BerlinerLuft.

Ventilation towers and steel chimneys

Ventilation towers and steel chimneys
Round design (free-standing)

PRODUCT DESCRIPTION

Ventilation towers are used for fresh air intake and exhaust air discharge. They are often installed in exposed locations outside buildings, in courtyards, or easily visible on flat roofs. As a part of the building concept, they are integral to modern architecture and should meet high aesthetic standards. BerlinerLuft. ventilation towers are designed to meet these requirements in terms of both attractive appearance and technical design. The wide range of different designs mean they can be perfectly adapted to local conditions.

Flue gas chimneys carry off the flue gases that arise in controlled combustion processes (such as in thermal power stations). Even with flue gas chimneys, functionality and aesthetics can be harmonised with flawless workmanship and surface finish quality.

1 | Ventilation towers at BMW Research and Innovation Centre, Munich
2 | Exhaust air and smoke extraction chimneys at Munich Airport, Terminal 2


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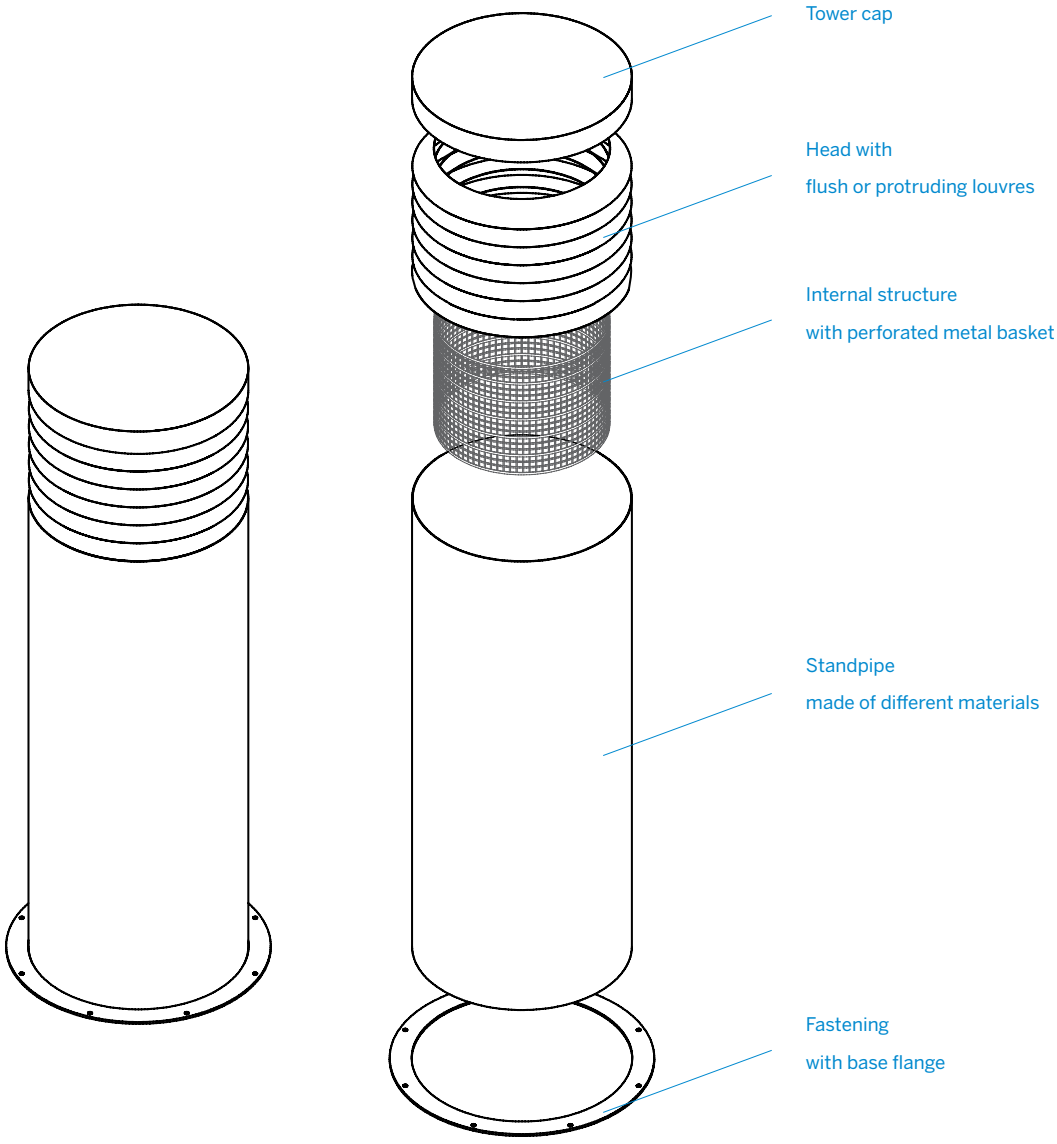
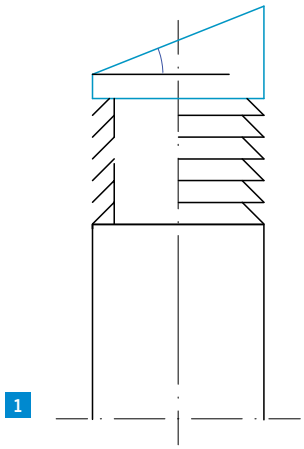
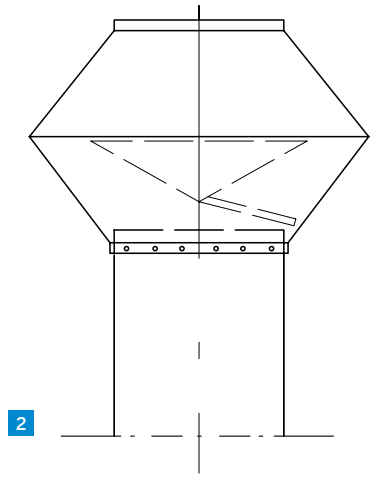
DESIGN AND CONSTRUCTION
USING THE EXAMPLE OF A LOUVRE TOWER



CAP DESIGNS

The top section always has a wire mesh to keep out small animals and coarse dirt. A flange on top of the head stabilises the head and is also used to screw in handling lugs.





1 | Louvre tower with sloped cap
2 | Tower with deflector head
3 | Louvre tower with flat cap
4 | Tower with bend

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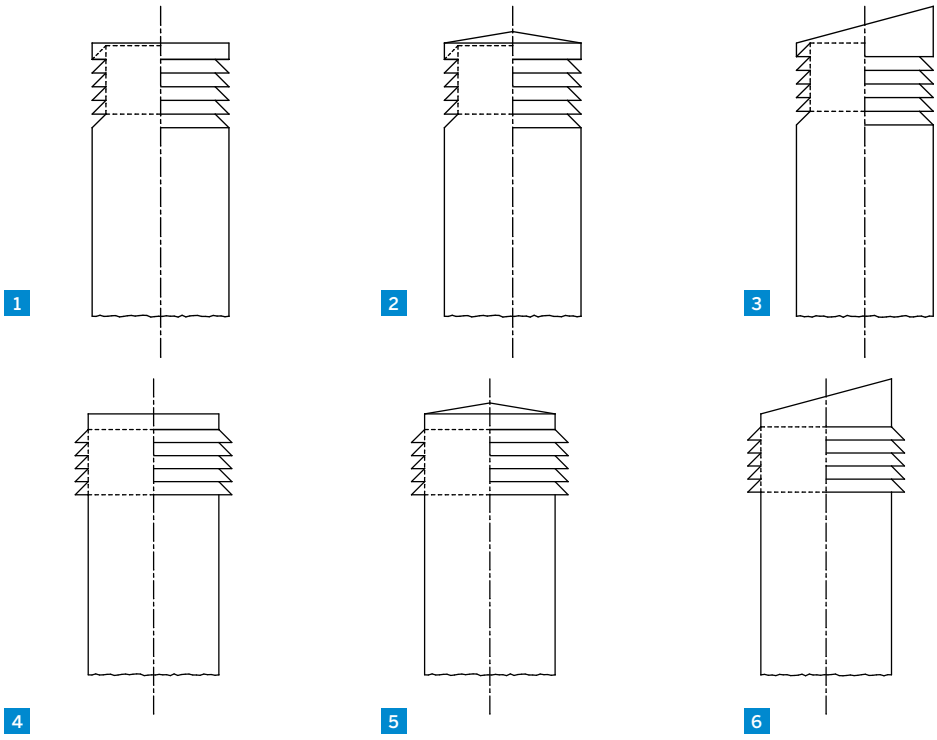
CAP TYPES



1 | Sydney
2 | Beijing
3 | Paris
4 | Moscow
5 | Venice
6 | Cape Town

OTHER TOWER DESIGNS

Towers for vertical air flow without louvres (cut straight or sloped)

This type of tower has no top cover plate. This means bad-smelling air can be discharged straight upwards. The throw range of the standpipe can be increased using a taper on the standpipe.

Tower with dummy louvres

Outlet towers for vertical air flow can be matched to the appearance of louvre-type intake air towers by fitting them with dummy louvres (without a ventilation function).

Combination tower

Fresh air and exhaust air towers can be combined. For example, an internal pipe with a deflector head discharges air vertically upwards, while a large outer standpipe with louvres is used for fresh air intake.

Discharge towers with integrated silencers

The standpipe of these towers has a mineral wool packing in a perforated metal shell and, if necessary, a sound-absorbing inner core. This solution is ideal if a silencer is required, but cannot be located inside the building due to lack of space

LOUVRE HEAD

The louvre head consists of a rounded, perforated metal shell with brackets on the outside, to which the louvres are welded. The shape, spacing and angle of the louvres are designed to maximise protection from rainwater ingress.

Louvres can be flush with the standpipe (internal louvres) or protruding (external louvres).

The number of louvres depends on the permissible pressure drop and acoustic requirements (maximum flow noise). The air velocity at the louvres should not exceed 2.5 m/s.

For standpipe diameters below 500 mm, external louvres are recommended in order to optimise flow and minimise noise.

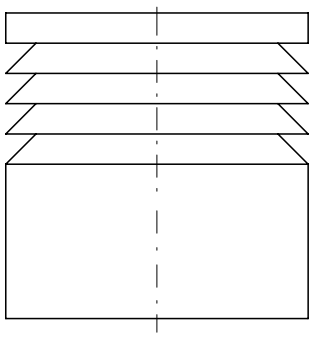
STANDPIPE

The diameter of the standpipe depends on the flow rate, pressure drop and soundproofing requirements. Dimensioning is based on the number of louvres (see above). The average flow rate in the pipe should not be more than 5.5 m/s.

Structural dimensioning is based on the DIN 4133 standard. The standpipe is a structurally self-supporting pipe. Its minimum wall thickness is 1.5 mm. All longitudinal welds are machine-welded using the plasma keyhole method. Transverse joints are manually welded by certified, qualified welders using TIG or MAG welding. As a manufacturer, we are certified as possessing "comprehensive welding suitability according to DIN 18800-7 and DIN-EN 1090-2".

Accessories (optional)

Thermally insulated design
Draining with run-off taper or double-stair separator
Fresh air filter
Integrated silencer
High temperature version



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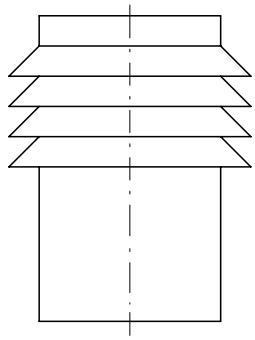

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1 | Internal louvres
2 | External louvres

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BASE AND FASTENING

Ventilation towers and steel chimneys are generally mounted on a concrete foundation or base.

Option 1:
Fastening with heavy-duty anchors

The ventilation tower is mounted on a suitably sized base flange or plate, which is directly fastened to the foundation provided by the customer using approved heavy-duty anchors. Irregularities on the foundation are compensated using shims and filled with non-shrink concrete by the customer if required.

Option 2:
Fastening with anchor basket

The tower is anchored in an anchor basket, set in concrete on site. The prefabricated anchor basket is sized according to structural engineering requirements. Using adjusting nuts and anchor rods, which protrude from the foundation, the base of the tower is then aligned and bolted down. The gaps caused by the adjusting nuts are then filled with non-shrink concrete by the customer.

The anchor basket is delivered in advance, joined to the reinforcements and cast in concrete by the customer's concreting contractor. The concrete must be given time to cure before installing the tower.

Fresh air and exhaust air towers with roof collar

DRAINAGE SYSTEMS

Rainwater that enters is discharged through a bottom drain. A water trap (double-stair separator) can also be installed.

There are three options for draining chimneys:

Double-stair separator with outlet pipes on both sides
Run-off taper with outlet pipe
Run-off floor (welded with 3° slope) with outlet pipe

CONNECTION VARIANTS
vertical and horizontal

As another option, cascades and a run-off taper can also be combined at the customer's request. For louvre towers, the run-off taper can also be used as condensate barrier.

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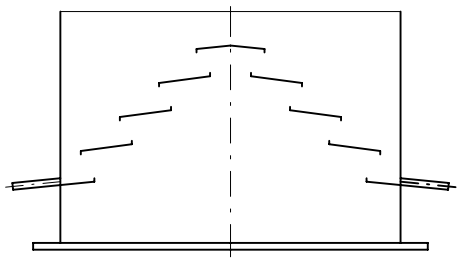

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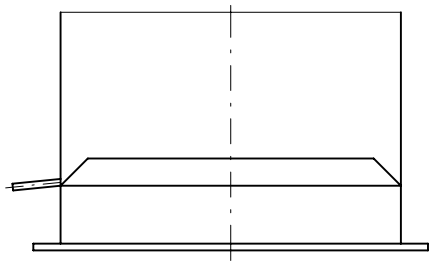

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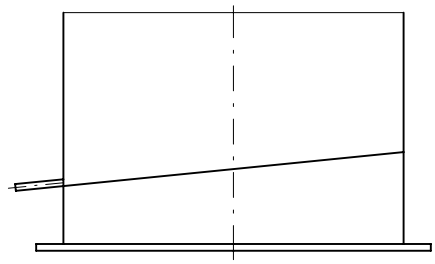

1 | Cascade or double-stair separator
2 | Run-off taper
3 | Run-off floor

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MATERIALS

Material	Surface finish (treatment)
Black sheet S235 JR	Outside liquid-coated as per DIN ISO 12944 in RAL colour
	Outside liquid-coated as per DIN ISO 12944 in RAL colour, inside primed
	Outside and inside liquid-coated as per DIN ISO 12944 in RAL colour
	Paint layers according to customer's specifications
Galvanised sheet/galvanised steel	Welds coated with anti-rust paint
	Outside liquid-coated as per DIN ISO 12944 in RAL colour, welds inside coated with anti-rust paint
Stainless steel 1.4301 (V2A)	All over matt-pickled and passivated, surface matt metallic III C
	Longitudinally brushed, welds brushed over
	Laterally brushed, with helical cylindrical grinding, welds brushed over
Stainless steel 1.4571 (V4A), pickled **Stainless steel 1.4404 (V4A), brushed** **Stainless steel 1.4301 (V2A)**	All over matt-pickled and passivated, surface matt metallic III C
	Longitudinally brushed (with brushed finish, 1.4404 is used instead of 1.4571 for optical reasons), welds brushed over
	Laterally brushed, with helical cylindrical grinding, welds brushed over

Other materials and finishes on request

REGULATIONS AND STANDARDS

VDI 3803 Structural and technical principles – Central air-conditioning systems

DIN EN 13779 Ventilation in non-residential buildings

FLUE GAS CHIMNEYS DESIGN AND CONSTRUCTION

Flue gas chimneys are manufactured in compliance with the building rule list A issued by the Deutsches Institut für Bautechnik (DIBt). The "Ü" mark guarantees the compliance with the relevant standards and regulations and indicates long-term stability.

BerlinerLuft. flue gas chimneys are a pipe-in-pipe design consisting of a supporting pipe and flue gas pipe. Guide rollers allow thermal elongation.

Depending on the temperature and the type of air carried, resistant stainless steel alloys are used in accordance with DIN EN 4133.

On request, the chimney can be provided with a dummy head or thermal insulation.

TRANSPORT AND INSTALLATION

BerlinerLuft. ventilation towers are transported, assembled and installed by trained personnel from specialised contractors in compliance with the installation instructions.

CONDITION MONITORING AS PER DIN 4133

Condition monitoring is always carried out by authorised specialists.

"Chimneys must be inspected by an expert on a regular basis, at least every two years. Shorter intervals for inspection and maintenance may be specified for vibration dampers and fall protection systems.

In the case of heavy chemical exposure and over-dimensioning to prevent corrosion, such inspections must be carried out at shorter intervals. Any passable space between the supporting and internal pipes must be included in the inspection. Such inspection must be documented." DIN 4133 § 11.

ACCESSORIES

Side connectors with reinforcements as required for structural stability

Inspection hatch with reinforcements as required for structural stability

Rain collar, welded or as two clamped sections

Roof collar

Inner pipe(s)

Anchor basket

Sleeve for anchor basket (stay-in-place formwork)

Wall bracket

Clamping flange

Bird mesh (fixed or detachable)

Vertical ladder with fall arrester as per DIN EN 353-1

Lightning protection bracket

Transport brackets

Rectangular base plate

Head flange

Cascade or double-stair separator

Rain and condensate run-off floor

Run-off taper

Accelerator nozzle

REGULATIONS AND STANDARDS

DIN V 4133
Self-supporting steel chimneys

Guidelines issued by the Industrieverband Stahlschornsteine e.V. (steel chimney industrial association)

CE marking

DIN EN 1090-2 –
Technical requirements for steel structures

DIN EN 13084-7 –
Free-standing chimneys - Product specifications

DIN 18800 Part 7 –
Comprehensive form of verification for welding with extension to DIN 4133 (steel chimneys and stainless steel)

DIN EN ISO 12944: Painting and coating systems

DIN 1055-4:
Effects on supporting frameworks – Wind pressures

Quality management: certified according to ISO 9001: 2000

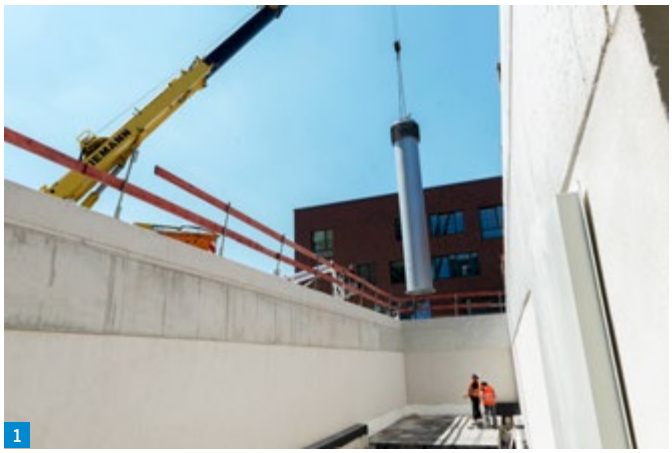
Installation of a ventilation tower

INSTALLATION PROCEDURE

1 + 2 // Unloading and placement using a crane on the concrete base

3 // Positioning: the tower is aligned and prepared for positioning

4 // Stable and quick-setting fastening using adhesive anchors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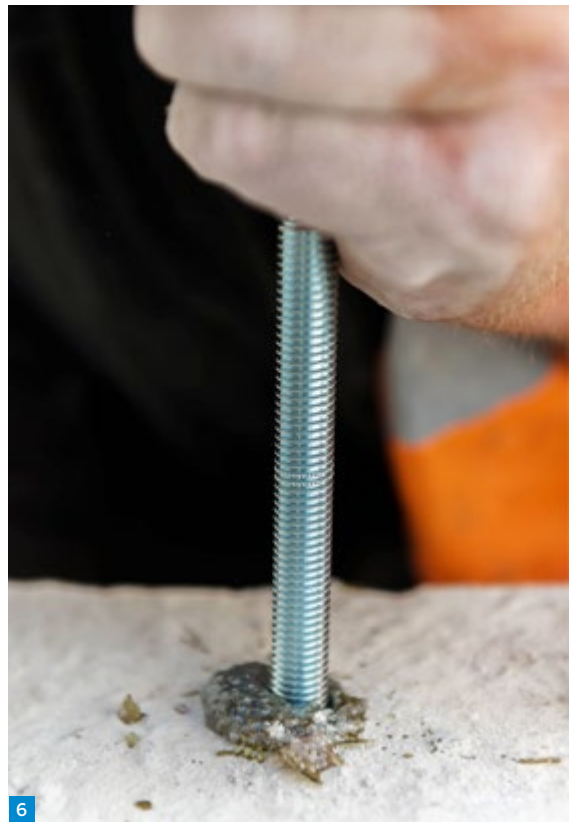

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5 + 6 // Stable and quick-setting fastening using adhesive anchors

7 // Exact alignment of the set anchor rods

8 // Tower is installed and balanced