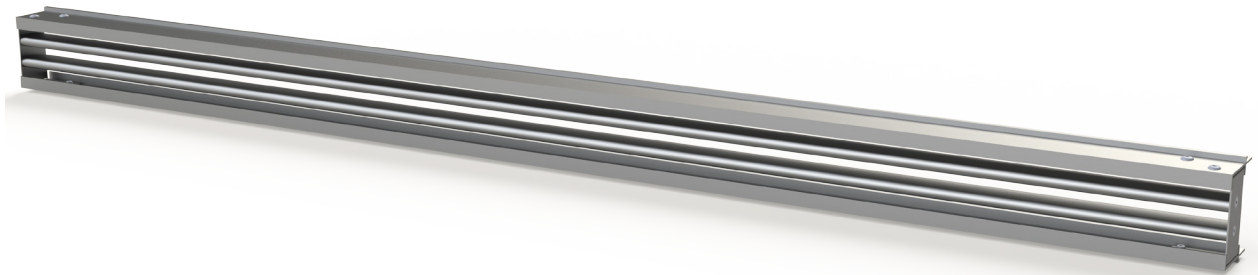


## LINEAR DIFFUSERS

# BF.USA



### CONSTRUCTION FEATURES:

The single slot linear diffusers with concealed perimeter frame of the BF.USA series are generally installed in spaces with a height of between 2.7 and 4.0 m and with ventilation systems operating within  $\pm 10$  K temperature differential between internal and supplied air. The most frequently used type of installation is flush with plasterboard, with ceiling installation (vertical throw) and on the wall (horizontal throw). In the wall installation, if the distance between the upper edge of the diffuser and the ceiling is less than 200 mm, a Coanda effect is obtained; otherwise, a free throw is achieved. The concealed perimeter frame, designed to facilitate positioning on plasterboard, makes the BF.USA series highly appreciated by designers who find in it not only functionality but also furnishing motifs. They can be used for both supply and return and in systems with variable air flow rates in the range 50...100%. In the special execution, they can be mounted one after the other to make continuous lines which, with the use of particular inactive corner pieces, are able to follow the ideal line of the perimeter of the room.

**FIXING**

Standard fitting with "L-shaped" profiles to facilitate the plastering.

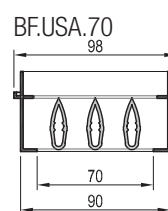
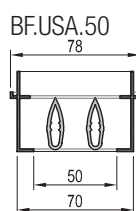
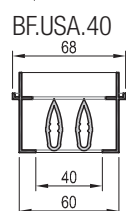
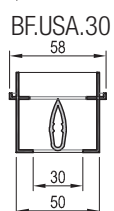
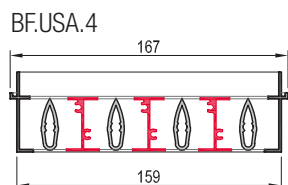
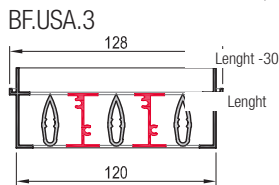
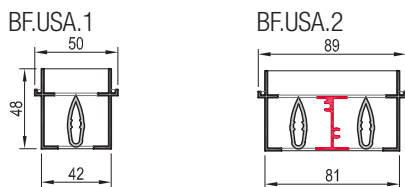
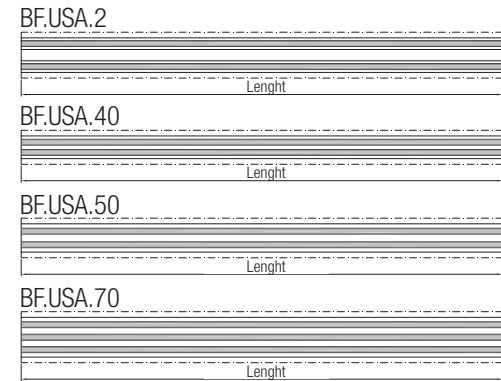
**MATERIALS**

Perimeter frame, inverted T profiles, end caps, spacers and flow deviating blades in extruded aluminum painted in white, RAL 9016 or black, RAL 9005; on request in anodized aluminium extrusions.

Equalising stretched sheet and slinding damper in galvanized steel.

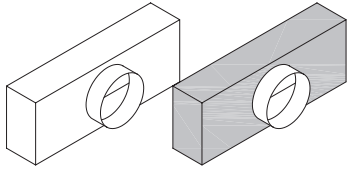
Plenum box in galvanized sheet steel; possible external insulation in polyethylene foam (fire reaction Euroclass, according to UNI EN 13501-1:2009, B-s2, d0).

**DIMENSIONS - customized lenght on request**



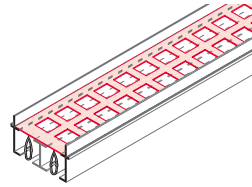
n° of slots	length	n° of inlets	Ø inlet
	mm		mm
1 BF.USA.1 BF.USA.30	1000	1	125
	1500	2	
	2000	3	
	2500	3	
2 BF.USA.2 BF.USA.40 BF.USA.50	1000	1	150
	1500	2	
	2000	3	
	2500	3	
3 BF.USA.3 BF.USA.70	1000	1	150 (BF.USA.3) 180 (BF.USA.70)
	1500	2	
	2000	3	
	2500	3	
4 BF.USA.4	1000	1	180
	1500	2	
	2000	3	
	2500	3	
4 BF.USA.4	3000	4	180
	1000	1	
	1500	2	
	2000	3	

ACCESSORIES



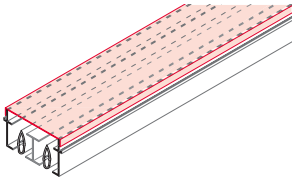
**PL.BF and PL.BF.ISO**

Plenum box, with or without external insulation, with lateral circular inlet, riveted in the factory to the diffuser.



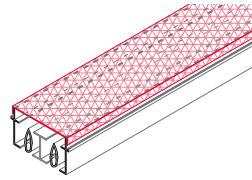
**SER.BF**

Sliding regulation damper, handling from the front of the diffuser.



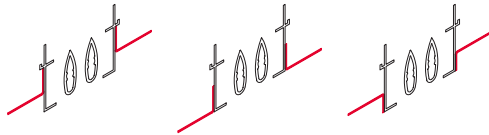
**TEG.BF**

Closing plate for the air passage, suitable for making part of the diffuser inactive.



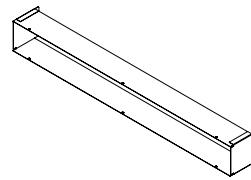
**LE.BF**

Equalising stretched sheet steel fitted on the back of the diffuser.



**FIS.BF**

Supporting profile for brick or plasterboard walls.

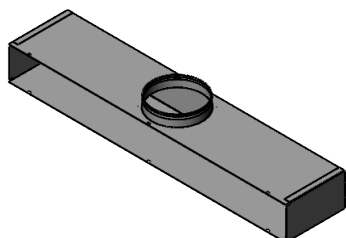


**CM.BF**

Open end frame, riveted to the diffuser.

## PLENUM

PL.BF / PL.BF.ISO



Galvanized steel plenum box

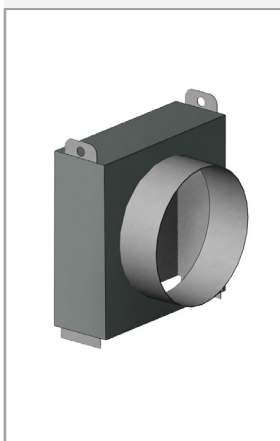
- riveted to the diffuser.
- standard inlet or with built-in damper on request.
- eyebolts for fixing.

PL.BF.ISO: external insulated version with CE marked polyethylene foam (Euroclass of reaction to fire, according to UNI EN 13501-1:2009, B-s2, d0).

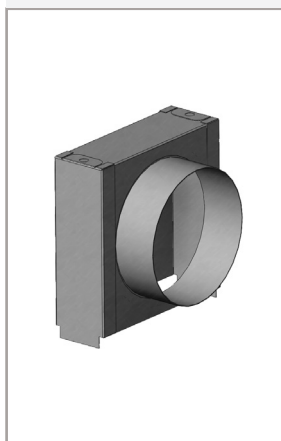
Note that the insulation layer provides +6mm thickness on each covered side.

### PARTS IN DETAIL

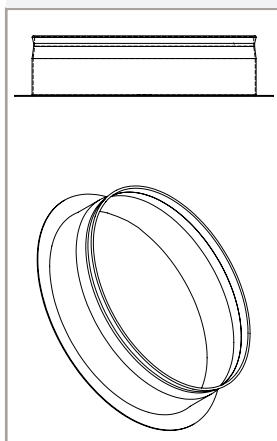
Straight eyebolts for fixing in a PL.ISO (insulated)



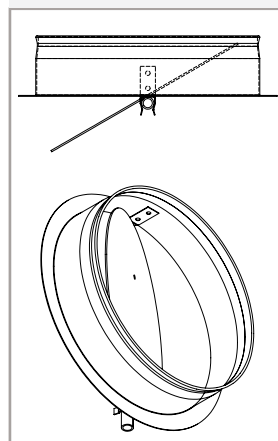
Folded eyebolts for fixing in a PL. (non insulated)



Standard inlet



Inlet with built-in damper

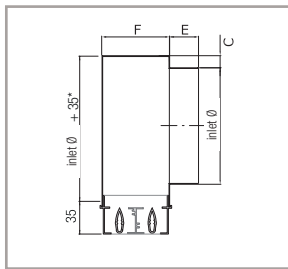


DIMENSIONS

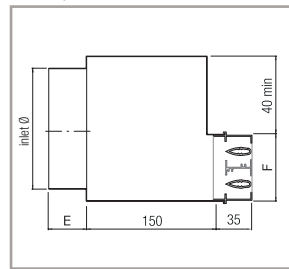
N° of slots	Inlet Ø	F	C	E
	mm	mm	mm	mm
1 - BF.USA.1	125	43	15	50
1 - BF.USA.30	125	53	15	50
1 - BF.USA.40	150	63	15	50
1 - BF.USA.50	180	73	15	50
1 - BF.USA.70	180	93	15	50
2 - BF.USA.2	150	82	15	50
3 - BF.USA.3	150	121	15	50
4 - BF.USA.4	180	160	15	50

POSSIBLE SHAPES FOR PLENUM PL.BF / PL.BF.ISO

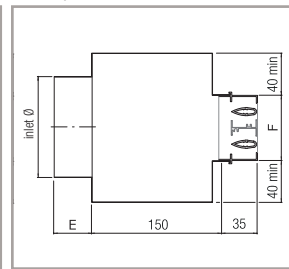
Standard



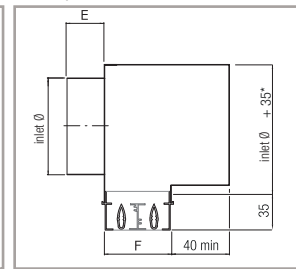
A-shaped - rear inlet



B-shaped - rear inlet



A-shaped - side inlet

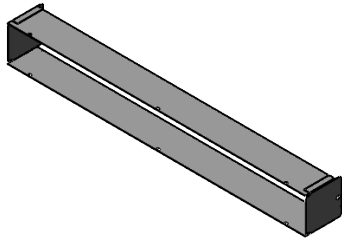


\*Ø + 50 with inlet with built-in damper

The air flow damper is not the same product (SER.BF) mentioned in the accessories page. SER.BF is located in the diffuser.

## FRAMES

CM.BF

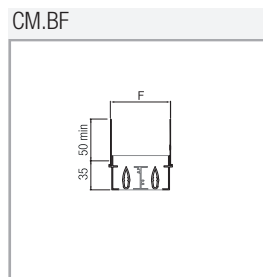


Galvanized steel frame

- riveted to the diffuser.
- eyebolts for fixing.

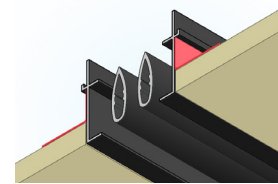
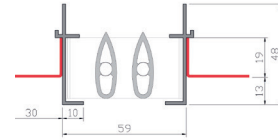
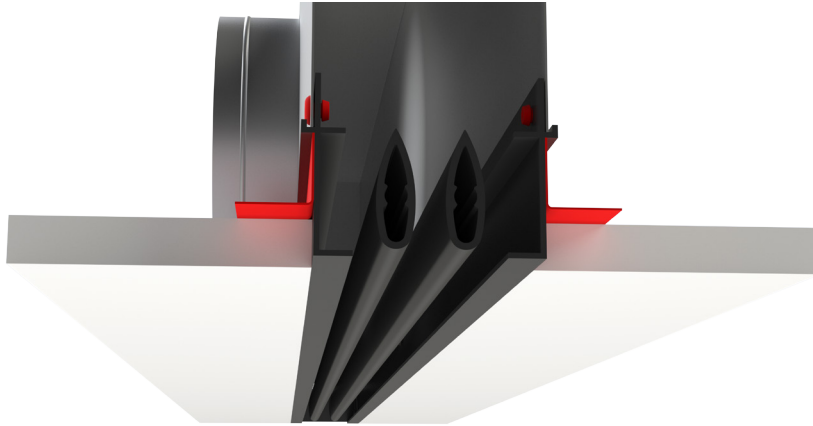
## DIMENSIONS

N° of slots	F
	mm
1 - BF.USA.1	43
1 - BF.USA.30	53
1 - BF.USA.40	63
1 - BF.USA.50	73
1 - BF.USA.70	93
2 - BF.USA.2	82
3 - BF.USA.3	121
4 - BF.USA.4	160

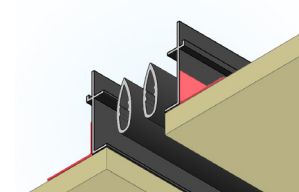
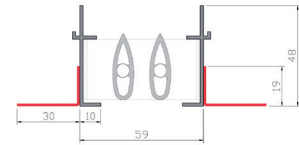
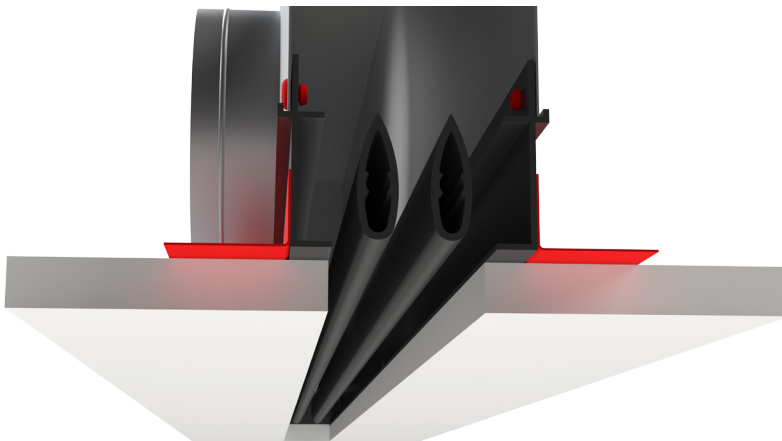


INSTALLATION VARIATIONS

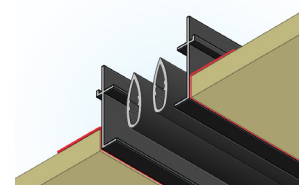
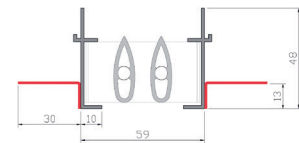
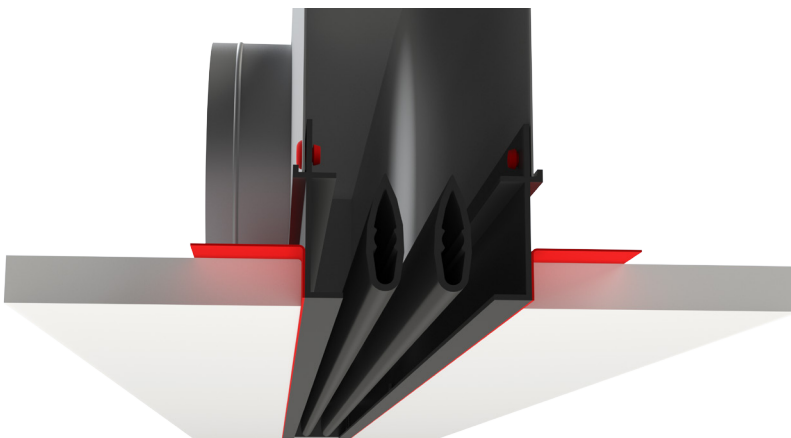
BF.USA + FIS.BF "A" type



BF.USA + FIS.BF "B" type



BF.USA + FIS.BF "C" type



TECHNICAL DATA

Quick selection table

type	L	Qmin		Qmax		L <sub>WA</sub> min	L <sub>WA</sub> max	Δpmin	Δpmax
	mm	l/s	m <sup>3</sup> /h	l/s	m <sup>3</sup> /h	dB(A)	dB(A)	Pa	Pa
BF.USA.1	1.000	14	50	58	180	<20	43	7	78
BF.USA.2	1.000	28	100	108	350	<20	50	7	70
BF.USA.30	1.000	31	110	106	380	<20	45	<5	25
BF.USA.40	1.000	36	130	125	450	<20	46	<5	25
BF.USA.50	1.000	56	200	194	700	<20	49	<5	30
BF.USA.70	1.000	92	330	264	950	<20	48	<5	30

Q air flow rate per diffuser per linear metre

L<sub>WA</sub> A-weighted sound power level, correction in compliance with UNI EN ISO 3741

Δp static pressure drop

Free area of passage

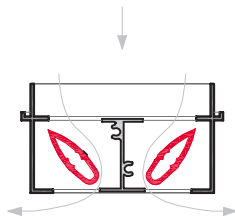
A<sub>eff</sub> in m<sup>2</sup> per L = 1000mm

type	Throw from ceiling		
	horizontal	inclinato	vertical
BF.USA.1	0,007	0,010	0,011
BF.USA.2	0,014	0,020	0,022
BF.USA.30*	0,023	-	0,023
BF.USA.40*	0,024	-	0,024
BF.USA.50*	0,032	-	0,032
BF.USA.70*	0,052	-	0,052

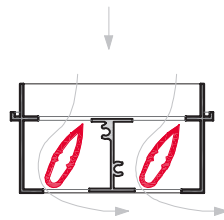
\* for BF.USA.40 - 50 - 70 the throw can be only horizontal from the wall or vertical from the ceiling.

Throw direction

BF.USA.1 - 2 - 3 - 4



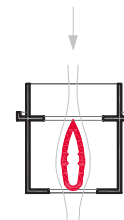
Horizontal throw in two directions



Horizontal throw in one direction

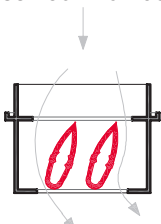


Oblique throw

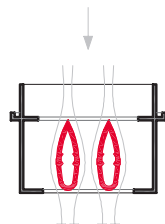


Vertical throw

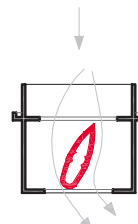
BF.USA.30 - 40 - 50 - 70



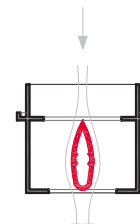
Oblique throw



Flusso verticale



Flusso verticale



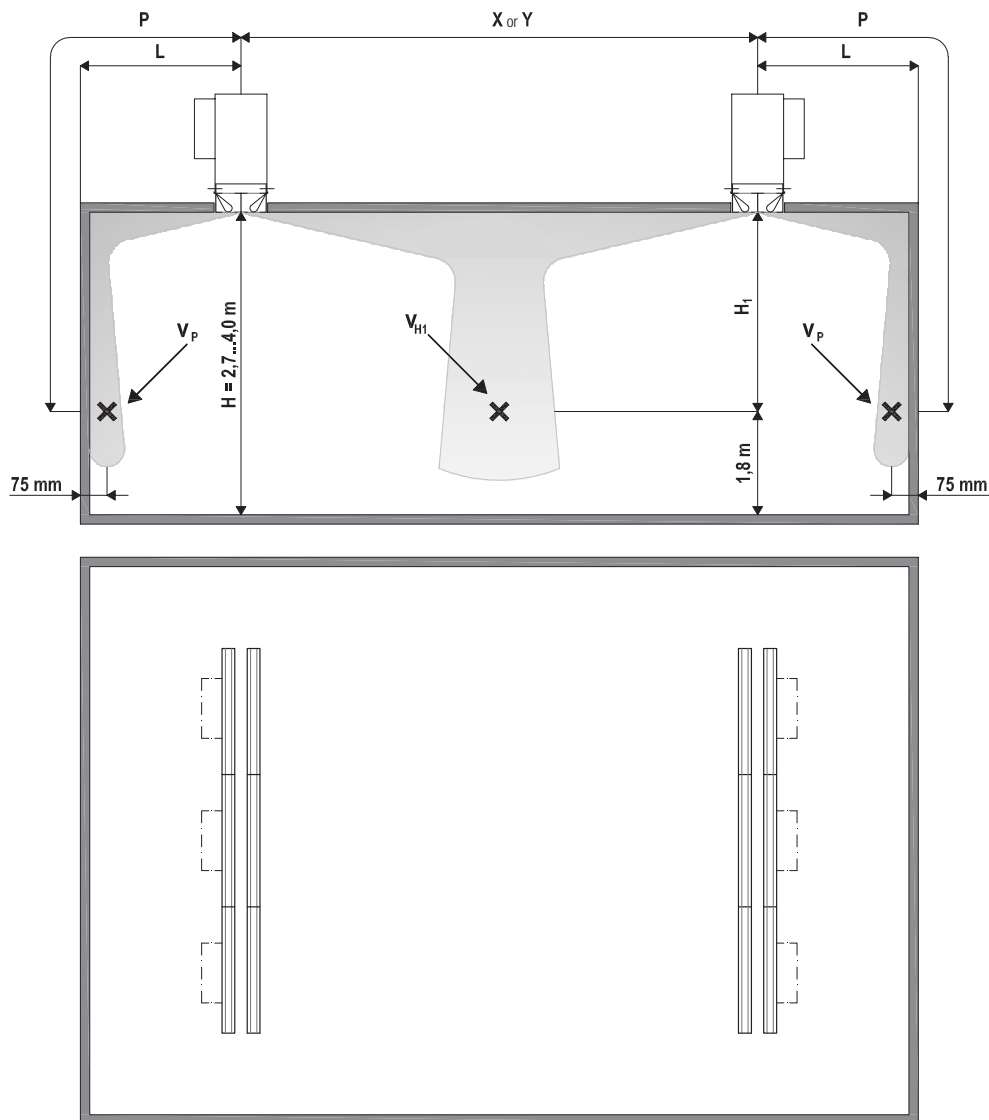
Vertical throw



### AEREAULIC - ACOUSTIC CHARACTERISTICS

The aeraulic characteristics were measured in our test room, varying the flow rate, the distance between two contiguous rows of diffusers, the distance from the wall and the position of the measuring point. The average speed of the air that can be obtained from the diagrams is intended as the average speed at a height of 1.8 m from the floor for a certain flow rate, for a certain distance between the diffusers and for a certain position of the measuring point or for a from the wall of 75 mm. The acoustic data relating to the generated sound level were measured in the reverberation room of the Giordano Institute, test report 205710 dated 16.12.2005.

Technical Data ( $\Delta T = 10^\circ C$ )



Q	flow rate per linear metre diffuser	$H_1$	distance between ceiling and living area
X or Y	distance between two diffusers	$V_{H1}$	average velocity between two diffusers at distance $H_1$
P	horizontal distance L + vertical $H_1$ for throw towards the wall	$V_P$	average velocity at 75 mm from the wall at distance P
L	distance between the center of the diffuser and the wall		

AERUALIC DATA - Pressure drop - Power sound level

Chart 1: BF.USA.1

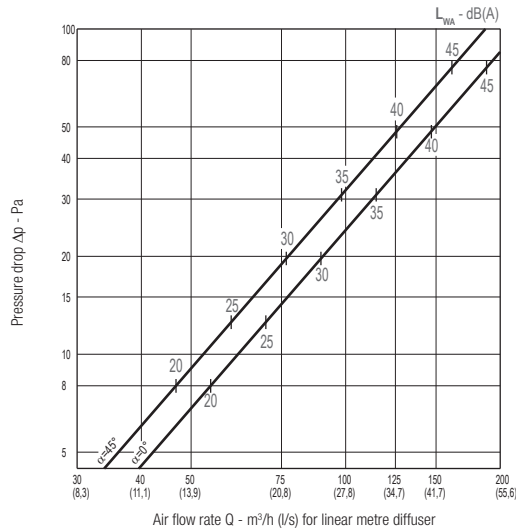


Chart 2: BF.USA.2

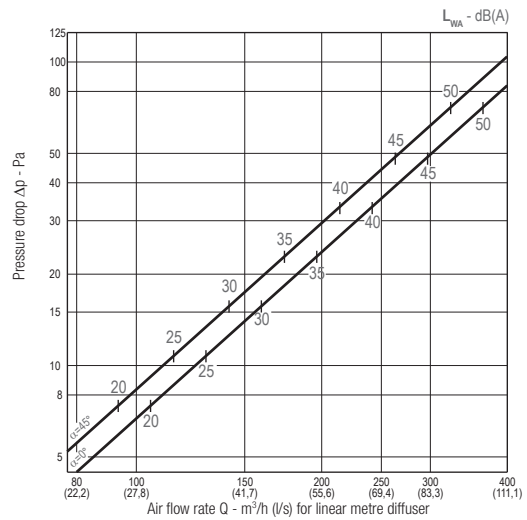
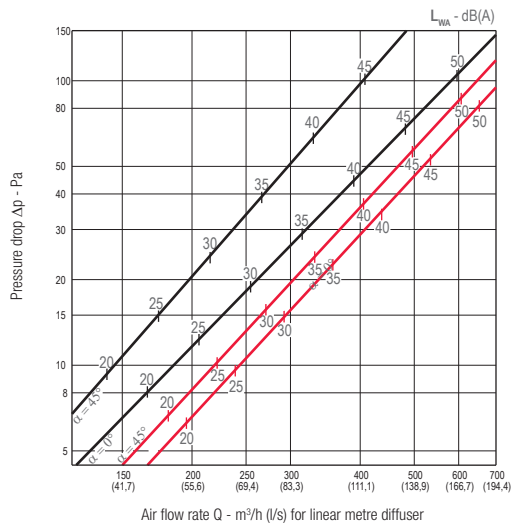


Chart 3: BF.USA.3 - BF.USA.4



Correction for chart 1 - 2 - 3

Type	Parameter	Throw					
		Horizontal with damper		Oblique with damper		Vertical with damper	
		0°	45°	0°	45°	0°	45°
BF.USA.1	Δp	x 1	x 1,3	x 0,85	x 1,25	x 0,8	x 1,2
	L <sub>WA</sub>	0	+ 3	- 2	+ 1	- 1	+ 2
BF.USA.2	Δp	x 1	x 1,3	x 0,85	x 1,25	x 0,8	x 1,2
	L <sub>WA</sub>	0	+ 3	- 2	+ 1	- 1	+ 2
BF.USA.40	Δp	x 1	x 1,3			x 1	x 1,3
	L <sub>WA</sub>	0	+ 3			0	+ 3
BF.USA.50	Δp	x 1	x 1,3			x 1	x 1,3
	L <sub>WA</sub>	0	+ 3			0	+ 3
BF.USA.70	Δp	x 1	x 1,3			x 1	x 1,3
	L <sub>WA</sub>	0	+ 3			0	+ 3

Static pressure drops are referred to diffusers that are assembled to the standard plenum box.

AERAUIC DATA - Pressure drop - Power sound level

Chart 1: BF.USA.30 - BF.USA.40

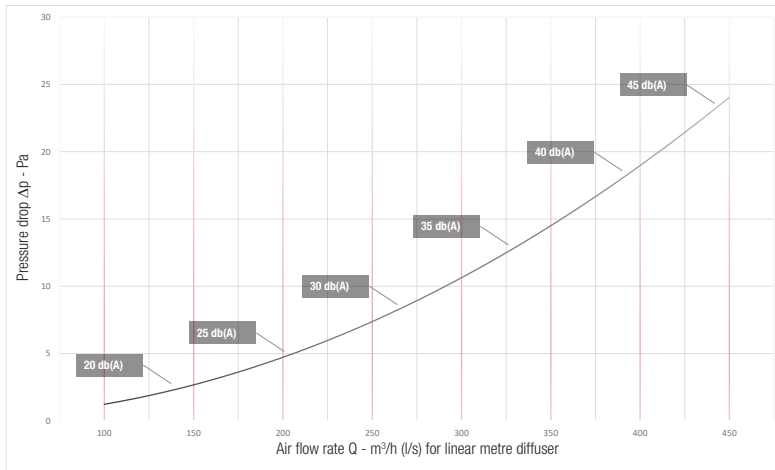


Chart 2: BF.USA.50

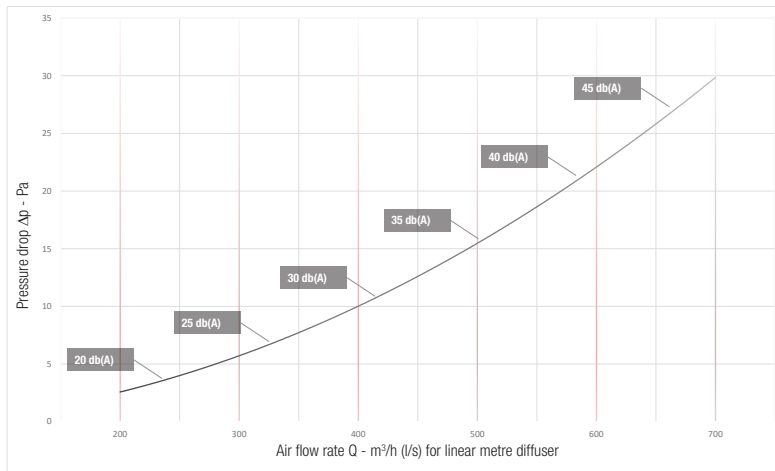
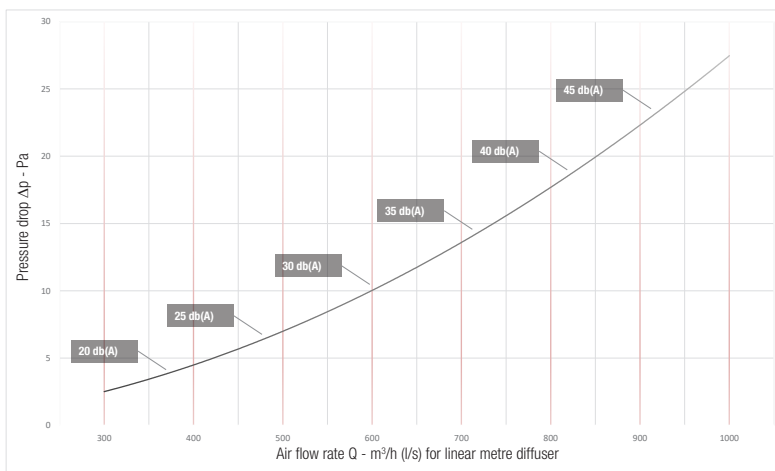


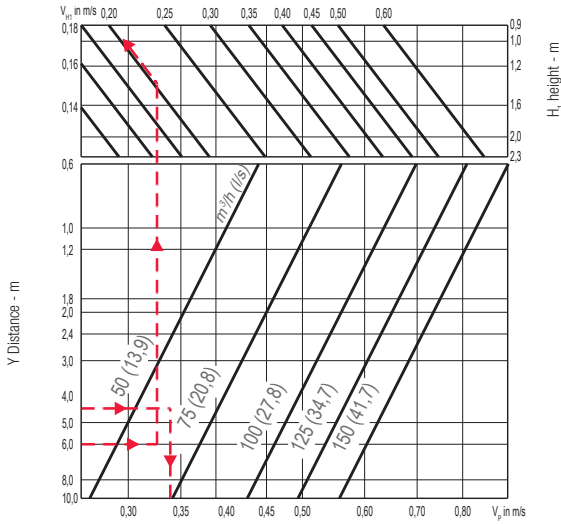
Chart 3: BF.USA.70



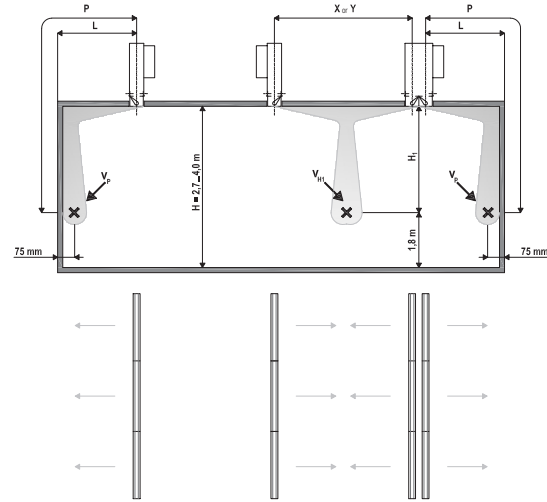
Static pressure drops are referred to diffusers that are assembled to the standard plenum box.

AEREAULIC DATA - Horizontal throw from the ceiling on one or two sides

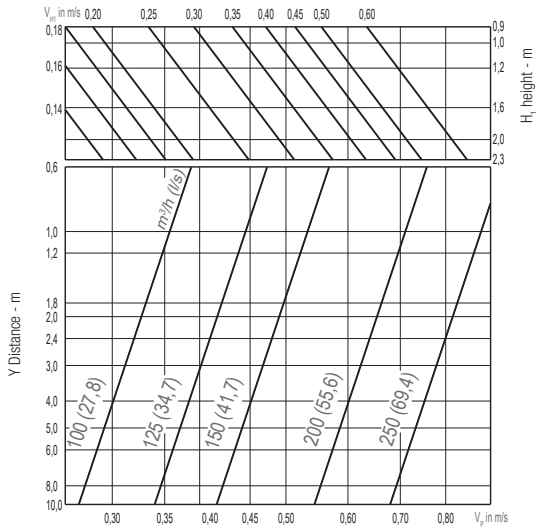
BF.USA.1



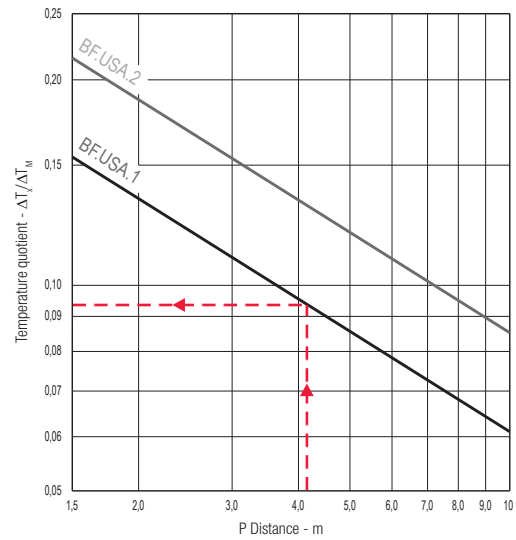
Throw type



BF.USA.2

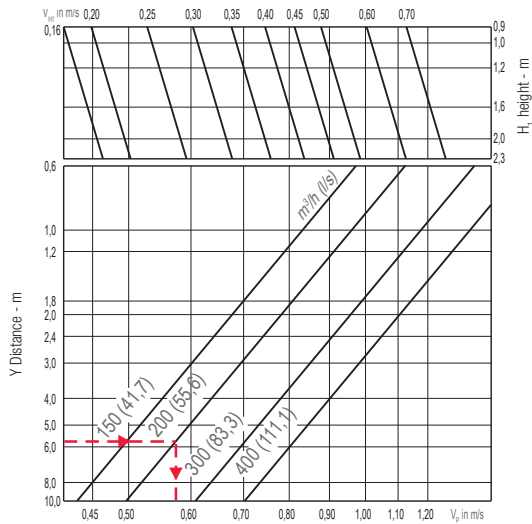


Temperature quotient

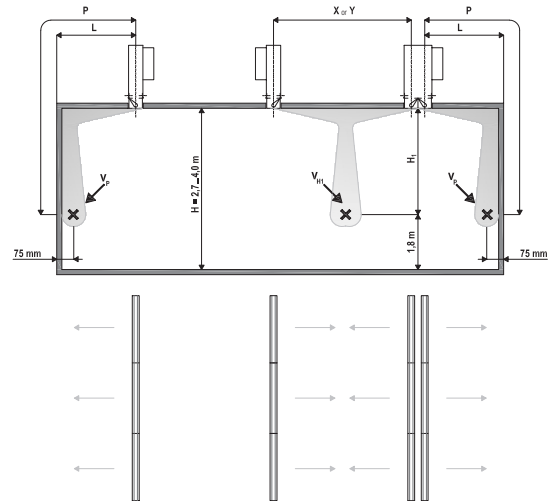


AERAILIC DATA - Horizontal throw from the ceiling on one or two sides

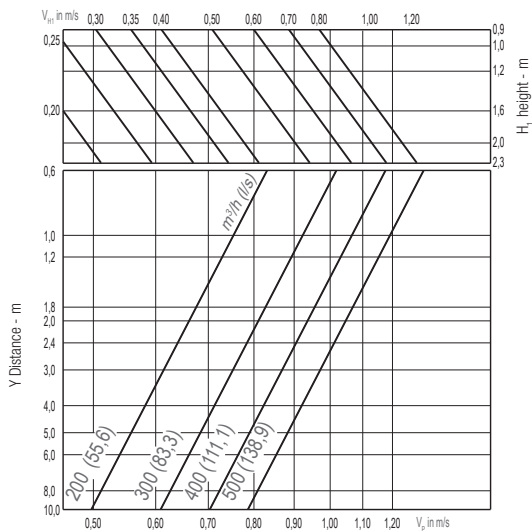
BF.USA.3



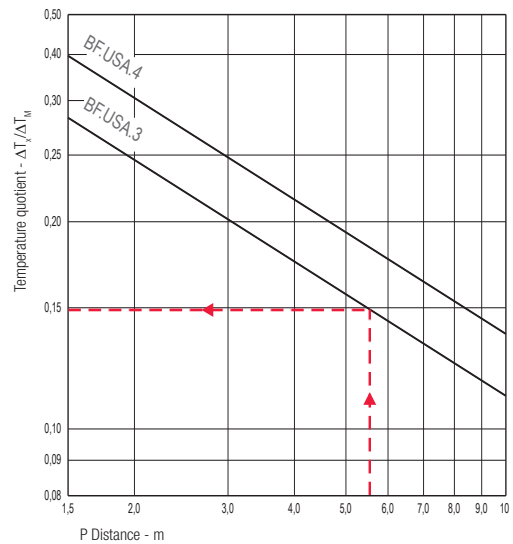
Throw type



BF.USA.4

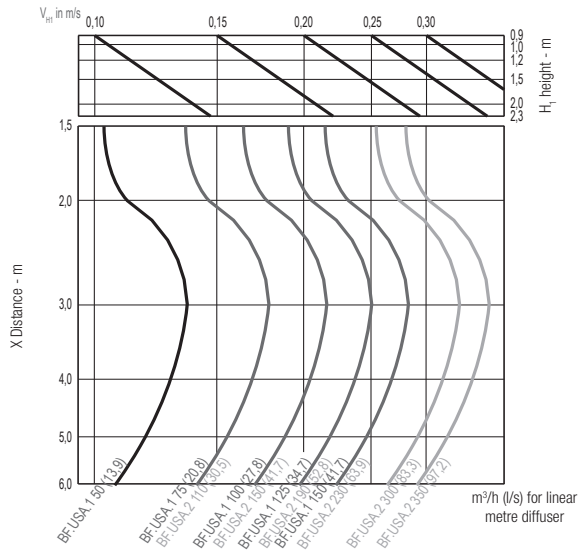


Temperature quotient

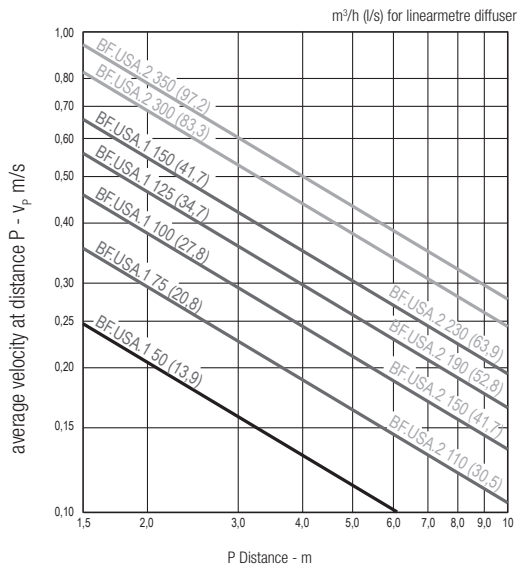


AERAILIC DATA - Alternate horizontal throw

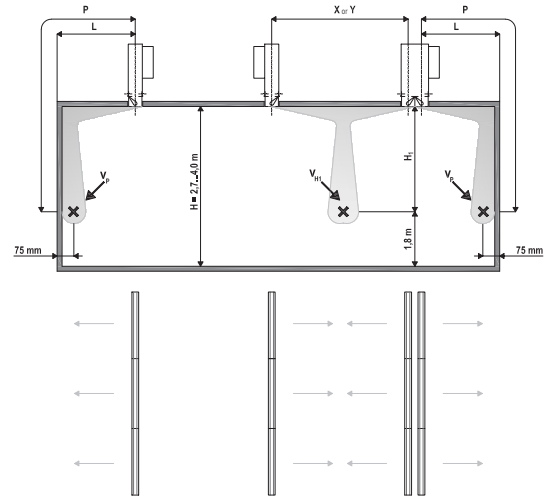
BF.USA.1 - BF.USA.2



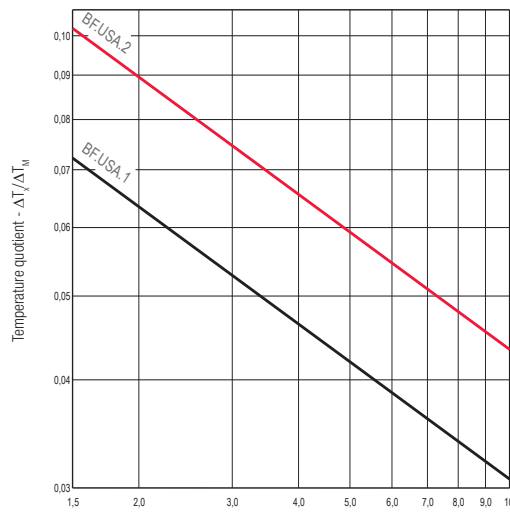
BF.USA.1 - BF.USA.2



Throw type

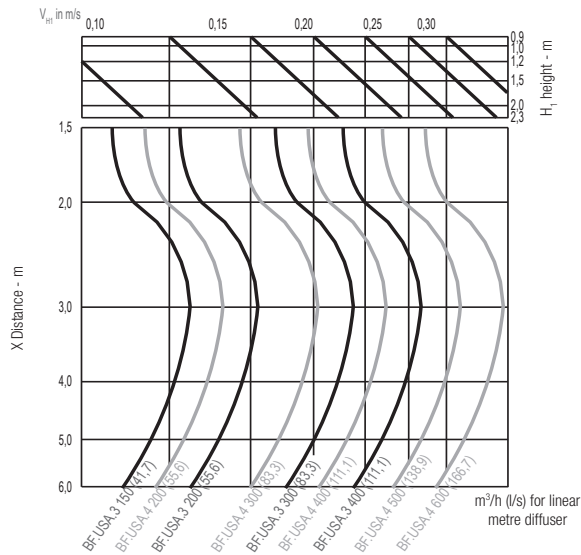


Temperature quotient

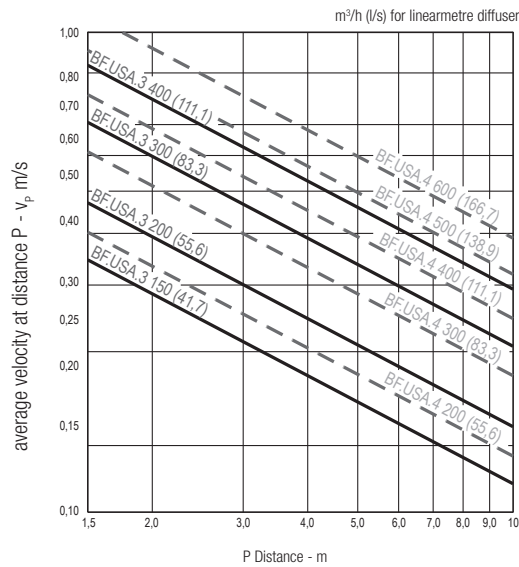


AEREAULIC DATA - Alternate horizontal throw

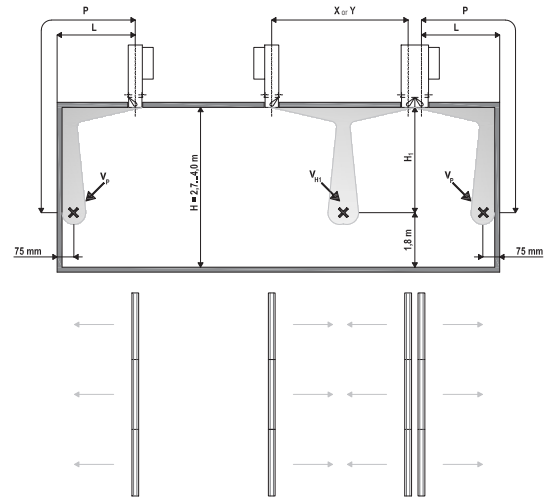
BF.USA.3 - BF.USA.4



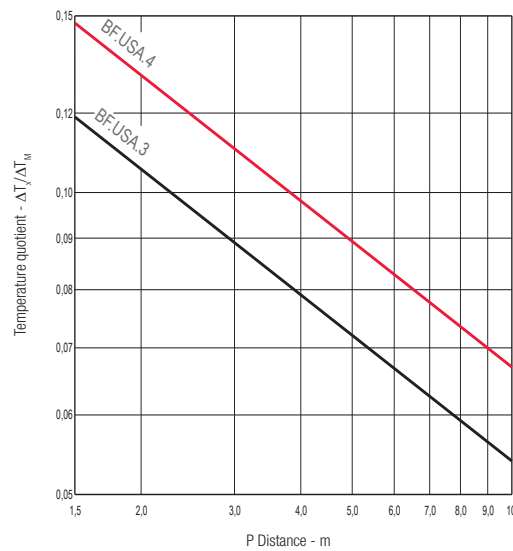
BF.USA.3 - BF.USA.4



Throw type

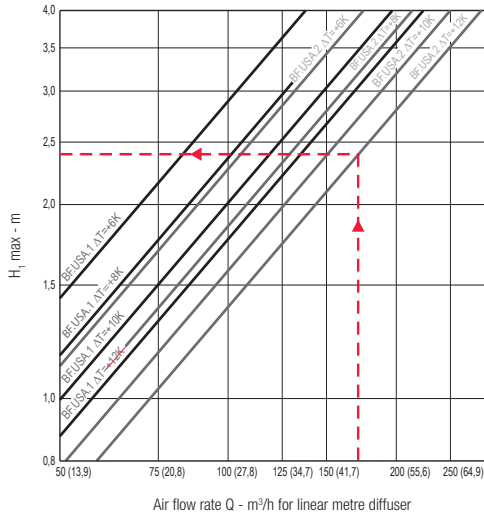


Temperature quotient

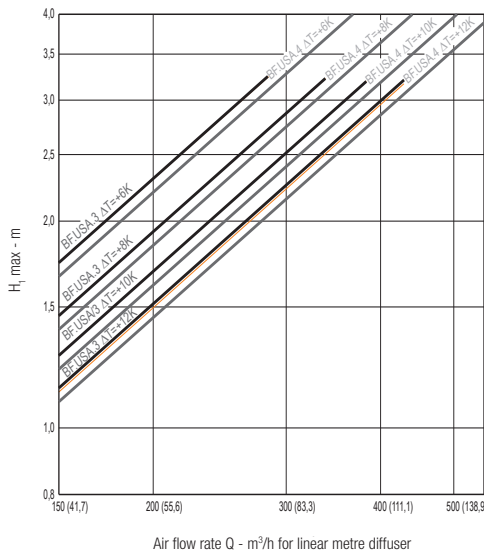


AERAILIC DATA - Vertical throw

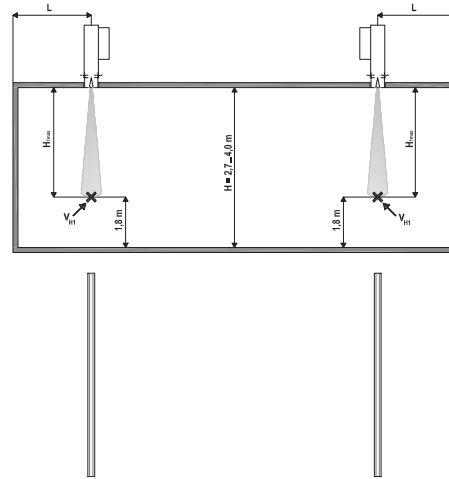
BF.USA.1 - BF.USA.2  
BF.USA.30 - BF.USA.40



BF.USA.3 - BF.USA.4  
BF.USA.50 - BF.USA.70



Throw type



Example

Data:

- 2 slots diffuser, 270m³/h
  - lenght 1700mm
  - $\Delta t = +11 K$
- Find the maximal depth of the air flow

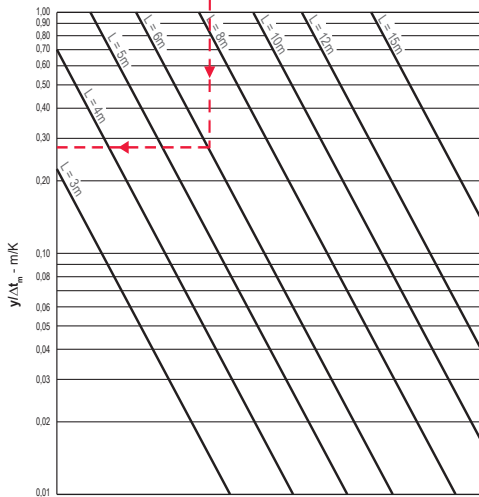
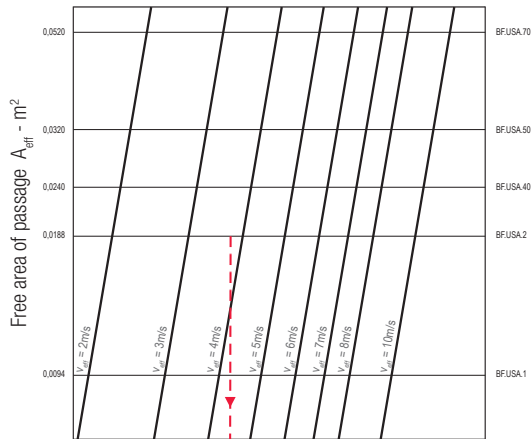
Solution:

- linear metre flow rate  
 $270/1,7 = 158,8 \text{ m}^3/\text{h}$
- maximal depth of the air flow = 2,4m

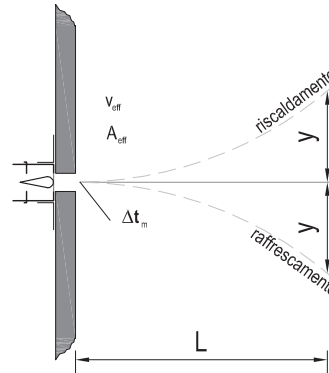


AERAILIC DATA - Throw from wall - Throw deviation

Throw deviation depending on  $\Delta t$



Throw type



Example

Data

- 3 slots diffuser, 580  $m^3/h$
- lenght: 2150 mm
- $\Delta t = - 8 K$

Find the throw deviation at distance  $L = 6 m$

Solution:

- linear metre flow rate  
 $580/2,15 = 269,7 m^3/h$
- $v_{eff} = Q/A_{eff} = 269,7/(0,0071 \times 3 \times 3600) = 3,52 m/s$
- $y/Dtm = 0,285$
- $y = 0,285 \times 8 = 2,12 m$

#### TEXT FOR TECHNICAL SPECIFICATION

Linear diffusers with one or more slots, made of anodized aluminum profiles powder coated in white, RAL 90016, or black, RAL 9005, possibly paintable in other shades of the RAL scale, teardrop deflectors with aerodynamic profile, adjustable from the front, with or without a series of accessories such as: plenum box with or without external thermal insulation in CE polyethylene foam (Euroclass fire reaction according to UNI EN 13501-1:2009 B-s2, d0), damper, equalizer plate. Option of having continuous lines by assembling modules without closing frames. Flexible installation depending on the plenum box for lateral or front assembly. Suitable for supply or return and, on request, with both supply and return in one double chamber plenum box.

