

# Zehnder Carboline Radiant Heating and Cooling Ceiling Panels



Heating

Cooling

Fresh Air

Clean Air



## Highly energy efficient with even heat distribution

Zehnder Carboline is an elegant and innovative response to modern indoor climate control requirements. The high and even surface temperature, a product of the thermal conductivity of the graphite layer, is considerably more energy efficient than conventional systems.

- Capital cost savings up to 30%
- Energy cost savings up to 20%
- Unrivaled reaction time
- Tool-less, solder-free connection hoses
- Smooth or perforated surface styles
- 5 year warranty

This high performance system can be easily and practically integrated into new or existing grid and suspended ceilings.

Zehnder Carboline sets new standards for radiant heating and cooling ceiling panels in terms of performance, temperature distribution and controllability.

What distinguishes Zehnder Carboline from other ceiling-mounted systems? Expanded natural graphite. The excellent thermal conductivity properties guarantee an extremely even distribution of temperature for cooling or heating loads and produce a much higher radiant component than comparable ceiling-mounted systems. Carboline panels can exchange 95% of the heating and cooling energy from the water running through the copper tubes whereas a standard panel can only achieve 84%.

The main areas of application are:

- Offices
- Schools
- Hospitals
- Sports facilities
- Meeting rooms
- Operating rooms

## Benefits

### Technology and performance

- Very high heating/cooling output
- Extremely quick reaction time to temperature changes
  - Low storage mass
  - Good thermal conductivity
- Lower heating and higher cooling flow temperatures further enable the use of alternative energy sources
  - Solar cells and heat pumps for heating
  - Ground water for cooling
- Simple and quick installation

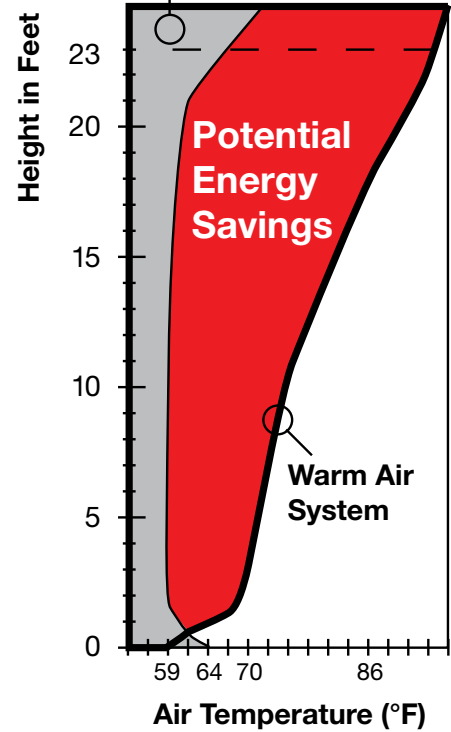
### Economic efficiency

- Cooling and heating with a single system
- High energy savings due to the radiation principle
- Low investment/operating costs
- Long service life

### Comfort and health

- No drafts or dust dispersal
- Even heat distribution
- Virtually silent operation
- Optional perforated design for acoustic absorption

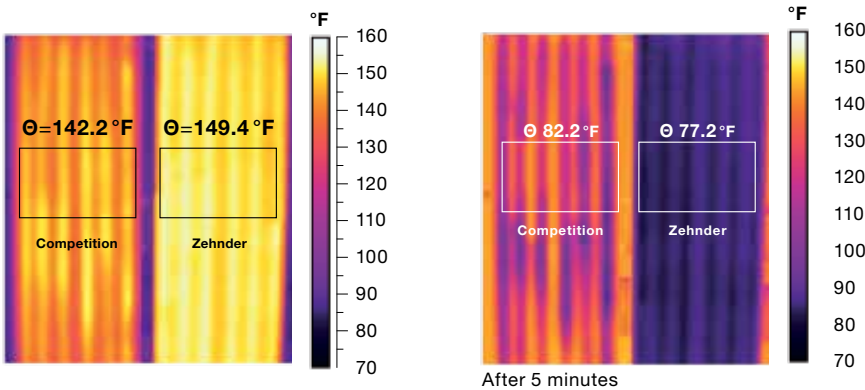
## Radiant Ceiling Heating



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## Thermographic Comparison

Thermographic imaging shows the comparison between Zehnder Carboline and a competing product, both exposed to the same temperature and mass flow.



$\Theta$  = average surface temperature

