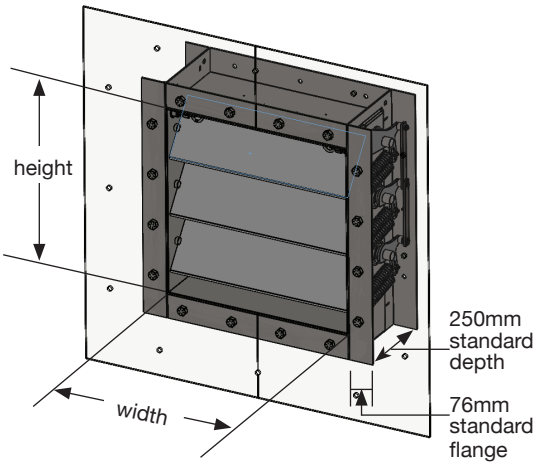
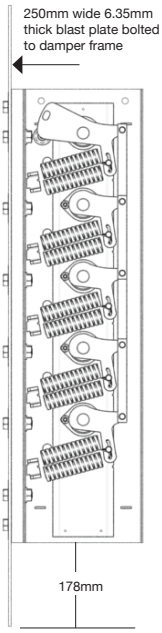
Blast Protection Damper

BL-201 Series

Blast plate shown as transparent





Application

- The BL-201 Series damper is designed for protection against sudden blasts and instantaneous pressure changes. Typical use is the protection of vent openings and/or HVAC supply & exhaust openings in exterior building walls.
- Blast pressures up to 65 psi. Complies with UFC 4-010-01 performance requirements for High Level of Protection, and GSA Level D blast loading
- Vertical and horizontal mounting applications. Surface mounting or duct flange mount
- ATEX certified for use in explosive atmospheres. Ambient temperature up to 195°C
- Max air velocity: 20 m/s.

Standard Construction

- Frame: 76x250x76mm, 10 ga. (3.4mm) carbon steel channel
- 250mm wide x 6.35mm thick blast plate for surface mount applications
- Blades: 3.4mm carbon steel double skin airfoil
- Optional Blade Lock: Latch mechanism can be set to lock blades in the closed position after a blast or set to allow the blades to reopen
- Axles: Ø 25.4mm solid 1018 steel
- Linkage: 6.35mm thick x 19mm wide bars
- Bearings: Two hole flange sealed ball bearings (type II)
- Stainless steel springs (to hold blades in open position)
- Finish: Gray primer for rust prevention

Min. Size* 200mm x 200mm
Max. Single Section* 1220mm x 1524mm (see graph for blast pressure limitations).
Max. Multi-Section* 2440mm x 1524mm (subject to blast pressure limitations)

*as measured to inside frame dimensions

Options

- Powder coating
- Stainless steel construction (ASTM-A240, SA240, AMS 5513)
- Galvanized steel construction
- Blast deflector on jambs
- Equalizing/debris grid (-GR models)
- Combined damper assembly with MAT BD-200-HD fire resistant pressure relief damper

Models BL-201, BL-201-GR

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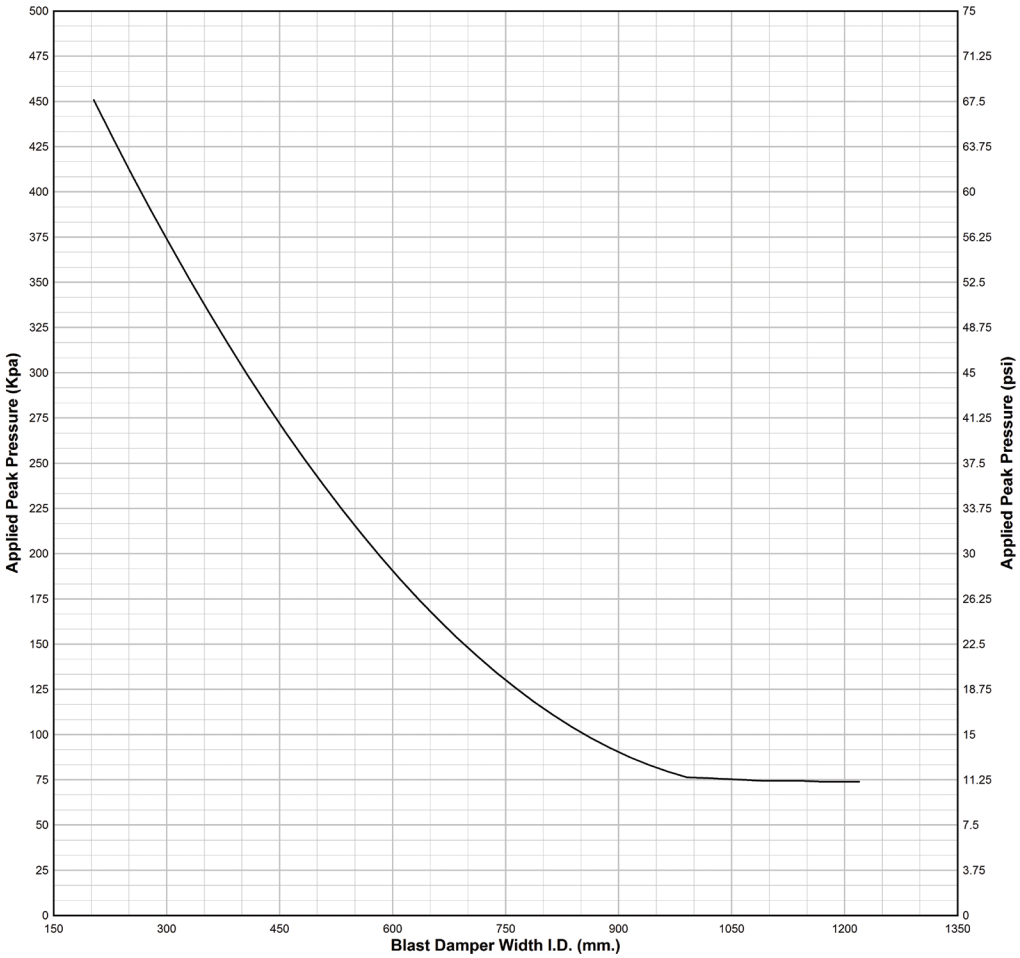
Blast Protection Damper

BL-201 Series

Total Reflective Pressure vs. Blast Damper Width



Note: Multi-section dampers may be required to meet high overpressure ratings

Shock Tube Testing: 32"x32" I.D. Blast Damper * Model BL-201				
Test	Test Specimen	Applied Peak Pressure (psi)	Applied Positive Phase Impulse (psi-ms)	Positive Phase Duration (ms)
1	1	16.3	1477	312.4
2	2**	3.2	128	77.1
3	2**	5.8	229	83.2
4	2**	8.7	370	103.4
5	2**	11.1	753	203.5
6	2**	16.2	1439	322.4
Shock Tube Testing: 48"x48" I.D. Blast Damper *** Model BL-201				
1	1	11.6	92	14.13

*Shock Testing of the 32"x32" Blast Damper was performed by Baker Risk Structural Component Testing Labs.

**Tests 2-6 were performed consecutively on the same test specimen.

***Shock Testing of the 48"x48" Blast Damper was performed by ATI-Intertek Architectural Testing Lab.

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Blast Protection Damper

Model BL-201 Performance Data

12"x 12"			
Face Velocity		Pressure Drop	
ft/m	m/s	in. H2O	Pa.
2997.0	15.2	7.1	1765.5
2490.0	12.6	5.0	1233.0
1987.0	10.1	3.2	801.0
1492.0	7.6	1.8	454.6
927.0	4.7	0.7	177.9

12"x 48"			
Face Area Velocity		Pressure Drop	
ft/m	m/s	in. H2O	Pa.
3407	17.3	5.3	1311
2948	15.0	4.1	1032
2464	12.5	2.9	724
1980	10.1	1.9	472
983	5.0	0.5	116

24"x 24"			
Face Velocity		Pressure Drop	
ft/m	m/s	in. H2O	Pa.
3382.0	17.2	10.9	2718.6
2719.0	13.8	7.0	1743.1
2217.0	11.3	4.7	1160.3
1725.0	8.8	2.8	703.5
1239.0	6.3	1.4	356.6

36"x 36 "			
Face Velocity		Pressure Drop	
ft/m	m/s	in. H2O	Pa.
2971.0	15.1	8.1	2023.3
2394.0	12.2	5.2	1300.7
1798.0	9.1	2.9	709.9
1198.0	6.1	1.2	306.1
593.0	3.0	0.3	74.4

48"x 12"			
Face Velocity		Pressure Drop	
ft/m	m/s	in. H2O	Pa.
2880	14.6	8.9	2210.7
2318	11.8	5.8	1443.3
1740	8.8	3.2	803.3
1166	5.9	1.5	362.5
588	3.0	0.4	90.6

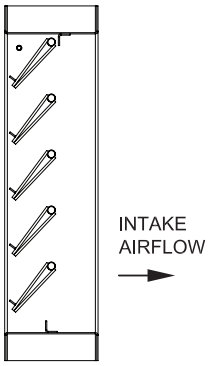
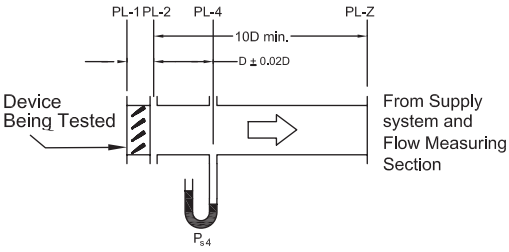
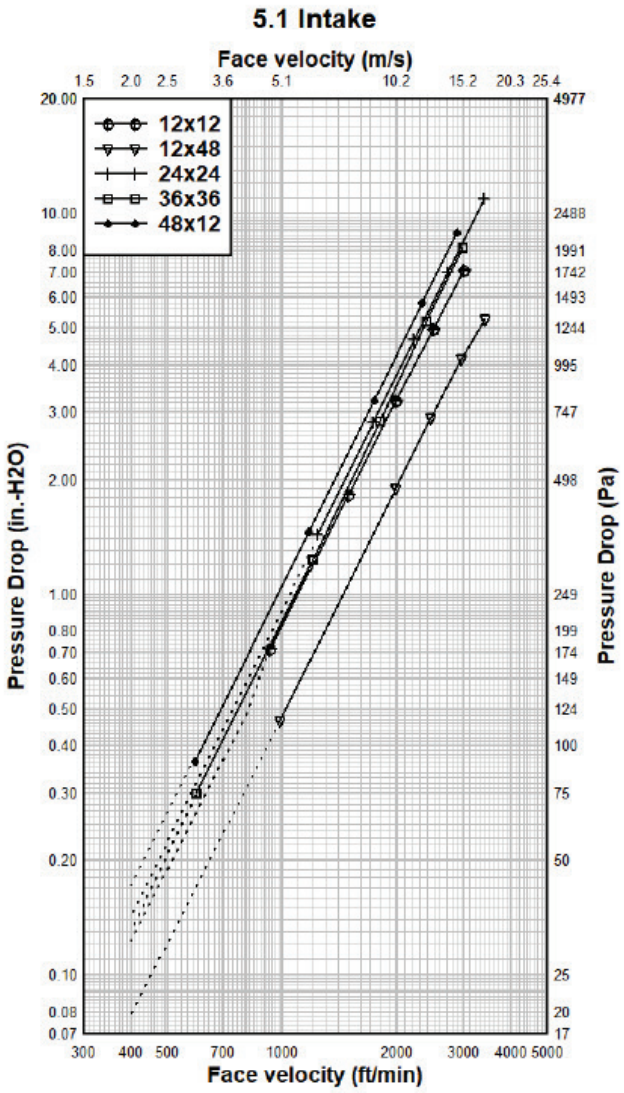


Figure 5.1- Test Device Setup with Outlet Duct Intake Application



Tested per AMCA Standard 500-D (fig. 5.1)

At Standard Air Density



Metropolitan Air Technology certifies that model BL-201 blast damper shown heron (or herein) is licensed to bear the AMCA Listing Label. 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 Rating Seal applies to Air Performance.

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Blast Protection Damper

Model BL-201 Performance Data

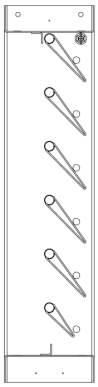
12"x 12"			
Face Velocity		Pressure Drop	
ft/m	m/s	in. H2O	Pa.
2625.0	13.3	7.3	1827.0
2463.0	12.5	6.4	1602.3
1971.0	10.0	4.1	1029.9
1493.0	7.6	2.4	590.2
920.0	4.7	0.9	217.7

12"x 48"			
Face Velocity		Pressure Drop	
ft/m	m/s	in. H2O	Pa.
3746.0	19.0	3.8	936.6
3011.0	15.3	2.5	621.4
2256.0	11.5	1.5	364.3
1500.0	7.6	0.7	171.7
740.0	3.8	0.2	43.8

24"x 24"			
Face Velocity		Pressure Drop	
ft/m	m/s	in. H2O	Pa.
3425.0	17.4	4.7	1181.0
2751.0	14.0	3.1	773.4
2063.0	10.5	1.8	450.6
1383.0	7.0	0.9	215.0
677.0	3.4	0.2	54.0

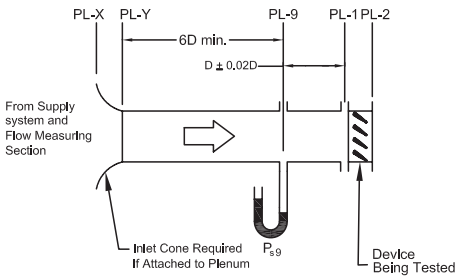
36"x 36 "			
Face Velocity		Pressure Drop	
ft/m	m/s	in. H2O	Pa.
2824.0	14.3	2.9	732.1
2261.0	11.5	1.9	484.2
1696.0	8.6	1.2	289.6
1130.0	5.7	0.5	134.1
560.0	2.8	0.1	33.3

48"x 12"			
Face Velocity		Pressure Drop	
ft/m	m/s	in. H2O	Pa.
3117	15.8	5.7	1427.4
2505	12.7	3.8	961.5
1881	9.5	2.2	555.9
1250	6.3	1.0	249.3
611	3.1	0.2	60.5



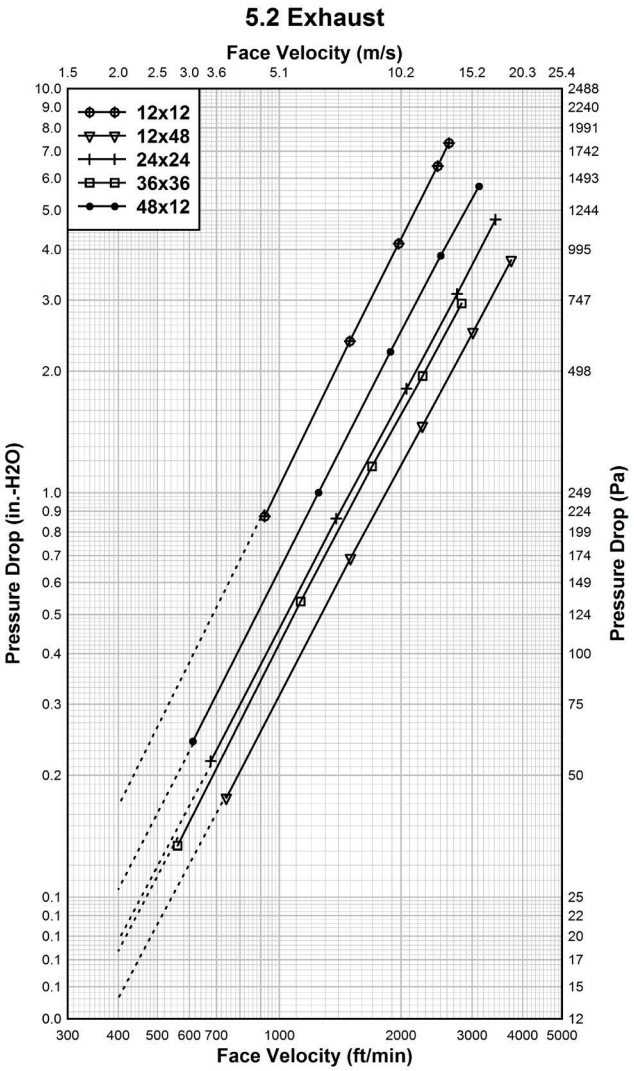
EXHAUST AIRFLOW

Figure 5.2- Test Device Setup with Inlet Duct Exhaust Application



Tested per AMCA Standards 500-D fig. 5.2

At Standard Air Density



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Metropolitan Air Technology

Blast Protection Damper

BL-201 Series

DAMPER FREE AREA CHART (sqm)

HEIGHT (OUTSIDE FRAME DIMENSION) \ WIDTH (OUTSIDE FRAME DIMENSION)	355	406	508	609	711	812	914	1016	1117	1219	1321	1372
355	0.018	0.022	0.031	0.040	0.049	0.058	0.066	0.075	0.084	0.093	0.102	0.106
406	0.021	0.026	0.036	0.046	0.057	0.067	0.077	0.088	0.098	0.108	0.119	0.124
508	0.028	0.035	0.049	0.063	0.077	0.091	0.105	0.119	0.133	0.147	0.161	0.168
609	0.041	0.051	0.071	0.092	0.112	0.133	0.153	0.174	0.194	0.214	0.235	0.245
711	0.048	0.060	0.084	0.107	0.131	0.155	0.179	0.203	0.227	0.251	0.275	0.286
812	0.058	0.073	0.102	0.131	0.160	0.190	0.219	0.248	0.277	0.306	0.335	0.350
914	0.071	0.089	0.124	0.160	0.196	0.231	0.267	0.302	0.338	0.373	0.409	0.427
1016	0.079	0.099	0.138	0.178	0.217	0.257	0.296	0.336	0.375	0.415	0.454	0.474
1117	0.089	0.111	0.155	0.199	0.244	0.288	0.332	0.377	0.421	0.465	0.510	0.532
1219	0.094	0.118	0.165	0.213	0.260	0.307	0.354	0.401	0.449	0.496	0.543	0.567
1321	0.112	0.140	0.196	0.251	0.307	0.363	0.419	0.475	0.531	0.587	0.643	0.670
1372	0.117	0.146	0.205	0.263	0.322	0.381	0.439	0.498	0.556	0.615	0.673	0.703
1422	0.121	0.152	0.213	0.273	0.334	0.395	0.456	0.516	0.577	0.638	0.699	0.729
1524	0.132	0.165	0.231	0.296	0.362	0.428	0.494	0.560	0.626	0.692	0.758	0.790
1626	0.139	0.174	0.243	0.313	0.382	0.452	0.521	0.590	0.660	0.729	0.799	0.834
1676	0.148	0.184	0.258	0.332	0.406	0.479	0.553	0.627	0.701	0.774	0.848	0.885

Free Area Chart Not Certified by AMCA

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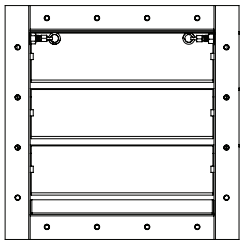
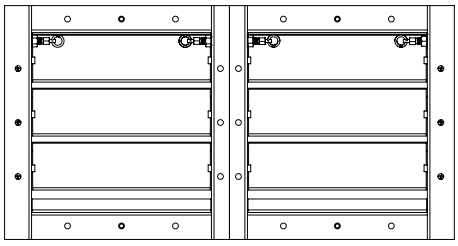
Blast Protection Damper

BL-201 Series Mounting Arragements



Single Section



Multi-Section

Vertical Mounting Arrangements

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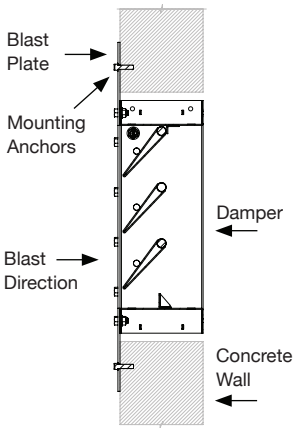

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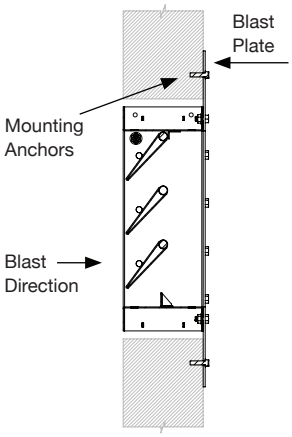

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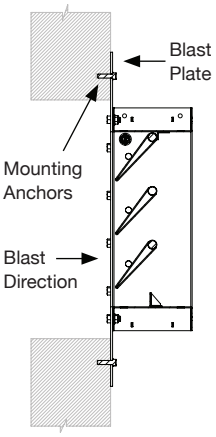

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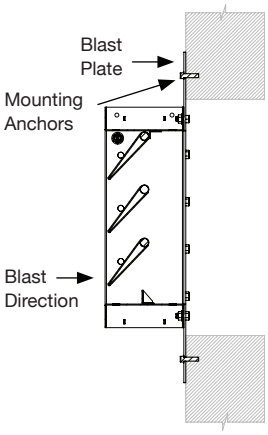

Horizontal Mounting Arrangements

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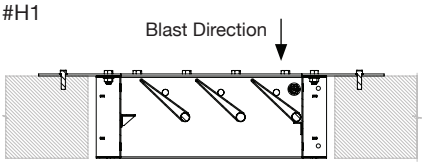

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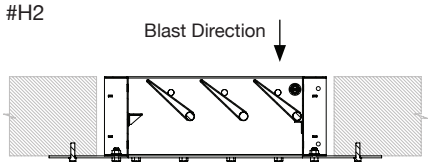

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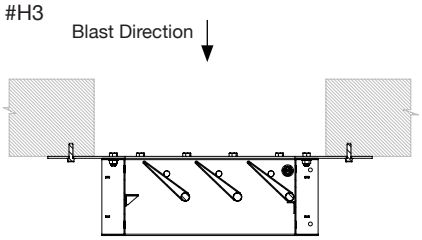

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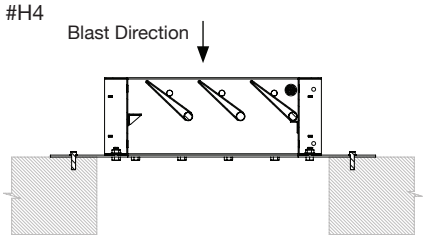

Duct Mounting Arrangement

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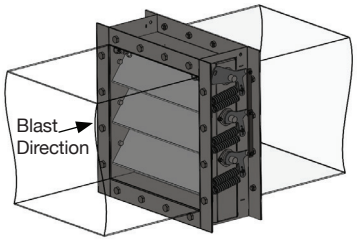

Dampers can be mounted in concrete or steel walls, and in ductwork. See MAT Model BL-201 Installation Instructions for mounting details and installation requirements.

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Blast Protection Damper

BL-201 Series

Suggested Specification

Furnish at locations shown in plans or in accordance with schedules, industrial grade blast dampers meeting the following construction standards. Frame shall be minimum 250mm deep x 75mm flange 10 gage carbon steel channel. Sleeve with inner frame is not acceptable. Blades shall be maximum 175mm wide, minimum 10 ga. carbon steel airfoil shaped double-skin. A 250mm wide x 6.35mm thick steel blast plate to be bolted to front flange. Axles shall be continuous 25mm diameter HSLA steel (ASTM 588) welded to blades. Linkage shall be 6.35mm thick, 19mm wide bar located on side of damper outside of airstream.

Linkages shall include externally mounted release springs to keep damper open until blast pressure forces blades closed. Damper shall include blade locks for protection against a delayed exothermic reaction (a moving flame front) and the negative pressure wave. Damper shall be tested by an independent lab at equally spaced successive overpressures up to 1 bar, using the shock tube method. Dampers shall be pressure drop tested in accordance with AMCA Standard 500-D. Damper shall be Metropolitan Air Technology's Model BL-201 blast damper. Add "-GR" suffix for equalizing grid.

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