Kelmar®
waterproofing systems

SPECIFICATION MANUAL
R&D TECHNICAL SOLUTIONS LTD

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KELMAR® TE SYSTEM SPECIFICATION MANUAL DIVISION 07 SECTION 07 18 16 Vehicular Traffic Coatings

Note To Specifier

The specification information below is intended for use by Architects, Engineers and other Specifiers in defining the criteria needed to install the KELMAR® TE SYSTEM.

The KELMAR® TE SYSTEM is a multi-layered system, intended for use in installations such as parking garages, plaza decks, stadiums and areas requiring abrasion resistance combined with a flexible waterproofing membrane.

1. This document has been prepared to assist Specifiers in the preparation of specifications for the installation of the KELMAR® TE SYSTEM.

2. This document was prepared to be included as part of a complete specification for new construction or can be used as a stand-alone document for existing structures.

3. There are several areas in this document that, at the discretion of the Specifier, will require values to be inserted, as appropriate for the type of placement being specified. Physical properties for the KELMAR® TE SYSTEM are listed in Section 2.3.

4. The KELMAR® TE SYSTEM can be specified and installed in a variety of exposures, depending on its intended use.

5. Also refer to related documents, Technical Data Sheets & Installation Procedures.

Questions regarding the selection, installation or intended use of R&D Technical Solutions Ltd. KELMAR® TE SYSTEM should be directed to the manufacturer.

1.1 System Description

The KELMAR® TE SYSTEM consists of a primer, waterproofing membrane, wear course and top coat, creating a seamless waterproof system with slip resistant wear course. The system can be designed for multiple different traffic requirements.

1.2 Summary

1. The contractor shall furnish all materials, tools, equipment, appliances, transportation, labor and supervision required during the preparation and installation process of installing a vehicular traffic coating system as outlined in this specification.

2. The manufacturer's application instructions for each product must be followed at all times.

3. Related sections:
    a. Section 03 30 00: Cast-in-Place Concrete
    b. Section 03 40 00: Precast Concrete
    c. Section 07 90 00: Joint Protection

1.3 Quality Assurance

1. Materials to be used on the project shall consist of the KELMAR® TE SYSTEM as supplied by R & D Technical Solutions Ltd.

2. Material to be applied as a vehicular traffic coating must possess a Class "A" Rating in accordance with ASTM E 84 "Steiner" tunnel test rating for building interiors with public access. ULI fire ratings for alternative materials are not acceptable if they were not tested to the ASTM E 84 rating.

3. Contractor and installer(s) shall have satisfactorily completed a program of instruction in proper methods of preparation of the substrate, patching of spalled and delaminated areas, crack and joint repair. The applicator shall have in writing, a certificate of approval from the manufacturer.

4. Contractor(s) seeking approval of substitute materials shall have a minimum of five (5) years experience installing this type of surfacing in similar size projects. They must also submit their request in writing to the Architect/Engineer at least seven (7) days before closing of bids.

Include samples, testing laboratory reports regarding conformity with specifications, and list of completed successful installations, including phone number of responsible person to contact to enable accurate appraisal of the system. Bidders shall be notified of acceptable substitute materials by written addendum or amendment.

1.4 Project / Site Conditions

1. Prior to starting work, applicators should familiarize themselves with application instructions, safety guidelines and other materials related to the installation of the KELMAR® TE SYSTEM.

2. Do not begin installation if precipitation is expected. Minimum substrate and ambient temperature of 50°F (10°C) for 48 hours before, during, and after installation is required, until all materials have cured fully. In elevated temperatures of 100°F (38°C) or higher, care may need to be taken, as cure times will be decreased substantially.

3. Adequate ventilation and clean water supply are required during installation.

4. Coordinate work with other trades etc., to ensure that the coating is allowed to cure fully before being opened to foot or vehicle traffic.

5. Allow concrete to cure for a minimum of 28 days prior to application of vehicular traffic coating. Concrete must have a minimum compressive strength of 3000 psi (21 MPa) and be structurally clean, sound and dry in accordance with ASTM D4263.

6. Shot blast concrete to a minimum profile of ICRI CSP-3 to remove laitance, dirt, dust, oil, grease, coatings and other surface contaminants.

7. Concrete to receive membrane traffic coating should be designed and installed to prevent random cracking and deflection. Prepare cracks, joints and detail work according to manufacturer's instructions.

8. Provide sufficient control and expansion joints.

1.5 Warranty

Contractor shall submit a limited warranty against improper workmanship and defective materials (from date of installation or project completion, whichever comes first). Length of warranty shall be dependent upon project requirements.

The owner will follow the maintenance guidelines as set forth by the National Parking Association (NPA) in the Parking Garage Maintenance Manual and will notify R&D Technical Solutions Ltd. within thirty (30) days of any defect.

2.0 Products

2.1 Acceptable Manufacturer

R&D Technical Solutions Ltd.
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Toll Free: (800) 387-5703
Local: (905) 795-9900
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2.2 Materials

1. Vehicular Traffic Coating System and membrane shall be R&D Technical Solutions Ltd. KELMAR® TE SYSTEM, meeting or surpassing physical property requirements as listed in section 1.4 Applicable Standards & Test Methods.
    a. Primer – Kelmar® Mononbond or Kelmar® Dualox Epoxy Primer
    b. Membrane – Kelmar® Neo V Elastomeric Waterproofing Membrane
    c. Wear Course – Kelmar® CWC 100% Solids Epoxy Wear Course or Kelmar® TE Coal Tar Epoxy Wear Course
    d. Top Coat – Kelmar® 1910 UV Resistant Acrylic Top Coat or Kelmar® 1920 UV Resistant 100% Solids Epoxy Top Coat
    e. Aggregate – Flint Silica or GS-20 quartz silica sand or equivalent
    f. Reinforcing Fabric – Kelmar® Fabric (if required)

2.3 Material Performance

Materials comprising the KELMAR® TE SYSTEM pass ASTM C957 testing. The following are results from testing performed by an independent laboratory:

Test Name	*Test Method*	*Requirement*	*Result*
Weight Loss of Base Coat	ASTM D6511	40% Max	39.2%
Crack Bridging	ASTM C1305	No Cracking	Pass
Adhesion in Peel – Concrete	ASTM C794	5.0 lbf Min	26.4 lbf
Adhesion in Peel – Plywood	ASTM C794	3.0 lbf Min	20.1 lbf
Chemical Resistance – Membrane	ASTM D471 Tensile Retention Water Immersion	70% Min	87%
	ASTM D471 Tensile Retention Ethylene Glycol	70% Min	74%
	ASTM D471 Tensile Retention Mineral Spirits	45% Min	50%
Chemical Resistance – Top Coat	ASTM D471 Tensile Retention Water Immersion	70% Min	74%
	ASTM D471 Tensile Retention Ethylene Glycol	70% Min	123%
	ASTM D471 Tensile Retention Mineral Spirits	45% Min	81%
Weathering Resistance and Recovery from Elongation – Full System (no aggregate)	ASTM C957 Recovery from Elongation, Initial	90% Min	91%
	ASTM C957 Tensile Retention	80% Min	95%
	ASTM C957 Elongation Retention	90% Min	90%
Abrasion Resistance CS-17 Abrasion Wheel, 1000 Cycles	ASTM C501	50 mg Max	44 mg
Penetration of Chloride Ion by Ponding (90 Days Ponding)	ASTM C1543	0 at 1 Inch Depth	0

3.0 Execution

3.1 Inspection

1. Before starting work, ensure environmental and site conditions are suitable for application and curing. Do not begin work in outdoor areas if precipitation is imminent.

2. Inspect surface for acceptability of levelness, texture, slope to drains, moisture content, etc.

3. Any and all deficiencies shall be reported, in writing, to the specifying engineer, and a copy sent to the material manufacturer. Surface must be approved by the manufacturer or certified contractor prior to application of membrane.

3.2 Preparation

1. Surface must be clean and sound, which in all cases, requires some form of preparation.
2. Substrate must be prepared in accordance with the manufacturer's printed instructions.
3. Effectively remove concrete laitance and other surface contamination by shot blasting to meet a minimum surface profile of ICRI CSP 3.
4. Pre-fill surface irregularities, holes and cracks per manufacturer's recommendation.
5. Concrete must have cured for a minimum of 28 days and have a minimum compressive strength of 3000 psi (21 Mpa).

3.3 Protection

1. Advise owner/operator and trades that unfinished surface is to remain free from traffic, and that fixtures, fittings and finishing are not to be installed, until waterproof coating is completed.

2. Protect adjacent surfaces from damage resulting from work of this trade. If necessary, mask and / or cover adjacent surfaces, fixtures, equipment, etc., by suitable means.

3. Traffic control — no individuals are permitted in areas during application and until the surface has fully cured and has been approved for traffic by the applicator and the manufacturer.

3.4 Installation /Application Detail

A. Exposure 1: Light Duty – Pedestrian Areas

1. Primer: Apply 4 wet mils Kelmar® Monobond or 6 wet mils Kelmar® Dualox.
2. Membrane: Apply Kelmar® Neo V Membrane at a minimum 32 wet mils to achieve 20 dry mils.
3. Wear Course: Apply Kelmar® CWC or Kelmar® TE to a total wet film thicknes of 18 wet mils. Immediately begin Step 4.
4. Aggregate: Immediately broadcast aggregate to refusal into wet base coat at the rate of 1 pound per sq. ft. Manufacturer approved aggregate 30-50 mesh size, washed, dried and bagged Flint Silica Sand, having a minimum hardness of six (6) on the Mohs Scale, at the recommended coverage, or GS-20 Silica Sand 20-30 mesh size.
5. Once coating has cured sweep off excess aggregate.
6. Top Coat: Apply Kelmar® 1920 or Kelmar® 1910 Top Coat to a total wet film thickness of 16 wet mils. Immediately back roll to level.

B. Exposure 2: Medium Duty – Parking Stalls and Light to Medium Traffic

1. Primer: Apply 4 wet mils Kelmar® Monobond or 6 wet mils Kelmar® Dualox.

2. Membrane: Apply Kelmar® Neo V Membrane at a minimum 32 wet mils to achieve 20 dry mils.

3. Wear Course: Apply Kelmar® CWC or Kelmar® TE to a total wet film thickness of 23 wet mils. Immediately begin Step 4.

4. Aggregate: Immediately broadcast aggregate to refusal into wet base coat at the rate of 1 pound per sq. ft. Aggregate to be Flint Silica Sand 30-50 or GS-20 Sand 20-30 mesh size.

5. Once coating has cured sweep off excess aggregate.

6. Top Coat: Apply Kelmar® 1920 or Kelmar® 1910 Top Coat to a total wet film thickness of 16 wet mils. Immediately back roll to level.

C. Exposure 3: Heavy Duty – Heavy Traffic, Ramps, Turning Areas, Areas Adjacent to Cashiers, Entry and Exit Areas

1. Primer: Apply 4 wet mils Kelmar® Monobond or 6 wet mils Kelmar® Dualox.

2. Membrane: Apply Kelmar® Neo V Membrane at a minimum 32 wet mils to ahcieve 20 dry mils.

3. First Wear Course: Apply Kelmar® CWC or Kelmar® TE to a total wet film thicknes of 23 wet mils. Immediately begin Step 4.

4. Aggregate: Immediately broadcast aggregate to refusal into wet base coat at the rate of 1 pound per sq. ft. Aggregate to be Flint Silica Sand 30-50 or GS-20 Sand 20-30 mesh size.

5. Once coating has cured sweep off excess aggregate.

6. Second Wear Course: Apply Kelmar® CWC or Kelmar® TE to a total wet film thicknes of 23 wet mils. Immediately begin Step 7.

7. Aggregate: Immediately broadcast aggregate to refusal into wet base coat at a rate of 1 pound per sq. ft. Aggregate to be Flint Silica Sand 30-50 or GS-20 Sand 20-30 mesh size.

8. Once coating has cured sweep off excess aggregate.

9. Top Coat: Apply Kelmar® 1920 or Kelmar® 1910 Top Coat to a total wet film thickness of 16 wet mils. Immediately back roll to level.

D. Exposure 4: Extra Heavy Duty – Extra Heavy Traffic, Shipping & Receiving Areas, Heavy Truck/Bus Traffic, Helix Ramp

1. Primer: Apply 4 wet mils Kelmar® Monobond or 6 wet mils Kelmar® Dualox.
2. Membrane: Apply Kelmar® Neo V Membrane at a minimum 32 wet mils to achieve 20 dry mils.
3. First Wear Course: Apply Kelmar® CWC or Kelmar® TE to a total wet film thicknes of 23 wet mils. Immediately begin Step 4.
4. Aggregate: Immediately broadcast aggregate to refusal into wet base coat at a rate of 1 pound per sq. ft. Aggregate to be Flint Silica Sand 30-50 or GS-20 Sand 20-30 mesh size.
5. Once coating has cured sweep off excess aggregate.
6. Second Wear Course: Apply Kelmar® CWC or Kelmar® TE to a total wet film thickness of 23 wet mils. Immediately begin Step 7.
7. Aggregate: Immediately broadcast aggregate to refusal into wet base coat at the rate of 1 pound per sq. ft. Aggregate to be Flint Silica Sand 30-50 or GS-20 Sand 20-30 mesh size.
8. Once coating has cured sweep off excess aggregate.
9. Third Wear Course: Apply Kelmar® CWC or Kelmar® TE to a total wet film thicknes of 23 wet mils. Immediately begin Step 10.
10. Aggregate: Immediately broadcast aggregate to refusal into wet base coat at the rate of 1 pound per sq. ft. Aggregate to be Flint Silica Sand 30-50 or GS-20 Sand 20-30 mesh size.
11. Once coating has cured sweep off excess aggregate.
12. Top Coat: Apply Kelmar® 1920 or Kelmar® 1910 Top Coat to a total wet film thickness of 16 wet mils. Immediately back roll to level.

F. Vapour Barrier System: Slab On Grade, Unvented Metal Pan Decks etc.

1. Vapour Barrier: Apply Kelmar® MVB Moisture Vapour Barrier to a total wet film thickness of 16 wet mils.
2. Primer: Apply 4 wet mils Kelmar® Monobond or 6 wet mils Kelmar® Dualox.
3. Membrane: Apply Kelmar® Neo V Membrane at a minimum 32 wet mils to achieve 20 dry mils.
4. Wear Course: Apply Kelmar® CWC or Kelmar® TE according to traffic and wear requirements. This may include single, double or triple wear course applications. Immediately begin Step 5.
5. Aggregate: Immediately broadcast aggregate to refusal into wet base coat at the rate of 1 pound per sq. ft. Aggregate to be Flint Silica Sand 30 – 50 or GS-20 Sand 20-30 mesh size.
6. Once coating has cured sweep off excess aggregate.
7. Top Coat: Apply Kelmar® 1920 or Kelmar® 1910 Top Coat to a total wet film thickness of 16 wet mils. Immediately back roll to level.

Exposure Recommendation Summary

Recommended Use	Areas of Application	Primer	Membrane	Wearcourse	Topcoat
Exposure 1 - Light Duty	Pedestrian Areas	4 Mils	20 Mils	18 Mils	10 Mils
Exposure 2 - Medium Duty	Parking Stalls and Light to Medium Traffic	4 Mils	20 Mils	23 Mils	16 Mils
Exposure 3 - Heavy Duty	Heavy Traffic, Ramps, Turning Areas, Areas Adjacent to Cashiers, Entry and Exit Areas	4 Mils	20 Mils	23 Mils 23 Mils	16 Mils
Exposure 4 - Extra Heavy Duty	Extra Heavy Traffic, Shipping & Receiving Areas, Heavy Truck/Bus Traffic, Helix Ramps, Roof Decks	4 Mils	20 Mils	23 Mils 23 Mils 23 Mils	16 Mils
Vapour Barrier System	Slab On Grade, Unvented Metal Pan Decks etc.	16 Mils MVB 4 Mils Primer	20 Mils	According to traffic requirements	16 Mils