Plasterboard radiant ceiling

Radiant Systems

Testing procedure for plasterboard radiant ceilings

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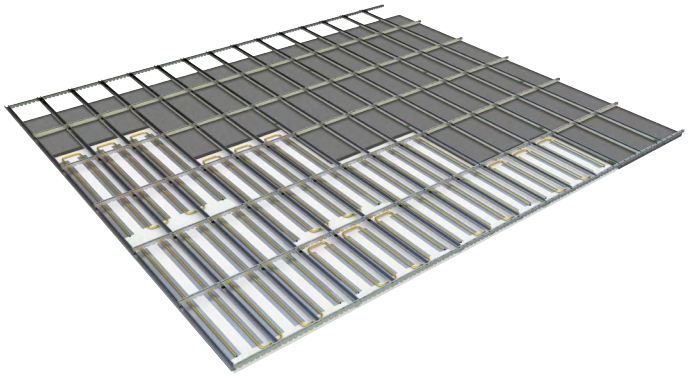

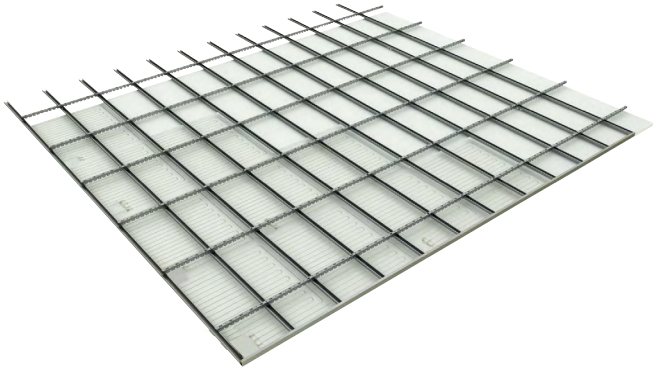

Radiant ceiling system

Modular radiant drop ceiling with plasterboard surface finish, particularly fit for heating and cooling of residential buildings, reception structures such as hotels, guest houses, schools and, more generally, buildings requiring civil-finish ceilings.
From a construction standpoint, the system is made by active and inactive plasterboard panels, sheet steel bearing structures and a suspension system with rigid droppers for flawless planarity and horizontality of the ceiling.
The two types of activations meet various thermal output needs.

• Panels **GKC** include:
- plasterboard sheet
- aluminum sheet working as anti-steam barrier
- activation with anodized aluminum thermal diffusers
- circuit with copper pipe coil
- thermal insulation layer

• Panels **GKS** include:
- plasterboard sheet
- circuit with PEX pipe coil
- thermal insulation layer

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Hydraulic testing procedure

As for all fluid-based installations, radiant systems must be hydraulically tested after installation and before use.
The testing stages given below must be followed strictly:
1) pressure sealing test with air;
2) pressure sealing test with room-temperature water;
3) pressure sealing test with heated water;
4) pressure sealing test with refrigerated water.

NOTE. Testing procedures 1) and 2) are essential.
Testing procedures 3) and 4) are strongly recommended as they expose the system components to a temperature cyclic test that ensures very high safety levels. During test 3 or 4, we recommend full thermal vision of the system to verify the compliance of the ceiling surface temperatures.

1) Pressure sealing test with air
After connecting the single panels of a series and the power lines, we recommend carrying out an initial sealing test with air compressed at least at 4 relative bar (if a compressor with enough power is available, perform the test with a working nominal pressure of 6 bar). All loops of the radiant ceiling must be tested for sealing.
For proper testing, shut off the automatic air vents and supply one installation circuit at a time.
In case of localized leaks within a loop, shut off the ball valves on the supply line, identify the leak and solve the problem.
The pressure sealing test with air can be carried out both on closed-loop and open-loop panels.
Tested circuits must be pressurized for at least 24 h; after that, vent the air to reset the circuits on atmospheric pressure.

2) Pressure sealing test with room-temperature water
After supplying all main distribution lines with room-temperature water and venting the air, fill the radiant circuits one by one giving the air inside the loops enough time to be discharged from the automatic vents.
When all circuits are filled with water, increase pressure to working value making sure there are no leaks.
Then start the system circulators to remove the remaining air bubbles from the circuits.
To properly carry out this operation on large systems, first perform an approximate balancing of the loops to prevent water circulation only in those with reduced losses of pressure and reduced or no circulation in those with larger losses of pressure.
When the air has been completely vented from the system (after about 24 h), stop the circulators and increase the pressure by 1.5 times the working pressure, with a minimum of 6 bar (UNI 9182 27.2.1).
The system must be set under such conditions for at least 24 h while monitoring the circuit sealing.
In case of localized leaks within a loop, shut off the ball valves on the supply line, identify the leak and solve the problem.
Once the testing cycle is completed, set the pressure on the working value.

3) Pressure sealing test with heated water
Maintain the system pressure on the working value with circulators ON, increase the water temperature slowly to 40 °C and leave the system running for 24 h.
Then, while the circulators are still ON; let the water cool down to room temperature.
This procedure is generally carried out on closed loops.
The purpose is to make sure water flows inside all loops connected to the main supply network and have the pipes and connections undergo a heating thermal cycle to eliminate installation stresses and stabilize the couplings.

4) Pressure sealing test with refrigerated water
Maintain the system pressure on the working value with circulators ON, increase the water temperature slowly to 12 °C and leave the system running for 24 h. Then, with circulators still ON, let the water cool down to room temperature.
This procedure is generally carried out on closed loops.
To prevent condensation on the panel surface during this test, the installation room should have low absolute humidity values.
With high humidity values providing dew-points exceeding 13 °C, we recommend turning ON the air treatment machines to control and maintain room humidity on values that prevent surface condensation.

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Smaltimento imballo. Scatole in cartone: raccolta differenziata carta. Sacchetti in plastica e pluriball: raccolta differenziata plastica.

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