



FLEXIBLE CEMENT II™

Road-tough repairs for concrete floors, decks, slabs and surfaces.

Two component, hybrid polyurethane for flexible polymer concrete

Description:

Roadware Flexible Cement II is a two component hydrophobic hybrid polyurethane system for maintaining control joints, repairing cracks, and filling spalls in portland concrete. The hydrophobic properties of this material allow it to chase water molecules out of the way, preventing them from reacting with the curing process. This allows Flexible Cement II to perform well in areas of moisture such as ground slabs, freezers, and containment areas. Flexible Cement II is designed to work in both asphalt and concrete to provide a tough weather resistant seal and at the same time prevent further deterioration of repair area surfaces. It is capable of rebonding slabs, cracks and delaminations. This material may be used with specified aggregate to create mix-in-place polymer concrete that withstands thermal and shock movement.

Uses:

- Repairing cracks, 1/8" or larger that may be subject to limited deflection, movement, dynamic loading, thermal expansion or contraction.
- Filling and protecting control joints.
- Repairing spalls and pop-outs in exterior concrete.
- Forming and repairing bridge joint headers and nosings.
- Filling potholes in concrete.
- Waterproofing.
- Filling traffic loops.
- Electrical podding.

Features:

- Excellent bonding strength in a wide temperature range
- Low moisture sensitivity, will tolerate small amounts of moisture when applied.
- Excellent chemical resistance.
- Incredible bond strength.
- All material is self-mixed and delivered at the point of application. No messy pot-mixing or wasted product.
- Completely cures in 15 - 20 minutes after application for heavy traffic at 70° F. Will also cure rapidly in subzero environments.
- Remains flexible for the life of the repair and at lower temperatures.
- Safe to use. Materials react quickly and are solvent and odor free with 100% solids and no VOC's.
- Self-leveling, excess material may be sliced off after curing.
- Bonds well to concrete, brick, tile, steel, asphalt, and wood.
- Non flammable.

Benefits:

- Long lasting repairs that accommodate harsh physical environments and thermal movement.
- No downtime, repairs are fully ready for traffic in about 20 minutes from application.
- Odor free, can be used in a wide range of indoor areas.
- Easy application. All material is self-mixed with specially designed packaging or bulk application equipment.
- May be bucket mixed with our special application equipment.

Limitations:

Roadware Flexible Cement II is designed for repairing low movement concrete surfaces. It is not intended to be used as a high movement expansion joint.

Packaging:

Roadware Flexible Cement II

21 fl. oz. dual cartridge units (600 ml) with mixer

2 gallon kits in two parts (7.57 liters)

10 gallon kits (38 liters) in two parts*

Technical Information:¹

	Part A	Part B	Mixed
Brookfield Viscosity:	1400 cps	700 cps	1200 cps
Color:	Black	White	Grey**
Pot Life (@100gm):			4 mins
Gel Time: (Tack Free):			<15 mins
Mixing Ratio:	1	1	by volume

** Cured material will lighten and discolor when exposed to UV sunlight

¹Summer grade material technical information is available upon request.

*Physical Properties: (Cured @ 73°F)

Compressive Sheer (Wet) Aged 24 hours	1595 psi minimum
Tensile Strength (ASTM D412)	1726 psi
Ultimate Elongation (ASTM D412)	180% or (+80%)
Tear Strength (ASTM D624)	25 N/mm
Hardness	70-80 Shore A
Adhesion (Peel Strength - ASTM D903)	80 lb/inch width
Service Movement	±20%

*Typical properties: not to be construed as a specification

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Aggregate: To produce flexible polymer concrete with Roadware Flexible Cement II, specified aggregates may be added. The aggregate must be clean, dry with less than 2% moisture, free from dirt, clay, or other organic materials. The aggregate should be hard and round such as "pea gravel.". The gradation shall be between 3/8" and 3/4" depending on the size and depth of the repair. See Roadware Aggregate Specifications for details.

Installation:

Application Temperature: Recommended application temperature for general grade material is between 0° F and 80° F. For repairs in temperatures above 80° F use Flexible Cement II's summer grade material. It is best to keep material at room temperature (60° to 80° F) prior to application. Keep manufactured sand and aggregate to be used with the material at room temperature. Avoid frost laden surfaces as this may adversely affect bonding and curing. Successful repairs may be made in ambient temperatures as low as -20° F. See cold application data sheet for details. Roadware Flexible Cement II will fully cure in 15 - 20 minutes at 72° F. Cure time is affected by the temperature of the material and the temperature of the concrete surfaces. Warmer temperatures will decrease cure time and colder temperatures will increase cure time.

Moisture: Reaction with moisture in the substrate can adversely effect the performance of the material. Roadware Flexible Cement II general grade material will resist moisture reaction at temperatures below 65°F. It is best to keep all surfaces as dry as possible when applying material. Use Flexible Cement II's summer grade for areas of high moisture combined with temperatures that exceed 65° F at the time of application.

Repair Design: Cracks– For best results, cracks repaired with Flexible cement II should not exceed ±20% movement of original size. Sidewalls should be free of loose concrete or contaminated repair materials. Control Joints– New concrete must be fully cured to prevent shrinkage of greater than 20% of original joint width. Shrinkage or movement greater than 20% of original size may cause adhesive or cohesive splitting. Joint sidewalls should be solid and free of contaminated repair materials. Flexible Cement II should not be used in expansion joints.

Preparation:

Surface Cracks (all depths and widths): Cracks should be free of dirt, oils, dust, latents and old crack repair materials. ALL SURFACES MUST BE CLEAN AND DRY. New concrete must be fully cured. A twisted wire wheel attached to an electric hand grinder or similar mechanical cleaning method such as sawing, needle scaling, sandblasting, or shot blasting is recommended for preparing cracks and creating a clean surface for bonding.

Control Joints: Saw-cut control joints should be free of dirt, oils, dust, latents and old joint fillers. ALL SURFACES MUST BE CLEAN AND DRY. New concrete must be fully cured for 12 months. Slab curling and movement should be addressed before application. A twisted wire wheel attached to an electric hand grinder or similar mechanical cleaning method such as sawing, needle scaling, sandblasting, or shot blasting is recommended for preparing joints and creating a clean surface for bonding. Control joints should be cut to 1/3 the depth of the slab and filled at full depth for maximum sidewall protection and wheeled traffic support. Tooled construction joints must be thoroughly cleaned and profiled before application. See Roadware construction joint details for more information.

Bridge Headers: Remove all loose materials back to sound concrete with a chisel or light chipper. DO NOT SAW-CUT THE REPAIR AREA. If a square appearance is necessary, lightly score surface and remove material. Use a twisted wire wheel attached to an electric hand grinder or similar mechanical cleaning method such as needle scaling, sandblasting, or shot blasting to clean the repair area. All surfaces must be free of dirt, oils, dust, latents and old repair materials. New concrete must be fully cured.

Forming: Forming may be necessary in some repairs and especially in maintaining expansion joints when repairing joint headers. Roadware Flexible Cement II repairs may be formed with "Dow Board" insulation or equivalent. Secure all forms to prevent "floating" when material is applied. Common duct tape may be used to fill in forming gaps. Canned insulating foam may be used to form irregular joint surfaces.

Mixing:

Cartridges: Roadware Flexible Cement II is a two component material and must be thoroughly mixed at a ratio of 1 part "A" to 1 part "B" by volume. All mixing and metering of Roadware Flexible Cement II is achieved with self-mixing cartridges provided by Roadware. 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: Roadware Flexible Cement II supplied in 10 gallon kits is best dispensed through a one-to-one ratio pump specifically designed to handle low viscosity materials while maintaining exact ratios. The system must not allow the two components to combine until they reach the point of delivery. All pumping equipment must be approved by Roadware, Inc. prior to application. Bucket mixing is allowed on a limited basis. Bucket mixed material will set very quickly. Do not mix more than 1 gallon of side "A" and 1 gallon of side "B". Keep material cool to reduce reaction time. Pour all of the material into the repair area immediately after mixing. SEE BULK MIXING INSTRUCTIONS.

Application Methods:

Surface Cracks: For cracks less than 1/2" in width, fill repair area to just above grade, leaving a slight over-band of material. For exterior repairs, add manufactured sand just before material sets (turns gray) and allow to cure. For interior repairs, fill repair area as above but do not add sand. Allow material to cure and shave off over-banding with a sharp scraper.

Assemble cartridge according to directions. 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. Immediately apply the material directly to the repair area. 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 cracks to slightly above grade. When material cures (turns gray) in about 10 minutes, remove excess material with a sharp scraper for a smooth and flat finish.

Spalls and Bridge Headers: Prime repair area with material. Fill repair areas to slightly below grade with specified aggregate. For repairs greater than 2" in depth, work in 2" lifts. This must be done before the primer material sets. Apply additional material directly into the aggregate, be sure to saturate all of the aggregate as well as the sidewalls of the repair. More aggregate may be added as necessary. After first layer sets (in approximately 2 minutes), apply additional material and broadcast manufactured sand over the top to desired grade. Work with one small area at a time. Allow to cure (approximately 10 -15 minutes). Finished repairs may be "cleaned up" by scraping with a sharp blade within a few hours of application.

Color:

Roadware Flexible Cement II is composed of a white colored liquid and a black colored liquid. The material is dark gray when it is dispensed and cures to a dark gray finish. Alternate colors can be achieved by selecting different colors of manufactured sand. Roadware Flexible Cement II will lighten in color when exposed to ultraviolet rays. This natural occurrence within urethanes will NOT effect the physical properties of the material or the repair.

Clean Up:

Clean all tools and equipment immediately after use with acetone, xylene, MEK, or toluene. Cured material may be removed by soaking or abrading. Roadware Flexible Cement II is very aggressive, gloves should be worn to keep material from contacting skin. Use an industrial paint and stain hand cleaner to remove from skin.

Curing:

Roadware Flexible Cement II will cure in approximately 15 to 20 minutes from application at 72° F for most traffic situations. The material will reach it's full strength in 24 hours. Cure rates in extremely cold environments should be tested beforehand.

CAUTION:

Roadware Flexible Cement II Part A contains diphenylmethane-diisocyanate (MDI) CASS# 101-68-8 and petroleum hydrocarbon CASS# 64742-94-5.

Coverage:	
Packaging	Cubic inches of material (neat)
One 21 fl oz cartridge set	36.614
One gallon bulk mixed	231

Approximate Liner feet per 21oz Cartridge without aggregate*							
Crack Depth (inches)	Crack Width						
	1/4	3/8	1/2	5/8	3/4	7/8	1
1/8	97.5	65.0	49.0	39.0	32.5	28.0	24.5
1/4	49.0	32.5	24.5	19.5	16.5	14.0	12.0
3/8	32.5	21.5	16.5	13.0	11.0	9.5	8.0
1/2	24.5	16.5	12	10.0	8.0	7.0	6.0

*Note: The above coverages are approximations and vary significantly depending on the type of sand used, the characteristics of the concrete, and the profile of the crack to be repaired. Always test a small portion of a large job to determine the amount of product needed.

Risks:

Inhalation of mists and vapors may cause dry throat, cough, dizziness, headache, nausea, unconsciousness and other central nervous systems effects. MDI can induce respiratory sensation with asthma-like symptoms. Repeated and prolonged contact with skin can cause irritation.

Emergency And First Aid Procedures:

Eye contact - flush eye with water for at least 15 minutes. Get medical attention promptly. Inhalation - remove person to fresh air, if breathing is difficult, administer oxygen. Get medical attention immediately. Skin contact - wipe off and wash thoroughly contacted area with soap and water. Ingestion - do not induce vomiting. Consult physician immediately.

Precautions:

Provide adequate ventilation to keep the airborne contamination of diisocyanate below TLV limit. For concentration above TLV limit, use of a positive pressure self-contained breathing apparatus (SCBA) or NIOSH/MSHA approved positive pressure supplied air respirator with a full face piece and escape (SCBA) required. Use protective equipment to minimize skin contact. Wear chemical safety goggles, and laboratory coats or aprons to avoid skin contact. Provide access to safety shower and eye wash stations.

SEE MSDS SHEETS FOR FURTHER INFORMATION.

CAUTION:

Roadware Flexible Cement II Part B contains petroleum hydrocarbon CASS# 64742-94-5.

Risks:

Inhalation of mists and vapors may cause dry throat, cough, dizziness, headache, nausea, unconsciousness and other central nervous systems effects. Repeated and prolonged contact with skin can cause irritation.

Emergency And First Aid Procedures:

Eye contact - flush eye with water for at least 15 minutes. Get medical attention promptly. Inhalation - remove person to fresh air, if breathing is difficult, administer oxygen. Get medical attention immediately. Skin contact - wipe off and wash thoroughly contacted area with soap and water. Ingestion - do not induce vomiting. Consult physician immediately.

Precautions:

Provide adequate ventilation to keep the airborne concentration of diisocyanate below TLV limit. For concentration above TLV limit, use of a positive pressure self-contained breathing apparatus (SCBA) or NIOSH/MSHA approved positive pressure supplied air respirator with a full face piece and escape (SCBA) required. Use protective equipment to minimize skin contact. Wear chemical safety goggles, and laboratory coats or aprons to avoid skin contact. Provide access to safety shower and eye wash stations.

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LIMITED WARRANTY

Please see Roadware representative for details.

THE ABOVE SALES SPECIFICATIONS ARE FOR USE IN PRODUCT EVALUATION AND INFORMATION ONLY.



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