

Design of radiant heating

1. Dimensioning

If radiant panels are to serve as the main source of heating, the required output is obtained from standard heat-loss calculations for individual rooms according to ČSN 06 0210 or ČSN EN 12831. With regard to the specific characteristics which radiant heating offers, it would be theoretically possible during the calculations to lower the losses from glass surfaces by approx. 10% and the norm-recommended temperature in the rooms by about 2°C. In reality, however, it is recommended that the installed wattage be greater than that suggested by the heat loss calculations by 15-20% in order to speed up the dynamics of the heating system start-up. For zone (spot) electric radiant heating it is possible to apply ČSN 06 0215, the validity of which was revoked on 1.11.2000 without the norm's replacement. Despite this fact, the rules prescribed by this norm can still be used as guidelines.

2. Placement of heating elements

Radiant heating panels are preferably placed on (or sometimes within) the ceiling structure, and always in such a way that their output is in proportion to the individual surfaces to be heated – the larger the floor area, the larger the area covered by heating panels – it is more advantageous to use more panels with lower output and thus equally cover the heated space, than to concentrate the output in a smaller number of more powerful heating panels. The distance from vertical constructions should be not less than 0.6 - 1 m, and it is necessary to keep to the minimum installation height in relation to the output of the radiant panels.

Heating panels can also be placed at an angle (directing the flow of radiation), or in a vertical position upon a side wall. A vertical position increases the convection element, however – the amount of output energy, or the efficiency of the panel does not change, but there is a percentual decrease in the conveying of heat via radiation and an increase in convection. The increase in the convection element has a beneficial influence on the start-up dynamics, but a disadvantage is that there is an increase in the difference between the temperature of the air by the floor and that under the ceiling. During vertical installation, low-temperature radiant panels are placed just like normal radiators i.e. the lower edge is around 20 cm above the floor.