TECHNICAL SPECIFICATIONS FOR TENNIS COURT & RECREATIONAL SPORT SURFACING, SECTION 32 18 23 53

1: GENERAL DESCRIPTION

A. MAPEI SPORTS FLOORING DIVISION provides this technical specification as a guideline only. Consultation with a professional architect or engineer is always recommended for a project specific specification. **Mapecoat TNS Comfort Elite** is an elastic, multilayered acrylic-based system with an underlayment of **Mapecomfort R7** rubber mat used to create sports surfaces for playing tennis and pickleball. Suitable for indoor or outdoor courts on asphalt, cementitious and existing acrylic substrates, the system forms a highly resistant and even playing surface for high-speed play with consistent ball bounce.

SECTION 02790 (32 18 23.53)

TENNIS COURT & RECREATIONAL SPORTS SURFACING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Tennis Court & Recreational Sports Surfacing for Asphalt and Concrete Surfaces Systems.

1.2 RELATED REQUIREMENTS

A. Section 02975 (32 01 17.63) – Tennis Court Crack Repair System: Repairing cracks in asphalt tennis courts.

B. Section 03300 (03 30 00) – Cast-in-Place Concrete.

C. Section 03400 (03 40 00) – Precast Concrete.

D. Section 32 13 13 - Concrete Paving: Concrete pavement. General requirements for Portlandcement concrete materials, including admixtures and curing materials

E. Section 32 17 23.13 - Painted Pavement Markings: Court marking for tennis courts.

1.3 REFERENCE STANDARDS

A. American Sports Builders Association (ASBA).

B. United States Tennis Association (USTA) Rules of Tennis.

C. International Tennis Federation (ITF).

D. National Asphalt Pavement Association (NAPA).

E. NFHS (Guide) - Court and Field Diagram Guide; current edition.

1.4 SUBMITTALS

A. Comply with Section 01330 (01 33 00) – Submittal Procedures.

B. Product Data: Submit manufacturer's product data, including surface and crack preparation and application instructions.

C. Samples: Submit manufacturer's color samples of color coating.

D. Test Reports:
1. Submit independent test results for solar reflectance index.
2. Submit independent test results for 2000 Hour ASTM G154, accelerated weathering UV test, to demonstrate long-term durability and fade resistance.
3. Submit independent test results for 2000 Hour, accelerated weathering ASTM G155 Xenon Arc test, to demonstrate long-term fade resistance and quality of pigment.
4. Elongation at failure – DIN 53504: 140%
5. Tensile strength – DIN 53504: 100 psi (0.7 N/mm^2)

E. Manufacturer's Certification: Submit manufacturer's certification that materials comply with specified requirements and are suitable for intended application.

F. Manufacturer's Project References: Submit manufacturer's list of successfully completed asphalt or concrete tennis court surface color-coating system projects, including project name, location, and date of application.

G. Applicator's Project References: Submit applicator's list of successfully completed asphalt/concrete tennis court surface color-coating system projects, including project name, location, type and quantity of color-coating system applied, and date of application.

H. Warranty Documentation: Submit manufacturer's standard warranty.

I. Authorized Installer Certificate: Submit manufacturer's authorized installer certificate.

1.5 QUALITY ASSURANCE

A. Manufacturer's Qualifications:
1. Manufacturer regularly engaged, for the past 5 years, in manufacture of asphalt and concrete tennis court surface color-coating systems of similar type to that specified.

2. United States owned company.
3. Member: ASBA.
4. Manufacturer has surfaces that are classified by the International Tennis Federation's (ITF's) pace classification program.
5. All the facilities where Mapecoat TNS systems are manufactured have an ISO 9001 and ISO 14001 certified management system.

B. Applicator's Qualifications:
1. Applicator regularly engaged, for the past 3 years, in application of tennis court surface color-coating systems of similar type to that specified.
2. Employ persons trained for application of tennis court surface color-coating systems.
3. Applicator must be authorized installer of the surfacing brand used.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Delivery and Acceptance Requirements: Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying product name and manufacturer.

B. Storage and Handling Requirements:
1. Store and handle materials in accordance with manufacturer's instructions.
2. Keep materials in manufacturer's original, unopened containers and packaging until application.
3. Store materials in clean, dry area indoors.
4. Store materials out of direct sunlight.
5. Keep materials from freezing.
6. Protect materials during storage, handling, and application to prevent contamination or damage.
7. Close containers when not in use.
8. Retain manufacturer batch codes on each container and application dates, for warranty purposes.

1.7 AMBIENT CONDITIONS

A. Do not apply asphalt or concrete tennis court surface color-coating system when air or surface temperatures are below 50°F (10°C) during application or within 24 hours after application.

B. Do not apply asphalt tennis court surface color-coating system when rain is expected during application or within 24 hours after application.

PART 2 PRODUCTS

2.1 MANUFACTURER

A. Acceptable Manufacturer: MAPEI Corporation, 1144 E. Newport Center Rd., Deerfield Beach, FL 33442, USA; Toll-Free Tel: 1-800-992-6273; Fax: 954-246-8805; Email: TechServiceRequests@mapei.com; Web: www.mapei.com.

B. Acceptable Manufacturer: MAPEI Inc., 2900 Francis-Hughes, Laval, QC, H7L 3J5, Canada; Toll-Free Tel: 1-800-361-9309; Fax: 450-901-0196; Email: TServicesCA@mapei.com; Web: www.mapei.com.

C. Requests for substitutions will be considered in accordance with provisions of Section 01 60 00 – Product Requirements.

All other brands must be pre-approved by the architect/owner, 7 days prior to the bid date. If submitting another brand, bidder must furnish copies of all submittal documents under section 1.4.

2.2 MATERIALS

A. Asphalt or Concrete Tennis Court Surface Color-Coating System: MAPEI Tennis Courts & Recreational Sports Surfacing Systems.

1. SURFACE PREPARATION:

i. **Ultrabond Turf PU 1K-HV:** 1-component, fast-set urethane patching compound
VOCs (Rule #1168 of California's SCAQMD): 4 g/L
Joint/bond strength – EN 12228 and EN 13744: > 25 N per 100 mm

ii. **Mapecoat TNS Patch PU 2K:** 2-component, fast-set, urethane patching compound with sand; can be used in time-sensitive situations for properly prepared deep depressions, defects, and cracks.
VOCs (Rule #1168 of California's SCAQMD): 2 g/L

iii. **Mapeflex P1:** For concrete expansion/control joints; high-performance, non-sag, onecomponent, elastomeric, moisture-cured, polyurethane sealant and adhesive.
Meets ASTM C920; Type S; Grade NS; Class 25; Uses NT, T, M, G, A and O; TT-S-00230C, Type II, Class A

iv. **Epojet or Epojet LV:** For concrete cracks; high-strength, two-component, 100%-solids, low-viscosity, epoxy resin for pressure injection and sealing of cracks in structural concrete, masonry, and wood.
Meets ASTM C881, Types I and II, Grade 1

v. **Mapecoat TNS Primer EPW:** For concrete substrates only; 2-component, epoxy-based primer in water dispersion adhesion promoter for absorbent, porous concrete substrates primarily but can also be used on acrylic-coated playing surfaces.
VOCs: 0 g/L

2. ADHESIVES

Ultrabond Turf PU 2K: Two-part polyurethane adhesive for rubber mat systems
i. VOCs (Rule #1168 of California's SCAQMD): 2 g/L

3. RUBBER MAT UNDERLAYMENT

Mapecomfort R7: Recycled rubber mat used in combination with Mapecoat TNS products
i. Tensile strength (N/mm²) – EN ISO 1798: ≥ 0.40
ii. Elongation at break (%) – EN ISO 1798: ≥ 45
iii. Stress at 25% compression (N/mm²) – DIN EN ISO 3386-2: ≥ 0.55

4. PRIMER (for rubber mat substrates only)

Mapecoat TNS Primer EPW: 2-component, epoxy-based primer in water dispersion adhesion promoter for absorbent, porous concrete substrates primarily but can also be used on acrylic-coated playing surfaces.
VOCs: 0 g/L

5. FIBERGLASS MESH UNDERLAYMENT

i. **Mapenet Reinforced :** Premium fiberglass mesh used in combination with Mapecoat TNS products.
i. Minimum tensile strength (warp) – ASTM D5035: 150 lbs. per in. (670 N per 2.54 cm)
ii. Minimum tensile strength (weft) – ASTM D5035: 180 lbs. per in. (790 N per 2.54 cm).
iii. Weight – ASTM D3776: 4.3 U.S. oz. per sq. yd. (145.0 g per m^2)
iv. Thickness – ASTM D1777: 0.017 in. (0.43 mm)
v. Construction (warp) – ASTM D3775: 6 yarns per inch (24 yarns per 10 cm)
vi. Construction (weft) – ASTM D3775: 5 yarns per inch (20 yarns per 10 cm)

6. BASE COAT

i. **Mapecoat TNS Base Coat Gray:** Fast-setting acrylic cushion coating fortified with rubber granules that provide shock force reduction and resiliency for Mapecoat TNS systems
i. Tensile strength – DIN 53504: 75 psi
ii. Elongation at failure – DIN 53504: 63%
iii. VOCs: 50 g/L

ii. **Mapecoat TNS Base Coat White:** Textured with sand; interior and exterior fast-set textured acrylic base coating with good filling capacity, used to even out asphalt substrates prior to topcoats.
    i. Tensile strength – DIN 53504: 72.51 psi
    ii. Elongation at failure – DIN 53504: 46%
    iii. VOCs: 50 g/L

iii. **Mapecoat TNS Base Coat Binder:** 100% acrylic latex; interior and exterior fast-set nontextured flexible acrylic base coating with good filling capacity used to even out asphalt substrates prior the topcoats.
    i. Tensile strength – DIN 53504: 100 psi
    ii. Elongation at failure – DIN 53504: 90%
    iii. VOCs: 50 g/L

7. BASE COLOR COAT

i. **Mapecoat TNS Base Color:** Premium interior and exterior acrylic base color coating. It is used as a base color coat for Mapecoat TNS systems.
    i. Tensile strength – DIN 53504: 100 psi
    ii. Elongation at failure – DIN 53504: 140%
    iii. VOCs: 50 g/L

8. TOPCOAT

i. **Mapecoat TNS Finish 1, 3** and **4:** ITF speed rating certified; premium interior and exterior acrylic textured top coating. Used as color topcoat for Mapecoat TNS systems.
    i. Certified International Tennis Federation (ITF) 1, 3, 4
    ii. Tensile strength – DIN 53504: 100 psi
    iii. Elongation at failure – DIN 53504: 140%
    iv. VOCs: 50 g/L

9. GAME LINES

i. **Mapecoat TNS Line Seal:** Fast-setting, ready-to-use premium, acrylic, transparent paint that seals the edges of the masking tape before the application of Mapecoat TNS Line Tex.
    i. Tensile strength – ASTM D638: 130 psi
    ii. Elongation at break – ASTM D638: 650%
    iii. VOCs: 50 g/L

ii. **Mapecoat TNS Line Tex:** Fast-setting, ready-to-use premium acrylic, textured paint for marking sport courts and urban areas for all Mapecoat TNS system surfaces.
    i. Tensile strength – ASTM D638: 130 psi
    ii. Elongation at break – ASTM D638: 650%
    iii. VOCs: 50 g/L

PART 3 EXECUTION

3.1 EXAMINATION

A. Inspect asphalt substrate per ASBA guidelines for proper slopes, drainage and soundness of the substrate and surface.
B. Inspect the concrete substrate per ASBA guidelines for proper slopes and drainage as well as the presence of an intact vapor barrier is present and CSP 3 profile (medium broom finish). If there are known drainage problems, it is ideal to identify and mark them after a hard rain, prior to resurfacing, but courts can be flooded alternately at the beginning of the project.

3.2 PROJECT CONDITIONS, LIMITATIONS AND OVERSIGHTS

A. Asphalt and concrete substrates shall be allowed to cure properly: Asphalt for 15-25 days minimum, concrete for 28 days minimum.
B. The substrate shall be clean and dry before coatings are applied. Substrate surface should be free of oil, grease, dust, dirt and any other foreign materials that negatively affect bonding.
C. Do not install when the moisture vapor emission rate (MVER) of the concrete substrate exceeds 8 lbs. per 1,000 sq. ft. (3.63 kg per 92.9 m^2) per 24 hours, when using the anhydrous calcium chloride test (ASTM F1869).
D. Do not install when relative humidity of concrete substrate exceeds 85% (ASTM F2170).
E. Do not apply unless surface temperatures are 50°F (10°C) and rising.
F. Do not apply when rain is imminent or if extremely high humidity will prevent drying.
G. Do not apply if the surface temperature is above 140°F (60°C). Water used on the project shall be fresh, potable and as cold as possible in hot-weather conditions. (Ice water should be used in extreme hot temperatures.)
H. If there are any known drainage problems, it is ideal to identify and mark them after a hard rain, prior to resurfacing.

3.3 SURFACE PREPARATION SYSTEM

A. New concrete and existing coated surfaces:

Clean the substrate surface. The substrate surface shall be free of grease, oil, dust, dirt, and any other foreign matter that could inhibit bonding before the work is started. Depending on the condition of the surface, three methods are typical:

1. Mechanical sanding machine (for existing acrylic coated surface)
2. Mechanical grinding machine (for existing or new concrete without a broom finish)
3. Pressure wash as needed, at not greater than 1,500 psi, allowing to dry properly.

Non-porous new concrete or sound concrete substrates with oil or grease stains must be thoroughly washed and cleaned with **Planiprep SA** and then rinsed several times or power-ground to the proper depth to remove all contaminants.

Note: Prime all uncoated concrete surfaces with **Mapecoat TNS Primer EPW** 2-component transparent epoxy water base. Use a roller or a rubber squeegee to apply the **Mapecoat TNS Primer EPW** diluted 50% in water. Concentrated application rate averages are 250 to 300 sq. ft./gal (6.1 to 7.3 m^2/L) with a roller and 150 to 200 sq. ft./gal (3.7 to 4.9 m^2/L) with a rubber squeegee.

Any depressions holding water deep enough to cover the thickness of 1/16" (1.6 mm) shall be outlined and leveled to match existing grades with a product below per Technical Date Sheet (TDS) directions.

i. **Mapecoat TNS Base Coat White** (minor surface imperfections)
ii. **Mapecoat TNS Patch PU 2K** (deep patches/repairs; time-sensitive; fast cure)

All cracks should be opened with a crack chaser and/or tuck point to clean the crack walls and create a void large enough to fill with quality materials. Apply the appropriate material below per TDS directions.

i. **Epojet / Epojet LV** (concrete cracks)
ii. **Mapecoat TNS Patch PU 2K** (existing cracks; time-sensitive; fast cure)

For expansion/control joints, use the material below per TDS directions.

i. **Mapeflex P1** (concrete joint sealant)

Note: For larger cracks, the proper diameter backer rod should be placed into the void prior to applying the appropriate crack filler material.

B. New or existing asphalt surfaces:

Clean the substrate surface. The substrate surface shall be free of grease, oil, dust, dirt and any other foreign matter that could inhibit bond before starting the work. Depending on the condition of the surface, two methods are typical:

1. If necessary, pressure-wash as needed (not greater than 1,500 psi).
2. If necessary, flood the surface. Any depressions holding water deep enough to cover the thickness of a nickel coin (1/16" or 1.6 mm) shall be outlined and leveled to match existing grades with a product below per TDS directions.

i. **Mapecoat TNS Base Coat White** (minor surface imperfections)
ii. **Mapecoat TNS Patch PU 2K** (deep patches/repairs; time-sensitive; fast cure)

All cracks should be opened with a crack chaser and/or tuck point to clean the crack walls and create a void large enough to fill with quality materials. Apply appropriate material below per directions on TDS.

i. **Ultrabond Turf PU 1K** (cartridge) (asphalt cracks)
ii. **Mapecoat TNS Patch PU 2K** (asphalt cracks; time-sensitive; fast cure)

Note: For larger cracks, the proper diameter backer rod should be placed into the void prior to applying the appropriate crack filler material.

3.4 PLAYING SURFACE SYSTEM APPLICATION

Note: The contractor should provide the inspector or owner's representative mixing instructions for all materials.

A. Using a neoprene notched rubber squeegee or trowel, apply **Ultrabond Turf PU 2K** uniformly to the properly prepared substrate. Allow enough time to place the rubber mat prior to cure. Concentrated application rate averages 45 to 55 square feet per gallon or 4.18 to 5.11 m^2 per 3.79 L (based on the surface texture).

B. Follow the manufacturer's instructions for installing **Mapecomfort R7**:
Lay in **Mapecomfort R** rubber mat into the still wet adhesive bed, which should have the adhesive ridges exposed. Take care to avoid air pockets and use your hands to press down the **Mapecomfort R4** rubber mat to ensure good adhesive transfer to the backing. Avoid excessive stress at the seams. After initial placement, carefully roll the mat with a lightweight roller from the center out, ensuring full contact between adhesive and backing and removing any air bubbles. If **Mapecomfort R7** is not perfectly flat, place weights (such as bags of sand) on the uneven areas, seams, and roll ends until **Ultrabond Turf PU 2K** has cured (in 4 to 6 hours). Extra care must be taken when installing **Mapecomfort R7** rubber mats outside if there are high temperatures or high variations in temperature. It is preferable to install **Mapecomfort R7** rubber mat during the cooler hours of the day. In normal conditions, **Mapecomfort R7** bonded with **Ultrabond Turf PU 2K** will be ready for light foot traffic after around 2 to 4 hours, with the adhesive setting completely in around 72 hours at 74°F (23°C).

Take great care with seams and check again before starting the acrylic coating steps. If necessary, seal the "open joints" with **Mapecoat TNS Patch PU 2K.**

C. Using a roller or spray machine (apply one [1] coat) to prime all uncoated rubber mats surfaces with **Mapecoat TNS Primer EPW** 2-component transparent epoxy in water base diluted with 50% water. Concentrated application rate averages 265 to 275 square feet per gallon, or 24.6 to 25.5 m^2 per 3.79 L.

D. Using a neoprene rubber squeegee, apply one (1) coat of **Mapecoat TNS Base Coat White** (acrylic resurfacer) – diluted with 20% water (undiluted material coverage is 60 to 65 square feet per gallon or 5.57 to 6.04 m2 per 3.79 L, or 75 to 85 square feet per gallon or 7 m2 per 3.79 L (based on the surface texture). Alternately, apply one (1) coat of **Mapecoat TNS Base Coat Binder** material. This concentrated material should be mixed with 20% water and clean bagged 40 to 60 mesh silica sand at a rate of 5 to 10 lbs. per gallon, or 2.27 to 4.54 kg per 3.79 L. Concentrated application rate averages 120 to 130 square feet per gallon, or 11.1 to 12.1 m2 per 3.79 L (based on surface texture).

Note: **Mapecoat TNS Base Coat** application must follow the **Mapenet Reinforced** roll width (each roll must be applied at the same time with the **Mapecoat TNS Base Coat** material).

E. As the **Mapecoat TNS Base Coat** product is applied and still wet, unroll **Mapenet Reinforced** flat into the fresh material and squeegee excess material over it to embed the fiberglass mesh to the

floor. Overlap every **Mapenet Reinforced** roll about 2" (5 cm) and repeat the embedding process described in Step A.

Note: Manage the overlap (**Mapenet Reinforced**) distance as you near the end of the court to avoid having to cut the material.

F. Using a neoprene rubber squeegee, apply two (2) coats of **Mapecoat TNS Base Coat White** diluted with 20% water. Allow each application to dry and cure completely before the next application. Undiluted application rate averages 80 to 90 square feet per gallon, or 7.43 to 8.36 m^2 per 3.79 L for each coat. Alternately apply two (2) coats of **Mapecoat TNS Base Coat Binder**. This concentrated material should be mixed with 20% water and clean bagged 40 to 60 mesh silica sand at a rate of 5 to 10 lbs. per gallon, or 2.27 to 4.54 kg per 3.79 L. Concentrated application rate averages 120 to 130 square feet per gallon or 11.1 to 12.1 m^2 per 3.79 L for the 1st coat, and 140 to 150 square feet per gallon or 13.0 to 13.9 m^2 per 3.79 L for subsequent coats (based on surface texture).

Inspect the entire surface. All defects should be scraped and/or machine sanded to remove any ridges. Blow and broom off any loose matter.

G. Using a neoprene rubber squeegee, apply one (1) coat of **Mapecoat TNS Base Color**, diluted with 20% water. (Colors are pre-determined by owner.) The application rate for **Mapecoat TNS Base Color** is 110 to 120 square feet per gallon, or 10.2 to 11.1 m^2 per 3.79 L. Allow the application to dry and cure completely before the next application. A small amount of additional water (≤ 5%) can be added on hot days when material is drying too quickly.

H. Using a neoprene rubber squeegee, apply one (1) coat of **Mapecoat TNS Finish 1**, **3** or **4**, diluted with 20% water. (Colors are pre-determined by owner.) The application rate for **Mapecoat TNS Finish 1**, **3** or **4** is 110 to 120 square feet per gallon, or 10.2 to 11.1 m^2 per 3.79 L.

If necessary, an optional one (1) coat of **Mapecoat TNS Finish 1**, **3** or **4** should be applied. The rate is 130 to 140 square feet per gallon, or 12.1 to 13.0 m^2 per 3.79 L. Allow the application to dry and cure completely before the next application. A small amount of additional water (≤ 5%) can be added on hot days when material is drying too quickly.

3.5 APPLICATION OF LINE MARKINGS

A. Lines shall be carefully measured and marked with chalk in accordance with ASBA and specific sports guidelines. (Note: Do not assume existing lines are measured properly on resurfacing work.)

B. All lines are to be applied by painting between high-grade masking tape with a brush or roller. No spraying of lines is allowed.

C. Prime masked line with one coat of **Mapecoat TNS Line Seal**. Allow to dry completely before continuing. Application rate is 1 gallon (3.79 L) per tennis court.

D. Paint lines with **Mapecoat TNS Line Tex** paint. Application rate is 1 gallon (3.79 L) per tennis court. Allow application to dry.

E. Remove masking tape immediately when dry. Leaving it in place too long could leave residue on the court surface.

3.6 PROTECTION

A. Allow a minimum of 24 to 72 hours drying time for outdoor courts before opening for play. Indoor courts will take longer to dry and cure and should dry within a minimum of 7 days before play is allowed, depending on the atmospheric conditions in the building.

END OF SECTION