GYP-SPAN®
Radiant

Hacker Industries, Inc.

SUBMITTAL FORM

GYP-SPAN® RADIANT

FLOOR UNDERLAYMENT

Technical Data	Properties	ASTM
Weight	14.6 lbs/ft² (71.2 kg/m²) at 1-1/2" (38mm)	C472 M
Thickness	1-1/2" (38mm)	
Compressive Strength	2000 - 3200 psi (13.8-22.1 MPa)	C472 M
Thermal Performance	K-value of 4.35 Btu; R-value of 0.23 ft².h.°F/Btu	C177
Fire Hazard Classification	Flamespread index 0; Fuel Contribution 0; Smoke Density 0	E84
Patty Size	7-1/2" (191mm) plus or minus 1/2" (13mm) in diameter	F2419
Sand	1/8" (3mm) or less washed plaster or masonry sand	E11

- High-strength gypsum concrete for use over radiant heat systems
- Contributes to excellent STC and IIC ratings
- Efficient thermal mass for uniform heat distribution
- Lightweight and crack-resistant
- No hot spots, air bubbles or shrinkage cracks
- Helps contribute points to LEED® project certification
- Creates a flat, durable surface for finished floor coverings
- Installed only by Licensed Applicators across North America

Product Description

GYP-SPAN® Radiant is specially formulated for use over hot water tubes or electric cables in radiant heat systems. The non-shrinking nature of GYP-SPAN® Radiant helps to lock radiant heat tubes in place, preventing noise, chaffing, and evenly distributing the heat throughout the subfloor. GYP-SPAN® Radiant provides compressive strengths from 2000-3200 psi (13.8 to 22.8 MPa). Depending on compressive strength, it can be installed before or after drywall. GYP-SPAN® Radiant accepts virtually all types of floor coverings such as ceramic tile, carpeting and wood.

GYP-SPAN® Radiant is mixed on the job site with local sand (per ASTM E-11) and water to create a lightweight slurry. Installed at a minimum of 3/4" (19mm) thick above the top of the tubes (total thickness of 1-1/2" (38mm), the underlayment weighs approximately 14.6 lbs/ft² with a dry density range of 107-115 pcf.

For residential projects, GYP-SPAN® Radiant is a cost-efficient way to create a warm, flat, and high-strength surface for finished floor coverings. To achieve additional sound isolation, use GYP-SPAN® Radiant with a Hacker Industries, Inc. sound mat.

Limitations

- Shall not be used in exterior locations, below grade, or where continious exposure to moisture is likely.
- Shall not be used as a wear surface; must be covered by a finished floor covering.
- Structure shall be designed so that deflection does not exceed L/360 live or dead load. Certain floor coverings such as marble, limestone, travertine and wood may have more restrictive deflection limits. Consult the appropriate floor covering manufacturer for recommendations.
- If installed above a crawl space, subfloor must be protected by a vapor barrier.
- No single application of GYP-SPAN® Radiant shall exceed 3" in depth.
- GYP-SPAN® Radiant is but one component of an effective sound and fire control system. Care must be taken in the installation of all components to assure the ultimate design performance. Published acoustical and fire system tests were conducted under controlled laboratory or field conditions and reflect results applicable only to those specific assemblies.

Installation

Before, during, and after the installation of GYP-SPAN® Radiant, the building must be enclosed and the temperature maintained at a minimum of 50°F (10°C). Prior to the installation of GYP-SPAN® Radiant, the subfloor shall be structurally sound (L/360) and broom clean, dry and free from oil, grease, paraffin, laitance, wax or other contaminants. Concrete subfloors shall be 28 days or older. For on-grade applications over concrete, measure the Moisture Vapor Emission Rate (MVER) per ASTM F1869. After installation, temporary wood planking shall be placed by the GC wherever the floor underlayment will be subject to wheeled or concentrated loads. MVER shall not exceed 3lbs./1000 sq. ft. per 24 hours.

Prime wood subfloors per recommended specifications before installing underlament. Adequate ventilation shall be provided by the General Contractor (GC) to ensure proper drying of GYP-SPAN® Radiant. If necessary, the GC shall provide mechanical ventilation. Depending on thickness and drying conditions, the underlayment will dry within 10 to 14 days. To avoid potential problems during the drying process, the GC shall consult Hacker Industries, Inc.'s Drying Conditions Flyer and information contained on Hacker Industries, Inc.'s website for additional information concerning drying of this product.

Finished floor coverings can be installed when the GYP-SPAN® Radiant is completely dry. Consult flooring contractor for recommended procedures to test for dryness and acceptable levels of moisture. Reference Hacker Industries, Inc.'s Guidelines for Installing Finished Floor Coverings. This guideline is not a warranty and shall be used as a guideline only. See ASTM F2419. For ceramic tile installations, a crack isolation membrane shall be used as recommended by setting material manufacturer for intended use or application. Reference TCNA Handbook.

Product Data

Approximate Compressive Strength (aggregated) ASTM C472 (modified): 2000 to 3200 psi (13.8 to 22.1 MPa)

Approximate Dry Density (aggregated): 107 to 120 pcf

Note *Compressive strengths published herein were achieved under controlled laboratory conditions. Actual field results may differ due to environmental conditions, regional sand variations, inconsistent proportioning of field applied water, sand and Hacker Floor Underlayment, as well as differences in mixing/pumping equipment.

Compliance

- ICC-ES ER-4147 • City of Los Angeles Research Report No. 24540 • ASTM F2419
- FHA - HUD MR 1255 Tile Council of America (F180, F200, RH111, RH122)

UL Designs

G565	G568	J917	J919	J920	J924	J927	J931	J957	J966	J991	J994
K906	L001	L004	L005	L006	L201	L202	L206	L208	L209	L210	L211
L212	L501	L502	L503	L504	L505	L506	L507	L508	L509	L510	L511
L512	L513	L514	L515	L516	L517	L518	L519	L520	L521	L522	L523
L524	L525	L526	L527	L528	L529	L530	L531	L532	L533	L534	L535
L536	L537	L538	L539	L540	L541	L542	L543	L544	L545	L546	L547
L548	L549	L550	L551	L552	L553	L555	L556	L557	L558	L559	L560
L562	L563	L571	L585	L598							

Ancillary Products

Hacker Floor Primer, Hacker TopCoat SP and Hacker Floor Sealer are available for use with GYP-SPAN® Radiant. Contact Hacker Industries, Inc. at (800) 642-3455 for more information.

Warranty

Subject to express warranty stated on Hacker Industries, Inc.'s website.

Submittal Approvals

Project Name:_____

Contractor/Architect: _____

Date:_____

Product Information
See HackerIndustries.com for current recommended product specifications and literature.

WARNING!
When mixed with water, this product hardens and becomes extremely hot. DO NOT attempt to make a cast enclosing any part of the body using this material. Failure to follow these instructions may cause severe burns that may require surgical removal of affected tissue or amputation of limb. Portland cement is strongly alkaline. Direct contact can be corrosive and cause severe damage or chemical burns to eyes and wet, moist skin. Avoid contact with eyes and skin. Wear protective glasses and clothing. If eye contact occurs, immediately flush thoroughly with water for 30 minutes and seek medical advice. Inhalation of dust may be corrosive or cause chemical burns or irritation to nose, throat and respiratory tract.

Avoid breathing dust. Use a NIOSH/MSHA-approved dust respirator. Wash thoroughly with soap and water after use. Do not ingest. If ingested, call a physician. Product safety, call (800) 642-3455. **KEEP OUT OF REACH OF CHILDREN**.

NOTICE
We shall not be liable for incidental or consequential damages, directly or indirectly, sustained, nor for any loss caused by application of these goods not in accordance with current printed instruction or for other than the intended use. Our liability is expressly limited to replacement of defective goods. Any claim shall be deemed waived unless made in writing to us within 30 days from date it was or reasonably should have been discovered.

SAFETY FIRST
Follow good safety/industrial hygiene practices during installation. Wear appropriate personal protective equipment. Read MSDS and literature prior to specification and installation.

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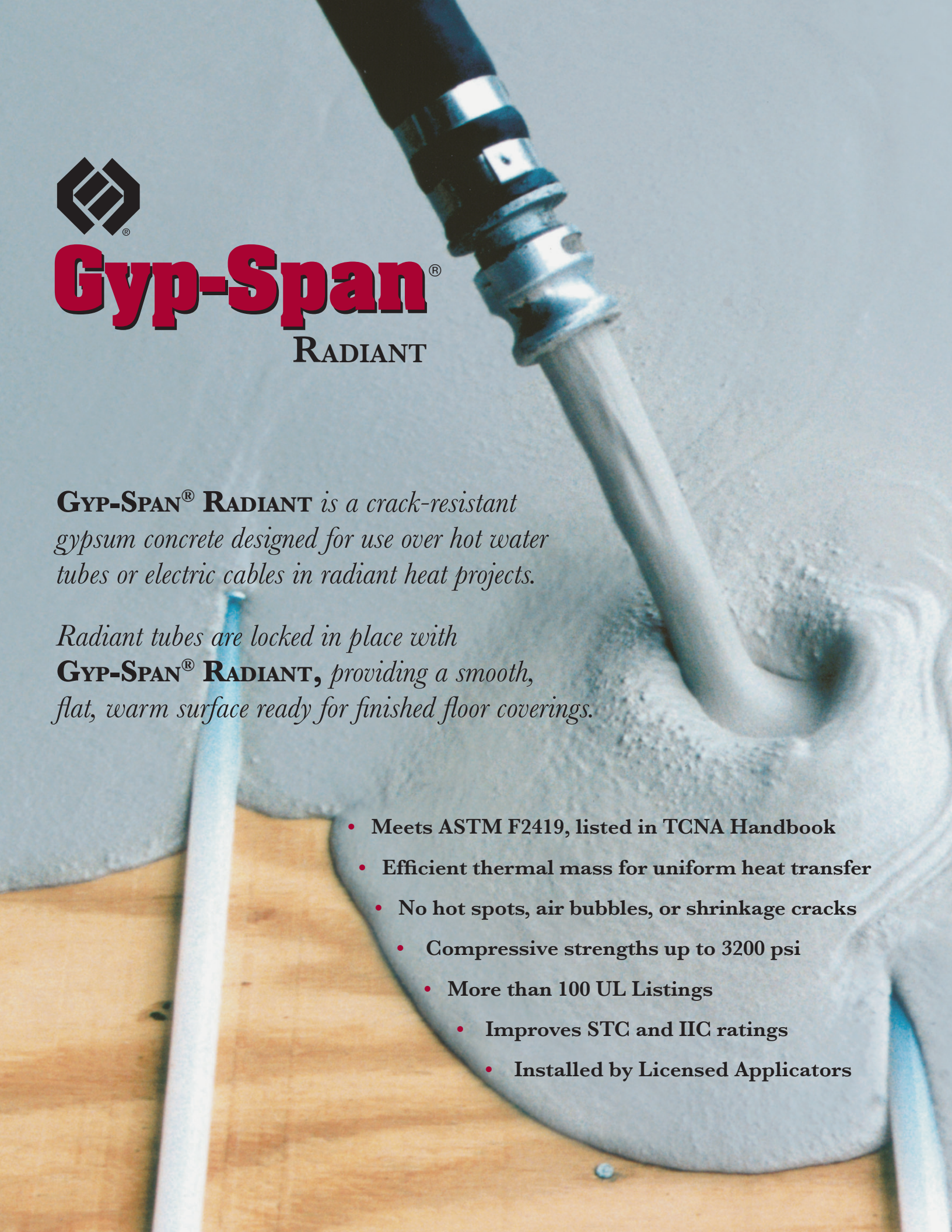


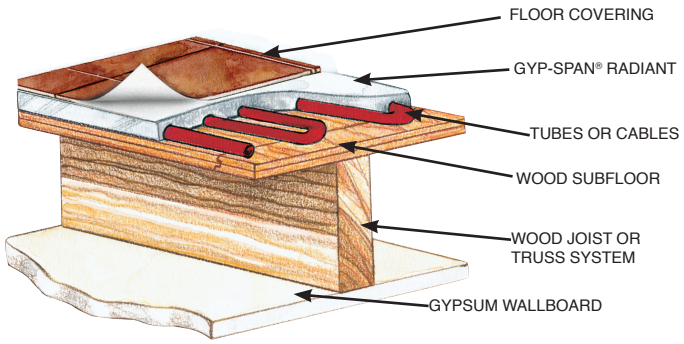
Gyp-Span®
RADIANT

GYP-SPAN® RADIANT *is a crack-resistant gypsum concrete designed for use over hot water tubes or electric cables in radiant heat projects.*

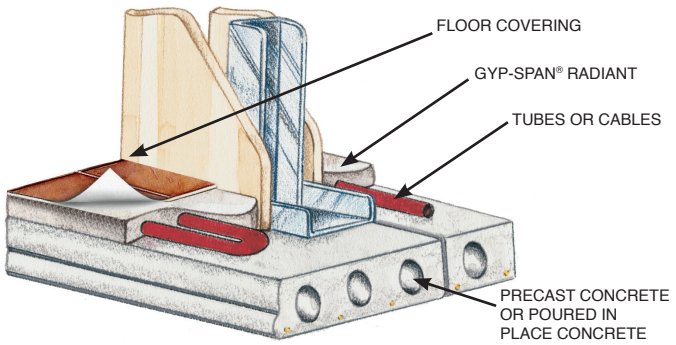
Radiant tubes are locked in place with **GYP-SPAN® RADIANT,** *providing a smooth, flat, warm surface ready for finished floor coverings.*

- **Meets ASTM F2419, listed in TCNA Handbook**
- **Efficient thermal mass for uniform heat transfer**
- **No hot spots, air bubbles, or shrinkage cracks**
- **Compressive strengths up to 3200 psi**
- **More than 100 UL Listings**
- **Improves STC and IIC ratings**
- **Installed by Licensed Applicators**

WOOD SYSTEM



CONCRETE SYSTEM



Recommended Specifications for GYP-SPAN® Radiant

PART I GENERAL

1.1 Scope – Specify to meet project requirements
- A. Work included:
  1. **GYP-SPAN® RADIANT**
  2. Hacker Floor Primer
  3. Hacker TopCoat™ SP (Surface Prep)

1.2 Qualifications
- A. **GYP-SPAN® RADIANT** shall be installed by Licensed Applicators of Hacker Industries, Inc., using approved mixing and pumping equipment with a water meter.
- B. **GYP-SPAN® RADIANT** shall be delivered in original, unopened bags and protected from exposure to the elements. Product shall not be used beyond shelf life.
- C. Install before or after drywall.
- D. Before, during, and after installation of **GYP-SPAN® RADIANT**, the building interior must be continuously ventilated and heated to a minimum of 50°F (10°C).
- E. Compressive strength can be specified from 2000 to 3200 psi (13.8 to 22.8 MPa).
- F. All materials specified herein shall be approved by Hacker Industries, Inc.

PART II PRODUCTS

2.1 Materials
- A. Gypsum Concrete: **GYP-SPAN® RADIANT** as supplied by Hacker Industries, Inc
- B. Hacker Floor Primer
- C. Hacker TopCoat™ SP, if specified
- D. Sand: 1/8" (3mm) or less washed plaster or masonry sand meeting Hacker Industries, Inc.'s Sand Guidelines.
- E. Mix Water: Potable & free from impurities.

PART III EXECUTION

3.1 Condition of Subfloor
- A. The General Contractor (GC) is responsible for providing a structurally sound (L/360) subfloor, broom cleaned, dry and completely free of oil, grease, laitance, paraffin, wax or other contaminants.
- B. Before installation, the GC shall approve the condition of the subfloor and test the existing subfloor for dryness.

3.2 Preparation of Subfloor
- A. All cracks and voids shall be filled with a quick-setting compound or equal.
- B. Plywood/OSB: Spray one coat Hacker Primer using one gallon (3.8L) per 500 square feet (46m^2).
- C. Other substrata: Conditions may vary. Consult Hacker Industries, Inc. for recommended preparation.

3.3 Mixing Instructions
- A. 4 to 6 gallons (15.1 to 22.7L) of water as specified per 80 pound (36.3 kg) bag of **GYP-SPAN® RADANT**. Do not overwater. Water amount will change with wetness of sand.
- B. **GYP-SPAN® RADIANT** mix proportions and methods shall be in strict accordance with Hacker recommendations.

3.4 Underlayment Application
- A. Application: **GYP-SPAN® RADIANT** shall be installed in one or two lifts. The minimum thickness over radiant heating systems is 3/4" (19mm) over the top of the tubes or cables. Place as continuously as possible until installation is complete.
- B. Protection: After installation, temporary wood planking shall be placed by the GC wherever the underlayment will be subject to wheeled or concentrated loads.
- C. Drying: The GC shall provide continuous ventilation and adequate heat to rapidly remove moisture from the area until the underlayment is dry. If necessary, the GC shall provide mechanical ventilation. Do not install finished floor coverings until the **GYP-SPAN® RADIANT** has been tested for dryness. Consult flooring contractor for recommended procedures to test for dryness and acceptable levels of moisture. See Hacker Industries, Inc.'s Drying Conditions Flyer.
- D. **GYP-SPAN® RADIANT** is suitable for interior applications only and shall be covered by a finished floor covering.

3.5 Preparation for Installation of Floor Coverings
- A. Sealing: Any areas where the underlayment surface has been damaged shall be cleaned and sealed regardless of specified floor covering. Floor covering manufacturers' specifications and requirements supercede these recommendations.
- B. For ceramic tile installations, a crack isolation membrane shall be used as recommended by setting material manufacturer for intended use or application. Reference TCNA Handbook.
- C. Floor Covering Procedures: Please see Hacker Industries, Inc.'s "Guidelines for Installing Finished Floor Coverings." The guideline is not a warranty and shall be used as a guideline only. See ASTM F2419.

3.6 Field Quality Control
- A. Slump Test: **GYP-SPAN® RADIANT** shall be tested as it is being installed using a 2" by 4" (51mm by 102mm) cylinder. The patty size shall be 7-1/2" (191mm) +/- 1/2" (13mm).
- B. Field Samples: Testing of molded cube samples shall be in accordance with ASTM C472 modified using split brass molds. Prior to independent testing, consult Hacker Industries, Inc.

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For the Licensed Applicator in your area, please call our toll-free number, (800) 642-3455.

Note: For Warranty information, please contact Hacker Industries, Inc. at (800) 642-3455.

Product Contributes Points Toward LEED® Credits

GYP-SPAN® Radiant Recommended Specifications

PART I. GENERAL

1.1 Scope

Specify to meet project requirements. The conditions of the Contract (General, Supplementary, and other conditions) and the General Requirements (sections of Division 1) govern the provisions of this section.

1.2 Qualifications

A. Supplier: Hacker Industries, Inc., Newport Beach, California.

B. Installer: Installation of GYP-SPAN® Radiant shall be by a Licensed Applicator of Hacker Industries, Inc., using mixing and pumping equipment with a water meter approved by Hacker Industries, Inc.

C. All materials specified herein shall be approved by Hacker Industries, Inc., Newport Beach, CA. All others must receive prior approval.

D. Compressive strength can be specified from 2000-3200 psi (13.8 to 22.1 MPa).

E. Materials shall be delivered in their original, unopened packages, and protected from exposure to the elements before and after delivery. Do not allow bags to get wet. Product shall not be used beyond shelf life.

F. Certification: Upon completion of this portion of the work, and as a condition of its acceptance, deliver to the architect a certificate from Hacker Industries, Inc., and signed by the Licensed Applicator, stating that the material used in this work complies with the specified requirements.

PART II. PRODUCTS

2.1 Materials

A. Gypsum Concrete: GYP-SPAN® Radiant, as supplied by Hacker Industries, Inc.

B. Subfloor Primer: Hacker Floor Primer or approved equal

C. Sand: 1/8” (3mm) or less washed plaster or masonry sand

D. Water: Potable and free from impurities

E. Hacker TopCoat™ SP (if specified)

2.2 Mix Designs: See section 3.3

PART III. PREPARATION

3.1 Condition of Subfloor

A. Subfloor shall be structurally sound (L/360), broom clean, dry and free from oil, grease, paraffin, laitance, wax or other contaminants before the arrival of the Hacker Licensed Applicator.

B. Leak Prevention: All cracks and voids shall be filled with a quick-setting patching or

taping compound or equal where leakage may occur.

C. Before installation, the GC shall inspect and approve the condition of the subfloor and test the existing subfloor for moisture.

3.2 Priming

A. Prime wood subfloors with one coat of Hacker Floor Primer (diluted 4:1 with water) using one gallon of Hacker Floor Primer (3.78L) per 500 sq. ft. (47m^2).

B. Hacker Floor Primer is not always required over concrete substrates. Multiple coats may be required over porous concrete or plank. The Hacker Licensed Applicator can give specific recommendations. (Note: For rehabilitation work or pours over old and/or porous concrete, consult a Licensed Applicator or Hacker Industries, Inc. for recommended preparation.)

3.3 Mixing Instructions

A. 4 to 6 gallons (15.1 to 22.7L) of water and sand as specified per 80 pound (36.3kg) bag of GYP-SPAN® Radiant. Do not overwater. Water amount will change with the wetness of sand.

B. GYP-SPAN® Radiant mix proportions and methods shall be in strict accordance with Hacker recommendations.

3.4 Underlayment Application

A. Scheduling:

1. Installation of GYP-SPAN® Radiant shall not begin until the building is enclosed, including roof, windows, doors and other openings.

2. GYP-SPAN® Radiant can be installed before or after the installation of drywall.

B. Application:

1. The minimum thickness of GYP-SPAN® Radiant varies with the type of radiant tubing. Install the first lift (pour) to the top of the tubing or cable. After the first lift has set-up, install the second lift (pour) 3/4” (19mm) above the first lift. The minimum thickness of GYP-SPAN® Radiant is 3/4” (19mm) over the top of the tubes or cables.

2. Install GYP-SPAN® Radiant at specified thickness by placing contents of bags, sand and water into the approved high-speed mixing device and blend for a minimum of one minute. GYP-SPAN® Radiant shall be pumped onto floor areas, spreading and screeding to a smooth surface. Place as continuously as possible until installation is complete so that no GYP-SPAN® Radiant slurry is placed against GYP-SPAN® Radiant that has obtained its initial set, except at authorized joints.

3. GYP-SPAN® Radiant is suitable for interior applications only and must be covered by a finished floor covering.

C. Protection: After installation, temporary wood planking shall be placed by the GC wherever the floor underlayment will be subjected to wheeled or concentrated loads. The GC shall not place concentrated loads such as pallets of material, drywall, taping compounds or any heavy items, which may cause deflection, in the middle of the floor or in hallways.

D. Drying: Before, during and after installation of GYP-SPAN® Radiant, building interior shall be ventilated and heated to a minimum 50°F (10°C) to assure completion of the drying process. The GC shall provide continuous ventilation and adequate heat to rapidly remove moisture from the area until the GYP-SPAN® Radiant is dry. If necessary, the GC shall provide mechanical ventilation. Do not install finished floor coverings until the GYP-SPAN® Radiant is tested for dryness. Consult flooring contractor for recommended procedures to test for dryness and acceptable levels of moisture. To avoid potential problems during the drying process, the GC shall consult Hacker Industries, Inc.'s Drying Conditions Flyer and information contained on Hacker Industries, Inc.'s website for additional information concerning drying of this product.

3.5 Preparation for Installation of Finished Floor Coverings

A. Sealing: Any areas where the underlayment surface has been damaged shall be cleaned and sealed regardless of floor covering specified. Floor covering manufacturers' specifications and requirements supercede these recommendations.

B. For ceramic tile installations, a crack isolation membrane shall be used as recommended by setting material manufacturer for intended use or application. Reference TCNA.

C. Floor Covering Procedures: Please see the Hacker Industries, Inc.'s "Guidelines for Installing Finished Floor Coverings." The document is not a warranty and shall be used as a guideline only. See also ASTM F2419 for recommended procedures.

3.6 Field Quality Control

A. Slump Test: GYP-SPAN® Radiant shall be tested for slump at the beginning of each installation in order to establish the required slump. Slump tests shall then be taken periodically during installation to verify that the required slump is maintained. Slump tests shall be conducted using a 2" by 4" (51mm by 102mm) cylinder. The acceptable patty size shall be 7-1/2" (191mm) plus or minus 1/2" (13mm) in diameter.

B. Field Samples: Testing shall be done in accordance with ASTM Modified C472 testing procedures, using split brass molds. Prior to independent testing, consult Hacker Industries, Inc.for proper ASTM procedures.

Warranty: *Subject to express warranty stated on Hacker Industries, Inc.'s website.*

GYP-SPAN® Radiant
Project References

GYP-SPAN® Radiant is a high strength, crack-resistant gypsum concrete designed for use over hot water tubes or electric cables. GYP-SPAN® Radiant locks radiant tubes in place to evenly distribute heat throughout the floor, providing a smooth, flat and warm surface ready for finished floor coverings. Below is a small sample of projects that have utilized GYP-SPAN® Radiant.

Contractor:	Carolina Homes
Project:	Johnson Landing Condominiums
Location:	Red Deer, Alberta Canada
Description:	GYP-SPAN® Radiant
Contractor:	Complete Landscape Co.
Project:	Executive Home
Location:	Wisconsin
Description:	3,300 sq. ft. of GYP-SPAN® Radiant
Contractor:	DLH Construction
Project:	Grace Residence
Location:	Williamsburg, Michigan
Description:	2,600 sq. ft. of GYP-SPAN® Radiant
Contractor:	Scott Hedrick Construction
Project:	Fullmer Residence
Location:	Donnelly, Idaho
Description:	6,500 sq. ft. of GYP-SPAN® Radiant
Contractor:	Voyager Construction
Project:	The Yellowstone Club - Private Custom Home
Location:	Big Sky, Montana
Description:	11,000 sq. ft. of GYP-SPAN® Radiant
Contractor:	Padelford Packet Boat Company
Project:	Minnesota Centennial Showboat
Location:	St. Paul, Minnesota
Description:	8,200 sq. ft. of GYP-SPAN® Radiant
Contractor:	South Fork Builders
Project:	Private Residence
Location:	West Yellowstone, Wyoming
Description:	2,500 sq. ft. of GYP-SPAN® Radiant

Contractor:	Fieldstone Development
Project:	Stonehaven at Brackenridge Golf Course
Location:	Breckenridge, Colorado
Description:	30,000 sq. ft. of GYP-SPAN® Radiant

Contractor:	T.W. Construction
Project:	Private Residence
Location:	Farmington, New Mexico
Description:	5,939 sq. ft. of GYP-SPAN® Radiant

Contractor:	PR Developments, Ltd.
Project:	Marion Chateau Senior's Retirement Centre
Location:	Regina, Saskatchewan Canada
Description:	83,000 sq. ft. of GYP-SPAN® Radiant

Contractor:	Liessmann Construction
Project:	Private Residence
Location	Farmington, New Mexico
Description:	3,400 sq. ft. of GYP-SPAN® Radiant

Contractor:	Midway Breeze
Project:	Midway Breeze Apartments
Location:	Menasha, Wisconsin
Description:	24,480 sq. ft. of GYP-SPAN® Radiant

Contractor:	Kurt Lloyd & Associates
Project:	Burnt Fork Log Home
Location:	Stevensville, Montana
Description:	2,600 sq. ft. of GYP-SPAN® Radiant

Contractor:	Drury Construction
Project:	Buckman Residence
Location:	Malibu, California
Description:	6,780 sq. ft. of GYP-SPAN® Radiant

Contractor:	Bonner, Inc.
Project:	Westmoreland Residence
Location:	Atlanta, Georgia
Description:	4,472 sq. ft. of GYP-SPAN® Radiant