
CHANGE TYPE: Addition

CHANGE SUMMARY: This is a new requirement, for all radiant floor slabs. The R-3.5 minimum corresponds to **Table C403.2.8 MINIMUM PIPE INSULATION**, up to 1½ inches (105°F to 140°F).

See Figure **C402.2.8**.

2012 CODE: C402.2.8 Insulation of Radiant Heating Systems. Radiant panels, and associated U-bends and headers, designed for sensible heating of an indoor space through heat transfer from the thermally effective panel surfaces to the occupants or indoor space by thermal radiation and natural convection and the bottom surfaces of floor structures incorporating radiant heating shall be insulated with a minimum of R-3.5 (0.62 m²/K × W).

CHANGE SIGNIFICANCE: Where a radiant heating system is incorporated into a heated slab, both:

- The perimeter insulation requirement found in Section C402.2.6, which has an exception for floors where the slab is greater than 24 inches below exterior finished grade
- The requirements of this section, which does NOT have an exception, need to be applied together

Although it has always been good practice to insulate under radiant floor slabs, this is the first time that the IECC has codified this as a requirement.

This is an excellent opportunity to discuss three seemingly similar—and potentially confusing—terms:

1. **Slab on grade.** The slab is in contact with the ground, regulated by C402.2.6.
2. **Heated slab.** Slab-on-grade construction in which the heating elements, hydronic tubing, or hot air distribution system is in contact with, or placed within or under, the slab.
3. **Radiant panel.** Floor, wall, or ceiling assemblies designed for sensible heating of indoor space. The structure of the panel may, or may not, be a slab; radiant slab panels are regulated by C402.2.8.

C402.2.8 continues

C402.2.8

Insulation of Radiant Heating Systems

C402.2.8 continued

It is possible to design and build an assembly classified by any, some, or all of these terms. Please refer to the example table below:

Slabs Summary Table

Assembly Description	Slab-on-Grade Required to Comply with C402.2.6	Heated Slab Required to Comply with Heated Slab in TABLE 402.1.2 or TABLE 402.2	Radiant Panel Required to Comply with C402.2.8
The panel is: <ul style="list-style-type: none"> • a slab in contact with the ground • less than 24" below exterior grade • designed for sensible heating of indoor space 	Yes	Yes	Yes
The panel is: <ul style="list-style-type: none"> • a slab in contact with the ground • more than 24" below exterior grade • designed for sensible heating of indoor space 	No	No	Yes
The panel is: <ul style="list-style-type: none"> • a slab NOT in contact with the ground • designed for sensible heating of indoor space 	No	No	Yes
The panel is: <ul style="list-style-type: none"> • a slab in contact with the ground • heating elements, hydronic tubing, or hot air distribution system is in contact with, or placed within, or under the slab • NOT designed for sensible heating of indoor space 	Yes	Yes	No
The panel is: <ul style="list-style-type: none"> • a slab in contact with the ground • heating elements, hydronic tubing, or hot air distribution system is NOT in contact with, or placed within, or under the slab • NOT designed for sensible heating of indoor space 	Yes	No	No
The panel is: <ul style="list-style-type: none"> • NOT a slab • designed for sensible heating of indoor space 	No	No	Yes
The panel is: <ul style="list-style-type: none"> • NOT a slab • NOT designed for sensible heating of indoor space 	No	No	No