



# System data sheet

## Insulation system ORSTECH Protect for fire resistant ducts Fire resistance EI 60 S

### SYSTEM DESCRIPTION

Insulation system ORSTECH Protect for fire protection of air ducts. It is possible to reach fire resistance of 60 minutes by a single layer of insulation for rectangular and circular ducts both in horizontal and vertical orientation (fire outside scenario, duct type A (o → i) according to EN 1366-1).

### DUCTWORK

The steel duct is constructed in sections of galvanised steel sheet 0.8 mm thick. Duct sections with maximum length 1500 mm are connected by flanges. Use a ceramic tape gasket 20 × 3 mm between the flanges to seal the joints. Flanges of the rectangular duct have to be fastened together with steel clamps with nuts M8 in maximum distance 300 mm.

### SUSPENSION DEVICE

Rectangular horizontal duct suspended with steel hangers suitable for ducts with fire resistance consisting of two threaded drop rods, a channel section bearer and hexagonal nuts and washers (e.g. MÜPRO MPC or an equivalent). The drop rods can be positioned inside or outside the insulation. If drop rods are outside there is no need to insulate them separately. Diameter of the drop rod depends on the calculated supported load - maximum value of stress in suspension device is 9 N/mm<sup>2</sup>.

**Tab. 1 Diameter of the drop rods for Orstech 65 H thickness 40 or 60 mm (distance of the drop rods 1500 mm, steel sheet thickness 0,8 mm)**

		Height of the duct (m)													
		160	225	255	315	355	400	450	500	560	630	710	800	900	1000
Width of the duct (m)	160														
	225														
	255			6 mm											
	315														
	355														
	400														
	450														
	500														
	560														
	630								8 mm						
	710														
	800														
	900														
	1000														
1120												10 mm			
1250															

Circular horizontal duct suspended by steel hangers consisting of two threaded drop rods and a two-part circular band. Fasten the band sections together and attach them to the drop rods with hexagonal nuts and washers. Place these hangers inside the insulation. The rods do not need to be protected by insulation. Diameter of the drop rod depends on the calculated supported load - maximum value of stress in suspension device is 9 N/mm<sup>2</sup>.

Duct diameter (mm)														
160	200	250	280	315	355	400	450	500	560	630	710	800	900	1000
6	6	6	6	6	6	6	6	8	8	8	8	10	10	10

**Tab. 2 Diameter of the drop rods in mm for Orstech LSP PYRO thickness 50 mm (distance of the drop rods 1500 mm, steel sheet thickness 0,8 mm)**

### INSULATION

Rectangular vertical duct can be insulated with slabs Orstech 65 H with 40 mm or 60 mm thickness, rectangular horizontal ducts with fire resistance EI 60 S only with 60 mm thickness (EI 45 S and lower can be insulated with 40 mm thickness). Circular duct is insulated with lamella mats Orstech LSP PYRO with 50 mm thickness. Density of both products is just 65 kg/m<sup>3</sup> thus makes cutting, bending or filling faster and more efficient than ever. Both products have reinforced aluminium foil facing.

Insulation slabs (lamella mats) need to be cut to fit the duct as tightly as possible. Install the insulation so that one slab (lamella mat) is adjacent and tightly fitted against the other. No gaps must be present between butt joints of insulation. Insulation can be easily cut with a standard lagger knife.

There is no need for adhesive on joints. From the esthetic reasons all the joints are sealed by aluminium tape. For rectangular ducts in the position of flange/hanger slabs are snick first 20 mm of the thickness to reduce lifting of the slabs over the flange/hanger. Butt joints should be positioned out of flanges or the insulation collar with width 200 mm and minimal thickness 40 mm must be added on top of the duct joints to cover the flanges. Such an insulation collar is needed also in case if insulation thickness over hanger is reduced more than by a half.

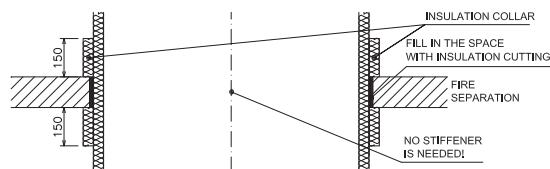


## ■ FIXING

The insulation is fixed to the duct using stud-welded steel pins, 2.7 mm nominal diameter, and spring steel washers 30 mm diameter. The length of pin should be equal to the insulation thickness. Approximate pin's quantity for rectangular duct is 16 pcs./m<sup>2</sup> (which correspond to 40 pcs. per meter of the duct 1000 × 500 mm), 14 pcs./m<sup>2</sup> for circular ducts. Recommended distance from duct edges and joints is 80 mm, 50 mm from flanges.

## ■ FIRE-STOPPING (WALL/FLOOR PENETRATION)

Insulation system ORSTECH Protect is unique in its simplification for the fire-stopping. Neither a stiffener (steel tube) is needed in the duct, where the duct passes through the penetration, nor any kind of glue and/or intumescent paint. Using the same insulation used for the rest of the insulated duct and partition (maximum gap is 20 mm), fully pack the space between insulated duct and partition. Ensure tight compression in order to completely fill the opening. Install the insulation so that it is adjacent and tightly fitted against the penetration. The insulation must be cut leaving excess length, so that it exerts as much pressure as possible between the penetration and the last fitted piece of insulation.



*Cross-section through a duct at the fire-stopping (wall/floor penetration)*

The fire-stopping is from the second insulation layer with the width of 150 mm from both side of fire separation. The length of pin is equal to the double insulation thickness (spacing of the pins is ca. 150 mm).

## ■ FIRE CLASSIFICATION

Fire protective system ORSTECH Protect has been tested by the fire testing laboratory PAVUS, a.s., an authorised body AO 216. Fire protection system ORSTECH Protect has been tested in accordance with EN 1366-1. Maximum size for the rectangular duct is 1250 × 1000 mm and for the circular duct up to

Fire resistance EI 60 S					
Part	Description	Unit	Rectangular duct		Circular duct
Duct	Duct orientation	-	vertical	horizontal	vertical and horizontal
	Flange fastening with steel clamps with bolts M8 in max. distance	mm	300	300	-
	Ceramic tape gasket between the flanges	-	compulsory	compulsory	compulsory
Hangers	Maximum tensile stress in the drop rod	N/mm <sup>2</sup>	-	≤ 9	≤ 9
	Position of the drop rods inside or outside the insulation material	-	-	optional	-
	Need to insulate the drop rods	-	-	no	no
Insulation	Insulation material	-	Orstech 65 H	Orstech 65 H	Orstech LSP PYRO
	Thickness	mm	40 or 60	60	50
	Density	kg/m <sup>3</sup>	65	65	65
	Number of layers	-	1	1	1
	Second layer of Orstech LSP PYRO thickness 50 mm at the drop rods and hangers	-	no	no	compulsory
Fixing of the insulation	Orientation quantity of stud-welded pins	pcs./m <sup>2</sup>	16	16	14
	Recommended distance from duct edges and joints	mm	80	80	80
	Recommended distance from flanges	mm	50	50	50
	Minimum quantity of pins per meter of the duct 1000 x 500 mm	pcs./m'	40	40	-
	Vertical duct – side 1000 mm	pcs./m'	12	-	-
	Vertical duct – side 500 mm	pcs./m'	8	-	-
	Horizontal duct – top side 1000 mm – lateral side 500 mm – bottom side 1000 mm	pcs./m'	-	8 8 16	- - -
Fire separation	Width of the insulation collar on both side of the fire separation	mm	150	150	150
	Maximum distance of stud-welded pins at the collar	mm	150	150	150
	Stiffening of the duct	-	no	no	no

**Important – only authorized companies are allowed to mount fire protective system ORSTECH Protect.**

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The information is valid up to date of publishing. The manufacturer reserves right to change the data. This can be caused by further development of the fire protection system.