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Methacrylate Flood Coat

Field Guide to Concrete Repair
Application Procedures
RAP 13

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What are Methacrylates?

- Methacrylates are liquid resins used to seal concrete slabs and structurally heal narrow, shallow cracks
- Supplied in two or three component packaging and mixed on site immediately prior to application
- Types of Methacrylates are High Molecular Weight and Reactive
- Similar in application and performance to super low viscosity epoxies
- Penetrating by gravity alone, fills pores in horizontal concrete surfaces and bond small cracks





Causes of Cracking

- Typical cause of concrete cracking
 - Corrosion of reinforcing steel
 - Freeze/thaw damage
 - Sulfate attack
 - Alkali-aggregate reactions (AAR)
- Improper practices during original construction
 - Poor concrete mix design
 - Adding too much water at site
 - Inadequate subgrade preparation
 - Poor joint design or construction
- External forces such as structural overload





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Purpose of Repair

- What is the purpose and when to use flood-coating methacrylates
 - Fill and bond shrinkage cracks
 - Seal the slab against water, salts, other deleterious chemicals
 - Repairing cracks and improving traffic wear
 - Structural repairs - consult structural engineer for evaluation (difficult to ensure full-depth filling of cracks)
 - Can be an aesthetic floor finish



Methyl Methacrylate Flooring installed at
Johnson Space Center
(www.flowcreteamericas.com)





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Using Methacrylates

When to use this method?

- Horizontal surfaces only – though can be used on sloped surfaces such as parking garage ramps
- Can be used to repair bridge decks, parking garages, industrial floors or concrete slabs
- Quick turn-around coatings – can prep, coat, and open to traffic within a few hours, depending on size of repair
- Not effective for repairing cracks caused by steel corrosion or AAR
 - Skid resistance should be considered when exposed to heavy traffic and high speeds
 - Not effective for moving cracks caused by thermal changes, structural loads, resistant or relief joints
 - Floor coat will seal slab and fill open cracks
 - Methacrylates are not effective in repairing moving cracks
 - Most methacrylates can resist movement up to 5% to 10% of the crack width. Specialized bridge deck methacrylate can resist up to 25% to 30%





Prepare the Surface

How do I prepare the surfaces?

- Clean, dry and free of oil, grease, dust, paint, sealers or other bond-breaking material
- Shotblasting or sandblasting to ICRI CSP-3 to CPS-5 surface profile
 - Clean deeper cracks with compressed air
 - Compressed air must be free of oil and moisture
- Waterblasting is not sufficient or recommended





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Materials

How do I select the right materials?

- Two types of Methacrylates
 - Reactive and High Molecular Weight
- Consider ambient temperatures
 - Shorter set time (shorter pot life) materials
 - Temperature range of 35 to 95 degrees Fahrenheit
 - Apply in the cooler times of day
 - Aggregate can be broadcast into the floor coat in improve traction on surfaces
- Strong Odors
 - Keep area from contract with public
 - Avoid areas of close proximity to building air intake vents





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Equipment

What equipment do I need?

- Shotblast or sandblast for surface preparation
- Compressed air
- 30 mesh dry aggregate for filling larger cracks (1/8" or wider)
- Clean mixing/measuring buckets
 - Proper proportioning is critical
- Low speed drill and mixing paddle
- Access to power or generator
- Methacrylate
 - 1 gallon per 100-150 sf
- Flat squeegee or roller
- 8 to 60 mesh dry aggregate
 - Aggregate at the rate of 15-20 pounds per 100 sq.
- Protective footwear with raised cleats
- Safety equipment





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Safety

What are the safety considerations?

- MSDS on site
- Protective Clothing
 - Safety glasses and gloves
- Full face respirators
 - Enclosed, poorly ventilated areas
- Eye wash facilities
- Materials are flammable
 - Keep away from heat, flames, sources of ignition
- Ventilate closed spaces
- Notify occupants
- Component formulations
 - Mix with extreme care
 - **Never mix catalyst and promoter directly together**
 - Follow manufacturer's instructions





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Pre-Construction

A pre-construction meeting is recommended

- Representatives from all parties
 - Owners, engineers, contractors, materials manufacturer, etc.
- Specifically address
 - Parameters, means, methods, materials and safety precautions





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Repair Procedure

- Shotblast or sandblast to CSP-3 to CSP-5 surface
- Compressed air to move dust/concrete chips
- Seal the bottom surface if underside surface is available
- Pre-fill all cracks 1/8" or wider using manufacturer's recommended mix resin
- Flat squeegee or roll flood coat with mixed resin. Cover approximately 100 – 150 sq. per gallon.
- Remove all excess resin gels
- Second coat if cracks are over ½ inch deep or if concrete surface is porous
- 20 minutes after applying final coat, broadcast aggregate at the rate of 15-20 pounds per 100 sq. ft.
- Allow to fully cure before allowing traffic – approximately 1 hour for Reactive and 3-4 hours for High Molecular Weight at 70 degree Fahrenheit is typical.

How do I check the repairs?

- Audit the quality of material
- Core to verify depth of penetration into cracks when depth is critical





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Questions?

Thank you!

