



Air diffusion systems

Floor diffuser Type BZD

Application

The Strulik Type BZD floor diffuser is designed for displacement applications and is mounted flush to the floor. It may be used for low to medium temperature differences between the supply air and the room air.

The diffuser may be used for both, cooling and heating with a maximum air temperature difference of approximately ± 6 K.

Front face design

The standard front face of the BZD is manufactured from a 2 mm stainless steel plate with long holes. As an option the standard front face of the sizes 200/125 and 200/160 can also be built from 1 mm stainless steel plate with round holes of 5,5 or 4,5 mm diameter.

Load support

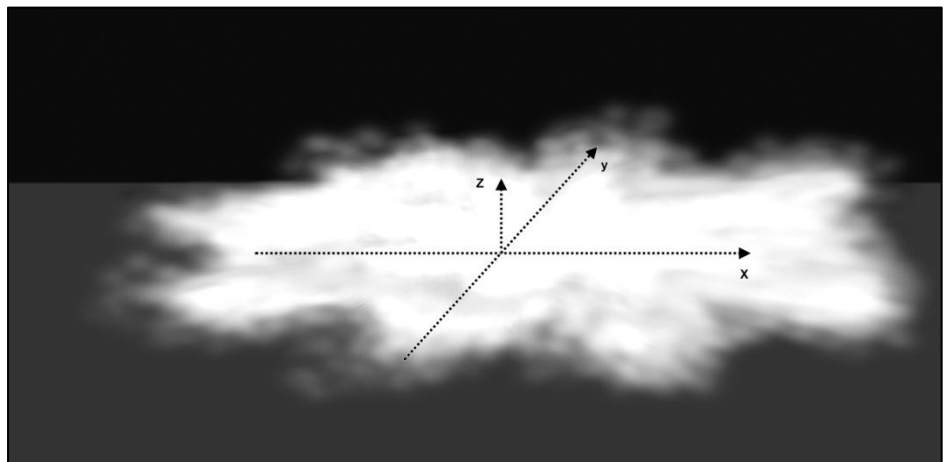
Depending on the size and reinforcing support element selected, the BZD offers solutions for light, medium and heavy classifications to EN 13264.

Function

The supply air is discharged from the face of the diffuser in eight swirling jets. These jets flow away from the diffuser across the floor.

The air leaving the diffuser is characterized with a low velocity and prevents draughts.

The BZD floor diffuser induces existing air from the room above and in the middle of the diffuser face. Therefore, it immediately reduces the temperature difference between the supply and the room as the air leaves the diffuser.



Sizes and front face designs

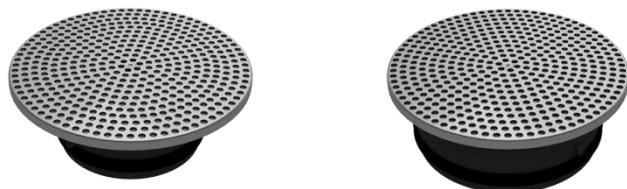


Front face of 2 mm stainless steel plate with long holes

Size 200/125

Size 200/160

Size 250/225



Front face of 1 mm steel plate with round holes as special option

Size 200/125

Size 200/160

Floor diffuser Type BZD

Flow simulation

The Computational Fluid Dynamics (CFD) simulations shown below have been carried out by Innis-GTD as their partner for CFD flow simulations

Functional diagram of flow simulation

Flow diagrams

Figures 1 and 2 show the CFD flow simulations for the Strulik Type BZD size 200/125 as a vertical section to show velocity and temperature distribution. Volume flow: 60 m³/h, temperature difference supply air/room air: 3 K cooling

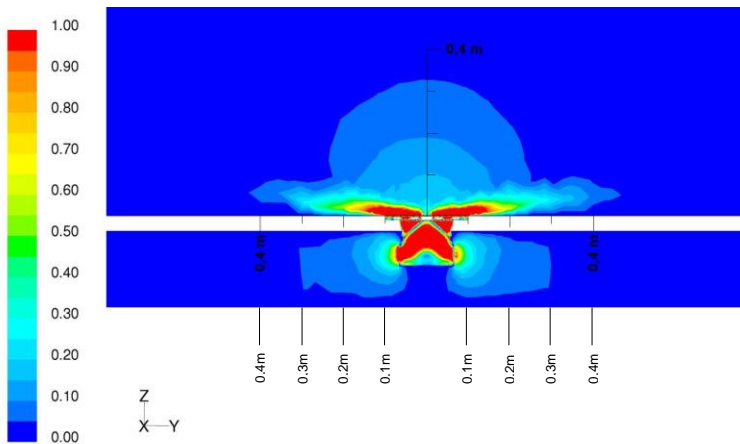


Figure 1:

Vertical section showing velocity distribution

- 60 m³/h, with
- 3 K cooling

(Strulik Type BZD 200/125 – 1 mm thick face plate, synthetic support element)

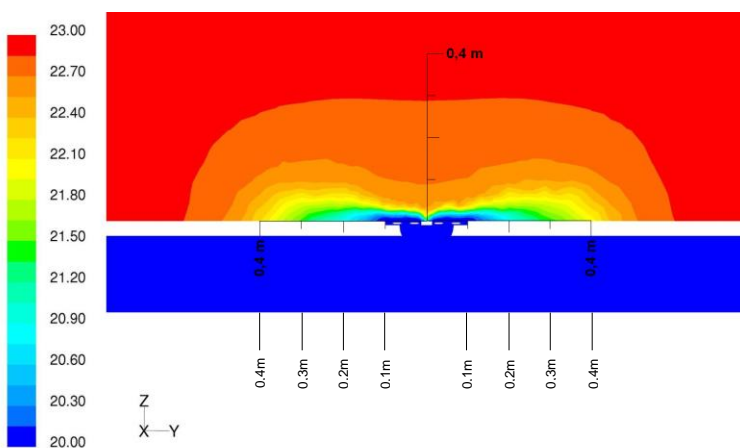


Figure 2:

Vertical section showing temperature distribution

- 60 m³/h,
- 3 K cooling

(Strulik Type BZD 200/125 – 1 mm thick face plate, synthetic support element)

NOTE: The standard variant with 2 mm thick face plate provides a slightly modified air flow pattern, with a vertical throw increased by 30 %

Floor diffuser Type BZD

BZD 200/125

- Structure
- Mounting

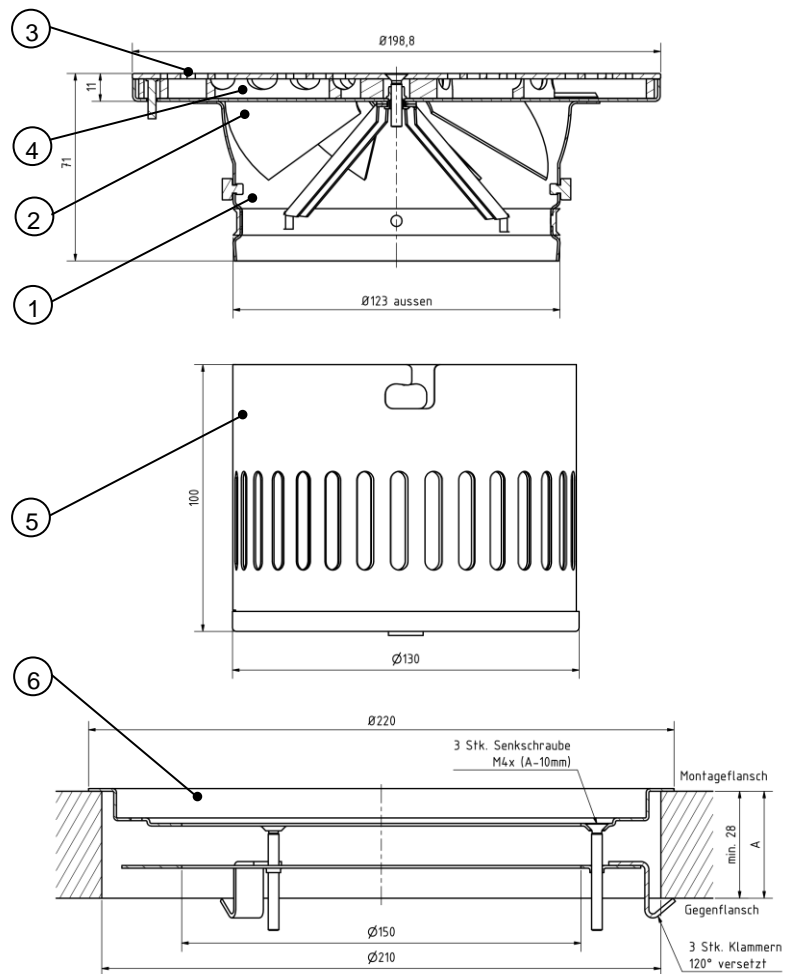
Structure – BZD 200/125

The Strulik Type BZD 200/125 floor diffuser has a 125 mm diameter inlet spigot with the swirl diffuser mounted above it. As standard the front face plate above the swirl diffuser is 2 mm thick stainless steel with long flat oval holes. As an option a 1 mm thick stainless steel face plate with round holes is available. Fitted between the swirl diffuser and the face plate is the reinforcing support element made from either synthetic materials or expanded metal.

A dirt trap (SF) or dirt trap with integral damper (SF + D) can be added and this is attached with a bayonet connection.

Structural elements

1. Air spigot – 125 mm diameter
2. Swirl diffuser
3. Face plate (2 mm or 1 mm thick)
4. Reinforcing support element
5. Dirt trap without or with damper
6. Mounting flange



Mounting

A two part mounting flange (MB) is supplied to fit the floor diffusers in a raised floor. This is then fixed into the floor tile using three brackets.

**Floor diffuser
Type BZD**

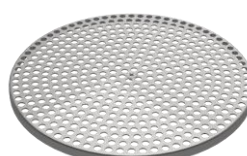
BZD 200/125

- **Design and construction variants**

Design and construction variants of BZD 200/125



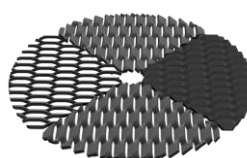
Front plate 2 mm
Long holes (LL)



Front plate 1 mm
Round holes (RL)



Substructure
(Synthetic material)



Substructure
(Expanded metal)



Diffuser part for
2 mm front plate



Diffuser part for
1 mm front plate



Dirt trap without
damper (SF)



Dirt trap with
damper (SF + D)



Mounting flange (MB)



Plenum box (AK)
Dimension:
400 x 400 x 220 mm
Spigot: DN 100

Capacity load groups for BZD 200/125

Face plate	Substructure	Capacity load group (EN 13264)
2 mm thick long hole	synthetic material	Light
2 mm thick long hole	expanded material	Medium
1 mm thick round hole	synthetic material	No specified load capacity
1 mm thick round hole	expanded material	Light

**Floor diffuser
Type BZD**

BZD 200/160

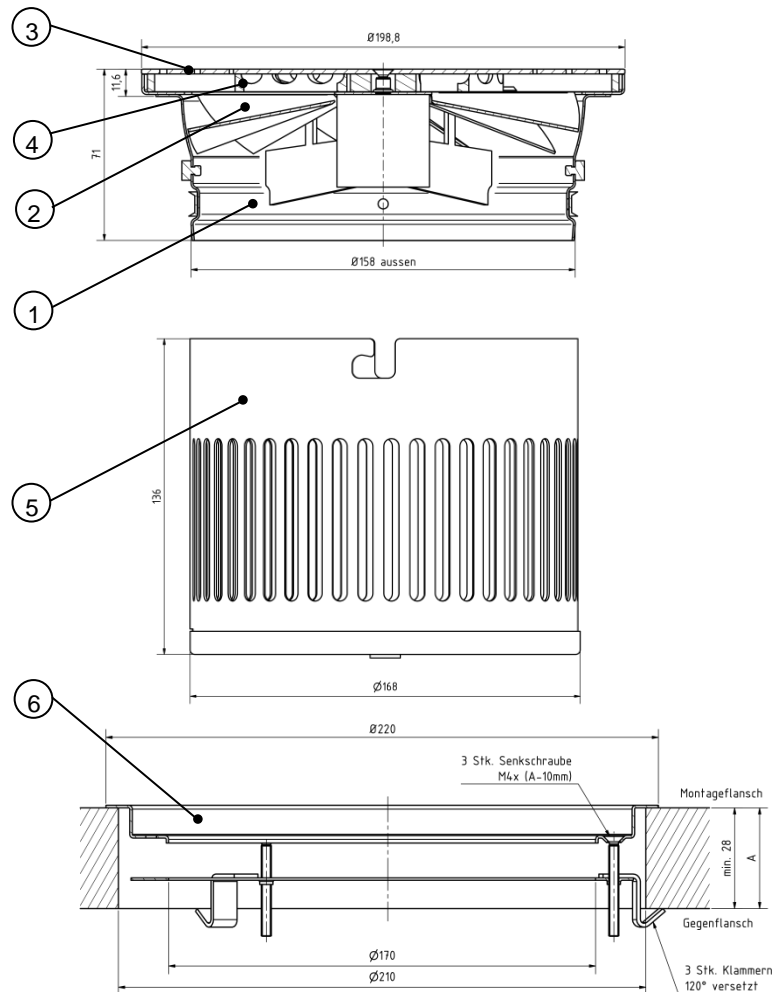
- **Structure**
- **Mounting**

Structure – BZD 200/160

The Strulik Type BZD 200/160 has a similar construction to the BZD 200/125. However, the stronger construction allows for heavier loads.

Structural elements

1. Air spigot – 160 mm diameter
2. Swirl diffuser
3. Face plate (2 mm or 1 mm thick)
4. Reinforcing support element
5. Dirt trap without or with damper
6. Mounting flange



Mounting

Mounting is similar to the BZD 200/125 and the other sizes.

**Floor diffuser
Type BZD**

BZD 200/160

- **Design and construction variants**

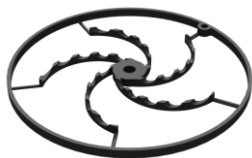
Design and construction variants of BZD 200/160



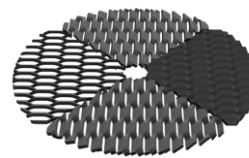
Front plate 2 mm
Long holes (LL)



Front plate 1 mm
Round holes (RL)



Substructure
(Synthetic material)



Substructure
(Expanded metal)



Diffuser part for
2 mm front plate



Diffuser part for
1 mm front plate



Dirt trap without
damper (SF)



Dirt trap with
damper (SF + D)



Mounting flange (MB)



Plenum box (AK)
Dimension:
400 x 400 x 220 mm
Spigot: DN 100

Capacity load groups for BZD 200/160

Face plate	Substructure	Capacity load group (EN 13264)
2 mm thick long hole	synthetic material	Medium
2 mm thick long hole	expanded material	Heavy
1 mm thick round hole	synthetic material	No specified load capacity
1 mm thick round hole	expanded material	Light

Floor diffuse Type BZD

BZD 250/225

- Structure
- Mounting

Structure – BZD 250/225

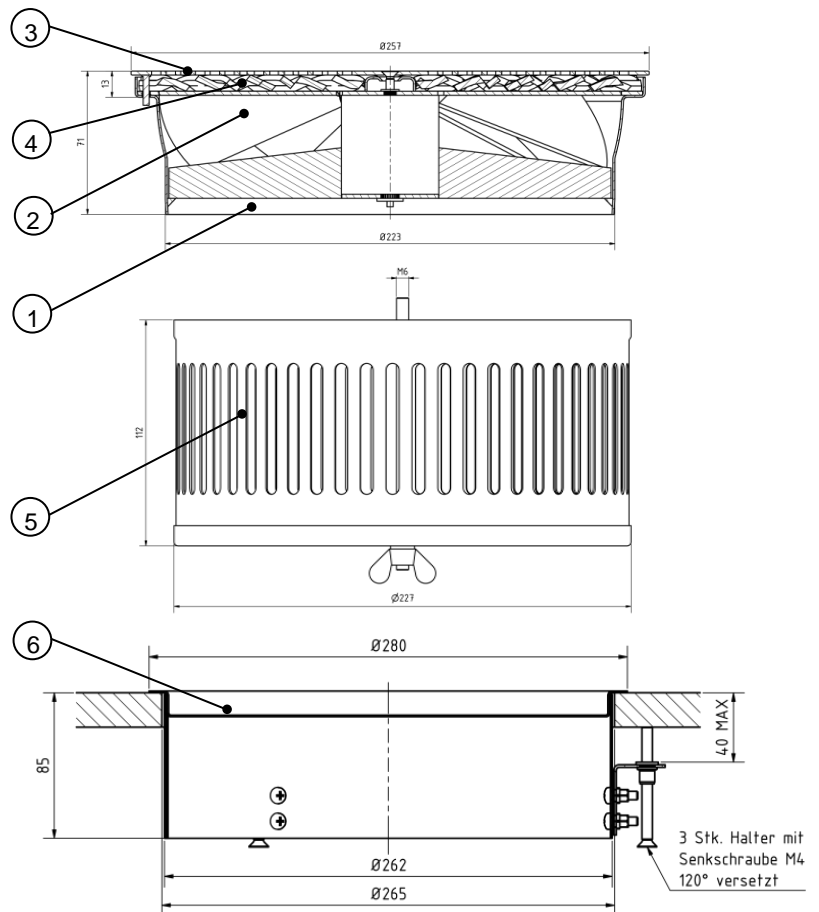
The Strulik Type BZD 250/225 has a generally similar construction to the smaller BZD 200/125 and BZD 200/160. However, the reinforcing sub element is only available in expanded metal. Where a dirt trap, without or with a damper, is requested this is fixed to the diffuser using a bolt fixing from underneath. The mounting method is different too.

Structural elements

1. Air spigot – 225 mm diameter
2. Swirl diffuser
3. Face plate (2 mm)
4. Reinforcing support element
5. Dirt trap without or with damper
6. Mounting flange

Mounting

Mounting is by means of jack screws which are fixed to bracket on the diffuser casing. These are tightened against the underside of the floor tile.



**Floor diffuser
Type BZD**

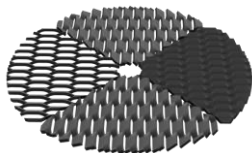
BZD 250/225

- **Design and construction variants**

Design and construction variants of BZD 250/225



Front plate 2 mm
Long holes (LL)



Substructure
(Expanded material)



Diffuser part for
2 mm front plate



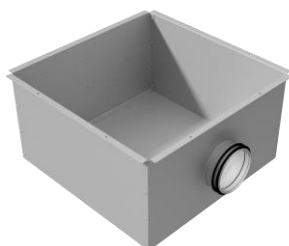
Dirt trap without
damper (SF)



Dirt trap with
damper (SF + D)



Mounting flange (MB)



Plenum box (AK)
Dimension:
400 x 400 x 220 mm
Spigot: DN 125

Capacity load groups for BZD 250/225

Face plate	Substructure	Capacity load group (EN 13264)
2 mm thick long hole	expanded material	Medium

Floor diffuser Type BZD

Technical Data

- Air velocities
- Decrease in temperature differences

Air velocities

The supply air is discharged in swirling jets and these results in a quick reduction in air velocity above the floor in the horizontal plane. The maximum air velocities are seen at a height of 50 mm.

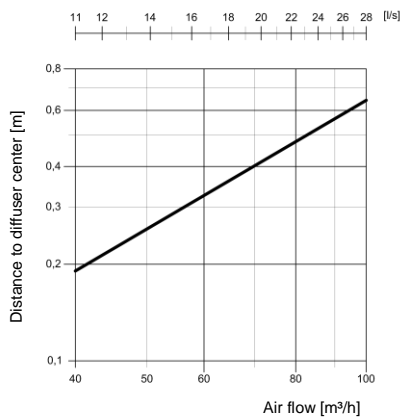


Figure 3: BZD 200; distance from the centre of the diffuser to the point at which the air velocity at a height of 50 mm above the diffuser is reduced to 0.2 m/s.

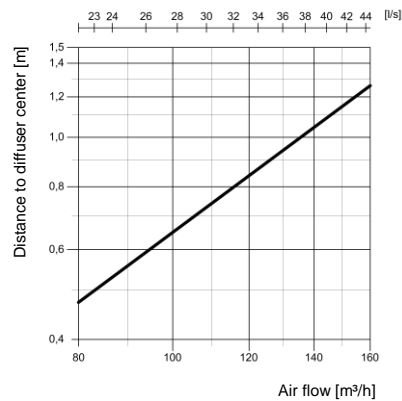


Figure 4: BZD 250; distance from the center of the diffuser to the point at which the air velocity at a height of 50 mm above the diffuser is reduced to 0.2 m/s.

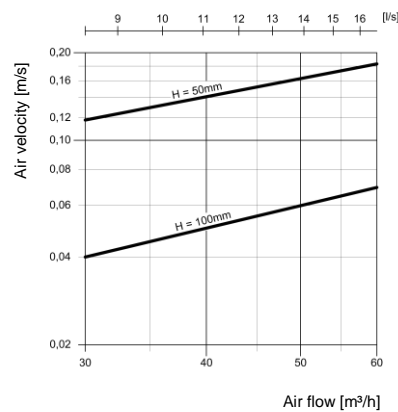


Figure 5: BZD 200; local air velocity at a distance of 450 mm from the center of the diffuser for volume flowrates from 30 – 60 m³/h (3 K cooling supply for the BZD 200)

Mixing – decrease in temperature difference between the supply air and the room air

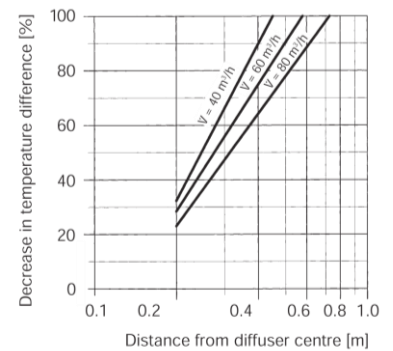


Figure 6 shows the rapid decrease in the percentage reduction of the temperature difference between the supply air and the room air against the distance from the center of the diffuser (valid for temperature difference between 2 K and 4 K for the BZD 200)

Floor diffuser Type BZD

Technical Data

BZD 200/125
BZD 200/160

- Noise level
- Pressure loss

Noise Level and pressure loss

Noise levels and static pressure losses for the BZD 200/125 and BZD 200/160 are shown in Figures 7 to 10. The variations for the 2 mm and 1 mm thick face plates are shown, together with the effects for either a synthetic or expanded metal reinforcing support element.

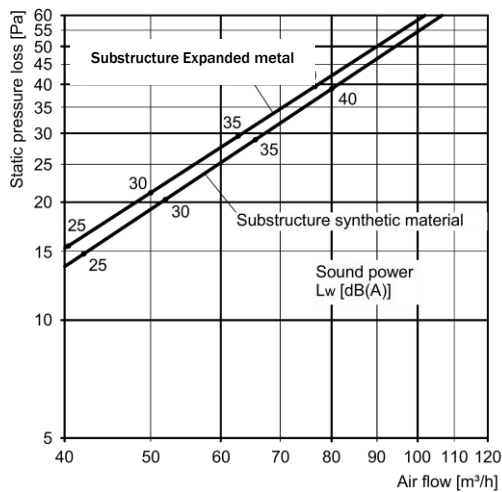


Figure 7 BZD 200/125 Static pressure and noise level, installation in raised floor, damper open, face plate 2 mm stainless steel with long holes

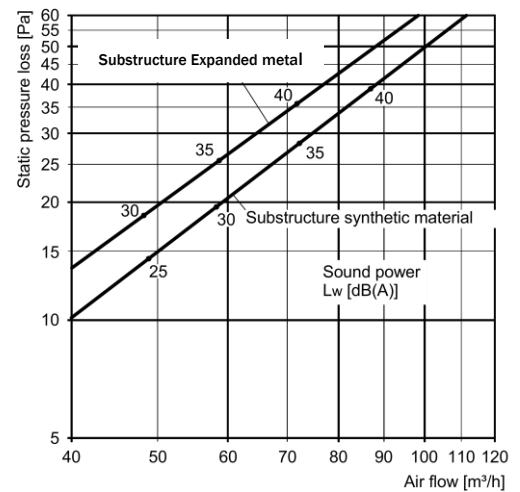


Figure 8 BZD 200/125 Static pressure and noise level, installation in raised floor, damper open, face plate 1 mm stainless steel with round holes

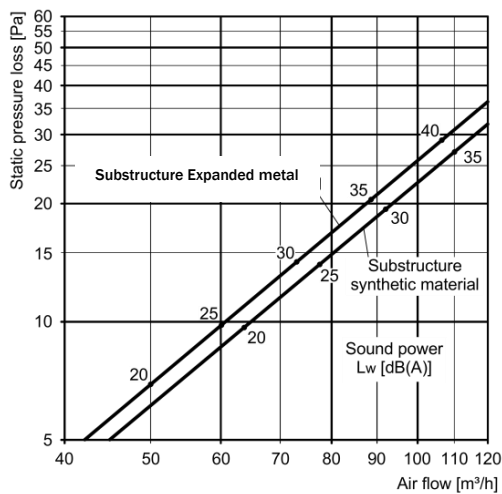


Figure 9 BZD 200/160 Static pressure and noise level, installation in raised floor, damper open, face plate 2 mm stainless steel with long holes

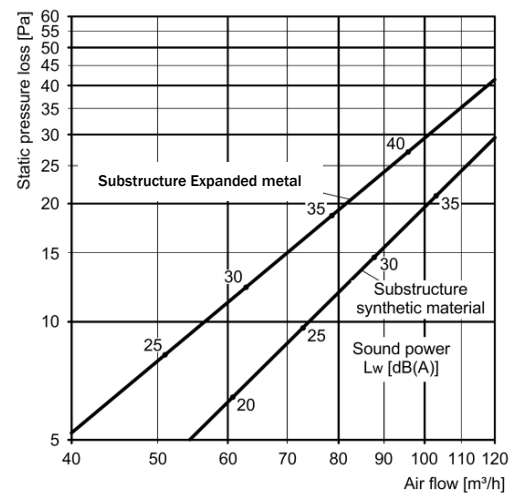


Figure 10 BZD 200/160 Static pressure and noise level, installation in raised floor, damper open, face plate 1 mm stainless steel with round holes

Floor diffuser Type BZD

Technical Data

BZD 250/225

- Noise level
- Pressure loss

Installation situations

Noise Level and pressure loss

Noise levels and static pressure losses for the BZD 250/225 is shown in Figure 11.

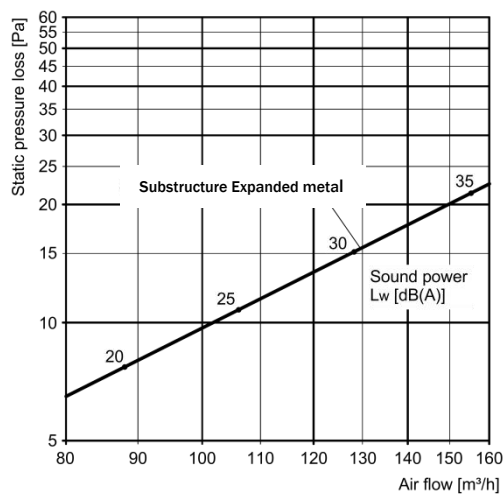
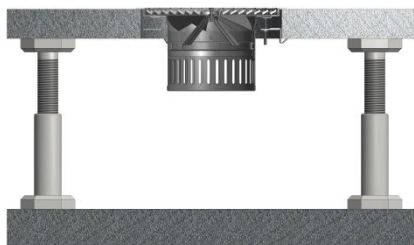
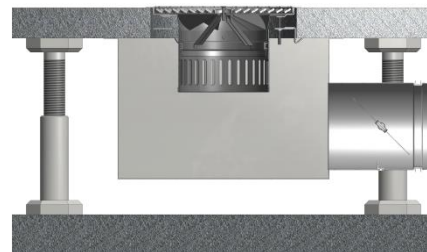


Figure 11 BZD 250/225 Static pressure and noise level, installation in raised floor, damper open, face plate 2 mm stainless steel with long holes

Installation of standard floor diffuser in a raised floor



Air supply direct from the plenum created by the raised floor



Air supply direct to the individual diffuser using a plenum box with ducted connection

**Floor diffuser
Type BZD**

Technical Data

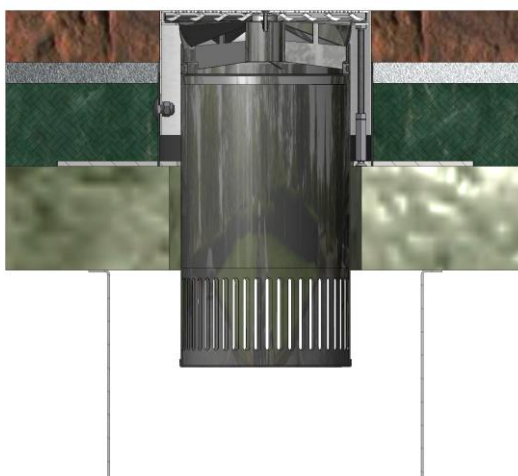
**Special application of BZD
floor diffuser**

Standard BZD diffuser with optional special extended dirt trap and integrated silencer section

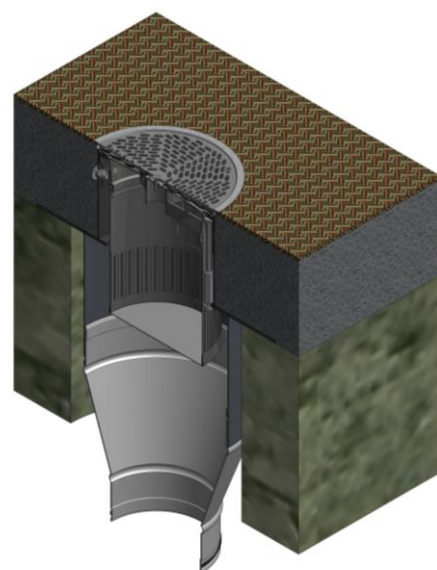


Reference site: Olympia, Paris, France

Special design application examples for BZD floor diffusers



Reference site: Rochester Cathedral, Rochester, UK



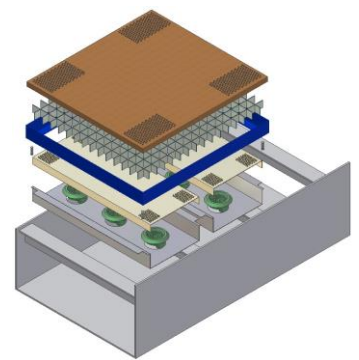
Reference site: Pier application.
Muscat International Airport, Sultanate of Oman

**Floor diffuser
Type BZD**

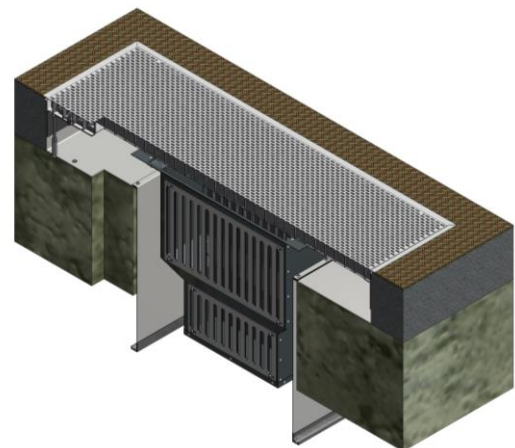
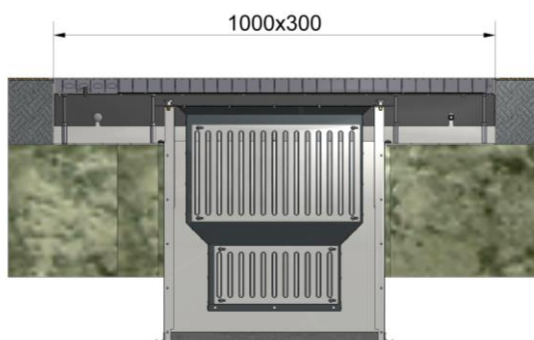
Technical Data

**Special application of BZD
floor diffuser**

Special design application for floor diffusers



Wooden floor diffusers in an oak parquet floor
Reference site: Academy of Arts, Berlin, Germany



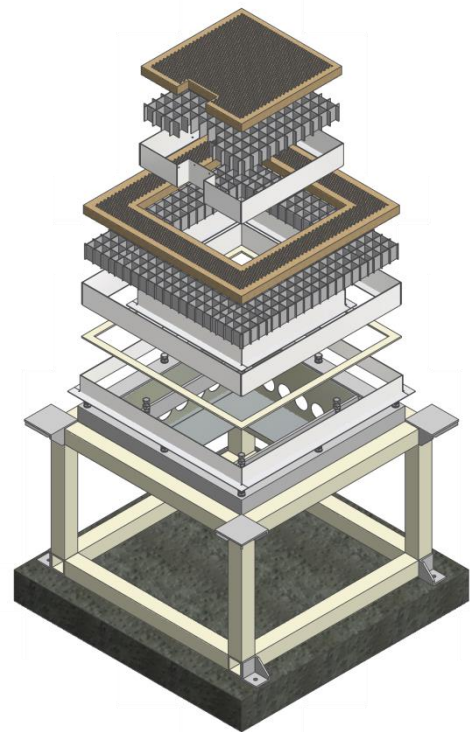
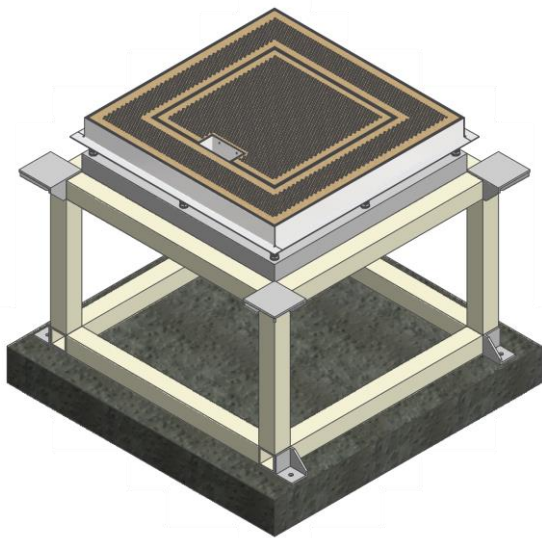
Rectangular stainless steel floor diffuser
Reference site: Muscat International Airport, Sultanate of Oman

**Floor diffuser
Type BZD**

Technical Data

**Special application of BZD
floor diffuser**

Special design application for floor diffusers – “BMW München – Hochhaus”



Special floor diffuser with a wooden front face (oak)
Size 630 x 630
Designed for heavy loads
It includes a special dirt trap with an integrated electrical
junction box for media connections
Installed in a concrete builderswork supply air duct

**Floor diffuser
Type BZD**

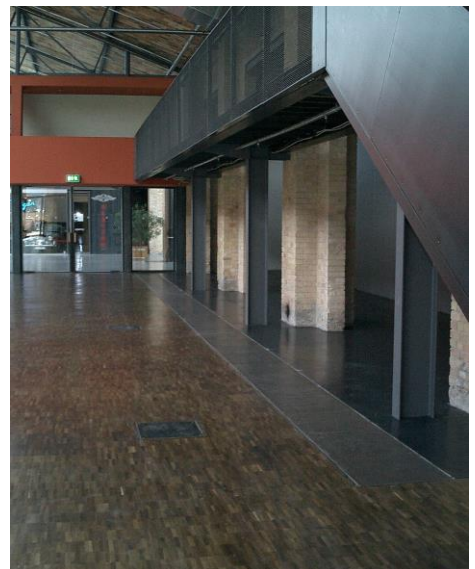
Technical Data

**Special application of BZD
floor diffuser**

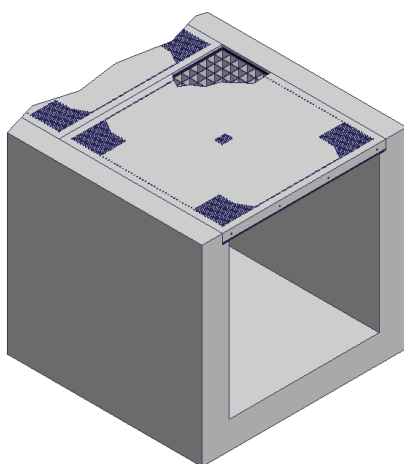
Special design application for floor diffusers at “Meilenwerk – Berlin”



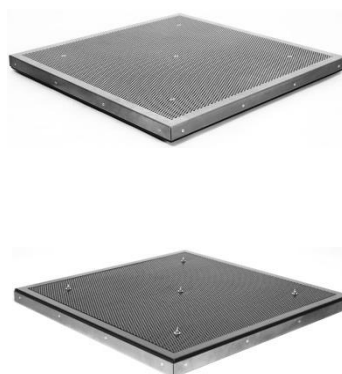
Supply duct below the floor of the exhibition hall



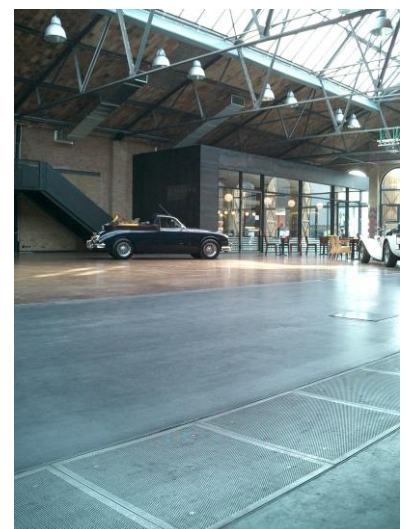
Floor diffusers in a raised floor



Concrete supply duct with
cast-in angle sections for the
incorporation of the diffuser plate



Top and bottom view of the
diffuser plate



Floor diffusers in a concrete floor

**Floor diffuser
Type BZD**

Technical Data

Tender text

Strulik Type BZD Floor Diffuser for draught free air supply at floor level. The diffuser to consist of a swirl element with a perforated face plate flat oval holes or round holes made from stainless steel. The face plate fixes to the diffuser by means of a central screw.

Depending on the required load duty the diffuser will have a reinforcing support element made from synthetic material or expanded metal.

An optional dirt trap, without or with an integral damper for the control of air flow, may be required.

Installation into the floor must be with a two piece mounting frame or jack screws to tighten to the back face of the floor tile.

Air supply to be direct from the floor air plenum or a dedicated ducted plenum box beneath the floor tile.

The swirl element, dirt trap and any associated dampers are to be manufactured from sheet mild steel and powder coated black (RAL 9005). Any associated plenum boxes to made from zinc plate mild steel.

Sizes:

- ☐ BZD 200/125
- ☐ BZD 200/160
- ☐ BZD 250/225

Loading to EN 13264 (depends on size and construction)

- ☐ Light
- ☐ Medium
- ☐ Heavy

Front face (refers also loading)

- ☐ 2mm thick stainless steel with long holes
- ☐ 1mm thick stainless steel with round holes
 - ☐ 5,5 mm diameter (standard)
 - ☐ 4,5 mm diameter

Front face finish

- ☐ Stainless steel
- ☐ Stainless steel, powder coated
- ☐ Stainless steel, Inox coating *

Reinforcing element selection (refer also loading)

- ☐ Synthetic
- ☐ Expanded metal

Accessories

- ☐ Mounting Frame (surface finish as front face plate) (MB)
- ☐ Dirt trap (SF)
- ☐ Dirt trap with damper (SF + D)
- ☐ Plenum (AK)

Air flow: m³/h
Max. sound power level: dB(A)
Static pressure loss (damper open): Pa
Manufacturer: **Strulik**
Type of Diffuser: **BZD**

*Note: Inox coating can be scratched easily. / Depending on the charge and material there can be differences in the optical views.