

Ventilation roof elements



Fig. 1
Ventilation roof elements

Rotating caps are assembled on the top of the chimneys as an ending of the fumes, smoke and ventilation ducts. Their use significantly improves the chimney draught and protects the ducts against negative atmospheric conditions.

The issue of closures of ventilation ducts and chimney shafts is often diminished. However, properly selected chimney cap may improve operation of gravity ventilation, stability of chimney draught and affect continuous exchange of air in the installation.

Disruptions of chimney draught are often caused by local atmospheric conditions affecting airflow around the building.

When to use chimney caps

Application of chimney caps is defined in the Polish law. Basic provisions are included in the Regulation of the Minister of Infrastructure of 12 April 2002 „concerning technical conditions that should be met by buildings and their locations“. Pursuant to article 143.1, in buildings located in 2nd and 3rd zone of wind impact, specified in the Polish Norms, chimney caps should be used in smoke and exhaust fumes ducts in order to prevent reversal of chimney draught (...). Article 143.2 Chimney caps specified in item 1 should also be used in other areas, if required by location of the buildings and local topographic conditions.



Fig. 2
Rotating chimney cap WD-A-TURBO-K

The Turbo type caps rotate using the wind power, supporting the chimney draught. They are assembled on the chimney outlets of gravity ventilation.

Pursuant to the above provisions, chimney caps should be also used:

- In areas with strong winds that often change direction,
- In chimneys, which are near high trees,
- In chimneys located below the roof surface,
- In chimneys with short lengths,
- In chimneys with small cross-sections.

The wind impact zones are described in the norm PN-EN 1991-1-4: 2005: „Impact on structures. Part 1-4: General impact - Wind impact”. Pursuant to the norm, Poland is divided into three zones:

- 1 – central Poland
- 2 – seaside area
- 3 – mountain area to the south

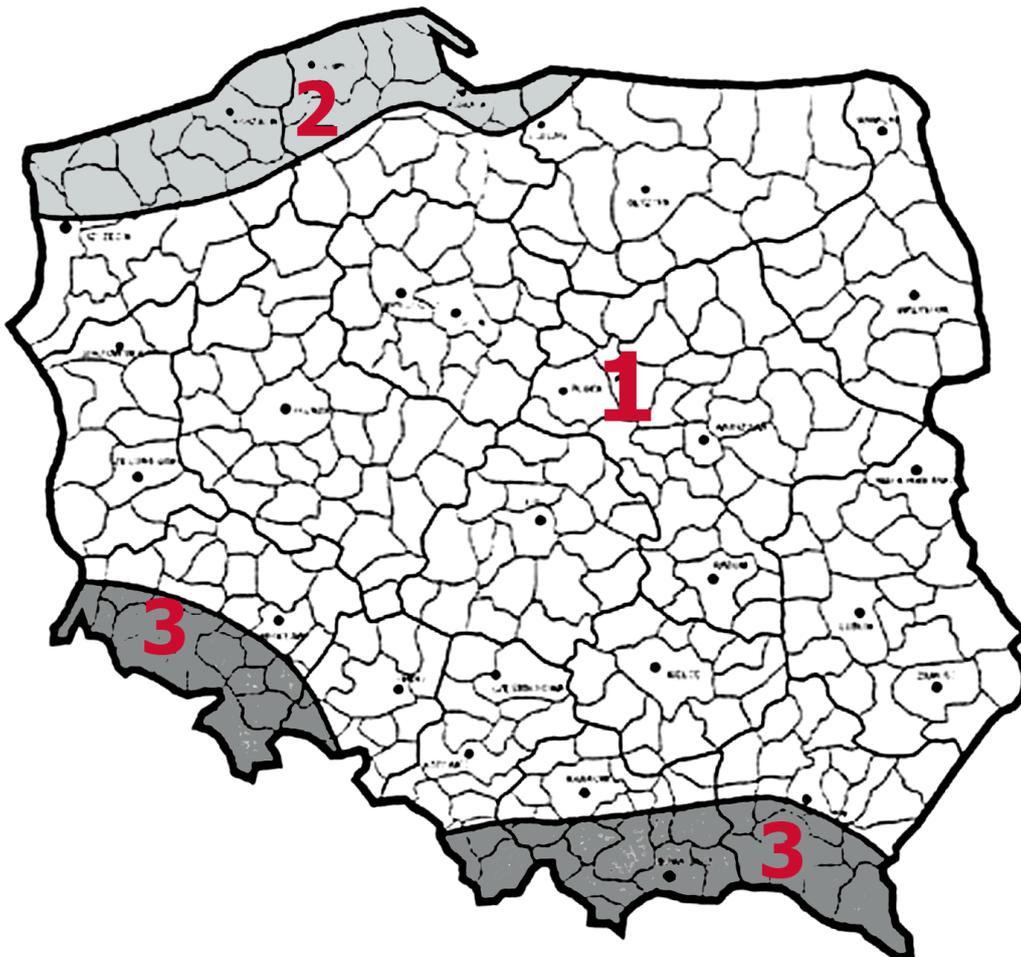


Fig. 3
Wind impact zones pursuant to the norm PN-EN 1991-1-4: 2005

Types of chimney caps

Chimney caps can be divided into:

- Fixed
- Self-aligning
- Rotating

Fixed chimney caps use kinetic energy of the wind to create sub-pressure in the chimney duct. They do not change their position in relation to the wind. Those caps, regardless of their structure, are based on physical phenomenon, namely the occurrence of sub-pressure on the leeward side of the screen surrounded by the wind. Their advantages include simple, reliable structure and low price. Disadvantages include dependence on the direction of the wind and low efficiency.

Chimney caps with mobile elements, namely self-aligning and rotating caps, use the wind energy in a dynamic way, so that they are rotated by it or set in the direction of the blowing wind. Their advantages include high efficiency parameters, good appearance, independence from the wind power and direction. Higher price is a disadvantage.

Every building has different chimney ducts for ventilation, exhaust fumes and smoke. Each of them should be closed with properly selected caps, paying special attention to the material used for their production. It decides about durability of the cap and its proper functioning.

Failure to use any chimney cap or assembly of an improper one may cause trouble with achieving the appropriate chimney draught and other problems. In the case of disadvantageous conditions for gravity ventilation, lack of closure of the chimney duct may prevent proper exchange or air in the rooms or cause reverse draught. Lack of proper ventilation in a long-term perspective may cause discomfort and an increased risk of occurrence of moisture. Reverse draught may pose more serious dangers: lack of proper pressure ventilation may cause the pressure ventilation ducts to function as air inlets.

There is also a risk of reverse flow of exhaust fumes. In the case of bathroom gas fires without protection, which are still popular in Poland, occurrence reverse flow of exhaust fumes may end in tragedy.

Proper selection of the chimney cap means selection of the appropriate type of the cap for a specific chimney duct: different caps are used in the case of exhaust fumes ducts and different for ventilation. The most important issue is the type of chimney cap and the materials used for its production. Caps for exhaust fumes ducts should be made of stainless steel sheets, guaranteeing durability and resistance to damaging remains of the combustion process. The cap made of zinc-plated steel assembled on a smoke chimney will not last longer than one heating season and then it will burn through or corrode, which in turn results in blocking the fumes outlet instead of supporting the chimney draught.



Fig. 4
Roof hood VHLA

The VHLA lamella hood has a special design, providing a nice visual effect very well compose the buildings architecture. It can be used with ground heat exchangers. VHL is available in any RAL color.