PROTECTA® FR DAMPER

TECHNICAL DATA SHEET

Content

General Product Description

Protecta® FR Damper is used to fire proof ventilation ducts which penetrate fire rated constructions such as fire compartments and fire walls; preventing the passage of fire and smoke (surrounding and inside the ventilation duct).

The product consists of a steel casing and contains horizontal steel blades, treated with a technically advanced heat expanding graphite which closes off the whole damper in a fire. The aperture surrounding the dampers are fire sealed with Protecta® fire stopping products.

The damper can be installed in the fire seal and the ventilation ducting attached, or the damper can be connected to the ducting and then fire sealed.

The aperture where the ducts pass through can include one or multiple ventilation ducts. One can also pass through other technical services such as cables, cable trays and pipes within the same aperture.

Properties

- Maintenance free and no electrical connections necessary.
- The same damper can be installed in drywalls, masonry and concrete walls, timber walls, concrete floors and timber floors.
- An aperture can include several dampers and in addition, technical services such as cables, cable trays and pipes.
- The product seals against penetration of fire and smoke, surrounding and inside the ventilation duct.
- Closes in the area where the fire is located (but not elsewhere), allowing the ventilation system to extract smoke from areas that are not on fire.
- Keeps the temperature in the duct network lower than 120°C, protecting fans and sensitive units in the system.
- Insulation of ducts is not necessary.
- Service life of more than 50 years; the damper will last the same life cycle as the ventilation system.
- The dampers are designed to fit standard ducting equipment, enabling the ducting system installer to easily fit the dampers.
- The dampers are attached to the inside of the ducts, giving the benefit of space saving.
- The dampers are only 15 cm long and bends can be connected right behind the fire seal (also available to order in other sizes).
- The damper can be attached to a vent on one side.

The 'Close in and Pull out' Principle

A combined 'close in and pull out' solution is one that prevents the spread of fire by closing off the fire inside the fire compartment, using the ventilation system outside the area of the fire to pull out any smoke that filters out through the fire compartments constructions.

Protecta® FR Dampers must be used in all ventilation duct penetrations in fire compartments and fire walls. The dampers will close off the fire compartment but not in the parts of the building that are not on fire. For the principle to work effectively, it is recommended that the ventilation unit is protected with a battery backup and a by-pass of the filters so that the smoke from the fire does not blind them.

Dust Formation and General Maintenance

Tests conducted on Protecta® FR Damper to determine dust formation inside the damper, has shown that dust does not collect inside the damper, and no more than in any other components in the ventilation system. The dust tends to be blown through the dampers as long as the ventilation system is in constant operation and installed in normal indoor environments (Z_2).

It is recommended that the ventilation system is designed and cleaned according to local regulations and building codes, to provide access for inspections and cleaning, along with the frequency of these cleaning routines. Protecta® FR Damper can easily be cleaned using a vacuum cleaner (if needed). Ducts from kitchens and similar, where there is the risk of grease and high humidity, must be fitted with grease filters or similar that are cleaned at fixed frequencies.

Casing Leakage Classification

Protecta® FR Dampers are fitted with high quality gaskets in circular ducts, and are tested according to EN 1751 to the highest possible **class C** for all sizes. Testing was conducted at BRE's accredited laboratory; test reports can be provided upon request.

Case leakage classification for rectangular dampers is dependent on which locking mechanism is chosen, and the classification will be the same as the classification of the locking mechanism used. Polyseam can supply dampers with most common types of locking mechanisms that are available in the marketplace.

www.protecta.eu
Polyseam Ltd tel.+44(0)1484421036
1 (5) 2020 4 10

PROTECTA® FR DAMPER

TECHNICAL DATA SHEET

Loadbearing Properties in Floors

Protecta® EX Mortar has been subject to concentrated load and impact tests in floors according to ETAG 026-2 and EOTA TR001 Clause 2. The tests were conducted on the minimum allowed cast depth of **100mm**.

According to the loading limits in the table below, reinforcement is not necessary, however it is highly recommended that the edges of the aperture are brushed free of any dust or loose particles and that any contamination is washed away using clean water. Moistening the edges well before casting will improve adhesion. Protecta® EX Mortar should not be cast in surface treated concrete. The mortar must be mixed to a thick but fluid mass at a rate of approx. 2 parts of powder to 1 part water. Maximum loadbearing performance will be achieved 28 days after casting. Test results:

Test in 1500x1000mm frame	Results
Soft body impact, serviceability	500Nm
Soft body impact, safety in use	700Nm
Hard body impact, serviceability	6 Nm
Hard body impact, safety in use	10 Nm
Concentrated load to ETAG 26-2	15 kN

Air Permeability in Fire Seal

Pressure (Pa)	Leakage Putty Cord (m^3/h)	Leakage FR Acrylic (m^3/h)	Leakage FR Board (m^3/h)	Leakage EX Mortar (m^3/h)
+ 25	0.24	0.00	0.00	0.00
+ 50	0.26	0.00	0.01	0.00
+ 100	0.36	0.00	0.03	0.00
+ 200	0.56	0.00	0.08	0.00
+ 300	1.11	0.00	0.20	0.00
+ 600	1.88	0.25	1.01	0.02
- 25	0.32	0.00	0.00	0.00
- 50	0.60	0.00	0.01	0.00
- 100	1.00	0.00	0.02	0.00
- 200	1.63	0.00	0.04	0.00
- 300	2.26	0.02	0.11	0.00
- 600	2.64	0.22	0.95	0.03

Protecta® products - tested at Warringtonfire Testing and Certification Ltd (UKAS accredited); according to EN 1026: 2016. The test report is available upon request.

Sound Insulation

Description	Sound Classification
Protecta FR Putty Cord in wall or floor	= Rw 67 dB
Protecta FR Acrylic in wall or floor	> Rw 62 dB
Protecta FR Board in wall	= Rw 52 dB
Protecta EX Mortar in floor	> Rw 48 dB

The sound insulation values are valid for the fire seal only and not any other components in the construction, as for instance through the ventilation ducts. Protecta® products has been tested at BM Trada (UKAS accredited); according to EN ISO 10140-2:2010.

Standard Sizes of FR Dampers

Dimension	Article number and barcode	Weight
Ø 63 mm	PRO195 - 5060153111478	0.51 kg
Ø 80 mm	PRO196 - 5060153111485	0.68 kg
Ø 100 mm	PRO197 - 5060153111492	1.24 kg
Ø 125 mm	PRO198 - 5060153111508	1.57 kg
Ø 160 mm	PRO199 - 5060153111515	2.35 kg
Ø 200 mm	PRO200 - 5060153111522	3.36 kg
Ø 250 mm	PRO201 - 5060153111539	3.90 kg
Ø 315 mm	PRO202 - 5060153111546	7.36 kg
Ø 400 mm	PRO203 - 5060153111553	11.28 kg
Ø 500 mm	PRO204 - 5060153111560	14.60 kg
Ø 630 mm	PRO205 - 5060153111577	20.90 kg
Ø 800 mm	PRO206 - 5060153111584	32.24 kg
Ø 1000 mm	PRO207 - 5060153117647	49.80 kg
Ø 1250 mm	PRO208 - 5060153117654	74.00 kg

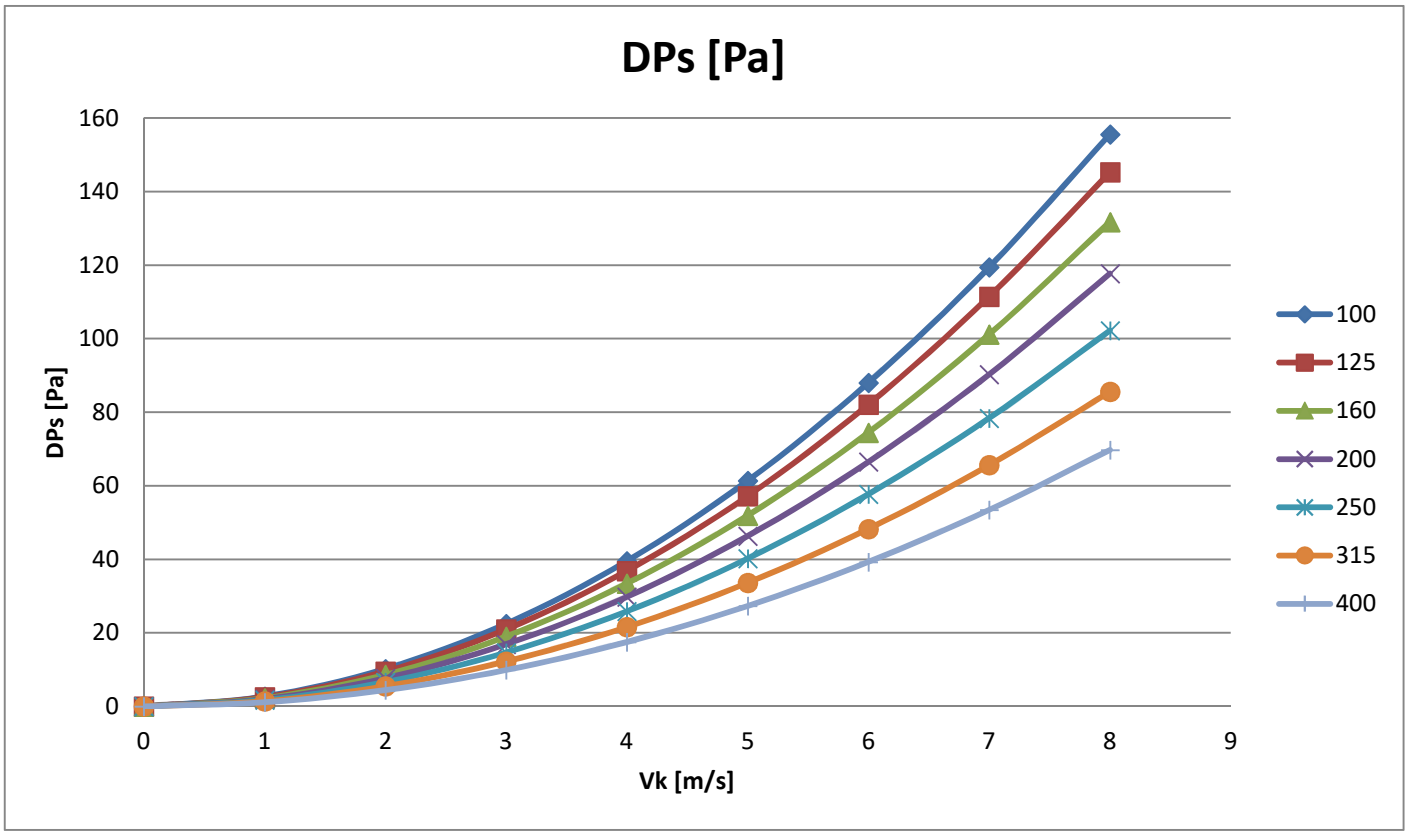
The length of the dampers in the table are 150mm plus overlap/ connection for the ventilation ducts (total length 200mm for small <400mm diam, 250mm for large >400mm diam). Longer and shorter dampers can be manufactured on request. Protecta® FR Damper for rectangular ducts are manufactured to precise measurements, and are not standard goods.

Technical Data

Appearance	Ready manufactured in steel and graphite
BREEAM	Approved, EC1^{PLUS} or M1 on all fire seals
Interior climate, installed	Z_2: Relative air moisture up to 85% and temperatures between 5 and 40 °C
Trigger-temperature in fire	100 °C
Temperature, full closure	160 °C
Time to full closure	From 50 seconds to 2 minutes
Expansion rate graphite	15.5 to 17
Density graphite	2.6 kg per ltr
Thickness graphite	1.6 mm
Leakage classification	Class C according to EN 1751 (circular)
Free air opening	Between 84.2% and 85.4%
Pressure in fire	FR Damper resists minimum 300Pa
Standard for connections	EN 1506:2007
Standard for fire testing	EN 1366-12:2014 & EN 1363-1:2012
Standard for aerodynamics	EN 1751:2014
Standard for sound levels	EN ISO 5135:1998
Flash point	None
Storage	In temperatures between 5˚C and 30˚C
Life span	Under normal conditions; 50 years +
Installation temperature	+5 °C to +50 °C
Colour	Galvanized steel with section of red colour to identify placement of the fire seal
Packaging	1 damper per box

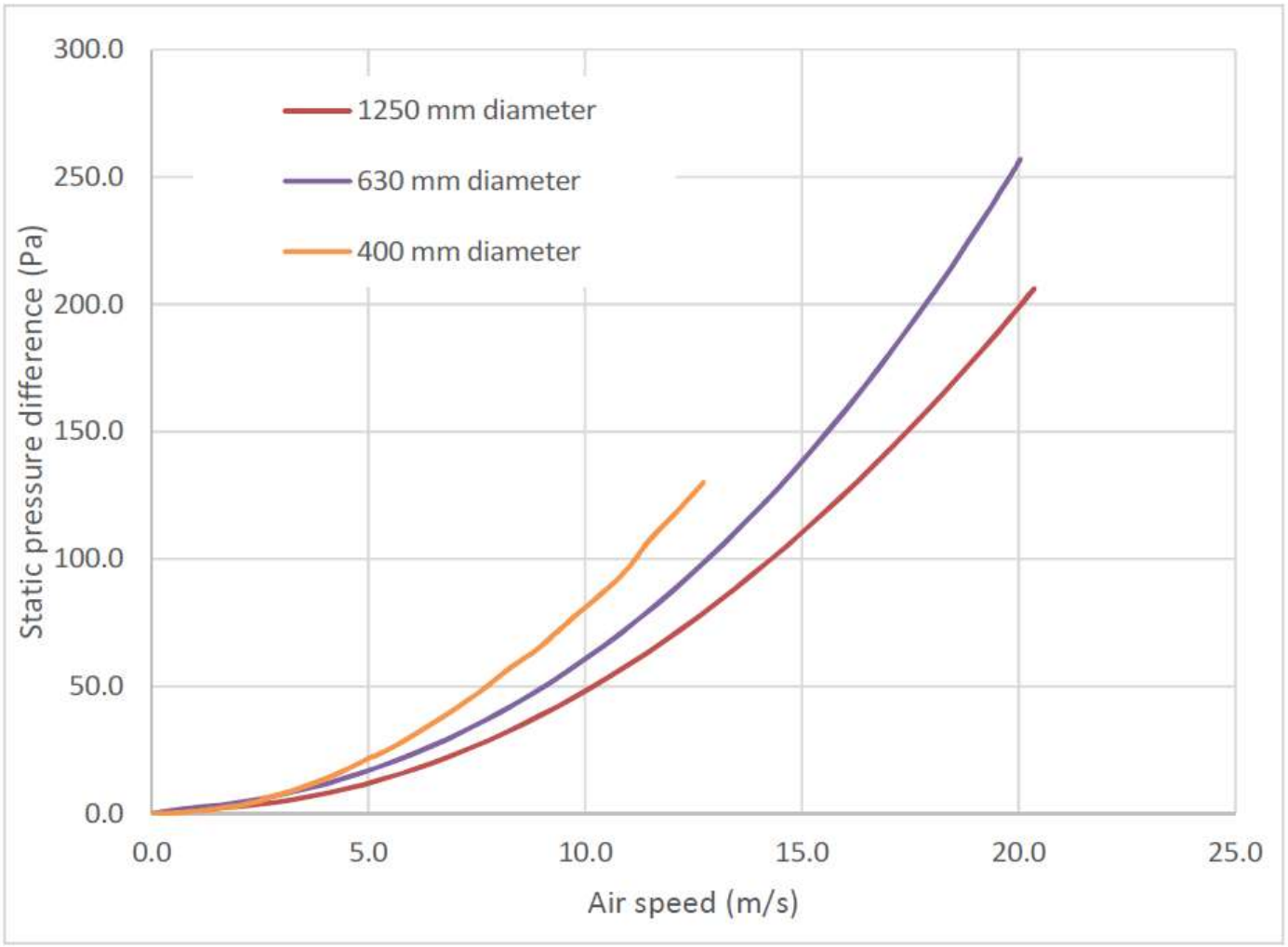
Appendix A – Pressure Differences Ø100 – Ø315mm

	DPs [Pa]					
	Diameter [mm]					
Vk [m/s]	100	125	160	200	250	315
0	0	0	0	0	0	0
1	2.71	2.52	2.27	2.02	1.73	1.42
2	10.20	9.50	8.60	7.65	6.62	5.50
3	22.48	20.95	19.00	16.92	14.66	12.22
4	39.54	36.86	33.42	29.80	25.86	21.58
5	61.38	57.20	51.90	46.32	40.22	33.61
6	88.00	82.10	74.47	66.50	57.73	48.27
7	119.42	111.45	101.15	90.28	78.39	65.60
8	155.60	145.25	131.73	117.69	102.22	85.56



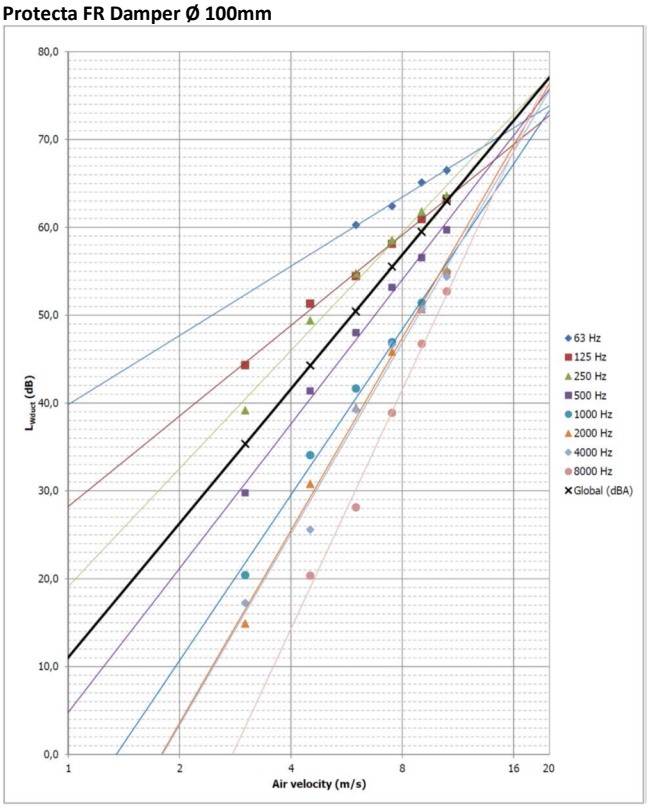
Appendix B – Pressure Differences Ø400 – Ø1250mm

	DP_S [Pa]				DP_S [Pa]		
	Diameter [mm]				Diameter [mm]		
Approx. Vk [m/s]	400	630	1250	**Approx. Vk [m/s]**	400	630	1250
0	0.00	0.00	0.00	**11**	93.43	76.30	54.10
1	1.30	1.95	1.80	**12**	118.54	87.69	72.60
2	2.93	3.45	2.30	**13**	130.25	100.02	82.80
3	8.77	8.32	5.50	**14**	-	113.30	93.80
4	12.47	11.74	8.10	**15**	-	142.84	105.40
5	22.59	15.84	11.50	**16**	-	159.14	130.80
6	27.75	20.65	15.50	**17**	-	176.51	144.50
7	41.38	32.50	25.60	**18**	-	194.95	158.90
8	48.72	39.59	31.70	**19**	-	235.19	174.00
9	64.91	47.49	38.50	**20**	-	257.04	189.80
10	74.50	56.23	46.00	**21**	-	-	206.30

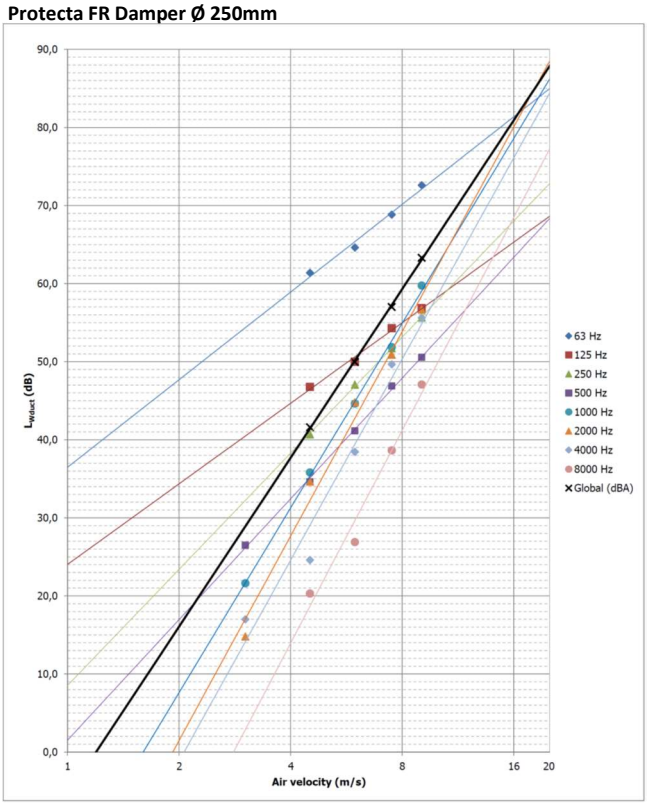


Appendix C – Sound Power Levels

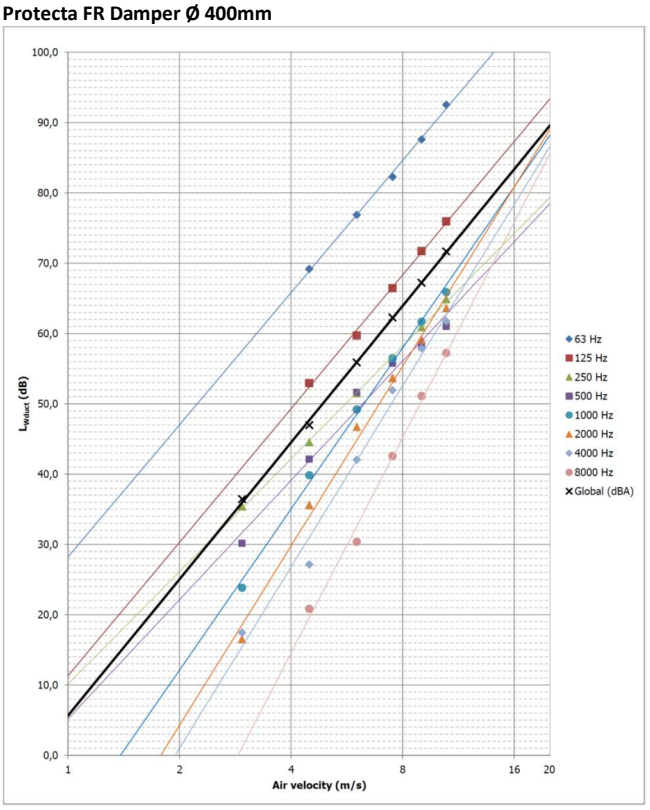
Protecta FR Damper Ø 100mm



Protecta FR Damper Ø 250mm



Protecta FR Damper Ø 400mm



L_{Wduct} (dBA) = 22,033 · ln (Air velocity) + 11,053

Lw_{63Hz} (dB) = 11,358ln(x) + 39,824
Lw_{125Hz} (dB) = 14,853ln(x) + 28,238
Lw_{250Hz} (dB) = 19,374ln(x) + 19,12
Lw_{500Hz} (dB) = 23,688ln(x) + 4,7794
Lw_{1000Hz} (dB) = 27,177ln(x) - 8,1366
Lw_{2000Hz} (dB) = 31,606ln(x) - 18,32
Lw_{4000Hz} (dB) = 31,363ln(x) - 18,375
Lw_{8000Hz} (dB) = 39,236ln(x) - 40,094