ROADWARE.US

MICRODOWELING

CONCRETE REPAIR SYSTEM

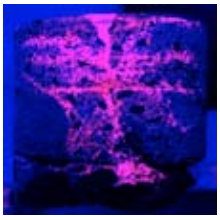
Protect your floors with a concrete repair system that fully cures in freezer floors below -20°F.

Now you can repair cracks and spalls to a smooth finish in a fraction of the time it takes with ordinary products. Roadware 10 Minute Concrete Mender™ is a revolutionary new two-part hybrid urethane for repairing concrete. It's nearly water thin for deep penetration and it won't pop out like epoxy because it never gets brittle.

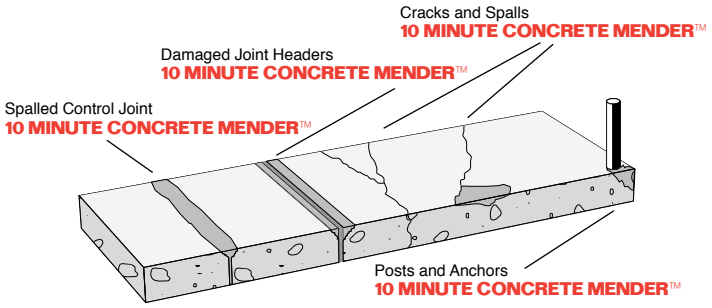
NO POT-MIXING AND NO WASTE.

Roadware 10 Minute Concrete Mender™ is packaged in uniquely designed ratio-packs that completely mix the material at the point of application. No pot-mixing and no unused material. Difficult repairs are now simple, just clean the area, prime with 10 Minute Concrete Mender, add manufactured sand, and flood with additional 10 Minute Concrete Mender. In just, minutes you'll get a tough 4500 psi polymer concrete that will stay in place permanently.

Roadware 10 Minute Concrete Mender™ "The advanced concrete repair material that repairs concrete from the inside out."



This concrete core sample shows the extent of penetration into concrete when photographed under UV light.



USE ON ALL COLD STOSTORAGE FLOORS.

Roadware 10 Minute Concrete Mender™ is extremely tough and will withstand even the harshest punishment. Great for freezers... may be applied at temperatures as low as -20° F with excellent results. Use on thresholds, cracks, spalls and control joints. Cures hard in freezers in 60 - 90 minutes.

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SAFETY

Smooth floors are safe floors.

Cracked and uneven floors are a leading cause in workplace accidents. Trips, falls, and tipped loads can lead to life changing accidents that can cause a really bad day for your entire organization. Keeping floors in good repair with **Roadware 10 Minute Concrete Mender™** will help maintain a safe workplace.

OPERATIONS

A workspace that looks good, will work good.

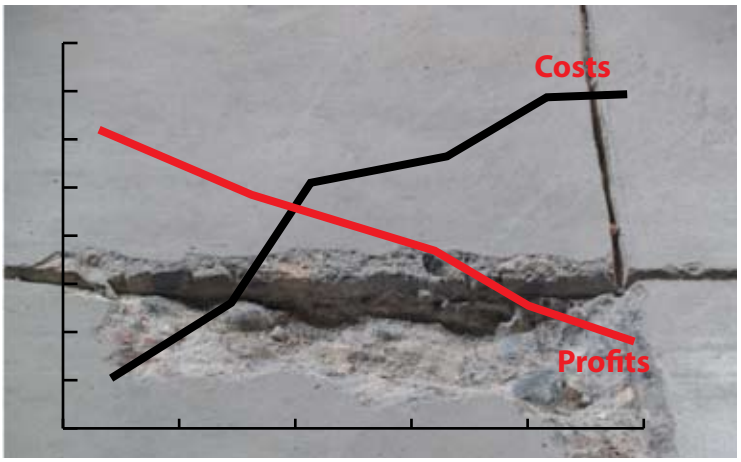
Your floors support your entire operation. Clear and smooth floors free from cracks and spalls are more productive and bring confidence to your entire team. **Roadware 10 Minute Concrete Mender™** can permanently repair cracks, spalls and joints. No more disappointing repairs that last only a few weeks. Retail operators like Wal•Mart, Home Depot, and Target spend millions of dollars to make their floors look good. They know that good looking floors and good looking stores lead to greater revenue. The same is true for warehouse floors and production floors. Your team will feel better, will be more productive, and will work better.

PROFITABILITY

Bad floors steal money.

Floors with cracks and spalls steal money from the bottom line. Just think about all the costs related to floor issues.

- Workers Comp claims attributed to accidents.
- Workers Comp claims due to repetitive stress injury of fork truck drivers.
- Fork truck maintenance and repair.
- Damage from tipped loads.
- Contaminated product from loose debris in floor cracks.
- Damage floors will get worse if not addressed quickly.
- Higher cleaning costs.



PRODUCTIVITY

Smooth floors are productive floors.

Floors with cracks and spalls can slow down your operation. When a fork truck has to slow down for a spalled control joint, productivity suffers. When a team member needs to summon help to push a cart through a threshold, productivity suffers. Using **Roadware 10 Minute Concrete Mender™** to repair floor bottlenecks that slow everything down will help productivity.

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ROADWARE INCORPORATED

Cooler and Freezer Application Guide
Roadware 10 Minute Concrete Mender™

Scope of Work
Spalls
Cracks
Thresholds
Surface Defects and Spalling

Challenges and Limitations

Longer Cure Times
Lower temperatures create longer cure times. At zero degrees F, the cure time can be two hours or more, depending on the repair size. Longer cure time also allows for longer working times. See Cure Time Diagram.

Limited Preparation Options
Freezers and Coolers will require a mostly mechanical approach to concrete prep. Diamond grinders, wire wheels, Shop Vacuums, and concrete dust mitigation may be required.

Enclosed Areas
Repairs made in high-moisture conditions can produce a stronger odor during curing. Before applying Concrete Mender, ensure the repair area, sand, and aggregates are dry. Exercise caution when using Concrete Mender in coolers, freezers, or any enclosed spaces with low ventilation. Additionally, repairs should not be performed near active food preparation areas or in close proximity to odor-sensitive products, materials, or merchandise.

Preparation

Remove loose concrete, dirt, and debris.
Use a heat gun or torch to remove water, ice, frost, and moisture from the repair area immediately before applying Concrete Mender.
Keep Concrete Mender and any added sand or aggregate at 60-80 degrees F until mixing and application. Frozen sand will likely contain ice and release moisture when mixed with Concrete Mender. Make sure any sand used is clean, warm, and dry.

Application

Cracks

Use a 300x300ml cartridge, flood the crack with Concrete Mender. Immediately apply a layer of 40-30 grit silica sand or equivalent. Add additional Concrete Mender and layers of sand up to the top making sure the sand is fully saturated. Strike off the top flush with the concrete and allow to cure. Finish as normal.

Spalls

Create a repair base by filling the lower one-inch of the repair area with a mixture of 10 Minute Concrete Mender™ and silica sand (30-40 grit). Use a ratio of 1 part mixed Concrete Mender to 2 parts silica sand. During the application, you can add up to 1/2 part of additional sand to help with troweling and placement. Make sure to leave the lower half of the surface rough and covered with sand to prepare for the next layer.
EXAMPLE
1 Qt side A,
1 Qt Side B,
4 Qts 40-30 grit silica sand, Up to 1 quart of additional sand as needed.
Once the lower layer sets and turns grey, continue adding additional layers to the surface and the desired finish.

The mixed material should always be resin-rich, and the sand should be fully saturated when applied to the repair area.

For extra surface strength, 30 grit aluminum oxide may be broadcast and troweled in place on top as the materials start to gel after placement.

Thresholds

See Threshold Repair Diagram.

Investigate the area to determine the sub-straight and conditions. You may encounter wood timbers, foam insulation, ice, water, and contaminants.

Wood timbers should be surface dry and be in good condition. Stainless steel screws can be partially installed into the wood to act as a mechanical pin between the wood and the repair.

Foam Board Insulation. Concrete Mender is compatible with most blue, pink, and yellow foam board-type insulation.

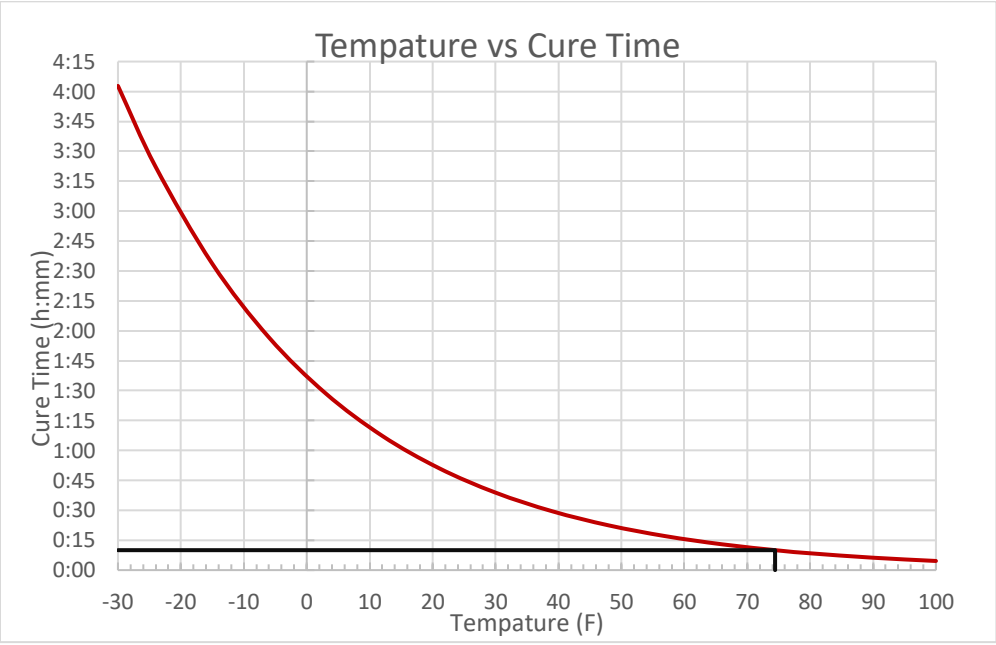
Expanded Polystyrene Insulation: Concrete Mender will dissolve typical white Styrofoam board insulation on contact. Use a barrier of some kind when this type of insulation is present.

Create a repair base by filling the lower one inch of the repair area with a mixture of 10 Minute Concrete Mender™ and silica sand (40-30 grit). Use a ratio of 1 part mixed Concrete Mender to 2 parts silica sand. During the application, you can add up to 1/2 part of additional sand to help with troweling and placement. Make sure to leave the lower half of the surface rough and covered with sand to prepare for the next layer.
EXAMPLE
1 Qt side A,
1 Qt Side B,
4 Qts 40-30 grit silica sand, Up to 1 quart of additional sand as needed.
Once the base layer sets and turns grey, continue with additional layers up to the surface and desired finish.

The mixed material should always be resin rich and the sand should be fully saturated when applying to the repair area.

For extra surface strength, 30 grit aluminum oxide may be broadcast and troweled in place on top as the materials start to gel after placement.

Relief Joint:
After the Concrete Mender repair cures, cut a 3/8’ deep x ¼” wide relief joint alongside the warm side of the threshold, as shown. Fill with Roadware Flexible Cement II.



Threshold Diagram:

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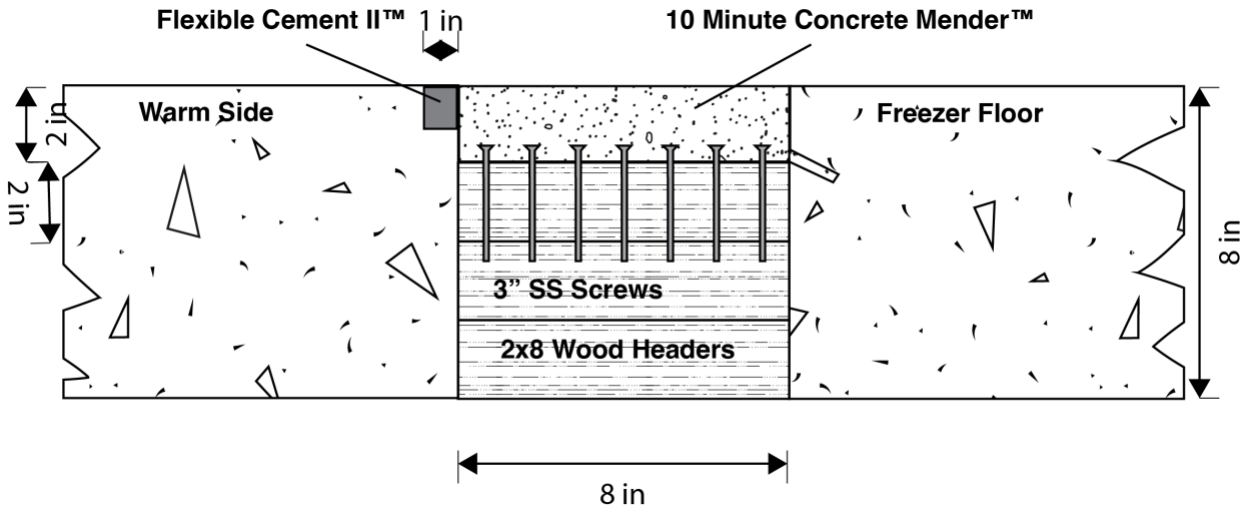
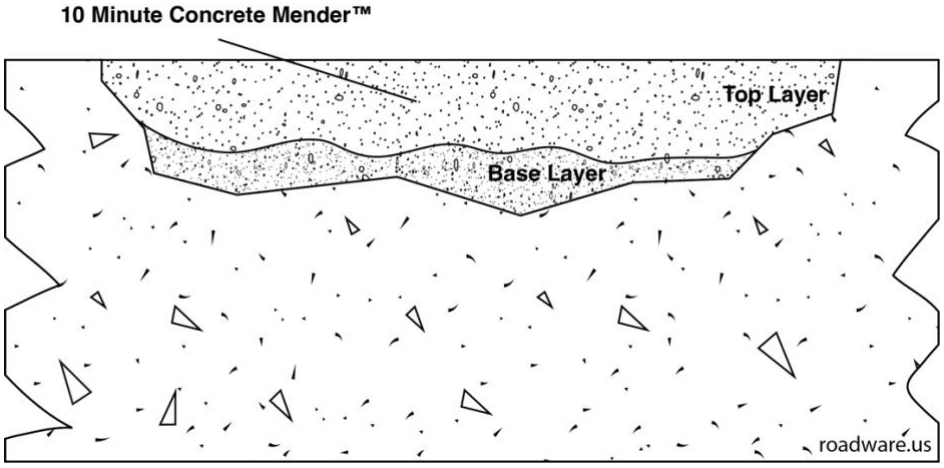


Typical spall repair:



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TECHNICAL DATA SHEET

ROADWARE 10 MINUTE CONCRETE MENDER™

PRODUCT DESCRIPTION

Roadware 10 Minute Concrete Mender™ is a high-penetration two-part structural polyurethane that combines with sand to form a tough instant polymer concrete. This nearly water thin formula is designed for Microdoweling™ deep into the host concrete creating extremely high bond strengths, reinforcement of the repair area as well as permanent repairs.

Roadware 10 Minute Concrete Mender™ produces polymer concrete repairs that absorb the shock and transfers the load of heavy traffic without cracking or dis-bonding. It is highly chemically resistant and can be applied in a wide range of temperatures. It is excellent for industrial floor repairs subject to forklift traffic and harsh conditions.

USES

- Repairing cracks, where future movement is not anticipated.
- Restoring integrity to distressed concrete.
- Repairing spalls and pop-outs in concrete.
- Securing bolts, equipment, or railings into concrete.
- Vertical repairs when combined with specified sand.
- Repairing concrete surface imperfections prior to coating.
- Repairing cracks and spalls prior to coating.
- Repairing polished concrete.
- Re-bonding delaminated floors.
- Horizontal and vertical crack injection.
- Polishing pit grout.
- Freezer thresholds and floor repairs.

FEATURES

- Ultra low viscosity allows deep penetration into concrete.
- Can be cartridge applied or bucket mixed.
- When combined with manufactured sand, Concrete Mender™ will form a tough 4500 psi polymer concrete with similar properties to existing concrete that will stay pliable over time.
- Safe to use. Materials react quickly.
- Self-leveling or may be combined with sand and worked with a trowel. Stays workable longer than similar materials.
- Completely cures in 10 minutes after application at 70° F. Will also cure rapidly in subzero environments.

BENEFITS

- Long lasting repairs that accommodate harsh physical environments.
- Easy preparation, a wire brush is all that is needed in some cases.
- No downtime, repairs are fully ready for traffic in approximately 10 minutes from application.
- Can be used in a wide range of indoor areas.

LIMITATIONS

Roadware 10 Minute Concrete Mender™ is designed for use on interior or exterior concrete surfaces. It is not intended for repairing areas of movement such as exterior cracks and joints subject to regular freeze-thaw cycling. It must be applied to concrete free of surface moisture, dirt or contaminates.

TECHNICAL INFORMATION

Colors	Grey, Natural Off-white Standard. Special order- yellow, Red, or custom.
Compressive Strength, ASTM D695-15	3883-6681 psi depending on sand load. (27-26 MPa)
Tensile Strength, ASTM D638-14	3385 psi (23.33 MPa)
Bond Strength, ASTM 882-99	1984 psi (13.6 MPa)
Elongation ASTM D638-14	7% Modulus 150.7 ksi
Hardness	72D
Surface Tension (Wilhelmy Plate)	0.026 N/m
Solids	98%
Viscosity	Approximately 8 cps
V.O.C. (Mixed)	5.5 g/l
MIN-MAX crack repar	0.020 Inches or less MIN with EZ Injection / Unlimited Max
Cure Time (Tac Free)	Approximately 10 minutes at 72° F (Gel 6-7 min.)
Packaging	80150 - 50 ml Cartridge 80300 - 600 ml Cartridge 80020 - 2-Gallon Kit 80050 - 10-Gallon Kit
Application Temperature Range	All data approximate. -30°F to 100°F See Tech Service for cold temperature application.

PREPERATION

Concrete must be clean, dry and free of dirt and contaminates. Use mechanical methods to remove loose concrete and profile hard trowled surfaces. Use surface applied heat to remove ice or frost if present.

MIXING

Cartridge: Static mixing 600ml or 50ml twin cartridge.
Bulk: Mix at a 1:1 ratio in a bucket by hand for 30 seconds. Start with a one quart total batch. Add up to two quarts of 40-30 grit or larger dry manufactured sand or quartz and blend well.

APPLICATION

Cartridge: Apply a thin layer of material into the crack, joint or spall. Add 1/4" of manufactured sand or quartz. Apply additional material to saturate the sand. Work in layers filling the repair area to just above grade. Trowel as necessary.
Bulk: Apply mixed material directly to the repar area. Screed off excess and allow to cure.

CURING AND FINISHING

Cure time is 20-30 minutes at 70°F. Repairs can be groud smooth, polished or coated after one hour.

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MIXING

Cartridges: 10 Minute Concrete Mender is a two-component material and must be thoroughly mixed at a ratio of 1 part "A" to 1 part "B" by volume. Mixing and metering of 10 Minute Concrete Mender is achieved with self-mixing cartridges provided by Roadware, Inc. Material is ejected from prepackaged cartridges through a supplied static mixing nozzle with a dual component caulking gun such as the Roadware 5300 Application Tool, Mixed material is applied directly into the repair area immediately after mixing.

Bulk: Due to the rapid setting nature of the product, pot-mixing of the components is not recommended for crack and joint repairs less than 3/4" in width. 10 Minute Concrete Mender supplied in 10 gallon kits may be bucket mixed in quart batches and applied immediately to the repair area. Combined one pint of Part A with one pint of Part B. Mix with a drill mixer or hand mixing stick for 30 seconds or until well blended. Add 2 quarts of manufactured sand and mix for an additional 10 seconds. Pour the entire batch into the repair area immediately. SEE BULK MIXING INSTRUCTIONS INCLUDED WITH MATERIAL. 10 Minute Concrete Mender may be dispensed through a one-to-one ratio pump specifically designed to handle extremely low viscosity materials while maintaining exact ratios. The system must not allow the two components to combine until they reach the point of delivery. Contact Roadware for information on acceptable pumping equipment. All pumping equipment must be approved by Roadware, Inc. prior to application

APPLICATION

Surface Cracks (all depths and widths): Assemble cartridge according to directions. Remember to use the flow restrictor included with each cartridge set. Holding the application gun upward, place cartridge set into gun. Gently squeeze trigger to bleed-off air and start material flowing into mixers. Point mixer into waste container and squeeze trigger to start mixing process. DO NOT POINT MIXER UPWARD AFTER MATERIAL IS FLOWING. This may cause material to flow back into the tubes and cause clogging.

Cracks: Pre-wet repair area with mixed Concrete Mender without sand. Fill with 30-40 grit manufactured sand and additional material to grade. Be sure to saturate all of the sand completely. Additional sand may be added to the repair as necessary. Saturated sand may be moved into place with a margin trowel or scraper. Work with one small section at a time. Do not stop flowing material for a period of more than 2 minutes. If material sets inside mixer, remove cartridge from gun and replace mixer. Fill all repair areas to grade. When material cures (turns gray) in about 10 minutes, remove excess material with a sharp scraper for a smooth and flat finish. Finished repairs may be "cleaned up" by sanding or buffing within a few hours of application.

Spalls: Pre-wet repair area with mixed 10 Minute Concrete Mender without sand. Fill with no more that one-inch of 30-40 grit manufactured silica sand and additional material. Add additional layers to grade if needed. Be sure to saturate all of the sand completely. Additional sand may be added to the repair as necessary. Saturated sand may be moved into place with a small squeegee or scraper. Work with one small section at a time. Do not stop flowing material for a period of more than 2 minutes. If material sets inside mixer, remove cartridge from gun and replace mixer. A trowel or scraper may be used to move saturated sand into place and to create a level surface. If required, surface friction may be maintained by adding additional manufactured to the surface as the material cures. Allow to cure (approximately 10 minutes). Finished repairs may be "cleaned up" by sanding or buffing within a few hours of application.

Delaminations: To address delaminations in concrete, use the Roadware Easy Injection System with cartridge mixer 1006-STR.

Preparation: First, determine the expected depth of the voids in the concrete. The Roadware Easy Injection works best for voids that are one inch deep or greater. Drill a pattern of 3/8-inch diameter holes into the delaminated area, making the holes approximately ¼ inch deeper than the void in the concrete. It's important to remove any drill dust using an OSHA-approved vacuum that can contain silica dust.

Establish a hole pattern based on the size of the delaminated area and the void in the concrete. A best practice is to start with a 6-inch grid of holes, make the repairs, and then test the results after the Concrete Mender has cured for 2-3 hours. You may need to add extra holes between the original ones if necessary.

When installing the Concrete Mender with the 1006-STR mixer, apply the product to several holes at a time, alternating between them as you work, and allowing the material to set. Filled holes can either be finished with a small amount of sand or left to cure flush with the surface.

In some cases, using a metal chain or bar to sound the concrete may not provide an accurate assessment of an effective repair. The structural bonding and high tensile strength of Concrete Mender create a pinning effect within the concrete, even if the voids are not completely filled.

Enclosed Areas: Repairs made in high-moisture conditions can produce a stronger odor during curing. Before applying Concrete Mender, ensure the repair area, sand, and aggregates are dry. Exercise caution when using Concrete Mender in coolers, freezers, odor sensitive areas, or any enclosed spaces with low ventilation. Additionally, repairs should not be performed in areas of active food preparation, or in close proximity to odor-sensitive products, materials, or merchandise.