



Product Application Guide

Creto RMO (Repair Mortar Overlay)

PRODUCT DESCRIPTION

Creto RMO is a proprietary admixture designed to be used as a modifier for Portland cement. It gives Portland cement unusual and unique properties not obtainable from other admixtures or modifiers.

Creto RMO contains proprietary copolymer components which induce cross linking in the presence of Portland cement, producing a chemical as well as mechanical bond both adhesively and cohesively.

Creto RMO is:

- Environmentally safe,
- non-reemulsifiable and will waterproof and seal from the positive or negative side of substrates, an excellent priming system, or bond coat, for other coatings and systems.

Creto RMO, when added to Portland cement, sand and water, provides extraordinary adhesion and flexibility without fatigue, in thickness' applied from paper thin to as thick as desired. The result is a durable patch and overlay system that will not delaminate, even at a feather edge.

Creto RMO gives cement base repairs the ability to be used as a permanent repair and/or resurfacer on virtually any sound surface. This includes concrete, masonry, asphalt, wood, metal, and surfaces not normally considered sufficiently "bondable".

Note: An application of Creto DPS to treat the concrete or alkali bearing substrate prior to an RMO application, produces a chemical bond between the aero silica gel produced by the DPS and the copolymers in our RMO. The result is a monolithic amalgamation of the RMO and the substrate which produces a bond far stronger than conventional patching or overlay materials and even epoxies!

Background

Creto RMO was originally formulated for the restoration of tennis courts, and to provide a vapour barrier to eliminate the delamination of cushioned tennis court coatings caused by moisture vapour through concrete or asphalt.

The objective was to perfect a waterborne copolymer that would mix easily with standard cement and sand, yet not re-emulsify in the

presence of standing water.

Another objective was to produce a product which could be easily applied, with a squeegee, similar to asphalt emulsion coatings.

Creto RMO enables the creation of various mix designs which could be applied in thickness' ranging from a foot or more down to the thickness of a coat of paint, with no delamination, even at a feather edge.

Characteristics & Advantages

Superior adhesive strength & capabilities

Flexibility without fatigue

Superior freeze-thaw capabilities

Waterproofs and seals

Excellent priming/bond coat for secondary coatings and systems

Weather, abrasion and UV resistant

Easy to apply, easy clean up with water

Non-toxic, environmentally friendly

Non-reemulsifiable waterborne copolymer

Allows virtually any type of surface texture

Typical Applications

Floor leveling/smoothing

Patching and repair

Spalled/deteriorated conditions

Concrete / asphalt renovation and resurfacing

Vertical and overhead concrete renovation

Pedestrian and vehicle surfaces

Renovation of gypsum underlayments

Slip resistant surfaces

Abrasion resistant surfaces

Reduction of moisture vapor emissions through slabs or walls

Asbestos tile encapsulation

Recreational surfaces, repair / smoothing

Highways/ bridges / sidewalks / curbs

Waterproofing

Parking structures, Warehouses/industrial floors

Pool decks

Driveways

Loading docks and ramps

Masonry walls



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Textures: Creto products can be used to produce textures such as smooth, slip-resistant, knockdown, swirl, broom finish, orange peel, and other textures normally possible with concrete surfaces. Creto products can also be used to create special, decorative effects such as brick, stone, flag stone or slate patterns. This is achieved by using tape-off or template systems with a contrasting color second coat.

Surface Preparation

Prior to any Creto products' application, a site survey is required to determine the suitability and proper application for each specific project.

Unless intended as a temporary repair, the first consideration is structural integrity. Any areas not structurally sound shall be repaired or replaced prior to application. In many cases, the repairs can be made with Creto products.

All concrete, wood, asphalt, masonry, metal and other surfaces must be structurally sound, clean and free of coatings, curing compounds, dirt, oils, grease, laitance, efflorescence, mildew, fungus, or any contaminant that prevents good adhesion.

A combination of cleaning methods can be used, Shot blasting, sand blasting and high pressure water blasting have proven to be effective methods of coating and contaminant removal. Chemical removal, such as degreasing and etching with Creto Deep Clean can also be used.

The least destructive method that will accomplish the desired end result should always be selected.

Extremely oily surfaces can be pre-heated with a propane torch to bring the oils to the surface, followed by an application of Deep Clean and a water blasting. Repeat this procedure and process until all such surfaces are free of oily substances.

Concrete Surfaces: New concrete shall be allowed to cure minimum of 72 hours and shall be neutralized prior to application.

Asphalt Surfaces: These surfaces have characteristics different from concrete and require special consideration. Sound surfaces can be overlaid with Creto products.

Note: Hotmix asphalt should not be applied prior to application of Creto products.

Wood Surfaces: Surfaces must be secured with screws to the structure, and all holes, seams and cracks shall be taped prior to application.

Hairline Cracks: Minor cracks or spalls do not require pre-filling. RMO Squeegee Mix made using Creto RMO should be allowed to flow into the cracks during an initial squeegee application. A flowable mixture will penetrate the cracks and surface and create better adhesion than a drier patching mix. Another method is to pour Squeegee Mix into cracks, voids, spalls or removed areas and allow to self level until filled.

Larger Cracks: Depending on extent of cracking, an anti-alkaline, elastic matting should be embedded in Squeegee Mix directly over individual cracks or over the entire surface, after cracks have been filled with squeegee mix by squeegee application or pouring. See details on application of Squeegee Mix later in this section. Note: Although no crack repair system is 100% effective, this system has proven successful on many applications.

Questionable Surfaces: Chalky, dusting, and pigmented surfaces should be pre-treated with Creto DPS and pre-dampened with "Pre-Mix". I.e. (1) part Creto RMO to (1-2) parts clean water.

Expansion Joints: Existing expansion joints should always be maintained. If joints are already filled, mask joint and remove masking after application. In unfilled joints, place a temporary filler that can be removed after application. Prior to filling joints with joint filling material, brush apply two (2) applications of RMO Squeegee Mix to edges of joints to provide a waterproof surface. Saw cutting can be used to re-establish expansion joints and can also help when a joint should have been installed in the original surface.



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Mixing Equipment

Drill and paddle
Mortar mixers or Transit mixers
Cement trucks

Application Equipment

Squeegee
Straight edge
Fresno trowel
Dragbox
Asphalt emulsion sprayer

Creto RMO Mixes

There are many different design mixes for different applications from very fluid squeegee mixes to dry, zero slump, patching mixes. For a specific application, please refer to the "Mixing Ratios and Repair Chart" on every pail of RMO and included as the last page of this Product Spec.

The five (5) most common RMO mixes are:

1. Pre-Mix: consists of pre-blended one (1) part Creto RMO, added to "various" parts clean water.

The ratios of RMO concentrate to water vary from 1:1 or 1:2 for 1/16" to 1/4" all the way up to 1:40 for 8" to 10" thick or thicker applications.

More water may be added to a thin (i.e. 1:1) "Pre-Mix" if a lower slump mix is required. (i.e. thinning a 1:1 Pre-Mix to a 1:40 Pre-Mix, is OK)

More moisture can be added to any Creto Mortar or Overlay mix made from RMO, but, you must use the Pre-Mix not water.

2. Primer Mix/Bond Coat: consists of the above "pre-Mix" blended with Portland Type I & II cement. The mix ratio is 1:1:1.

Primer Mix/Bond Coat is used as the name implies as a primer or bonding coat applied prior to the repair with Patching or Formless Mixes, or overlay.

3. Squeegee Mix: By sheer volume, this is the most common mix design, primarily for overlays, consisting of:

Mix 2.5 gallons Creto RMO with 2.5 gallons clean water. Mix well.

Add one 5 gal pail of Portland cement. Mix until no lumps remain.

Add two 50 pound bags silica sand. Mix until no lumps remain. Size of sand determines thickness and texture of coating.

Add sufficient water, not to exceed 5 gallon total, to make a good squeegee consistency.

By volume, this mix is: 1 RMO Concentrate /1 water/2 cement /4 sand.

Mixing is to be by mechanical means. A 1/2 drill motor with proper mixer works well for small batches. Mortar type mixers can be used for larger batches.

When color pigment is to be added, separate mixing of dry materials and wet materials is recommended prior to blending. This procedure helps assure that all cement and color particles are properly blended and dissolved.

4. Patching Mix: is used for patching spalls, cracks, and filling uneven or non-level surfaces.

Mix standard squeegee mix. More sand may be added, up to four (4) parts sand to one (1) part cement. By volume this mix is: 1 RMO /2 water /2 cement /up to 8 sand.

5. Formless Mix: is used for vertical and other patches where a non-slump consistency is desired.

Pre-blend sand and cement, one (1) bag cement to two to three (2-3) bags silica sand.

Make Creto RMO Pre-Mix.

Add Pre-Mix to pre-blended dry mix. Add only enough liquid to make the mixture moist enough to pack in hands without getting hands wet (dry packed snowball consistency).



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Squeegee Application

1. Some applications require priming with Pre-Mix or Primer Mix/Bond Coat as previously discussed. Otherwise:
2. Pre-moisten surface prior to application by lightly spraying with water. Do not puddle.
Keep surface damp throughout application.
3. Pour Creto Squeegee Mix onto surface and spread evenly by squeegee, straight-edge, dragbox, broom, brush or trowel. For large jobs, a sealcoat machine may be used. **Keep surface in front of squeegee moist.** This is important for ease of application and maximum bond. Allow to dry.
4. Scrape or stone to remove any ridges or irregularities from surface.
5. Repeat procedure when equipment can be moved onto surface without disturbing or damaging product. Minimum one (1) hour at 70 degrees F. (Under direct sunlight at less than 1/8" thickness).

Note: Use Squeegee Mix to resurface in thin layers. When dry, squeegee applications can be sanded between applications or after final application with an asphalt seal-coat type terazzo stone or sandpaper attachment. A floor buffing machine can be used to produce a final surface uniform in texture and appearance.

Patching Application

1. Apply patching mix to spalls, cracks, and non-level areas with straight-edge, asphalt lute, or squeegee. The patching mix must be allowed to flow into the cracked and deteriorated area to seek out and fill all voids.

Formless Application

1. Prime area to be patched with Pre-Mix and keep damp throughout application.
2. Pack "snowball" into area.
3. Brush placed material with Pre-Mix and finish with trowel or float to desired finish and texture.
Note: Additional Pre-Mix can be added for a More fluid mix if desired.

Spray Application

Creto RMO mixes can be sprayed with hopper guns, rotor-stator or diaphragm pump equipment such as used for pumping and spraying other cementitious materials.

Fluid content of mix combined with size and quantity of aggregate enables application of finishes from "orange peel" to globs of material for knock-down finishes. Spraying is an effective method of applying decorative finishes.

Cure Time

Creto cement base products require the same full cure time as normal concrete. Normal traffic will not adversely affect Creto cement base products after the first 12-24 hours and can often be coated after 24 hours.

For interior applications or those not in direct sunlight, allow 72 hours prior to coating.

Coverage Rates

Coverage rates vary according to design mix, porosity and profile of surface.

For example: Five gallons of Creto RMO, mixed per standard Squeegee Mix instructions, will yield 46 gallons of mix.

Using #60 mesh sand and applying the mixture with a squeegee, the mix will yield approximately 2,000 square feet per coat.

Finer grades of sand can increase the yield.

Packaging

18.9 liter/US 5 gallon pails

208 liter/US 55 gallon drums



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Test Data

The following tests were conducted by Construction Testing & Engineering Inc., Escondido, CA., USA, in accordance with ASTM C 39 for Compressive Strengths, and ASTM C 882 for Slant Shear Strengths:

7 Day	A-Slant	2030 psi
	B-Slant	2020 psi
	C-Compressive	6500 psi

The following test was conducted by Construction Technologies Laboratories Inc., Skokie, IL., USA, in accordance with ASTM C66-90, "Standard Test method for Resistance of Concrete to Rapid Freezing and Thawing":

Result - 320 cycles: Passed

For additional test data refer to the extensive ICBO test report included in the Test Data Section, on RMO overlays, carried out by RamTech Laboratories Inc.

Maintenance

Creto products are often applied as wear surfaces. As such, these surfaces should be inspected at regular intervals and touched up or repaired as necessary to preserve the integrity of the system. Frequency of required maintenance will be determined by factors such as use, wear, abuse, additional coatings, etc.

Limitations

Creto RMO is not to be applied unless surface temperatures are 12°C / 53°F and rising. Creto products are not to be applied when precipitation is expected within 24 hours following completion of application. Creto products must be applied to surfaces that are structurally sound, unless application is considered temporary.

All Creto product applications should be preceded by a site survey to determine suitability and proper application. Creto RMO is available only to qualified, "certified" applicators. In the event of a specified job or one requiring a warranty, only applicators approved and certified by Creto Engineered Solutions, will be permitted to purchase and apply Creto products for that project. If a bid process is involved, such certification must take place prior to the bid opening.

Technical Services

Assistance will be provided through the network of authorized representatives and certified applicators who will assist in site evaluations, recommendations, specification writing and job follow-ups.

Additional Creto products and systems are also available through this same network.

Creto RMO Mixing Ratios and Repair Chart

Estimated Thickness of Application	“P re-M ix” R at i o s (RMO Concentrate & water)		P o r t l a n d C e m e n t, T y p e I & I I A p p r o p r i a t e M e s h S i l i c a S a n d, W a s h e d G r a v e l o r C r u s h e d S t o n e			
	P a r t s R M O C o n c e n t r a t e	P a r t s W a t e r	P a r t s C e m e n t	P a r t s S a n d	P a r t s G r a v e l	M a x . S i z e o f G r a v e l
1 / 32” to 1 / 16”	1	1	1	1	0	-
1 / 16” to 1 / 4”	1	2	1	2	0	-
1 / 4” to 1 / 2”	1	3	1	3	0	-
1” to 2”	1	6	1	2	2	1 / 2”
2” to 3”	1	9	1	2	2	3 / 4”
3” to 4”	1	12	1	2	2	1”
4” to 5”	1	16	1	3	2	1 1 / 2”
5” to 6”	1	20	1	3	2	1 1 / 2” to 2”
6” to 8”	1	25	1	3	2	2”
8” to 10”	1	30	1	3	2	2”

1. Make the “Pre-Mix” separately by thoroughly mixing the appropriate amounts of Creto RMO and water by volume.
2. Make the dry repair or coating mixture separately by thoroughly blending the appropriate amounts of cement, sand, and/or gravel by volume.
3. Add the wet “Pre-Mix” to the dry mixture slowly until the desired consistency is achieved (zero slump for repairs, wet mixtures for coatings). If mixture is too dry, add only wet “Pre-Mix”, if mixture is too wet, add only the prescribed ratio of dry mixture, (pre-mixed cement and sand/gravel).
4. Thoroughly clean and dampen repair areas, removing any loose materials and excess water.
5. Prime repair areas with “Pre-Mix”, removing any excess. Applications
6. less than 1 / 4” should be applied with a squeegee (overlaid) and do not require priming, but, should be dampened just prior to the coating application and any excess water removed with a sponge.
7. Pack zero slump repair materials into repair areas and thoroughly compact until filled.
8. Apply final brush coat of “Pre-Mix” to repair areas for smooth transitions, feathering out to zero and to facilitate finishing with trowel, brush and sponge.
9. Carefully protect finished areas from traffic, water run-off, etc., until dry.