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PRODUCT DESCRIPTION

iPASSIVE FR Dampers are used to fire proof ventilation ducts where they penetrate fire rated constructions such as fire compartments and fire walls, preventing the passage of fire and smoke both surrounding and inside the ventilation duct.

The product consists of a steel casing containing 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 iPASSIVE FR Board in walls and iPASSIVE EX Mortar in floors.

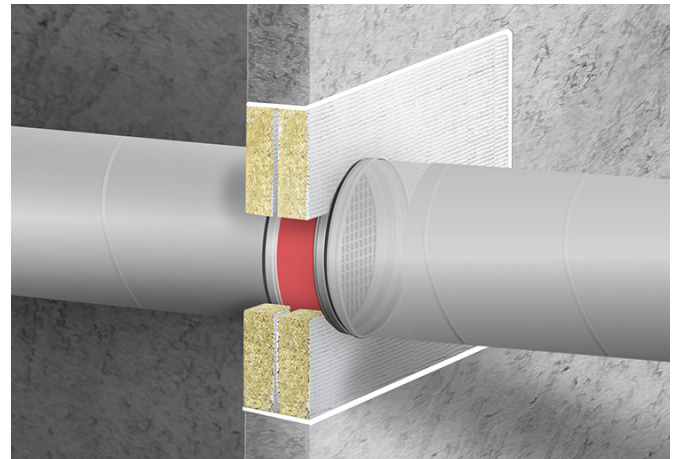
The damper can be installed in the fire seal and the ventilation ducting attached or the damper can be connected to the ducting and then fire sealed.

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.

MINIMUM DISTANCES AND LIMITATIONS

The maximum size of an aperture is 1200 x 2400mm in floors and 1500mm height x 2400mm width or 1200mm height x unlimited width in walls. An aperture can include several services, and they may also include a combination, e.g. cables, cable trays and pipes.

The minimum permitted separation between adjacent seals/apertures is 200mm. Services should be a minimum of 25mm from seal edges. Services within the system iPASSIVE fire seal do not require a minimum separation, except when pipes where combustible pipe insulation penetrates the seal and plastic pipe penetrations which should be a minimum of 30 mm from other services in the aperture. There must be sufficient distance between two ventilation ducts so that the fire seal can be constructed as stated in the installation instructions.



THE 'CLOSE IN AND PULL OUT' PRINCIPLE

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

When using iPASSIVE FR Dampers the ventilation ducts do not need to be fully insulated.

SUPPORTING CONSTRUCTIONS

Flexible walls must have a minimum thickness of 100mm and comprise steel studs or timber studs*) lined on both faces with minimum 2 layers of 12.5mm thick boards.

Rigid walls must have a minimum thickness of 100mm and comprise concrete, aerated concrete or masonry, with a minimum density of 650 kg/m³.

Rigid floors must have a minimum thickness of 150mm and comprise aerated concrete or concrete with a minimum density of 650 kg/m³.

The supporting construction must be otherwise tested or assessed to achieve the required FRL of the penetration seal in accordance with AS1530.4 -2014.

*) Timber studs: no part of the penetration seal may be closer than 100mm to a stud, and minimum 100mm of insulation of class A1 or A2 according to EN 13501-1 must be provided within the cavity between the penetration seal and the stud.

iPASSIVE 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.

LOADBEARING PROPERTIES IN FLOORS

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.

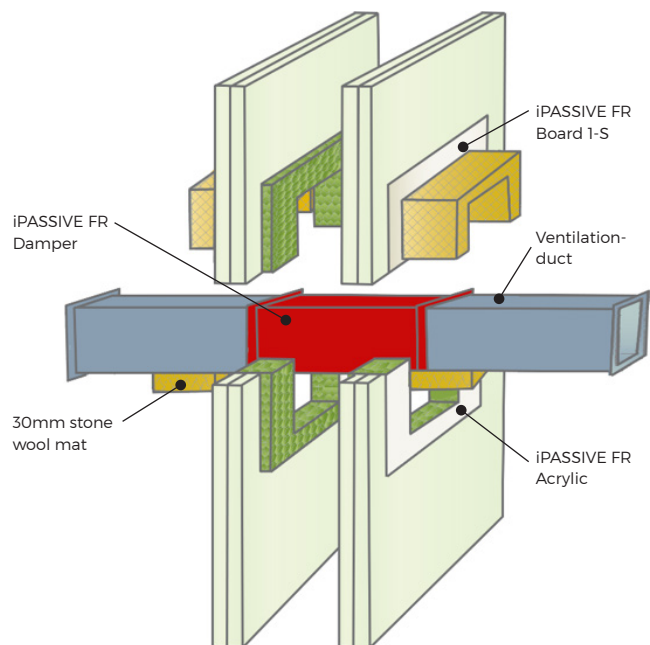
iPASSIVE EX Mortar should not be cast in surface treated concrete. The mortar must be mixed to a thick but fluid mass at a rate of approx. 2 parts of powder to 1 part water. Maximum loadbearing performance will be achieved 28 days after casting.

INSTALLATION INSTRUCTIONS IN FLEXIBLE WALLS

1. Before installing iPASSIVE FR Board ensure that the surface of all service penetrations and surrounding construction is free from all loose contaminants, dust and grease.
2. iPASSIVE FR Coating and iPASSIVE FR Acrylic are water based, so in cases where corrosion protection is a problem, some metals may require a barrier between the seal and the surface prior to this installation.
3. Use the product iPASSIVE FR Board 1-S 50mm with two boards in the aperture. The coated side of the board should be flush with the surface of the wall on both sides.
4. When fire sealing shaft walls consisting of gypsum only on one side, subject to authority approval, install iPASSIVE FR Board on the exposed side only.
5. Cut the required board(s) to suit the aperture dimensions and type and size of service penetration(s). All exposed and cut edges of the board can be sealed with iPASSIVE FR Coating or iPASSIVE FR Acrylic prior to fitting which will act as an adhesive and ensure a smoke tight seal.
6. Cut a hole for the damper and glue the damper into the boards with iPASSIVE FR Acrylic or iPASSIVE FR Coating.
7. All joints, gaps or imperfections in the installed seal must be filled with iPASSIVE FR Acrylic on both sides.
8. Connect the ventilation ducts to the damper.
9. Insulate the duct towards the fire seal on both sides with 30mm thick stone wool mat in lengths - refer to FRR table in Technical Data Sheet. If the duct is ending in the wall then insulate on one side only.
10. iPASSIVE FR Board can be over-painted with most emulsion or alkyd (gloss) paints.

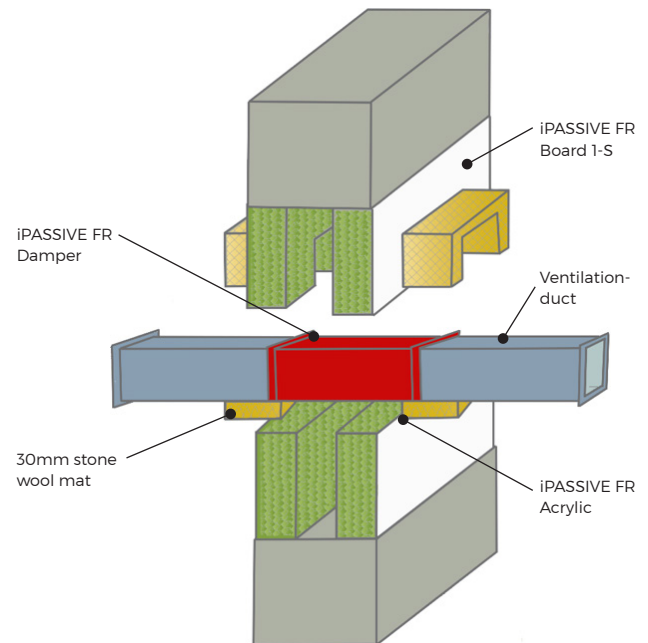
Test results:

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



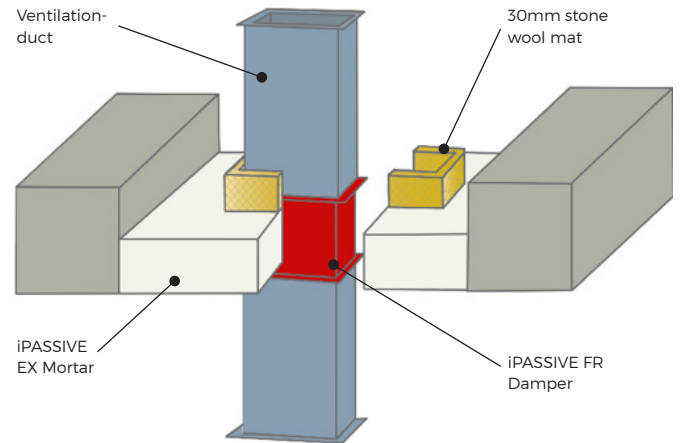
INSTALLATION INSTRUCTIONS IN RIGID WALLS

1. Before installing iPASSIVE FR Board ensure that the surface of all service penetrations and surrounding construction is free from all loose contaminants, dust and grease.
2. iPASSIVE FR Coating and iPASSIVE FR Acrylic are water based, so in cases where corrosion protection is a problem, some metals may require a barrier between the seal and the surface prior to this installation.
3. Use the product iPASSIVE FR Board 1-S 50mm with two boards in the aperture. The coated side of the board should be flush with the surface of the wall on both sides, but not at such distance so the ends of the damper is covered.
4. Cut the required board(s) to suit the aperture dimensions and type and size of service penetration(s). All exposed and cut edges of the board can be sealed with iPASSIVE FR Coating or iPASSIVE FR Acrylic prior to fitting which will act as an adhesive and ensure a smoke tight seal.
5. Cut a hole for the damper and glue the damper into the boards with iPASSIVE FR Acrylic or iPASSIVE FR Coating.
6. All joints, gaps or imperfections in the installed seal must be filled with iPASSIVE FR Acrylic on both sides.
7. Connect the ventilation ducts to the damper.
8. Insulate the duct towards the fire seal on both sides with 30mm thick stone wool mat in lengths - refer to FRR table in Technical Data Sheet. If the duct is ending in the wall then insulate on one side only.
9. iPASSIVE FR Board can be over-painted with most emulsion or alkyd (gloss) paints.



INSTALLATION INSTRUCTIONS IN RIGID FLOORS

1. Ensure the faces of the aperture opening are free of dust and any other contaminants. The faces may be moistened for better adhesion.
2. Bare metal pipes or similar passing through the seal must be protected against corrosion using a suitable primer/ protection system.
3. Install the damper in the aperture with a temporary support, for instance with the shutter board.
4. Install a stone wool shutter board or another type of shutter to achieve the required 100mm thickness of mortar. Make sure that this achieves a very tight seal - any small openings should be sealed with iPASSIVE FR Acrylic.
5. Pour clean water into a suitable mixing vessel and pour enough mortar to obtain the required consistency. Mix well to avoid lumps. Always add the mortar to the water, do not reverse this mixing process. For different mix ratios and drying times, please refer to the iPASSIVE EX Mortar Technical Data Sheet.
6. Once the desired consistency is achieved pour or trowel the mortar onto the shutter board making sure that it flows into all corners and around services. Apply a firm pressure to the mortar to eliminate any trapped air bubbles. Build up to the required depth of 100mm.
7. Connect the ventilation ducts to the damper.
8. Insulate the duct towards the fire seal on the top side with 30mm thick stone wool mat in lengths - refer to FRR table in Technical Data Sheet



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

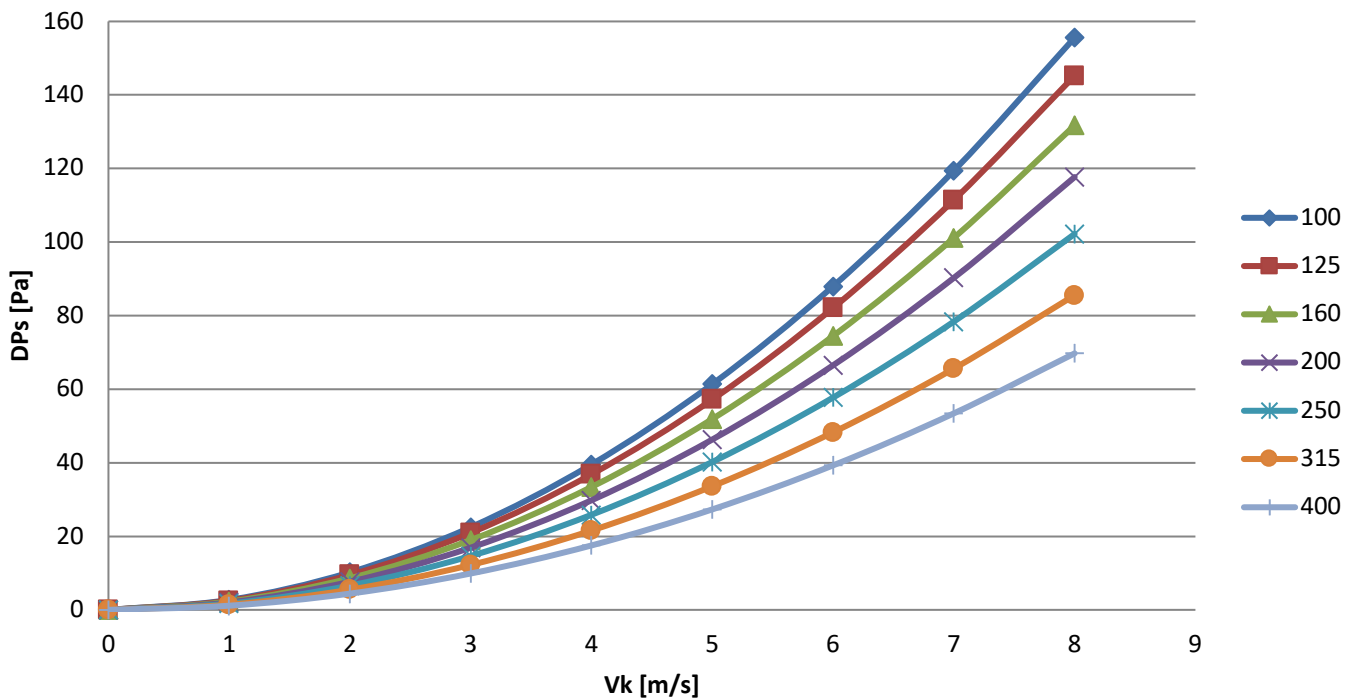
The length of the dampers in the table are 150mm plus overlap/ connection for the ventilation ducts. Longer and shorter dampers can be manufactured on request.

iPASSIVE FR Damper for rectangular ducts are manufactured to precise measurements and are not standard goods.

APPENDIX A - PRESSURE DIFFERENCES Ø100 - Ø315MM

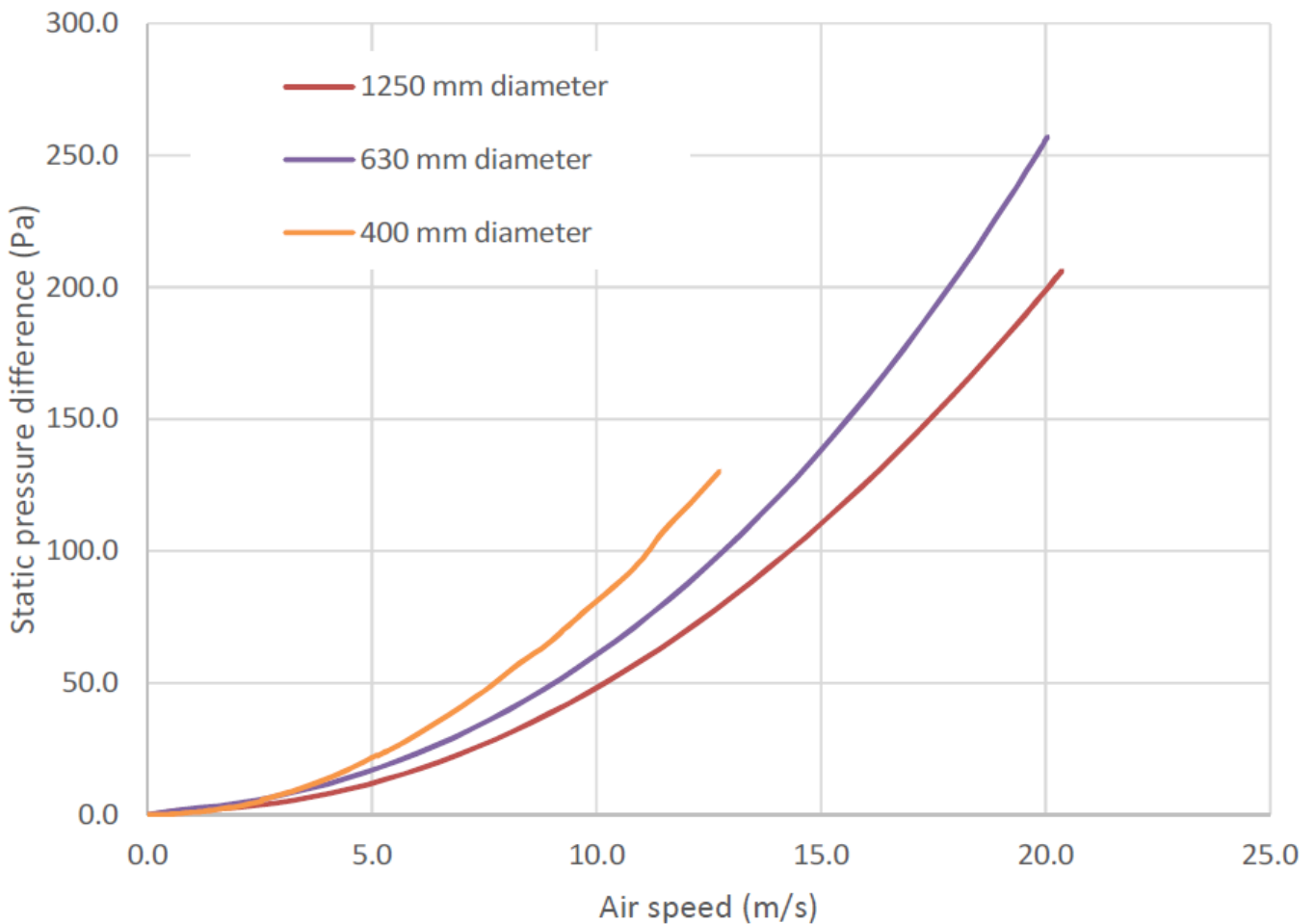
Vk [m/s]	DPS [Pa]					
	Diameter [mm]					
	100	125	160	200	250	315
0	0	0	0	0	0	0
1	2.71	2.52	2.27	2.02	1.73	1.42
2	10.20	9.50	8.60	7.65	6.62	5.50
3	22.48	20.95	19.00	16.92	14.66	12.22
4	39.54	36.86	33.42	29.80	25.86	21.58
5	61.38	57.20	51.90	46.32	40.22	33.61
6	88.00	82.10	74.47	66.50	57.73	48.27
7	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

DPS [Pa]



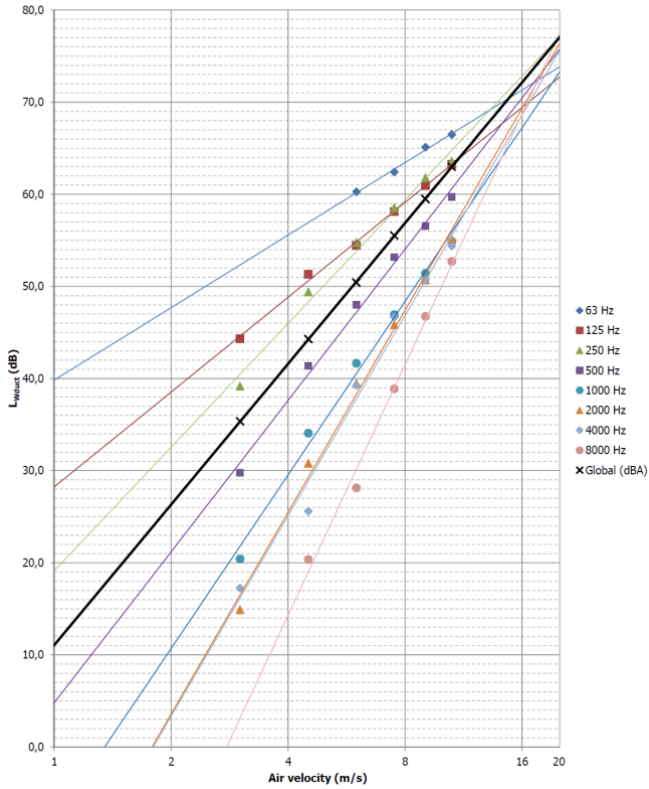
APPENDIX B - PRESSURE DIFFERENCES Ø400 - Ø1250MM

Approx. V _k [m/s]	DPS [Pa]			Approx. V _k [m/s]	DPS [Pa]		
	Diameter [mm]				Diameter [mm]		
	400	630	1250		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

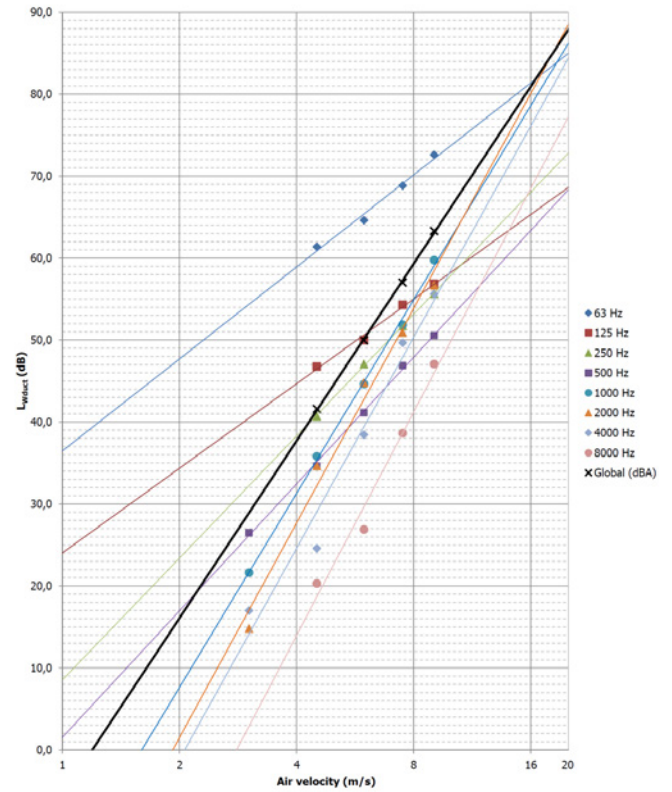


APPENDIX C - SOUND POWER LEVELS

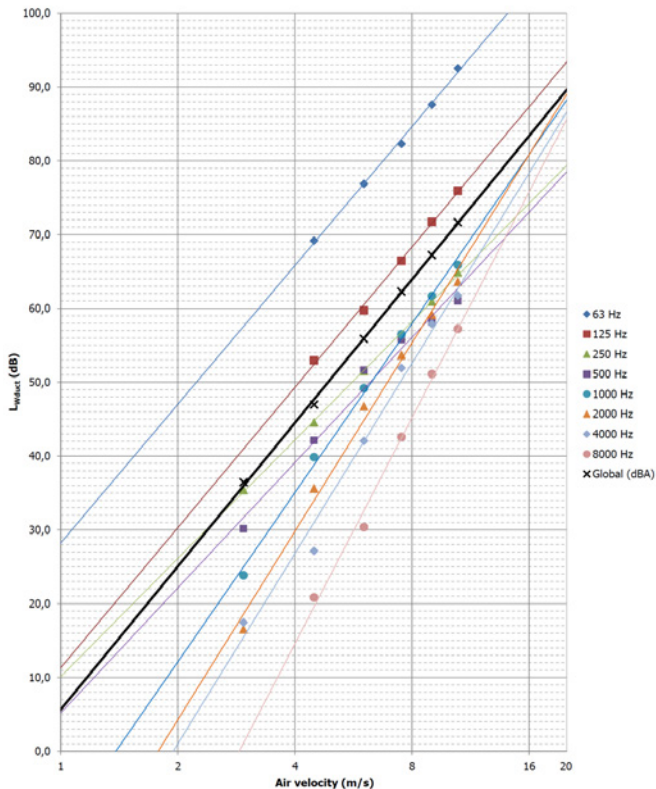
iPASSIVE FR Damper Ø 100mm



iPASSIVE FR Damper Ø 250mm



PASSIVE FR Damper Ø 400mm



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