REMR Material Data Sheet CM-PC-1,2

Concrete Patching Material: GILCO Highway Patch

1. NAME

GILCO
Highway Patch

2. MANUFACTURER

Gifford-Hill and Company, Inc.
One Woodlawn Green
Charlotte, NC 28210
Tel 704-525-9555

3. DESCRIPTION

Rapid-setting, high-strength, durable mortar designed for patching concrete highway pavements, concrete bridge decks, and concrete floors and for other concrete patching applications where rapid strength gain and durability are desired.

4. APPLICABLE SPECIFICATIONS

ASTM C 928-80, "Standard Specification for Packaged, Dry, Rapid-Hardening Cementitious Materials for Concrete Repairs."

5. USES & LIMITATIONS

Uses: All types of concrete patching applications, including bridge decks; concrete pavements; concrete pavement joint repairs; airport runways and taxiways; industrial floor repairs; truck dock repairs; repairs to concrete structures; and prestress and precast repairs.

Limitations: None listed in manufacturer's literature.

6. MANUFACTURER'S TECHNICAL DATA

Packaging: 55-lb bags

Yield: One 55-lb bag when mixed yields approximately 0.45 cu ft

Shelf Life: Indefinite, if kept dry

Physical Properties:

Setting Time, Gilmore, ASTM C 266	
Initial Set	17 min
Final Set	27 min
Compressive Str, psi, ASTM C 109 (modified)	
2-hour	2,875
6-hour	3,800
24-hour	5,250
28-day	10,200
Freeze-Thaw Resistance, ASTM C 666, Method A, Relative Modulus of Elasticity,	
100 cycles	90%
300 cycles	84%

7. MANUFACTURER'S GUIDANCE FOR APPLICATION

Surface Preparation: Sound base concrete is essential. Thoroughly clean and remove all oil, grease, dirt, and loose debris or concrete from areas to be patched. Square edges by chipping or sawcutting. Feather-edge patching is not recommended. Exposed reinforcing steel should have rust removed by

brushing or sandblasting. Bonding agents should not be used on steel. If concrete in contact with the reinforcing steel is damaged or destroyed, remove the adjacent concrete approximately 3/4 in. to provide a new patch over all exposed reinforcing steel and cleaned concrete surfaces.

Minimum depth of patch is a function of load and age of the patch at the time of exposure. Patches deeper than 3 in. should be extended with 3/8-in. coarse aggregate.

The area to be patched should be thoroughly dampened with clean water before patching. Just prior to patching, the water should be removed with clean rags or compressed air.

Mixing: A mortar-type mixer is recommended. Small quantities may be mixed in a clean 5-gal bucket or other suitable container using an electric drill with a paddle-type mixer.

Locate the mixer close to the area to be patched. Mixing, placing, and finishing should be completed in approximately 10 min in normal temperatures of 70°F.

Mixing Procedure (Follow carefully):

a. Wash out mixer and determine number of bags to be mixed at one time. Mix only amount that can be placed in approximately 10 min.

b. Pour clean water into mixer, and add aggregate if required. (See Mixing With Coarse Aggregate.)

c. Add GILCO Highway Patch.

d. Mix approximately 2 to 3 min until a homogeneous mixture is achieved.

DO NOT add materials other than coarse aggregate to GILCO Highway Patch (see below).

Water Demand: Approximately 1 gal per 55-lb bag.

Mixing With Coarse Aggregate: For patches over 3 in. in depth, GILCO Highway Patch should be extended with clean, well-graded 3/8-in. coarse aggregate.

Coarse aggregate should be soaked prior to use. Moisture content of coarse aggregate should be taken into consideration when calculating the total water content.

Coarse aggregate may be used at the rate of 30 to 35 lb per 55-lb bag of GILCO Highway Patch. For convenience, a 5-gal pail of coarse aggregate may be used for every two 55-lb bags of GILCO Highway Patch. The addition of 3/8-in. coarse aggregate at the above indicated rates will result in a yield increase of approximately 40%.

Special Considerations: Setting time characteristics of GILCO Highway Patch are affected by mixture temperatures and the temperature of the area to be patched.

Cold weather--

a. Heat mixing water to 80° to 95°F. (Temperatures greater than 95°F could cause material to flash set and lower than 80°F could have little or no effect on raising temperature of material.)

b. Concrete surfaces should be warm to the touch. (Do not use accelerators or anti-freeze agents.)

c. Mixer should be warmed with hot water prior to mixing.

d. Follow mixing procedures.

Hot weather--

a. Use chilled water as close to 35°F as possible. This can be

accomplished by placing a block of ice in a 55-gal drum of water. Patching material should be approximately 80°F or below.

b. Areas to be patched should be thoroughly saturated with cool water prior to use of material. Just prior to placing the patch, remove standing water with compressed air or mop with clean rags.

c. Prior to mixing, cool mixer with chilled water.

d. Follow mixing procedures.

Placing: Place the material immediately into a thoroughly dampened area. Place from one side to the other, and work material into sides and bottom of patch area to assist in satisfactory bonding.

Screed and level to proper elevation of existing concrete. Trowel and seal edges and saw cuts. Excessive trowelling is not required. Do not retemper patching materials.

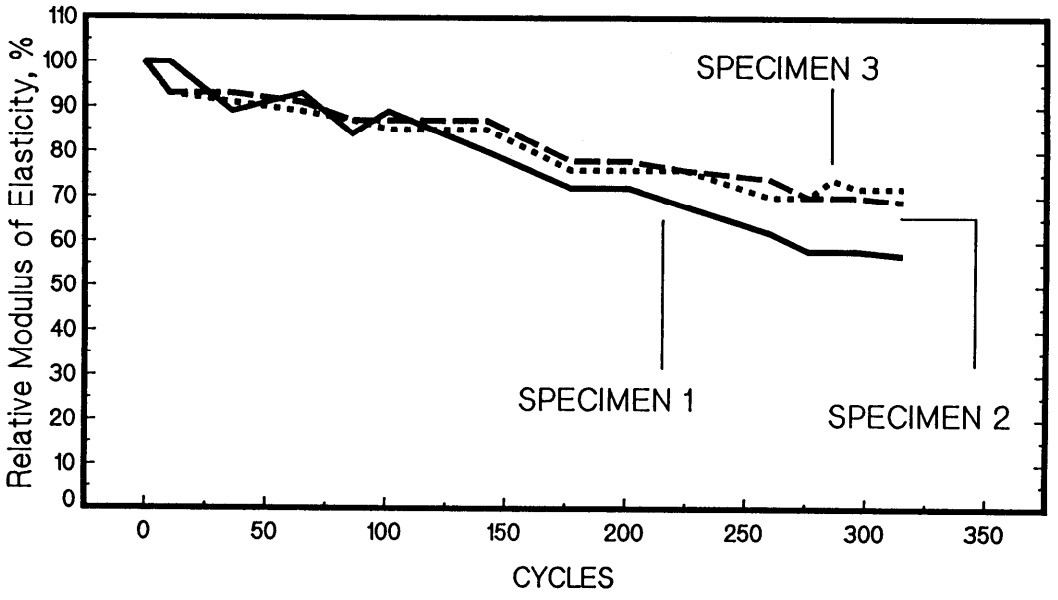
When patching across joints, it is recommended that a full-depth joint be cut into the patch and in the same position as the original joint.

Curing: Immediately after hardening, flush with cold water. Then normal concrete curing methods should be followed, and the patch should be protected from temperature extremes.

8. CORPS OF ENGINEERS' EVALUATION

Compressive Str, ASTM C 109, psi	1-hr	2560
	2-hr	3220
	3-hr	3450
Compressive Str, ASTM C 39, psi	24-hr	5160
	28-day	7960
Mod of Elast, ASTM C 469, psi	24-hr	3.08×10^6
	28-day	4.04×10^6
Flexural Str, ASTM C 78, psi	3-hr	500
	24-hr	740
	28-day	900

Rapid Freezing and Thawing, ASTM C 666, Relative Dynamic Modulus of Elasticity, %:



Bond to Con, ASTM C 882, psi	24-hr	2020
	28-day	4090*
Shrinkage, percent	GR-83-10**	
(Unconfined Condition)[1]		0.080
(Concrete Patch)[2]		-0.025
Rapid freezing and thawing, ASTM C 666, see chart.		

* Material and concrete failure.

** Bureau of Reclamation Technical Report Standard.

1 An exotherm of 39°F was recorded on the shrinkage specimen using a mix design of 1 gal per 55-lb bag.

2 An exotherm of 25°F was recorded on the shrinkage specimen using a mix design of 1 gal of water, 33 lb of 3/8-in. limestone aggregate, and 55 lb of material.

9. ENVIRONMENTAL CONSIDERATIONS

Reasonable caution should guide the preparation, repair, and cleanup phases of concrete or mortar repair activities involving potentially hazardous and toxic chemical substances. Manufacturer's recommendations to protect occupational health and environmental quality should be carefully followed. Material safety data sheets should be obtained from the manufacturers of such materials. In cases where the effects of a chemical substance on occupational health or environmental quality are unknown, chemical substances should be treated as potentially hazardous toxic materials.

10. AVAILABILITY & COSTS

Availability: This material is available throughout the US through a network of local distributors.

Costs: Approximately $13.50/bag for small quantities; price per bag is reduced as volume of order increases.

11. TECHNICAL SERVICES

Gifford-Hill representatives are available to assist at any step from specification to field service. There is no charge for this service.