SILPRO

RAECO® R-50™

Topping and Structural Repair Mortar
Polymer-Modified
Portland Cement-Based
Resurfacing / Patching / Leveling
1/8"- 3/4" Use Neat
3/4"- 3" Add Crushed Stone

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Silpro **RAECO® R-50™** is a polymer-modified, Portland cement-based mortar used for patching, resurfacing, and leveling floors, or as an underlayment for any floor covering.

RAECO® R-50™ can be applied in thicknesses ranging from 1/8" to 3/4" when mixed right from the bag (neat), or from 3/4" to 3" when extended with 20# – 40# of clean, washed and drained, 3/8" crushed stone. The specially formulated **RAECO® R-50™** powder is mixed on the job with **C-21 ALL ACRYLIC®** Admix.

RAECO® R-50™ provides a tough, resilient surface that is highly resistant to abrasion and impact, and can withstand extreme fluctuations of temperature. Use it indoors or outdoors, above or below grade, and in areas that may become totally submerged.

Use Raeco® R-50™ For

- Resurfacing warehouse floors and parking garages.
- Patching concrete floors, shipping docks, ramps, steps, sidewalks, driveways, and aprons.
- An underlayment for floor coverings of all kinds including carpeting, vinyl, rubber, wood, "seamless", epoxy and/or urethane.
- Restoring pitch, drainage, and non-skid surfaces in: Garages, laundries, commercial and industrial kitchens, locker and shower rooms, basements, docks and patios, hospitals, dairies, food processing plants, and all work and wash areas.

Advantages

- **Excellent adhesion: RAECO® R-50™** bonds readily to new and old concrete, wood, plywood, cement plaster, stone, cement mortar, and clean steel.
- **Resistance to abrasion:** The abrasion resistance and high density of **RAECO® R-50™** make it an ideal patching and resurfacing material for high traffic and work areas. Performs exceptionally well under forklift traffic. Even broom textured, non-skid finishes receive extended life.
- **Resistance to freeze/thaw lifting:** Since **RAECO® R-50™** has the same coefficient of expansion and contraction as the concrete to which it is bonded it resists lifting, spalling, or crumbling after freeze/thaw cycling or extremes of high or low temperatures.
- **Increased resistance to de-icing salts**
- **Shortened curing time:** Most new or repaired surfaces of **RAECO® R-50™** can be put into service for light foot traffic in 12 to 24 hours. Thick patches or those in heavy work or high traffic areas may require up to 4 days for curing depending on temperature and other conditions.
- **High impact resistance and flexural strength:** These combined characteristics make **RAECO® R-50™** the ideal surface for loading docks and warehouse floors, and the ideal topping for use over Silpro **EASY PATCH®** for repairing sidewalks.

Advantages (cont.)

- **Improved dimensional stability:** The **C-21 ALL ACRYLIC®** Admix used in the preparation of **RAECO® R-50™** produces an internal curing membrane which retains the water of hydration. This prevents premature drying, promotes thorough curing, and results in higher strength and greater durability.
- **Enhanced resistance to chemical attack:** Surfaces of **RAECO® R-50™** suffer little or no effect from prolonged exposure to common chemicals, soaps, industrial cleansers, animal and vegetable fats, urine, and kitchen and dairy breakdown products.
- **Nailability:** Because **RAECO® R-50™** is polymer-modified it can be nailed into without shattering or splitting.

Technical Data

Test	Test Age	Test Results
Compressive Strength (ASTM C-109)	28 Days	5200 psi
Bond Strength: (ASTM C-1042)	28 Days	1540 psi
Modulus of Elasticity in Compression: (ASTM C-469)	28 Days	3.14 x 10^6 psi

Prior to Starting the Job

Know the history. Before beginning a flooring job involving a cementitious coating, topping, or patch, it is often helpful to know the **history** of the **slab** and the **structure** of which it is a part.

If possible, ask someone familiar with the building what the building or the floor **was used for** in the past. How was the slab/floor built? Maintained? Cleaned? What was most recently on the floor? How was it removed? With chemicals? Shot-blasting equipment? Other methods?

Inspect

Visually inspect the **surface of the floor** and, if possible, the **structure of the building**. Are there any cracks? Does the surface look like concrete or cementitious material in color and texture? Is it soft? Coated? Sticky? Slippery? If you rub it, does the cloth come up stained? Does the area or the surface have an odor?

Hardness of Surface

Test the surface for **hardness** by scratching it with a knife or screwdriver, or have a qualified engineer perform a quantitative test.

Soundness of Bond

If going over an existing repair, test the surface for **soundness of the bond of the repair to the substrate** by tapping it with a hammer while listening for hollow sounds. If the substrate itself is hollow, cut it out and replace it.

Dusting of Surface

If there is dust you may have an unsound surface that is prone to dusting and unsuitable for the application of a topping.

Such a surface may be the result of the slab having been rained on, or frozen when it was freshly poured. Other possible causes include the application of de-icing salts to fresh concrete, carbonation, an over-troweled finish, or placement of concrete that sat too long in the truck.

Hidden Chemicals

In some jobs there may be **oil or other chemicals hidden below the surface**. These materials may affect adhesion of the coating, or may migrate up through the concrete and the coating in the future causing staining, or failure of the adhesive holding the finished flooring.

Presence of Sealers

Test for the presence of a sealer, etc., by placing drops of water on the surface. If the water doesn't absorb into the surface immediately, rub it with your finger as dust may be causing surface tension. If it still doesn't absorb immediately this indicates the presence of a sealer/coating or organic substance in the substrate which may prevent adhesion of a topping.

Additional Testing

If the **prior building use** included the handling or storage of food, oil-containing materials like wool or machinery, acids or strong chemicals, **additional testing or research** may be necessary.

Surface Preparation

Surfaces must be clean, sound, and free of standing or flowing water. Remove deteriorating concrete, loose material, oil, grease, wax, form-release agents, water-soluble materials, gypsum patches, any foreign matter and all coating materials that may prevent the topping from developing adequate bond. A mechanical method of surface preparation such as shot-blasting or scarifying is recommended.

Remove mold and mildew by applying either bleach mixed 1:1 with water, or tri-sodium phosphate following manufacturer's instructions and rinsing thoroughly. Remove moss with a commercially prepared moss remover, then clean off surface mechanically or with water. Any removal agent should be rinsed thoroughly from the surface before proceeding.

Floors that have been polished smooth or sealed should be tested for adhesion.

Apply a sample of at least 1 sq. ft., wait 2 - 4 days, and then try to pry off the patch with a hammer and chisel. If there is any question about the **RAECO® R-50™** adhering, please call Silpro before proceeding with the application.

Surface Preparation Continued

Note: Even if the sample patch bonds adequately to the smooth or sealed surface, do not apply **RAECO® R-50™** over 1/4" thick if any dimension is longer than 15' as the accumulated shrinkage stress may cause cracks and adhesion failure. Instead, clean and roughen the surface mechanically, or place control joints at intervals of 15' or less.

In lieu of testing, polished floors should be shot-blasted or scarified and sealed floors should be shot-blasted, scarified, or completely stripped.

Rusted or corroded metal within the patch area must be sand blasted or wire brushed clean. Coat all metal with an anti-rust sealer such as a zinc coating or a slurry of **RAECO® R-50™** and **C-21 ALL ACRYLIC®** Admix.

Note: Areas that show efflorescence or to which snow removal salts have been applied should be shot-blasted (preferable), power-washed with detergent or cleaned with muriatic acid following the manufacturer's instructions, and rinsed thoroughly prior to being coated with **RAECO® R-50™**.

Wooden floors must be clean, rigid, and well fastened. Nail and screw heads should be set level with or below the surface.

Remove standing water by vacuuming, blowing, sweeping, or with a squeegee.

Surface Preparation Methods

When choosing which preparation method to use take a look at what type of contaminant must be removed. How much? What is the desired profile (texture) of the surface prior to coating? The condition of the floor? What coating will be applied later? Will noise and dust be a problem? What else is going on in this space, and in the adjoining work areas? What are the environmental considerations?

Mechanical Cleaning Methods/Tools Include:

- Shot-Blast
- Scarifier
- Chipping Hammer
- Sand-Blast
- Water-Blast and Pressure Wash
- Wet-Blast
- Bush Hammer
- Scabbler
- Needle Scaler

Note: After a mechanical cleaning be sure to remove any loose material by vacuuming.

Chemical Cleaning Methods Include:

- Detergent
- Acid Etch
- Chemical Stripper/Paint Remover
- Degreaser

Note: After a chemical cleaning be sure to neutralize the surface and rinse thoroughly. Follow manufacturer's instructions.

Cracks in the Substrate

Active: If the crack or break is active, i.e., still moving due to forces such as settlement, frost expansion, contraction, etc., consult an engineer.

Static: If the crack or break is not active, cut out to 3/4" depth or greater and fill with Silpro **RAECO® R-50™** mixed with undiluted Silpro **C-21 ALL ACRYLIC®** Admix, or Silpro **EASY PATCH™** Fast-Setting Repair Mortar mixed with undiluted **C-21 ALL ACRYLIC®** Admix.

Apply A Test Patch

To confirm the suitability of the surface for adhesion of the coating, and that the final appearance and function will be as the owner, architect, and contractor expect, install a 10' x 10' test patch at the maximum designed thickness anticipated on the project and subject it to anticipated service conditions before beginning the entire job.

Priming

Surfaces will be easier to work and yield a better bond if they are primed with Silpro **C-21 ALL ACRYLIC®**.

Over concrete: For optimum performance prime concrete surfaces with undiluted Silpro **C-21 ALL ACRYLIC®**.

Over wood (interior only): A primer coat of 1 part **C-21™** : 1 part clean, potable water should be applied directly to wooden surfaces and allowed to dry. Re-prime with undiluted **C-21™** just prior to coating with **RAECO® R-50™**.

Note: Use only new plywood decking as a substrate. Prime the surface just prior to applying **RAECO® R-50™**. **RAECO® R-50™** may be applied while the surface is either tacky or dry.

Mixing

For applications 1/8" to 3/4" thick: use neat (right from the bag).

In a clean container, mortar box, or paddle mixer add approximately 1 gallon Silpro **C-21 ALL ACRYLIC®** Admix to the 50# bag of powder. Do not add water. Mix thoroughly to obtain a trowelable consistency, but do not over mix. Too much mixing will entrap air, reducing adhesion and strength. Let stand 3 - 5 minutes. Remix for 20 - 30 seconds adding a small amount of **C-21 ALL ACRYLIC®** if necessary.

For applications 3/4" to 3" thick: stone must be added. Extend a 50# bag of **RAECO® R-50™** with 20# - 40# of clean, washed and drained, 3/8" crushed stone. Add the stone after the **C-21 ALL ACRYLIC®** has been mixed with the **RAECO® R-50™**. Adjust the amount of **C-21 ALL ACRYLIC®** as necessary.

Note: For applications in thicknesses greater than 1 1/2", or when undivided area is thicker than 3/4"and larger than 15' in any direction, place expansion joints or saw cuts to eliminate the possibility of shrinkage cracking.

Application

Place and trowel **RAECO® R-50™** to the desired thickness. Lubricate the trowel with **C-21 ALL ACRYLIC®** Admix to prevent dragging. Do not use a power trowel. Do not overtrowel. **RAECO® R-50™** may be steel troweled, floated or broom finished for a non-skid surface.

All control and expansion joints must be carried through the **RAECO® R-50™**. Do not bridge them because they may crack.

Note: If drying conditions include hot, dry, or rapid air movement: correct the conditions if possible, protect the surface from rapid drying, dampen the substrate before application, and do not apply **RAECO® R-50™** thicker than 1/2".

Note: Where featheredging is required, coat with Silpro **MASCO®** Underlayment and Repair Mortar.

Working time is from 30 - 60 minutes depending on surface conditions, thickness, temperature, humidity, and air movement.

The **RAECO® R-50™** mix may be retempered up to 1 hour from original mixing by remixing and adding a little more **C-21 ALL ACRYLIC®** Admix if necessary.

Clean Up: Clean equipment and tools with water during and immediately after use.

Curing

RAECO® R-50™ is self-curing under normal conditions. **DO NOT WET CURE**. Latex needs to air cure to properly coalesce. **RAECO® R-50™** should be allowed to cure before painting. Consult paint manufacturer's label for recommendations. **RAECO® R-50™** will be ready for light foot traffic in 12 to 24 hours. Heavy traffic areas may require up to 4 days for curing depending on temperature and other conditions.

Extreme Tempmperatures and Conditions

Cold: Polymer emulsions, also called "latexes", must coalesce (have water evaporate allowing the polymer to come together within and under the coating) to form a film. This film is necessary to produce a good bond and a durable coating.

C-21 ALL ACRYLIC® must coalesce at or above 50˚F. (10˚C.) to perform properly. Therefore, keep newly applied **RAECO® R-50™** above 50˚F. (10˚C.) for 24 hours under good drying conditions, and 48 hours forthick applications and/or slow drying conditions.

Hot: Polymers within the material form a film on the surface and retard the passage of water out of the coating. If it is hot, dry and windy, however, this film may not be sufficient to prevent the water from being drawn out of the coating before the Portland cement has a chance to hydrate. Excessive heat and drying conditions, especially outside, could cause shrinkage and adhesive failure.

Ultimate strength and bonding will be improved by covering the coating, after it has dried for an hour or two and is hard to the touch, with paper or sheet plastic to protect the surface from drying out too fast. Remove covering when conditions cool down to allow coating to air cure.

Humidity

Water must evaporate for polymer emulsions to coalesce and that process is slowed by excess humidity. For best results allow polymer-modified toppings to cure with adequate ventilation.

Limitations

- Apply **RAECO® R-50™** only if temperature of air, surface and material is above 50˚F. (10˚C.) and will not fall below that for 24 - 48 hours after application. Then keep patched area above 32˚F. (0˚C.) for a total of 7 days.
- Do not add set-accelerating admixtures.
- **RAECO® R-50™** may be applied over new concrete the next day (as soon as it is hard enough to walk on).
- Do not apply **RAECO® R-50™** over plywood outside, or over plywood in damp areas inside, as the plywood will delaminate.
- Protect from strong winds and/or direct sun during placement and finishing.
- For temperatures higher than 90°F. consult with Silpro's Technical Service Department.
- In storage keep **RAECO® R-50™** bag dry and protect **C-21 ALL ACRYLIC®** Admix from freezing.

Package Size

50 lb. bag (22.68 kg.)

Approximate Coverage

One 50# bag (22.68 kg.) of RAECO® R-50™ powder and approximately 1 gallon (3.78 liters) of C-21 ALL ACRYLIC® Admix:

50 sq. ft. (4.6 sq. m.) at 1/8″ thickness
25 sq. ft. (2.3 sq. m.) at 1/4″ thickness
12 sq. ft. (1.2 sq. m.) at 1/2″ thickness

1# of R-50™ will cover 1 sq. ft. at 1/8″ of thickness.

With 50# of stone: 6 sq. ft. at 2″ thickness

Shelf Life

2 years

Caution!

SILPRO offers products that may contain cement, latex, epoxy, and other chemicals. Please review the Safety Data Sheet before the use of this product.

Guarantee

Please call **SILPRO, LLC** for copy of guarantee.

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