



The Chemical Company

PRODUCT DATA

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Maintenance of Concrete

# EMACO® R 400 ARCHITECTURAL

Smooth patching mortar for architectural concrete

## Description

Emaco® R 400 Architectural is low-slump, fast setting, Portland-cement-based, multi-purpose smooth repair mortar for detailed fine architectural work. It does not require the use of forms or multi-layered casting techniques.

## Yield

0.45 ft³/50 lb bag  
(0.013 m³/22.7 kg bag)

0.54 ft³/60 lb pail  
(0.015 m³/27.2 kg bag)

Yields are approximate, depending on job site conditions.

## Packaging

12 lb (5.5 kg) metal cans

50 lb (22.7 kg) polyethylene-lined bags

60 lb (27.2 kg) metal pails

## Color

Standard: light gray

For special colors refer to Elements color chart. Available in minimum quantities of 5,000 lbs (2268 kg).

## Shelf Life

1 year when properly stored

## Features

- No forms required
- Smooth consistency
- Light gray
- Wide temperature service range
- Resistant to weathering, wind-driven rain, and fading
- One component
- Can be mixed with Acryl 60®
- Elements colors available

## Benefits

- Speeds production
- Trowels easily and efficiently
- Color blends with most standard concrete surfaces
- Suitable for all climates
- Provides durable, waterproof, long-lasting patches
- Easy to mix
- Improved freeze/thaw resistance and adhesion
- Enhances structure's appearance

## Storage

Transport and store in unopened containers protected from moisture and dampness in a cool, clean, dry area between 45 and 90° F (7 and 32° C). Do not allow Acryl 60® to freeze.

## Where to Use

### APPLICATION

- Detailing architectural concrete
- Repairing cast-in-place, precast, and steel-reinforced architectural concrete
- Resurfacing precast or tilt-up concrete panels
- Cornices, lintels, sills
- Sound barriers or retaining walls
- Highway-median barriers
- Curbing

### LOCATION

- Vertical, overhead
- Nontraffic-bearing horizontal surfaces
- Above grade, interior or exterior
- Below grade, interior or exterior

### SUBSTRATE

- Concrete
- Masonry

## How to Apply

### Surface Preparation

1. Area to be repaired must be clean, structurally sound, and free of all loose, dirty, oily, and scaly material or any material that may affect proper bonding.
2. Repair area should have sawcut straight edges at a minimum depth of 1/4" (6 mm).
3. Clean all reinforcing steel to a white-metal finish.



## Technical Data

### Composition

Emaco® R 400 Architectural is a proprietary mix composed of cement, graded silica, fillers, and additives.

### Test Data

Emaco® R 400 Architectural modified with Acryl 60® diluted with water in a 1 to 3 ratio at 3.75 qts (3.5 L) per 50 lb (22.7 kg) bag.

PROPERTY	RESULTS	TEST METHODS
<b>Initial set</b> , min	10 – 15	ASTM C 807, modified
<b>Final set</b> , min	20 – 30	ASTM C 807, modified
<b>Density</b> , lb/ft <sup>3</sup> (g/cm <sup>3</sup> )		ASTM C 138
Wet	128 – 133 (2.05 – 2.12)	Lab Method
Cured	125 – 131 (2.00 – 2.10)	
<b>Compressive strength</b> , psi (MPa), using 2" (51 mm) cubes		ASTM C 109
1 day	3,000 (20.7)	
7 days	4,000 (27.6)	
28 days	5,000 (34.5)	
<b>Flexural strength</b> , psi (MPa)		ASTM C 348
7 days	680 (4.7)	
28 days	990 (6.8)	
<b>Tensile strength</b> , psi (MPa)		ASTM C 190
1 day	210 (1.4)	
7 days	580 (4.0)	
28 days	830 (5.7)	
<b>Modulus of elasticity</b> , psi (MPa)		ASTM C 469
28 days	3.4 x 10 <sup>6</sup> (2.3 x 10 <sup>4</sup> )	
<b>Freeze/thaw resistance</b> , %		ASTM C 666
Weight gain	1.9	
Durability factor	104	
<b>Scaling resistance</b> , rating at 50 cycles	0	ASTM C 672
<b>Water-vapor transmission</b> , perms	4.72	ASTM E 96
<b>Coefficient of thermal expansion</b> , linear, in/in/° F	4.49 x 10 <sup>-6</sup>	ASTM C 531

Test results are averages obtained under laboratory conditions at 70° F (21° C) and 50% rh. Reasonable variations can be expected.

### Mixing

- Product can be mixed with water only or with a water and Acryl 60® mixture to enhance its properties. Prepare a mixing solution of 1 part Acryl 60® to 3 parts water. To improve bonding, Acryl 60® may be mixed 1 to 1 with water.
- Elevated material and mixing water temperatures will shorten open time. Precondition Emaco® R 400 Architectural to 70° F ±5° (21° C ±3°).
- Mix only enough material that can be placed within 10 – 15 minutes.

- Low slump and ability to build without forms is dependent on a low water-to-cement mix. Add 3 quarts (2.7 L) of water and Acryl 60® mixture to a clean container. Gradually add powder while mixing at low speed to obtain a uniform, lump-free consistency. Add up to 3/4 quarts (0.7 L) of water and Acryl 60® mixture only if needed for workability. Mechanically mix with slow-speed drill and mixing paddle at 400 to 600 rpm, or use an appropriately sized mortar mixer.
- Do not overmix or beat air into the mix. Do not exceed 3.75 quarts (3.5 L) of liquid per 50 lb (22.7 kg) bag, or 4.5 quarts (4.2 L) per 60 lb (27.2 kg) pail. Mix for 2 – 3 minutes. Do not overmix.

- Maximum single-lift recommendation is 1" (25 mm) on vertical surfaces and 1/2" (13 mm) overhead, with a minimum placement depth of 1/8" (3 mm).
- For applications exceeding the above recommendations, extend Emaco® R 400 Architectural with up to 15 lbs (6.8 kg) of washed, graded, saturated surface-dry (SSD) aggregate per 50 lb (22.7 kg) bag. When extended up to 3 50 (22.7 kg) bags of Thorite® 400 can be used at once.

## Application

1. Prewet the substrate to a saturated surface-dry (SSD) condition. Some substrates may require extended and even overnight soaking. Remove any ponding water from the surface before placing the scrub coat.
2. As a scrub coat, apply the fresh mortar by brush to the properly prepared, prewetted substrate, vigorously scrubbing it into the exposed surface. Do not allow scrub coat to dry prior to placement of the trowel mix. If the scrub coat dries out before the wet mortar can be placed, it must be removed as if it were laitance.
3. Immediately apply fresh mortar to the wet brush coat using firm trowel pressure. Completely fill all voids around steel reinforcement.
4. As Emaco® R 400 Architectural hardens, score material between layers to improve adhesion. After initial set and apply a second layer, building out the patch above the final profile required. Shave back the patch, working from the center towards the perimeter to achieve the final profile before the patch fully hardens.
5. Use a wet sponge float for final shaping. Finishing with a straight edge may be required.

## AESTHETICS

1. Special care is required to achieve a suitable surface texture and color of the cured patch.
2. This texture should be achieved on a jobsite sample area and retained throughout the entire restoration project as a standard.
3. Improperly textured patches will be clearly visible at certain low angles, especially if a clear water repellent or an acrylic film-forming coating is used as a topcoat.

## Curing

In normal conditions, keep patch moist by water mist or fog spray until final set. Refer to ACI 308 Practice for Curing Concrete. In hot, dry, windy conditions or for deeper placements, longer periods of moist curing may be necessary; an ASTM C 309 compliant curing compound may also be used.

## Clean Up

Clean tools and equipment immediately with water. Cured material must be removed by mechanical means only.

## For Best Performance

- Do not apply to unsound, cracked, or microfractured concrete or to concrete surfaces that are not clean and free of all contaminants.
- Do not apply to frozen or frost-covered substrates or when surface and air temperatures are below 40° F (4° C) or expected to fall below 40° F (4° C) within 24 hours after application.
- Do not apply over dynamic cracks, control joints, or expansion joints.
- Emaco® R 400 Architectural is not intended for continuous contact with acid or sulfate containing water. Very soft water will have an adverse affect on performance.
- Overmixing can reduce density, strength, and durability.
- This product is not designed for large placements. Consult Technical Service for recommendations.
- Make certain the most current versions of product data sheet and MSDS are being used; call Customer Service (1-800-433-9517) to verify the most current version.
- Proper application is the responsibility of the user. Field visits by BASF personnel are for the purpose of making technical recommendations only and not for supervising or providing quality control on the jobsite.

## Health and Safety

EMACO® R 400 ARCHITECTURAL

### WARNING!

Emaco® R 400 Architectural contains alumina cement; silica, crystalline quartz; portland cement; limestone; calcium aluminate; aluminum oxide; anhydrite.

### Risks

Product is alkaline on contact with water and may cause injury to skin or eyes. Ingestion or inhalation of dust may cause irritation. Contains small amount of free respirable quartz which has been listed as a suspected human carcinogen by NTP and IARC. Repeated or prolonged overexposure to free respirable quartz may cause silicosis or other serious and delayed lung injury.

## Precautions

Avoid contact with skin, eyes and clothing. Prevent inhalation of dust. Wash thoroughly after handling. Keep container closed when not in use. DO NOT take internally. Use only with adequate ventilation. Use impervious gloves, eye protection and if the TLV is exceeded or used in a poorly ventilated area, use NIOSH/MSHA approved respiratory protection in accordance with applicable Federal, state and local regulations.

## First Aid

In case of eye contact, flush thoroughly with water for at least 15 minutes. In case of skin contact, wash affected areas with soap and water. If irritation persists, SEEK MEDICAL ATTENTION. Remove and wash contaminated clothing. If inhalation causes physical discomfort, remove to fresh air. If discomfort persists or any breathing difficulty occurs or if swallowed, SEEK IMMEDIATE MEDICAL ATTENTION.

Refer to Material Safety Data Sheet (MSDS) for further information.

## Proposition 65

This product contains material listed by the State of California as known to cause cancer, birth defects or other reproductive harm.

## VOC Content

0 g/L or 0 lbs/gal less water and exempt solvents.

**For medical emergencies only,  
call ChemTrec (1-800-424-9300).**

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