	.276	.203	.161	.133	.114	.099	.088	.079	.072	.066	.060	.056	.052	.049	.046	.044	.041	.039	.037	.035	.034	.033	.032	48
52	.624	.253	.187	.148	.123	.105	.091	.081	.073	.066	.060	.056	.052	.048	.045	.042	.040	.038	.036	.034	.033	.031	.030	.029	52
56	.579	.236	.173	.137	.114	.097	.085	.075	.067	.061	.056	.052	.048	.045	.042	.039	.037	.035	.033	.032	.030	.029	.028	.027	56
60	.540	.219	.161	.128	.106	.090	.079	.070	.063	.057	.052	.048	.046	.042	.039	.037	.036	.033	.031	.030	.028	.027	.026	.025	60
64	.506	.205	.151	.120	.099	.085	.074	.065	.059	.053	.049	.045	.042	.039	.036	.034	.032	.031	.029	.028	.026	.025	.024	.023	64

Press Drop Conversion Velocity



With the Equation,

$$\text{Conversion velocity (V)} = \text{Flow Rate} \times \text{Area factor for the selected size damper}$$

We have,

$$\text{Pressure Drop} \propto \text{Air Flow} \times \text{Area Factor (Free Area of Damper)}$$

Assume Air Flow = Constant

$$\therefore \text{Pressure Drop} \propto \text{Area Factor}$$

There is no doubt that,

Free Area of curtain type damper > That of local mild steel damper

$\therefore$  the structure of local mild steel damper is similar to that of louver

The pressure drop of Ruskin fire damper is much less than that of local mild steel fire damper.

**IBD Performance Examples:**

1. Find the pressure drop across a 24" x 24" (610 x 610) IBD A style fire damper handling 5747 CFM. From the table, the area factor is 0.348 = 2,000. From the chart, pressure drop = .065" w.g.
2. Find the pressure drop across a 30" x 26" (762 x 660) IBD A style fire damper handling 6383 CFM. From the table, the area factor is 0.235. The conversion velocity = CFM x area factor = 6383 x 0.235 = 1500. From the chart, pressure drop = .034" w.g.



**R**egular maintenance is essential to ensure that a building's life-safety system will perform as intended under fire conditions. Regular maintenance should include periodic testing of all equipment associated with the life-safety system such as fire dampers. The interval of testing and maintenance varies widely depending on the duration of system operation, condition of fresh air, amount of dust in return air, and other factors. According to British Standard 5588 Part 4, depending on the type and style of dampers, the maintenance is specified at a maximum interval of 12 months for spring operated fire dampers or 2 years for others. National Fire Protection Association (NFPA), 80 (Standard for Fire Doors and Other Opening Protective) recommends testing of all fire dampers 1 year after installation and then once every four years as a minimum.

#### **Maintenance:**

- Check closure springs. If defective, repair or replace.
- Operate the damper by removing the fusible link and allowing the blades to drop or close. (Caution: keep fingers and hands out of the blade package travel path.)
- Check the damper for rust and/or corrosion.
- Clean damper blades and lubricate the working parts. Do not use petroleum-based products as they could cause excessive dust collection.
- Re-open the damper (move the blade package back to the top of damper) and replace the fusible link.


#### **Testing Dampers:**

- Use a heat source and melt the fuse link or remove the fuse link and let the blade package drop. (Caution: keep fingers and hands out of the blade package travel path.)
- Check the blades to make sure they completely close and lock (if a lock is used).

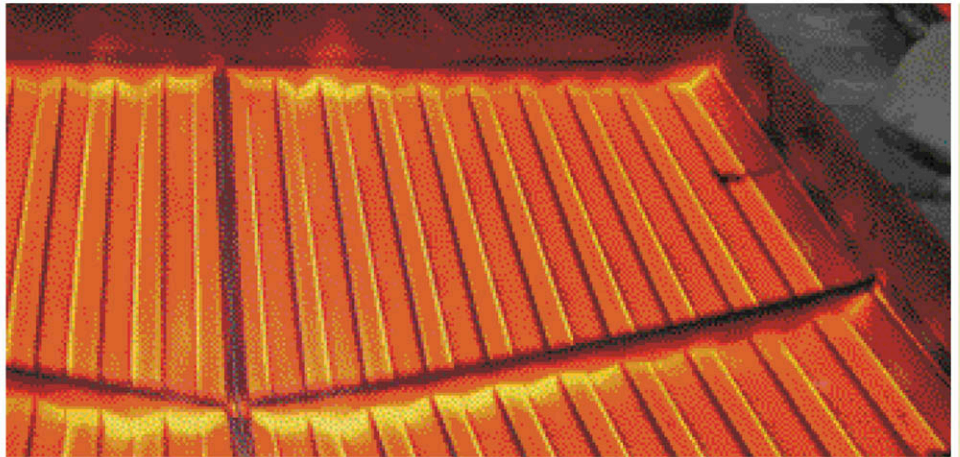
#### **Notes:**

1. If the damper is determined to be impossible to test, Delta Ruskin recommends a thorough examination to insure nothing exists which would prohibit the damper from closing. A thorough examination should include checking the damper for square-ness and the blade channel for obstructions.
2. Fire dampers may be easier to re-open from a specific side.
3. If possible, fire dampers should be tested under normal airflow conditions.

# Operation & Maintenance Instruction



# Certificate



**The 1<sup>st</sup> brand of fire damper in Hong Kong, through Product Conformity Certification Scheme accredited by the certified body, achieved the product certification.**

- This aims to promote the quality of manufacture and supply of passive fire products.
- The scheme ensures that all the certified products are quality controlled at various critical stages of manufacture and supply that are including,
  - Auditing of quality management system of production plants
  - Initial prototype testing of products
  - Technical inspection of manufacturing process
  - Subsequent surveillance visits and continual audit testing of products
- The certifications of products are required for reasons of the safety, health, environmental protection, fraud prevention and market fairness.
- All the certified products are entitled to bear a certification mark together with relevant technical product description.



- ISO 9001: 2000
- Certificate no: CC216



- ISO 9001:2000
- Certificate no: CC217



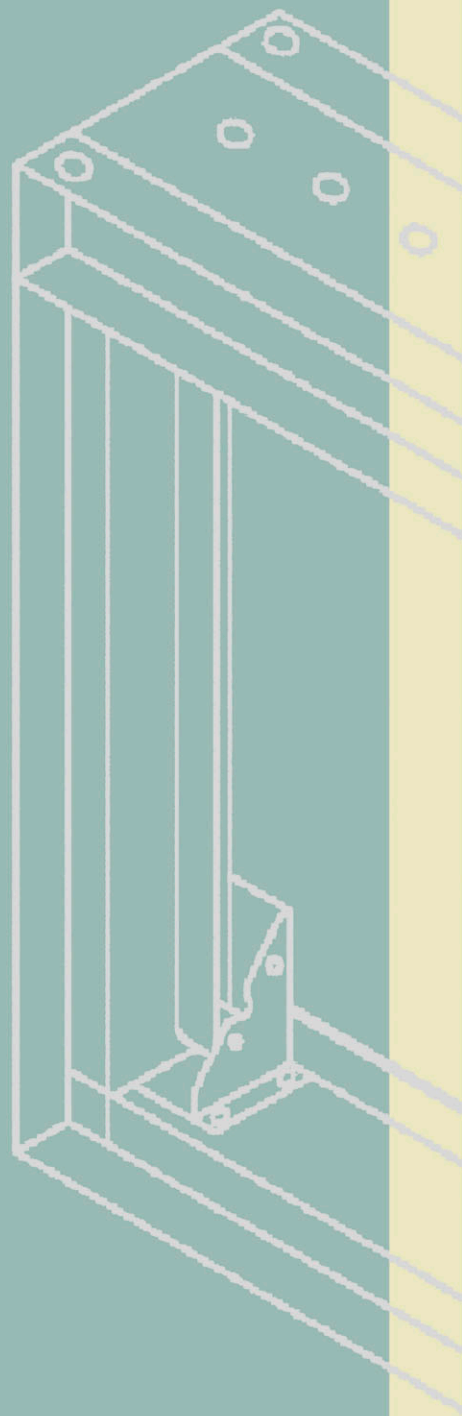
- ISO 14001:2004
- Certificate no: E083

# What is Product Certificate?

- An independent assurance on passive fire protection products is achieved.
  - These products are manufactured and supplied under an effective system of testing, inspection, conformity control and regular monitoring by an independent accredited certification
- Products are complied with the product standard = Purchasers of the products are assured
  - Each individual product is certified to be in compliance with both the stringent administrative procedures and the relevant technical requirements of the scheme.
- Product mark is printed on the product
- Clear identification on product and Defined certification scope
- Highly effective in improving production efficiency with reduced wastage and rejects during this scheme

# Reason to Use

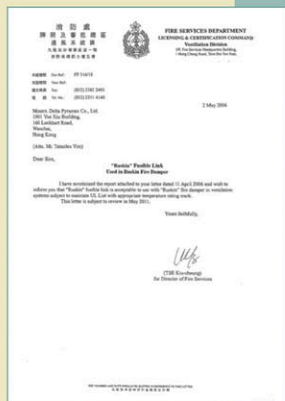
- Delta Pyramax Co., Ltd is the one of manufacturers in Hong Kong which install the fire damper into the wall without using retaining angle.
- Self-owned manufactory is located in Hong Kong.
  - Benefits:
    - Quick delivery
    - Quick production
    - Available on size and quantity in adjustment
- Lots of installation method with test reports.
- NO back-fill by concrete is necessary for typical installation.



• BS476: Part20: 1987  
• Certificate no: 009



Fire Certificate  
• Ref. no: FP (LC)316/13



Fire Certificate  
• Ref. no: FP 316/18

## **Delta Pyramax Co., Ltd.**

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