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# RAUPLATE™ RADIANT HEATING SYSTEMS

Heat Transfer Plate

Product Instructions

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# SCOPE

This guide provides instruction regarding installation of RAUPLATE™ heat transfer plates. RAUPLATE may only be installed by an appropriately licensed installer of radiant heating systems.

Design considerations are not covered. This guide assumes the installer has already been provided with a REHAU radiant heating system design or approved equivalent in accordance to REHAU's *Radiant Heating Systems Design Guide*.

The contractor should also review the REHAU *PEXa Limited Warranty* and pertinent REHAU *Technical Guidelines* prior to installation of a REHAU hydronic system. Contractors should also check the REHAU Resource Center ([na.rehau.com/resourcecenter](http://na.rehau.com/resourcecenter)) for the latest updates to REHAU *Technical Guidelines*.



This symbol and the signal words DANGER, WARNING or CAUTION alert you to personal injury hazards. If you don't avoid the hazardous situation:

- DANGER! Will result in death or serious injury
- WARNING! Could result in death or serious injury
- CAUTION! Can result in minor or moderate injury

The signal word NOTICE is used to help you avoid property damage. We cannot warn of all hazards; you must also use your own good judgment.

## About RAUPLATE Heat Transfer Plates

RAUPLATE heat transfer plates are used in radiant floor heating systems to efficiently and evenly distribute the heat from the RAUPEX pipe into the room above. Plates are installed below the subfloor in the joist space of a wood frame structure. RAUPLATE securely holds two pipes at 8 in (20 cm) on center which is well suited for many residential new construction and retrofit projects.

**NOTICE:** Excessive temperatures can overheat and damage the floor structure and coverings leading to discoloration, delamination, warping, cracking or deterioration.

- The plates must be installed in accordance to a properly specified radiant heating system design
- Verify floor products are approved for use with radiant heating systems
- Check floor temperatures are within the limitations set by the manufacturer of the floor coverings, underlayments, adhesives and grouts

## System Components

The RAUPLATE system is comprised of:

- 1/2 in. RAUPLATE Heat Transfer Plates
- 1/2 in. RAUPEX® O<sub>2</sub> Barrier Pipe (see note below)
- PRO-BALANCE® Brass Heating Manifold
- 1/2 in. R20 Brass Manifold Outlets
- Universal Fixing or 1/2 in. RAILFIX Rails
- PE Protection Sleeves (appropriately sized)

See the REHAU *Sustainable Building Technology Product Catalog* for a detailed description of each system component.

Note: UV Shield and Non-Barrier RAUPEX pipe may be used with radiant heating systems in conjunction with non-ferrous components.

## Additionally, the installer will need:

- Radiant heating system design
- 6 screws per plate and 3 screws per cut length of fixing rail (recommend #10 combo hex/Phillips head screws with sharp point; lengths not to exceed subfloor thickness)
- Cordless drill
- Hex driver for drill to secure screws
- Drill bit for drill to bore holes in joists
- Sheet metal snips
- Marker
- Deburring tool
- Work gloves
- Safety glasses
- Tape measure
- RAUPEX pipe cutter
- Uncoiler

# RAUPLATE TECHNICAL DATA

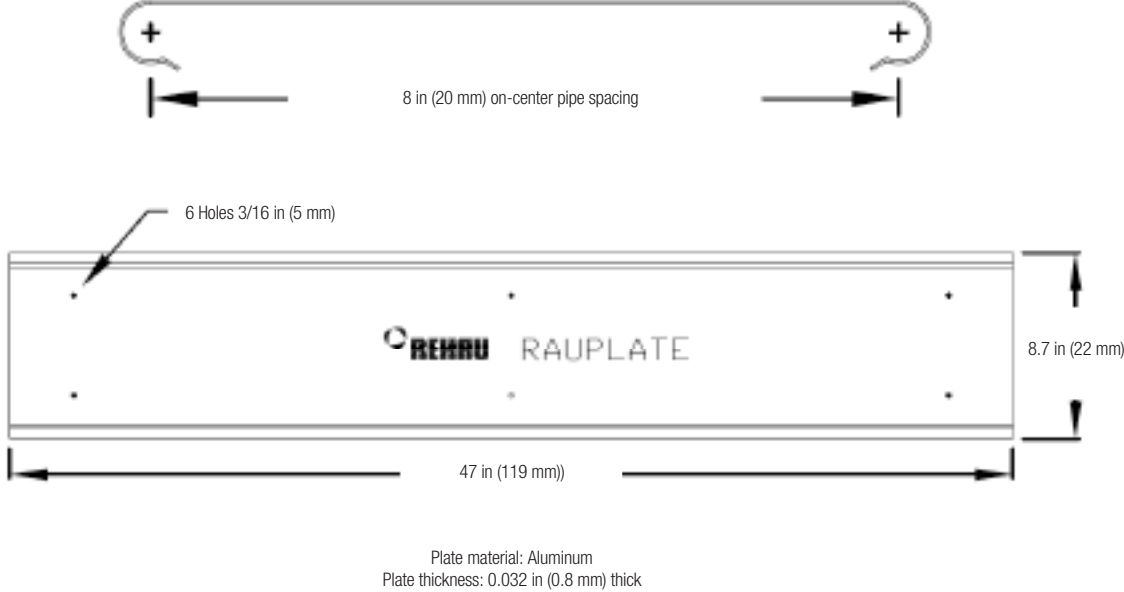


Fig. 1: Plate dimensions and material (diagrams not to scale)

# INSTALLING RAUPLATE



Fig. 2: Underside of joist space construction

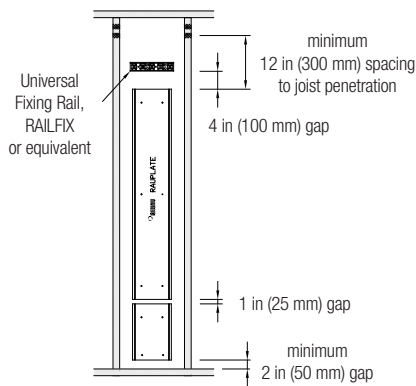


Fig. 3: Plate spacing

This instruction describes the installation of the RAUPLATE system in a residential building with standard wood joists spaced 16 in (40 cm) on center.

1. Ensure site conditions are suitable for the installation of joist space heat transfer plates – clear space to work, stable elevated support to stand on, and underside of subfloor flat and even. Protrusions through the subfloor such as nails or screws need to be cut flush to the subfloor surface before beginning the installation.
2. Install PRO-BALANCE manifold according to the design and ensure compatibility with site conditions. Refer to REHAU *PRO-BALANCE Manifold Product Instructions* and REHAU *Radiant Heating System Design Guide* for directions on placement and installation.
3. Plan and mark the joist penetrations according to the design, making necessary corrections for the site conditions. This will allow pipes to pass between joist bays.
4. Begin attaching the plates to the underside of the subfloor according to the design. Use 6 screws per plate. Plates must be parallel and aligned.

**⚠ CAUTION:** Must use eye protection when working overhead. Foreign particles can cause eye damage.

**⚠ CAUTION:** Must use work gloves when handling plates and installing pipes to plates. Unprotected hands can be cut by sharp edges.

The following spacing guidelines should be followed when installing plates:

- Plates should be fixed a minimum distance of 12 in (300 mm) from the holes in the joist where the pipe enters and leaves the joist bay
- A minimum gap of 1 in (25 mm) between plates (lengthwise)
- A minimum gap of 2 in (50 mm) from plate to end of joist bay where pipe does a 180° bend

When cutting plates to length, see the section CUTTING RAUPLATE.

5. Cut the fixing rail to size using pipe cutters or shears. Typically 10 in (250 mm) lengths are suitable. Locate rail 4 in (100 mm) from the plate. Ensure the clips on the fixing rail are aligned with the pipe channels of the plates.

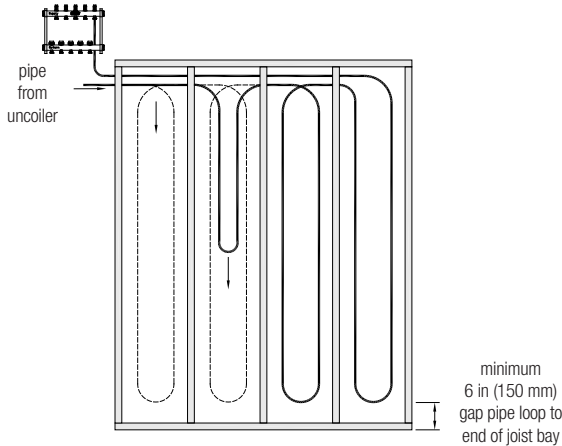


Fig. 4: Pulling pipe circuit  
(RAUPLATE and fixing rail not shown)

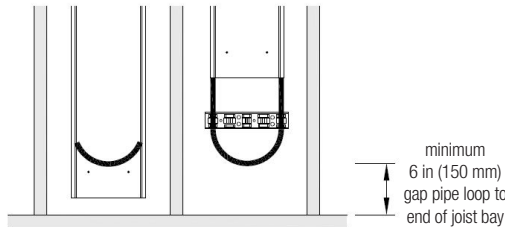


Fig. 5: End loop --preferred method (left) and alternate (right)

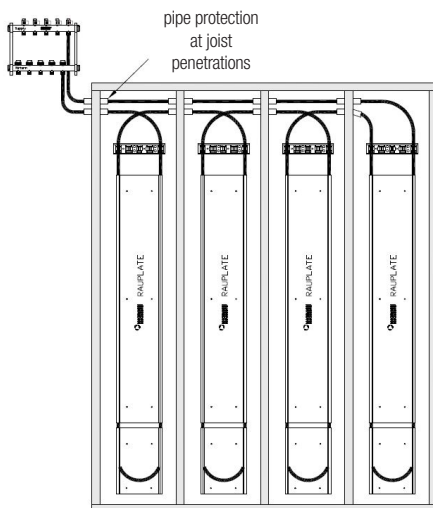


Fig. 6: Typical REHAU RAUPLATE system 8 in (20 cm) on center

6. Before preparing the joist penetrations, visually walk the layout from the supply side of the manifold through the circuit and back to the return side of the manifold ensuring joist penetrations are in the correct locations. Normally, the center 1/3 of a standard wood joist is the best place for drilled holes, as this is the least stressed part of this joist type.

**Note:** Must check with building owner, joist manufacturer and local code officials before drilling or notching a joist to ensure the penetrations, and their size/shape/location, are acceptable.

7. Prepare the joists according to the plan from the previous steps to allow pipes to pass through joists. Bore holes in standard wood joists with a 1 in (25 mm) drill bit for a single 1/2 in RAUPEX pipe to pass through. This hole size allows clearance to install a PE Protection Sleeve later in the installation. Alternatively, it is acceptable to run several pipes through a larger common hole. See the REHAU *Sustainability Building Technology Product Catalog* for bore hole sizing to accommodate larger PE Protection Sleeving.

8. The circuit can now be installed according to the diagrams (see Fig. 4 to Fig. 6). Bends should be carefully formed at the pipe entry/exit points and at the end of the joist bay to prevent kinking. Should a pipe become kinked, see the section REPAIRING KINKS IN RAUPEX .

- 8.a. Thread the pipe from the uncoiler through the holes in the joists.
- 8.b. Thread the pipe back through the remaining holes in the joists and connect pipe tail to manifold. Refer to REHAU PRO-BALANCE Manifold Product Instructions for properly connecting the pipe to the manifold.
- 8.c. Start in the joist bay with the secured tail of pipe. Typically this is the farthest joist bay from the manifold.
- 8.d. Pull enough pipe into the joist bay.
- 8.e. Cross the pipes as they are entering and leaving the joist bay. This allows for a larger bending radius.
- 8.f. Push the pipe into the clip of the fixing rail, then into the channel of the plate.
- 8.g. Loop the pipe at the end of the joist bay. See Fig. 5 for two different methods of securing the return loop.
- 8.h. Push the pipe into the opposite channel of the plate and into fixing rail clip.
- 8.i. Secure the remaining loops following steps 8.d-8.h.



8.j. Connect the remaining pipe tail to the manifold.

**WARNING:** Building codes require installation of an approved firestop system where pipes penetrate a fire-rated assembly. Fire or smoke that is not contained may lead to death or serious injury. The installer must determine suitability of the intended firestop system and the installer must seek on his own licensed professional advice for any particular project. The authority having jurisdiction should review and approve the firestop system prior to installation.

9. Where pipe passes through holes in joists refer to REHAU *Radiant Heating System Design Guide* for acceptable pipe protection methods to prevent abrasion and minimize noise.
10. Test the system. See section PRESSURE TESTING THE SYSTEM.
11. Insulate the joist bay. See section INSTALLING INSULATION.
12. Install caution labels at each manifold and other locations as appropriate to act as notification that radiant heating pipes are installed under the floor. Should a nail or screw from the flooring above damage the pipe inside a RAUPLATE, the section of damaged pipe must be replaced. See section REPAIRING RAUPEX IN JOIST SPACES.

**NOTICE:** The pressure test should be repeated during the installation of the finish floor coverings. Nails or screws that contact or penetrate the pipe may damage the pipe resulting in leaks and operational failure.

# CUTTING RAUPLATE

The plate can be easily trimmed to length by cutting a notch into both channels, bending the plate until it separates into two pieces, and then cleaning up the cut edges with snips and a deburring tool or file before fitting any pipe.

**⚠ CAUTION:** Wear safety glasses and work gloves when cutting plates. Foreign particles can cause eye damage and unprotected hands can be cut by sharp edges.

1. Mark the plate evenly on both side.



2. Rough cut V-shaped notches in the channels.



3. Bend over a straight, solid edge (e.g., a step of a ladder is a good bending surface).



4. Reverse the fold back and forth until the plate separates into two pieces.



5. Finish cut the channels in the plates to remove any deformation, sharp corners and rough edges.



6. Deburr all cut edges with deburring tool or round rat tail file.



## PRESSURE TESTING THE SYSTEM

Pressure test must be performed on the system to ensure the RAUPEX pipe and connections are leak-free. Local jurisdictions may have additional testing requirements.

The pressure test must be performed immediately after installation of the pipe in the plates. The system is filled with water and pressurized to 1.5 times the operating pressure or 100 psi (6.9 bar), whichever is greater.

**NOTICE:** If there is a chance that the water could freeze, use a water/glycol mixture when filling the system, or perform an air test. Frozen pipes may burst resulting in leaks and operational failures.

Refer to the REHAU *Radiant Heating Installation Guide* for instructions on performing the purging and pressure testing.



# REPAIRING RAUPEX IN THE JOIST SPACE

Fold back the plate in the affected area and install a F2080 compression-sleeve coupling. Refer to the REHAU *Radiant Heating Installation Guide* for detailed instructions on assembling these fittings. Sleeve the coupling with RAUCROSS Heat Shrink to minimize noise and the potential for galvanic corrosion of dissimilar metals. Secure the coupling tight to the subfloor using talon clips to minimize noise. Repeat the pressure test to ensure the connection is leak free.

# REPAIRING KINKS IN RAUPEX

RAUPEX pipe is flexible and resists kinking even at temperatures well below freezing. Should the pipe become accidentally kinked, it is possible to restore the pipe to its original shape. Refer to REHAU *Radiant Heating Installation Guide* for detailed instructions on pipe repair of kinks.

# INSTALLING INSULATION

To ensure thermal comfort of the room occupants, proper operation of the system and efficient use of energy, the joist space must be insulated after completing the installation and pressure testing of the RAUPLATE system. Install insulation with a 2 to 4 in (5 to 10 cm) air gap between the pipe and the top of the insulation. Ensure there is no air infiltration into this air gap where heat would escape by sealing leaks and insulating ends of joist bays. Always follow local codes to ensure compliance with insulation minimums. Insulation of R-19 above heated spaces and R-30 above unheated spaces to direct heat upward is recommended.

For updates to this publication, visit [na.rehau.com/resourcecenter](http://na.rehau.com/resourcecenter)

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