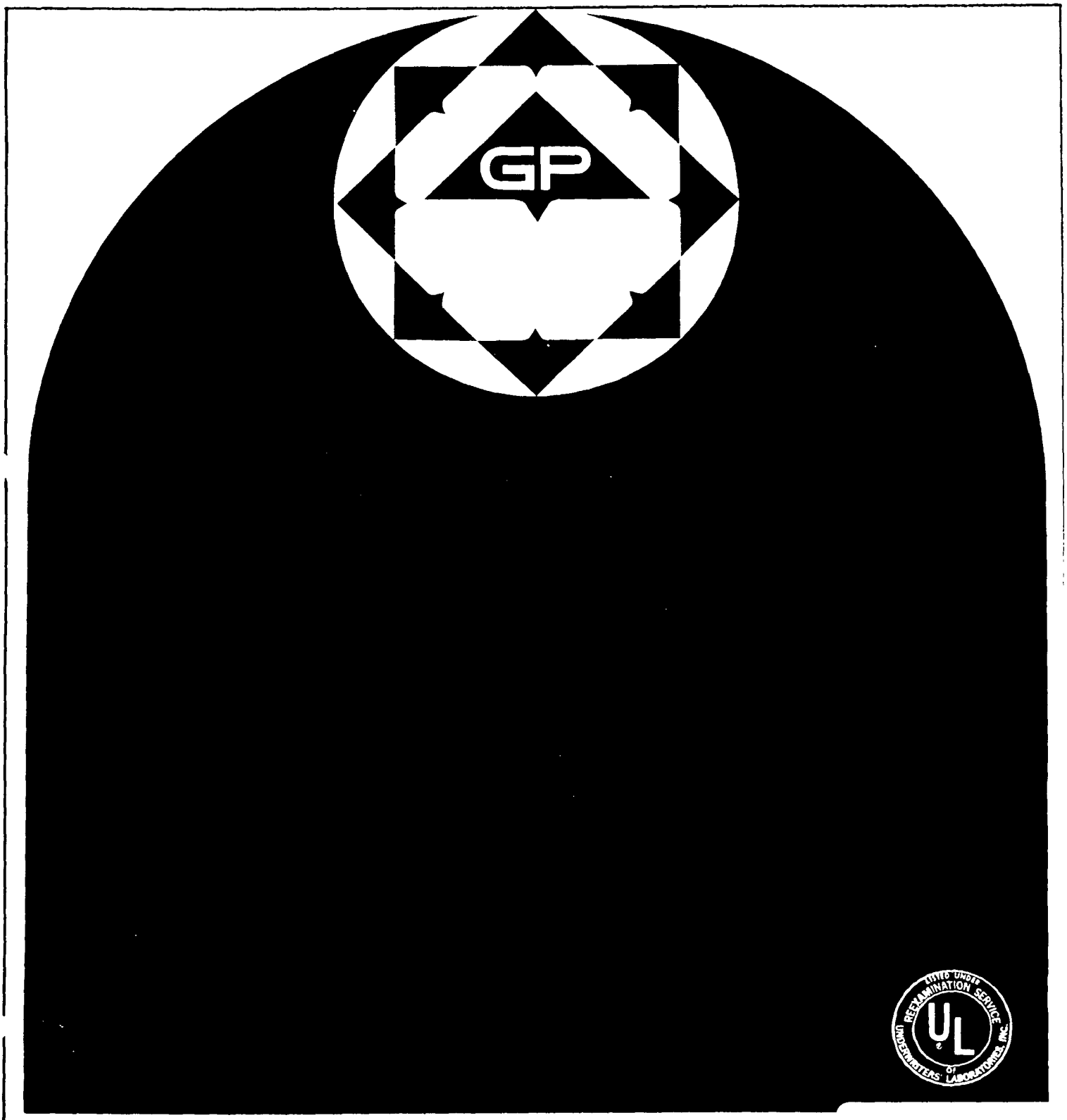
PLAINTIFF'S EXHIBIT

GP-1102

COMPLETE CEILING AND HEATING SYSTEM IN ONE INSTALLATION

RADIANT HEAT PANEL



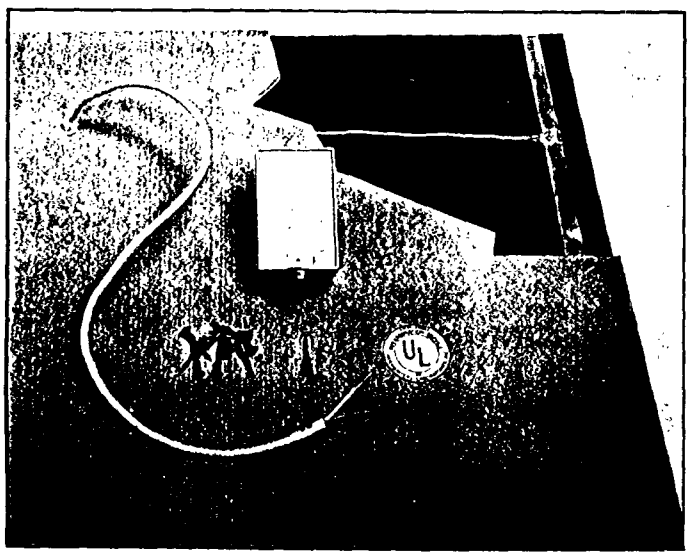
SGP 0025612

GEORGIA-PACIFIC / GYPSUM DIVISION

RADIANT HEAT PANEL

A new system that provides a complete ceiling and a uniform, low temperature, electrical radiant heating system in one installation.

- Underwriters Laboratories listed.
- NEW conductive Temsheet® provides a uniform and consistent heat source.
- Only one layer to install.
- Factory laminated construction, provides a strong, rugged panel.
- Easily field cut to length. . . . The 4′ wide half-conductive panel with a 2′ wide heating surface is easily field cut to width or length.
- Lighting fixtures may be readily installed.



DESCRIPTION

The basic panel consists of the conductive Temsheet between two layers of special gypsum wallboard. The conductive Temsheet is the heating element. The face layer of wallboard is ¼″ thick and the back layer is ⅜″ thick. The electric current is supplied through two copper electrodes which run the full length of the panel. A lead wire (pigtail) is attached to each copper electrode and runs through the back side of the panel. The pigtail (at least 12′) is coiled onto the back of the panel ready for connection to the electrical supply and thermostat. Georgia-Pacific insulated nails and thermostats are available as part of the package.

®*Registered U. S. Trademark of Armstrong Cork Company.

TECHNICAL DATA

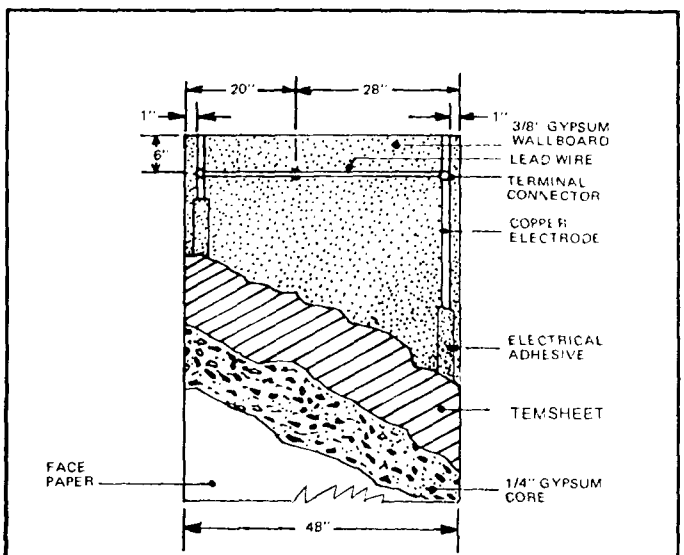
Thickness—⅝″ (¼″ and ⅜″ laminated).

Sizes—4′x6′, 4′x8′, 4′x10′, 4′x12′—available in both the full-conductive and half-conductive panels.

Heat Output—Produces 15 watts or 51 B.T.U.'s of heat per square foot at 240 volts.

Standards—Underwriters' Laboratories listed under Cat. No. P4-240-60 and P2-240-30. Conforms to the requirements of the National Electrical Code.

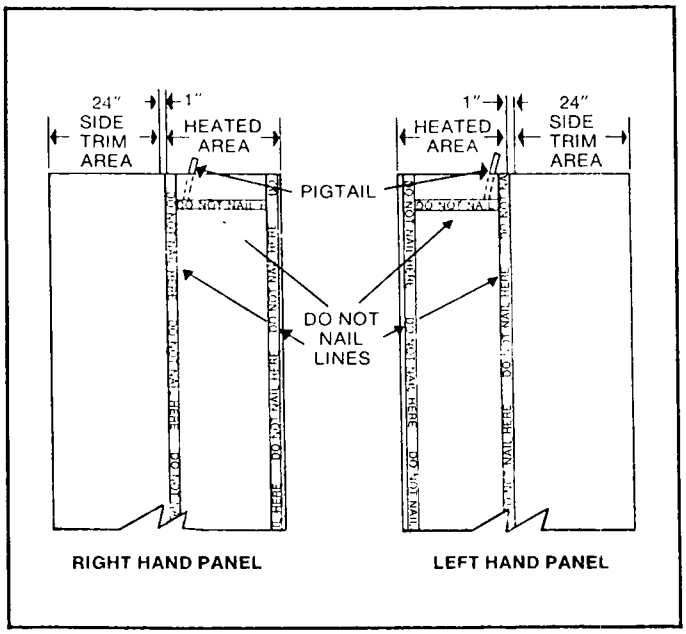
Offers *flexibility* not previously available in this type of heating system . . . easier installation, less waste and lower installed cost.



SGP 0025613

Full-Conductive Panel (P4-240-60)
Easily field cut to length. The full 4′ wide conductive panel is for use in the main, standard dimension, room ceiling areas.

Half-Conductive Panel (P2-240-30)
Easily field cut to width and length. The half-conduc-



tive panel is for use in hallways or odd dimension rooms. This is available in a "Right Hand" and "Left Hand" panel.

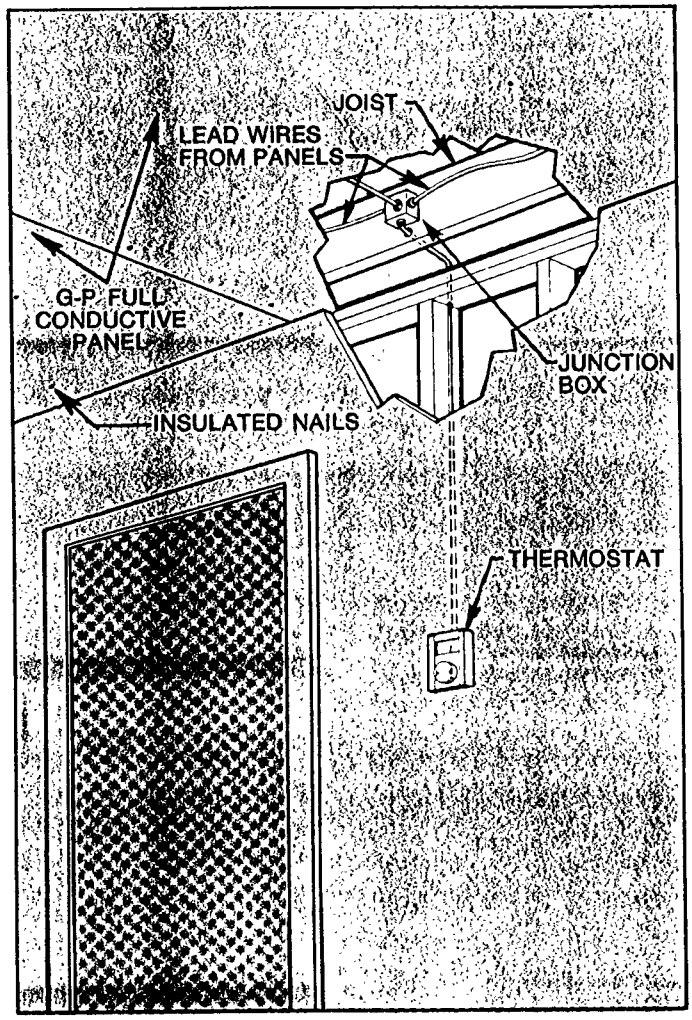
FINISHING THE RADIANT CEILING

The electrical current to the ceiling panels should be turned off one hour prior to applying joint treatment products. Use conventional drywall taping and finishing methods. **Do not turn on electric current until the joint treatment is thoroughly dry.** Embed G-P wallboard tape with G-P Triple Duty or Ready Mix Compound. Apply two finishing coats of Triple Duty or Ready Mix Compound. The electrical current should be turned off one hour prior to painting and remain off until surface is thoroughly dry. Use of a high quality primer/sealer is recommended. A high quality interior finish paint is recommended for the final decorating.

PRECAUTIONS

1. Make only one cutout for light fixtures in an 8′ panel and only two cutouts in larger panels. Space cutouts at least 6″ from panel ends and edges.
2. Trim panels with a hand or reciprocating saw.
3. Attach panels only to wood framing or furring with G-P insulated nails.
4. Do not nail into the "no nail" line marked over the copper electrodes 1″ from the edges and over the pigtail leads 6″ from one end.
5. Do not use any tile or acoustical finishes on the panels.
6. Do not exceed maximum frame spacing of 24″ o.c.
7. Do not use radiant heat panel cutoff pieces as filler board.
8. Do not operate panels until joint treatment is thoroughly dry. The use of panel heat to accelerate drying of the joint treatment may result in cracked joints.
9. Do not install G-P radiant heat panels in closets, over walls or partitions that extend to the ceiling, or over wall hung cabinets.

TYPICAL RADIANT HEATING CEILING INSTALLATION



SPECIFICATIONS

SCOPE

These specifications cover the installation of G-P radiant heat panels. References concerning the panels should also be made in the electrical, insulation, roofing, walls and ceiling sections.

PLANNING

Some preliminary work will result in the most satisfactory performance of the G-P radiant heat panels. The structure should be well insulated. It is recommended that there be at least 6 inches of mineral insulation in the ceilings, 3 inches in the outside walls and 2 inches under the floors. The heat losses for each room and the entire structure should be calculated in accordance with methods recommended in the ASHRAE handbook.

GENERAL CONDITIONS

The framing and electrical installation shall meet the minimum requirements of FHA, National Electrical Code, and the local building codes.

The panels shall be installed by a G.P. licensed contractor (usually drywall). He will furnish all materials and labor and be responsible for the complete installation. The calculation of the heat loss and the planning of the panel installation shall also be the contractor's responsibility.

All panels and accessory products shall be delivered to the job in good condition. If necessary, heat or ventilation or both shall be provided to maintain a temperature of not less than 40° F and to prevent excessive dampness.

The installation of G-P radiant heat panels and auxiliary products shall be in conformance with the printed instructions prepared by Georgia-Pacific Corporation.

MATERIALS

1. **G-P Full-Conductive Panel (P4-240-60)**
   5/8" thick, 4' wide and in 6', 8', 10' and 12' lengths.*
2. **G-P Half-Conductive Panel (P2-240-30)**
   5/8" thick, 4' wide and in 8', 10' and 12' lengths.*
3. **Insulated Nails**
   1½" with red plastic shields.
4. **Filler Board**
   Regular G-P 5/8" wallboard for unheated ceiling areas.
5. **Joint Finishing Products**
   G-P paper joint reinforcing tape and either G-P Triple Duty or Ready Mix Joint Compound.
6. **Thermostats**
   M7 single line break, M7D double line break or M75 two stage.
7. **Exhaust Fan**
   For humidity and air circulation (furnished by others).
8. **Humidstat**
   For humidity control (furnished by others).
9. **Electrical Materials**
   Junction boxes, branch circuits and other electrical components shall be furnished by others. These products shall conform to local codes and be installed in conformance with the National Electrical Code.

Standard pigtail length is 12', but longer lengths are available.

G-P PANEL INSTALLATION DETAILS

The G-P radiant heat panels shall be applied to the ceiling framing members and attached with insulated nails spaced 8" o.c. The nails may be driven through any part of the panel except the areas where the copper electrodes are located. These areas are identified by a "no-nail" legend. Use full panels wherever possible. Both full-conductive and half-conductive panels may be cut to length by using a saw. Only the half-conductive panels may be trimmed to width which is accomplished by trimming the unheated half (24-inch maximum) as required. Cutouts for lighting fixtures may be made in the field of the panel, but never where the electrodes are located (no-nail lines). Allow at least an 8" clearance around lighting fixtures or other electrical fixtures. A 2" clearance is sufficient for other openings. Never make more than two cutouts in larger panels. Cutouts must be located at least 6" from end and edges of panels. Space panel ends and edges ½" from sidewalls. This can be accomplished by installing the boards on the walls first or by shimming with small scraps of board. The ceiling area not covered by G-P radiant heat panel is to be filled with G-P 5/8" gypsum wallboard. Where radiant heat panel is applied to the underside of soffits, stairwells, etc., hold the radiant panel back at least one inch from the edge of the framing members and fill this in with 5/8" regular wallboard. This corner can then be protected using the normal metal bead. **Do not install G-P radiant heat panels in closets, over walls or partitions that extend to the ceiling, or over wall-hung cabinets.**

ELECTRICAL CONNECTIONS

Connect the panels in parallel to a 240 volt supply circuit. Whenever there is access to an attic space above the ceiling, attach the junction box to the joist above the insulation. When connecting panels that butt end to end, always match polarities. Locate the thermostat on an inside wall away from drafts or other heat sources, such as stoves or refrigerators. Each room should be connected on a separate circuit and thermostat.

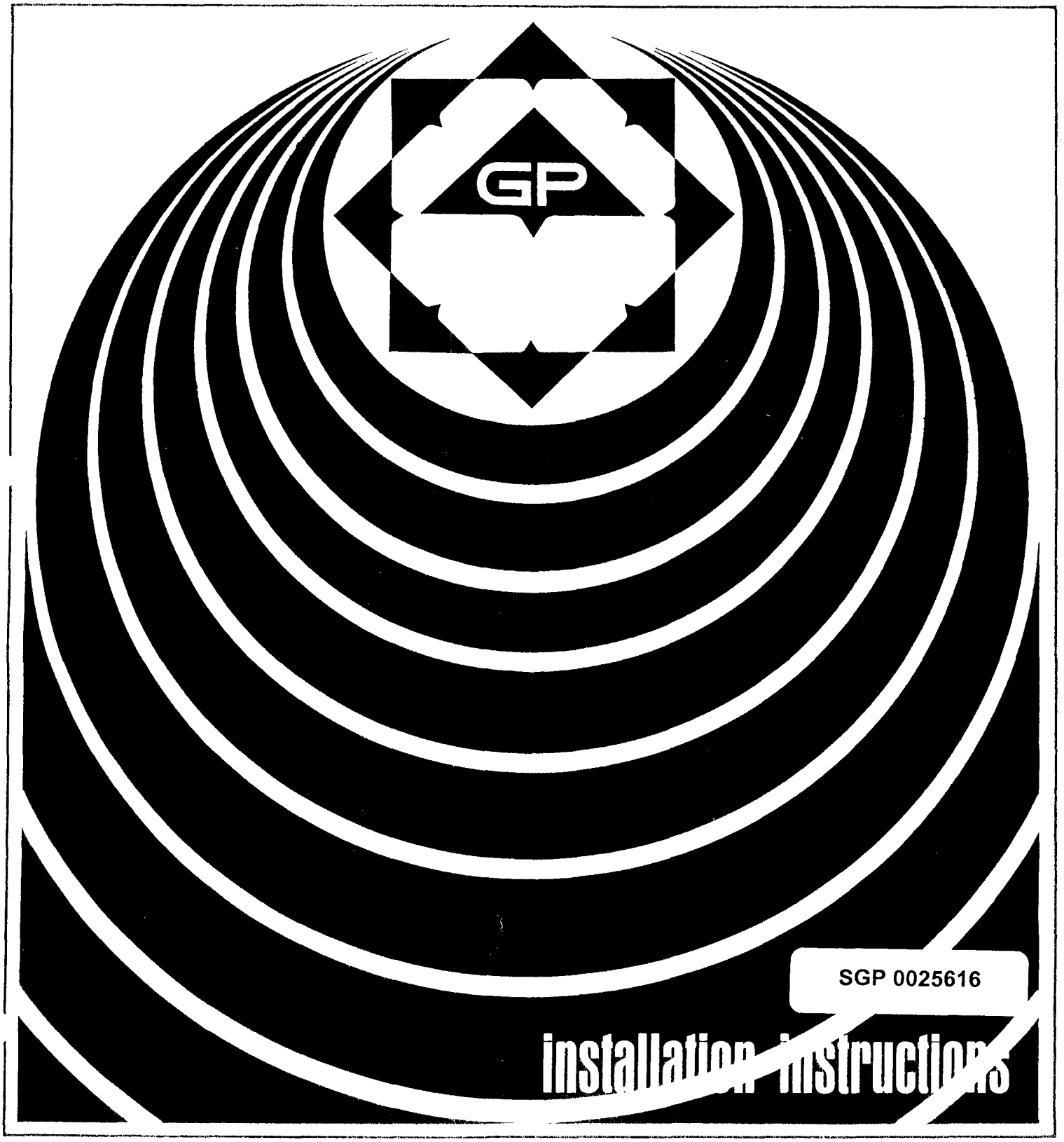
INSPECTION

The panels are all checked before leaving the manufacturing point, but they should be checked again after they are installed and connected electrically. After each room is wired, check the resistance and amperage of the complete circuit to be sure that the wiring is correct. The total resistance for the circuit should be approximately 960 ohms divided by the lineal feet of full-conductive panel and 1950 ohms divided by the lineal feet of half-conductive panel.

FINISHING

After the circuits have been checked, the joints should be taped and finished with the recommended G-P joint finishing products. Prime with a high quality wallboard primer/sealer and finish using a latex base paint or other high quality paint. Acoustical or insulating materials shall never be applied to the surface of the panels.

RADIANT HEAT PANEL



INSTALLATION INSTRUCTIONS

DESCRIPTION

Georgia-Pacific U.L. listed Radiant Heat Panels are designed to be used as a ceiling surface that provides a complete uniform low temperature electrical radiant heating system. The panels produce 15 watts or 51 BTU's of heat per square foot at 240 volts AC. They are four feet wide and come in 6, 8, 10 and 12 foot lengths. Four foot wide panels with two foot heating elements also operate at 240 volts AC.

The Georgia-Pacific Radiant Heat Panels are fabricated with self-contained lead wires. They need only be attached to ceiling framing members with special insulated nails and connected to a circuit and thermostat by the pigtail which is provided.

PANEL CONSTRUCTION (Composition)

The basic panel is a sandwich with a conductive sheet between two layers of gypsum board. The Temsheet®* is the heating element. The electric current is supplied through two copper electrodes which run the full length of the panel and are located one inch from each edge. These electrodes are attached directly to the conductive sheet by means of a special adhesive. A lead wire (pigtail) is attached to the electrodes. The face board of the panel is 1/4" thick and the back board is 3/8" thick. The pigtail protrudes through the back of the panel and is ready for connection to the supply voltage which is controlled by a thermostat.

INSTALLATION OF PANELS

1. Fitting G-P Radiant Heat Panels

Plan to use full panels whenever possible. It may be necessary to cut panels to *length* in order to fit ceiling areas. Always use the full width of the panel since any lengthwise cut will remove one of the electrodes and render the panel unuseable. Also, do not trim the panel edges beside the electrodes. If trimmed here, arcing or short circuiting may result. A special panel with a 2' wide heating element is made to fit narrow spaces such as hallways or to provide added heat in a ceiling where another full panel will not fit. These panels may be cut to any width between two feet and four feet. Cut the panel with a manual or power saw.

Cutouts may be made in panels for lighting fixtures, etc. which must protrude through the ceiling. Allow a clearance of at least 8" around lighting fixtures or other electrical devices as specified in the National Electric Code. Clearance is not needed around fixtures where the local code permits plastic fixture boxes. A 2" clearance is sufficient for other openings. Corners of all cut-outs must be rounded. It should be noted, however, that where a cutout is made there will be no heat for the full width of the panel. Therefore, where possible, try to locate heating panels to avoid ceiling fixtures or use half conductive panels, so that the fixtures occur in the non-heating half of the panel. *Never* make more than one cutout in an 8' panel. Never make more than two cutouts in larger panels. Space cutouts at least 6" from panel ends and edges.

2. Attaching G-P Radiant Heat Panels

Attach the G-P panels directly to wood framing with G-P insulated nails. Drive the nails into any part of the panel except on the NO-NAIL lines. These are located over the copper electrodes 1" from the edges and over the pigtail leads 6" from one end. Place the insulated nails 3/8" to 1/2" from edges and 8" o.c. across the board. Install the panels either perpendicular or parallel to the ceiling joists.

FIG. 1

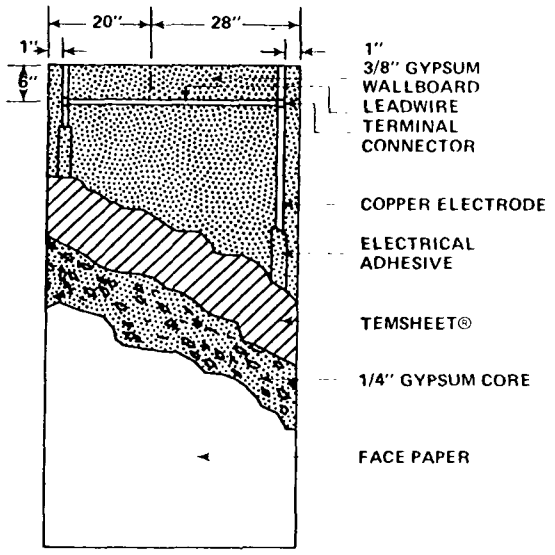
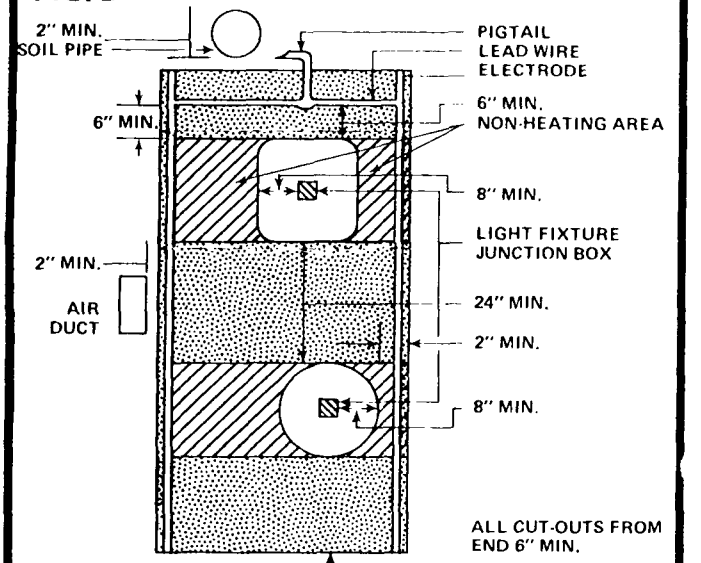


FIG. 2



*Registered Trade Mark Armstrong Cork Co.

SGP 0025617

Space the heating panel at the ends and edges at least 1/2" from the wall framing. Scraps of 1/2" or 5/8" wallboard can be used to shim out panels or gypsum board can be applied to two walls before starting the ceiling. This will insure that the heating element does not come in contact with plumbing, electrical conduit or other metal devices in the wall cavity. This shimming will remove some of the nailing surface at the end of the panel and it may be necessary to add a wood scab.

Fill the area not covered by radiant heat panel with regular 5/8" board. Do not use scraps of G-P radiant heat panel to fill in ceiling area.

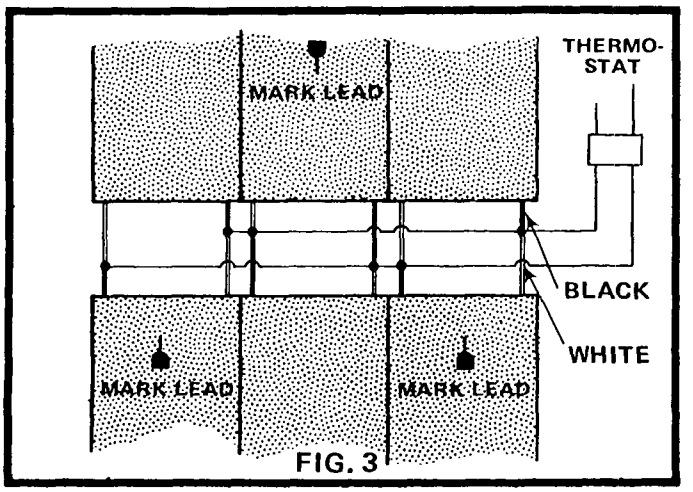


FIG. 3

ENERGIZING G-P RADIANT HEAT PANELS

1. 240 Volt Full Conductive Panels

Refer to Table "A" for electrical data regarding this panel.

All wiring is to be in accordance with the National Electric Code with particular reference to Article 424, Section E. Connect the panels in parallel to a 240 volt supply circuit. Whenever there is access to an attic space above the ceiling, install junction boxes above the ceiling insulation. When there is no access to the space above the ceiling, install the junction box in a closet or other accessible location.

When connecting panels that are adjacent or butting end to end, always match the polarities of the adjacent ends and edges. This can easily be done for any combination of panels by referring to figures 3 and 4 and using the rules listed on the next page. Figure 3 shows a schematic diagram of a typical circuit. Note that some of the panels are marked. This is to show that the leads of the panels are to be marked in some distinctive way such as with a piece of tape, crayon or tag. The other panels are unmarked so the leads are also unmarked.

TABLE A
Catalog No. P4-240-60
4' wide panel with full width element

I. 240 volts (operating voltage)

Panel Size	Watts	BTU/Hour	Current (Amps)	Resistance (Ohms)
4 x 8	480	1640	2.0	120
4 x 10	600	2040	2.5	96
4 x 12	720	2450	3.0	80
Per Lineal Ft.	60	204	0.25	960*

II. 220 volts (operating voltage)

Panel Size	Watts	BTU/Hour	Current (Amps)	Resistance (Ohms)
4 x 8	400	1360	1.8	120
4 x 10	500	1700	2.3	96
4 x 12	600	2040	2.7	80
Per Lineal Ft.	50	170	0.23	960*

*To calculate resistance for odd lengths divide 960 by the length in feet and fraction of feet.

Example
A panel cut to 6'6" long has a resistance of $\frac{960}{6.5}$ = 148 ohms.

TABLE B
Catalog No. P2-240-30
4' wide panel with half width heating element

I. 240 volts (operating voltage)

Panel Size	Watts	BTU/Hour	Current (Amps)	Resistance (Ohms)
4 x 8	240	815	1.0	240
4 x 10	300	1050	1.25	192
4 x 12	360	1230	1.5	160
Per Lineal Ft.	30	105	0.125	1920*

II. 220 volts (operating voltage)

Panel Size	Watts	BTU/Hour	Current (Amps)	Resistance (Ohms)
4 x 8	200	680	0.9	240
4 x 10	250	850	1.2	192
4 x 12	300	1020	1.4	160
Per Lineal Ft.	25	85	0.12	1920*

*To calculate resistance for odd lengths divide 1920 by the length in feet and fraction of feet.

SGP 0025618

INSTALLATION PRECAUTIONS

1. Use **ONLY** G-P insulated nails to attach panels.
2. **DO NOT** use scraps of G-P Radiant Heat Panels to fill in ceiling areas.
3. **DO NOT** trim from long edges of full-conductive panels.
4. **BE SURE** to energize panels and check the circuits for amperage before finishing.
5. **BE EQUALLY SURE** to turn the current OFF while finishing the joints and leave it off until the joints are dry.
6. **DO NOT** use any type of acoustical material or tile on panels.

A. Rules for Marking Leads (Figure 4 below)

Definition: The end of the panel with a pigtail is the "head" and the other end is the "foot".

Rule 1. If panels are side by side with the heads in the same direction, mark the leads from alternate panels.

Rule 2. If two panels are butted head to head or foot to foot, mark the lead from one panel but not the other.

NOTE: If panels are both side by side and butted head to head or foot to foot, application of rules 1 and 2 will result in panels being marked in a checkerboard pattern.

Rule 3. If panels are butted head to foot, either mark all of the leads or none of the leads.

B. Rules For Wiring Panels

1. Connect to one side of the circuit: Black wires from all marked leads and white wires from all unmarked leads.

2. Connect to the other side of the circuit: All the wires that are left. (White wires from all marked leads and black wires from all unmarked leads.

C. Tracing Leads

If leads were not marked when panels were installed, the leads can be traced as follows:

Drive a pin or small finishing nail into a panel exactly 1½" from the long edge and attach one lead from an ohmmeter to it. Proceed to check each pigtail with the other ohmmeter lead. When the ohmmeter reads close to zero, the matching pigtail and panel have been found. If a reading close to the rated resistance of the panel shown in the tables is obtained, the lead to the opposite side of the panel to which your meter is attached has been found. This way each pigtail can be traced to its proper panel and side.

2. 240 Volt Half Conductive Panels

Refer to Table "B" for electrical data regarding this panel. Connect panels in the same manner. The actual width of the panel that is installed may be anywhere from 2' to 4', but the heating element is only 23" wide starting one inch from one edge. This panel is designed for use in hallways and other areas where a 4' panel is too wide.

There are two types of half conductive panels available, a right hand and a left hand panel. Assuming the pigtail is located on the north end when looking at the face of the panel, the conductive element is located on the west side for left hand panels and on the east side for right hand panels.

INSTALLING THE THERMOSTAT

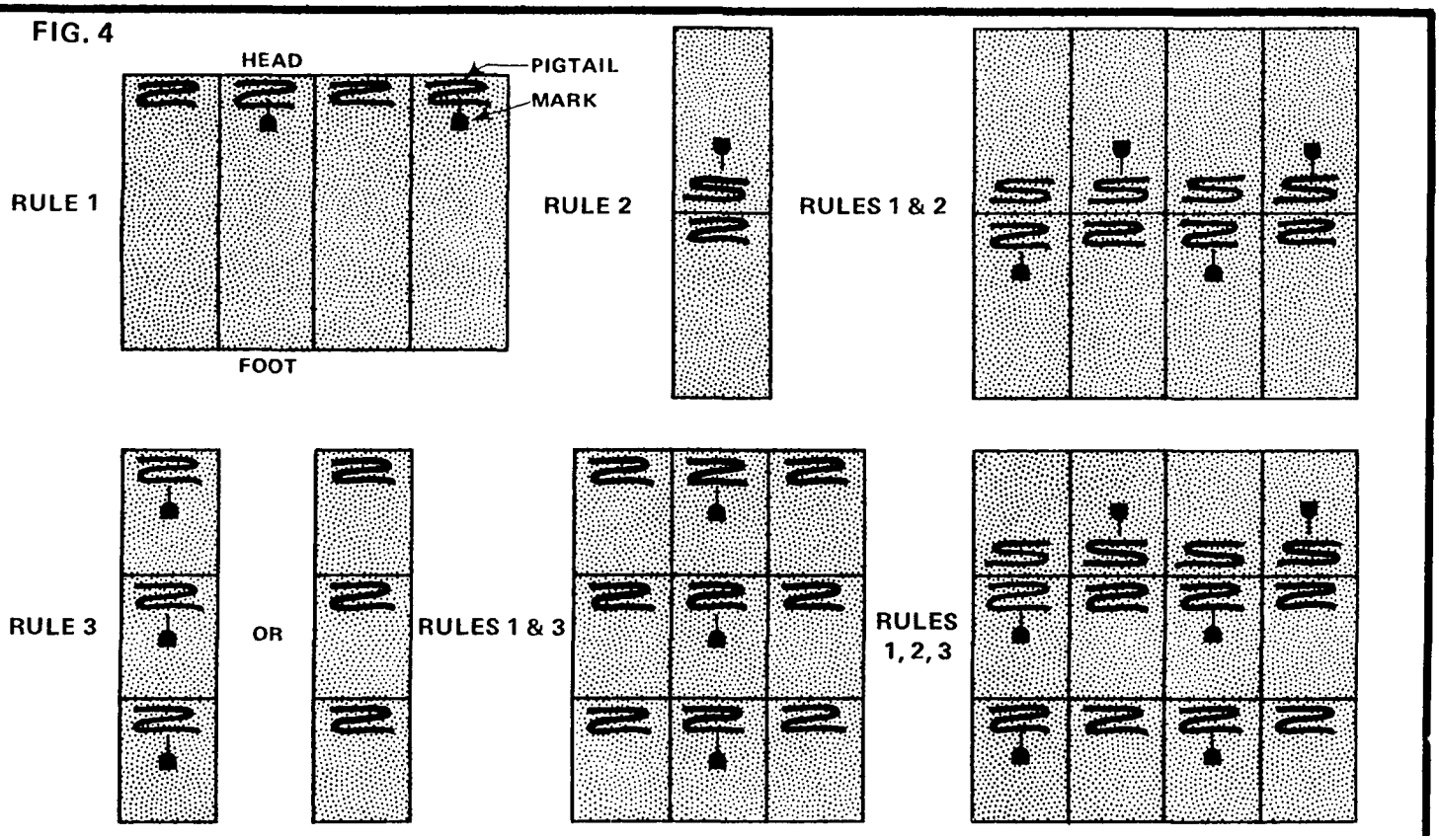
Use either line voltage or low voltage thermostat. Put the thermostat on an inside wall away from drafts and other source of heat such as stoves and refrigerators. Each room will have a separate circuit and be controlled by a separate thermostat. Run a single cable from the junction box to the thermostat or relay.

FINISHING

The joints in the radiant ceiling surface are to be finished in the conventional manner. Georgia-Pacific Ready Mix, Triple Duty or One Day Joint Compounds are the only materials recommended for the taping and finishing. The Radiant Panels should be *off* prior to and during the taping and finishing of the joints. It may be turned on only after the joints are thoroughly dry. Use of the panels to dry the joint system may result in joint cracking.

The ceiling surface can be decorated with paint or wallpaper. A good primer sealer is recommended before the paint or wallpaper is applied. Acoustical tiles or finishes should never be applied over the surface of the panels.

FIG. 4



SGP 0025619