



SURFACE PREPARATION AND APPLICATION GUIDE

POLYURETHANE MODIFIED CONCRETE
INCLUDES SERIES 242, 243, 244, 245

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1.0 INTRODUCTION

The purpose of this guide is to familiarize applicators with the basic information necessary for properly bidding, ordering and installing Tnemec's Ultra-Tread floor topping. Prior to starting work, please read this entire guide carefully. If you have questions, contact your Tnemec representative or call +1-816-483-3400. It is important that you obtain answers to any questions before beginning the process. Due to the complex application and potential exposure to extreme environments, only qualified applicators should install Ultra-Tread. Please review all pertinent Product Data Sheets as well as Detail Drawings.

Also, reference the project specifications and compare them with this guide and the Product Data Sheets. Resolve any inconsistencies prior to starting work.

This application guide cannot cover every issue that may be encountered in the field. If issues arise that are not addressed in this guide or the Product Data Sheets, please contact your Tnemec representative or call +1-816-483-3400. for assistance.

2.0 PRECAUTIONS

- Material should be stored between 35°F (2°C) and 110°F (43°C). Material should be stored at temperatures between 70°F and 90°F (24°C and 32°C) for at least 48 hours prior to use.
- Do not install material if substrate temperatures are below 40° F (4°C) or above 85°F (29°C).
- Do not install if relative humidity is above 85%.
- Do not mix material by hand.
- Due to the limited working time of the material, adequate manpower should be considered.
- Part B is moisture sensitive. Do not open until ready to mix.
- Part C is moisture sensitive and should be stored in a dry area.
- Ensure substrate is clean, dry and free of contaminants.

3.0 PRODUCTS AND PACKAGING

3.1 SERIES 242 ULTRA-TREAD S

Series 242 is a low odor, slurry applied, flowable mortar floor topping designed for monolithic applications in abusive service areas. It provides superior performance to other flooring systems such as acid brick, quarry tile and most polymer flooring systems. Series 242 provides excellent chemical resistance and withstands thermal shock due to hot liquids and aggressive cleaning procedures. It is available in two standard colors--gray and red. **Note:** Additional lead times may apply when ordering Beige, Black, Blue, Green, Off White and Yellow.

3.1.1 SERIES 242 PACKAGING

KIT SIZE	PART A (Partially Filled)	PART B (Partially Filled)	PART C (Aggregate)	MIXED YIELD
Extra Large	1-tote	1-tote	300 - 44 lb. bag	1103.3 gal. (4176.4 L)
Medium	1-5 gallon pail	1-5gallon pail	5 - 44 lb. bag	18.2 gal. (68.9 L)
Small	1-1 gallon jug	1-1gallon jug	1 - 44 lb. bag	3.6 gal. (13.6 L)

Theoretical yield (applied neat): 31 sq. ft. (2.9 m²) per mixed small kit at 3/16"* 47 sq. ft. (4.4 m²) per mixed kit at 1/8"*

*Substrate condition, application and waste may vary and can affect coverage.

Note: Empty measuring pails are available. Reference F100-H189-UT for the 2-gallon Part A pail and F100-H190-UT for the 2-gallon Part B pail. Empty measuring pails are only needed for breaking down Series 241, 242 and 245 part A & B components when mixing Medium and X-Large Kits. The measuring pails are not needed for Small Kits as the part A & B components are already prefilled at the correct fill amounts.

3.2 SERIES 243 ULTRA-TREAD V

Series 243 is a vertical/coving material for application where vertical trowelling, such as trench walls, vertical faces of equipment pads or coving, is required. A brush or short nap roller, wetted with water and shaken out, may be used to seal and provide a smoother appearance to the mortar. Series 243 is available in two standard colors--gray and red. **Note:** Additional lead times may apply when ordering Beige, Black, Blue, Green, Off White and Yellow.

3.2.2 SERIES 243 PACKAGING

KIT SIZE	PART A	PART B	PART C (Aggregate)	MIXED YIELD
Large	1-5 gallon pail	1-5 gallon pail	20 - 25 lb. bag	32.7 gal. (123.7 L)
Medium	1-1 gallon jug	1-1 gallon can	4 - 25 lb. bag	6.5 gal. (24.6 L)
Small	1-1 quart jug	1-1 quart can	1 - 25 lb. bag	1.6 gal. (6.05 L)

Theoretical yield: 13 sq. ft. (1.2 m²) per mixed small kit at 3/16"* 18-20 lineal feet per mixed kit of 4" rolled radius base"

*Substrate condition, application and waste may vary and can affect coverage.

3.3 SERIES 244 ULTRA-TREAD M

Series 244 is a seamless mortar floor topping designed to resist chemicals, organic acids and thermal shock due to hot liquids, cleaning procedures and severe temperature fluctuations. It is applied between 1/4" to 3/8" using a screed/trowel method and loop rolled to a smooth, even surface. Series 244 is available in two standard colors--gray and red. **Note:** Additional lead times may apply when ordering Beige, Black, Blue, Green, Off White and Yellow.

3.3.1 SERIES 244 PACKAGING

KIT SIZE	PART A	PART B	PART C (Aggregate)	MIXED YIELD
Medium	1-5 gallon pail	1-5 gallon pail	10-50 lb. bag	32.4 gal. (122.6 L)
Small	1 - 1 gallon jug (partially filled)	1 - 1/2 gallon can	1 - 50 lb. bag	3.24 gal. (12.3 L)

Theoretical yield: 14 sq. ft. (1.3 m²) per mixed kit at 3/8"^{**} 21 sq. ft. (1.9 m²) per mixed kit at 1/4"^{**}

^{**}Substrate condition, application and waste may vary and can affect coverage.

3.4 SERIES 245 ULTRA-TREAD S

Series 242 is a low odor, slurry applied, flowable mortar floor topping designed for monolithic applications in abusive service areas. It provides superior performance to other flooring systems such as acid brick, quarry tile and most polymer flooring systems. Series 242 provides excellent chemical resistance and withstands thermal shock due to hot liquids and aggressive cleaning procedures. It is available in two standard colors--gray and red. **Note:** Additional lead times may apply when ordering Beige, Black, Blue, Green, Off White and Yellow.

3.4.1 SERIES 245 PACKAGING

KIT SIZE	PART A (Partially Filled)	PART B	PART C (Aggregate)	MIXED YIELD
Extra Large	1-tote	1-tote	300 - 42.5 lb. bag	1083.3 gal. (4100.7 L)
Medium	1-5 gallon pail	1-5 gallon pail	5 - 42.5 lb. bag	17.9 gal. (67.8 L)
Small	1-1 gallon jug	1-1 gallon jug	1 - 42.5 lb. bag	3.6 gal. (15.6 L)

Theoretical yield (applied neat): 23 sq. ft. (2.1 m²) per mixed kit at 1/4"^{**} 31 sq. ft. (2.8 m²) per mixed kit at 3/16"^{**}

^{**}Substrate condition, application and waste may vary and can affect coverage.

Note: Empty measuring pails are available. Reference F100-H189-UT for the 2-gallon Part A pail and F100-H190-UT for the 2-gallon Part B pail. Empty measuring pails are only needed for breaking down Series 241, 242 and 245 part A & B components when mixing Medium and X-Large Kits. The measuring pails are not needed for Small Kits as the part A & B components are already prefilled at the correct fill amounts.

3.5 SERIES 44-714 ULTRA-TREAD ACCELERATOR

Series 44-714 is a special additive used to increase the cure time of our four component Ultra-Tread products where faster return to service is needed. Series 44-714 has virtually no volatile organic compounds or odor. It may be used with Series 241, 242, 243, 244 and 245.

Due to shortened working time, Series 44-714 is not recommended for use if the substrate is 70°F (21°C) or greater. Do not exceed recommended dosage, reference mixing for more information. Do not exceed 0.25 oz per kit when mixed with Series 243. Use of Series 44-714 may affect flow and leveling properties when used with Series 242 or 245.

3.5.1 SERIES 44-714 PACKAGING

Series 44-714 is available in quarts (0.95 L) or gallon (3.79 L) sizes.

4.0 SURFACE PREPARATION

4.1 PREPARATION OF CONCRETE

Allow new poured-in-place concrete to cure a minimum of 10 days at 75°F (24°C). Verify concrete dryness in accordance with ASTM F 1869 "Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride" (moisture vapor transmission should not exceed twenty pounds per 1,000 square feet in a 24 hour period), F 2170 "Standard Test Method for Determining Relative Humidity in Concrete using in situ Probes" (relative humidity should not exceed 99%), or D 4263 "Standard Test Method for Indicating Moisture in Concrete by the Plastic Sheet Method" (no moisture present). **Note:** The testing listed above cannot guarantee avoidance of future moisture related problems particularly with existing concrete slabs. This is especially true if the use of an under slab moisture vapor barrier cannot be confirmed or concrete contamination from oils, chemical spills, unreacted silicates, chlorides or Alkali Silica Reaction (ASR) is suspected.

Prepare concrete surfaces in accordance with NACE No. 6/SSPC-SP13 Joint Surface Preparation Standards and ICRI Technical Guidelines. Abrasive blast, shot-blast, or mechanically abrade concrete surfaces to remove laitance, curing compounds, hardeners, sealers and other contaminants and to provide a minimum ICRI-CSP 5 or greater surface profile. Existing concrete should be sound and free of all contaminants. Removal of weak or contaminated concrete prior to installation is required to ensure a strong bond between the concrete and Ultra-Tread floor topping system. Large cracks, voids and other surface imperfections should be filled with a recommended filler or surfacer.

4.2 ALL SURFACES

Must be clean, dry and free of oil, grease and other contaminants. **Note:** Substrate conditions which can adversely affect the adhesion of Series 243, 244 or 245 include: concrete that is structurally unsound, wet, damp, contaminated, or inadequately profiled at the time of application, absent or inadequate under slab moisture barrier, hydrostatic pressure, Alkali Silica Reaction (ASR), and migration of oils, chemicals, and other contaminants.

4.3 PATCHING

All surface imperfections such as spalls, large cracks and areas requiring keyways, such as drains and terminations, should be detailed prior to the installation of the Ultra-Tread topping. Reference the Series 242, 244 or 245 product data sheet for additional information.

4.4 TERMINATIONS - SERIES 242, 244, 245

Any stopping points such as perimeters, drains, trenches, etc., must be keyed to provide anchorage against shrinkage during cure and thermal cycling stress. This is achieved by saw cutting 1/2" wide by 1/2" deep channels into the substrate. When applying Series 242, 244 or 245 in larger areas exposed to thermal shock, it may be beneficial to cut additional channels in a grid pattern throughout the substrate being topped. Do not featheredge. Reference the latest version of the StrataShield Standard Detail Drawings.

Note: Preset drains will also require isolation joints to allow for thermal movement of the surrounding substrate.

4.5 CONTROL JOINTS - SERIES 242, 244, 245

Control/saw cut joints can be cleaned out and left exposed. They will assist in acting as anchor keyways in the floor.

4.6 EXPANSION JOINTS

Expansion joints can be considered moving joints and should be honored. Appropriate caulking/sealants should be selected based on the intended use of the area. New expansion joints should be installed to isolate the following areas: load support columns, equipment set in the substrate, preset drains, any areas exhibiting differences in temperature from the surrounding floor such as around ovens and freezers, and when butting up to different flooring materials. Reference the latest StrataShield Standard Detail Drawings.

5.0 MIXING

5.1 SERIES 242 AND 245 ULTRA-TREAD

To mix either Series 242 or 245 small kits, use a variable speed 850-RPM drill and four-inch (4") dispersion blade, slowly mix the entire contents of both the A and B components for a minimum of one minute. Continue agitation and slowly add the Part C aggregate and mix until material is uniform and no dry aggregate is present. The entire mixing procedure should take approximately three minutes. **Note:** Part B is moisture sensitive. Do not open until ready to mix. Never mix more material than can be applied within 15 minutes of initial mixing. It is also not recommended to mix more than one kit of Series 242 or 245 at a time.

Premix the Part A and Part B components of either Series 242 or 245 medium or extra-large kits. Mix 0.9117 gallons (3.45 L) of Part A component with 0.7993 gallons (3.03 L) of Part B component. **Note:** Empty mixing pails are available for measuring these kit sizes. Reference F100-H189-UT for the 2- gallon Part A pail and F100-H190-UT for Part B pail. Slowly mix the measured amount of both the part A and B components for a minimum of one minute. Continue agitation and slowly add one Part C aggregate and mix until material is uniform and no dry aggregate is present. The entire mixing procedure should take approximately three minutes. **Note:** Part B is moisture sensitive. Do not open until ready to mix. **Note:** The Medium Kits break down to equal five (5) Small Kits or units and the Extra-Large Kits break down to equal three hundred (300) Small Kits or units. Single batch mixes equal to one (1) Small Kit or unit are frequently mixed in five-gallon pails. Multiple batch mixes are frequently mixed in larger portable, Hippo style mixers and used for larger pours.

5.2 SERIES 243 AND 244 ULTRA-TREAD

To mix either Series 243 or 244 small kits, use a mortar mixer or variable speed 850-RPM drill and four-inch (4") dispersion blade, slowly mix the entire contents of both the A and B components for a minimum of one minute. Continue agitation and slowly add the Part C aggregate and mix until material is uniform and no dry aggregate is present. The entire mixing procedure should take approximately three minutes. **Note:** Part B is moisture sensitive. Do not open until ready to mix.

Premix the Part A and Part B components of Series 243 medium and large kits. Mix one quart (0.2500 gallons) of Part A component with one quart (0.2500 gallons) of Part B component. Slowly mix the measured amount of both the Part A and B components for a minimum of one minute. Continue agitation and slowly add one Part C aggregate and mix until material is uniform and no dry aggregate is present. The entire

mixing procedure should take approximately three minutes. **Note:** Part B is moisture sensitive. Do not open until ready to mix. **Note:** The Medium Kits break down to equal four (4) Small Kits or units and the Large Kits break down to equal twenty (20) Small Kits or units. Single batch mixes equal to one (1) Small Kit or unit are frequently mixed in mortar mixers or pails. Multiple batch mixes can be mixed in an appropriate size mortar mixer or pail.

Premix the Part A and B components of Series 242 Medium kits. Mix one half gallon (0.500 gallons) of Part A component with one half gallon (0.500 gallons) of Part B component. Slowly mix the measured amount of both the part A and B components for a minimum of one minute. Continue agitation and slowly add one Part C aggregate and mix until material is uniform and no dry aggregate is present. The entire mixing procedure should take approximately three minutes. **Note:** Part B is moisture sensitive. Do not open until ready to mix. **Note:** The Medium Kits break down to equal ten (10) Small Kits or units. Single batch mixes equal to one (1) Small Kit or unit are frequently mixed in mortar mixers or pails. Multiple batch mixes can be mixed in an appropriate size mortar mixer or pail.

5.2 SERIES 242, 243, 244 AND 245 ULTRA-TREAD ACCELERATOR

For accelerated cure on low temperature applications, add Series 44-714 Ultra-Tread Accelerator to the Part A component prior to mixing. The proper amount of Series 44-714 is based upon ambient temperature; at 70°F (21°C) with 50% relative humidity, 1 oz per small kit will result in a 9 hour maximum cure time, 2 oz per small kit will result in a 7.5 hour maximum cure time, 3 oz per small kit will result in a 6.5 hour maximum cure time. **Note:** Material will set up quickly if not applied immediately after mixing.

6.0 SCREED AND HAND TROWEL APPLICATION

6.1 SERIES 244 ULTRA-TREAD M

Once the surface has been properly prepared, Series 244 may be mixed and applied using a screed box and hand trowels.

After the material is mixed for the appropriate amount of time, immediately place material into the screed box and slowly pull across the floor. It may help to level the material with a trowel in the box. This will help ensure that the material is laid out evenly. The material can then be trowelled to close and smooth. After troweling, loop roll the surface to help remove trowel marks and further close and smooth the surface.

7.0 SLURRY APPLICATION

7.1 SERIES 242 OR 245 ULTRA-TREAD S

Once the material is thoroughly mixed, immediately transfer to working area. Pour onto the floor in a thick ribbon and then evenly spread to the appropriate thickness with either a trowel, screed rake or cam rake. A smoothing blade may be used at this point to further level the material. Once level and even, a wire porcupine roller or loop roller should be used to backroll the material to help facilitate leveling and alleviate imperfections. Backrolling will also help force the aggregate down into the system while working a layer of resin to the surface. If left alone, this layer of resin will help close or seal the surface.

7.2 NON-SLIP OR DECORATIVE OPTION

If a textured surface or topcoat is desired, immediately broadcast aggregate, decorative quartz or flake to refusal into the wet Series 242 or 245 surface. Color quartz or decorative flake systems will require an additional broadcast layer to obtain a uniform appearance and texture before applying the desired clear finish coats. This will typically result in a total system thickness of 3/16" to 3/8". **Note:** Broadcast 30/50 aggregate or colored quartz at a rate of 0.5 lbs per sq ft and decorative flake at a rate of 0.25 lbs or 1/4 lb per sq ft. Excess aggregate, decorative quartz or flake can either be vacuumed or swept off once the material has cured a minimum of 6 hours. Optional topcoats may then be applied to lock in the broadcast aggregate, decorative quartz or flake. Reference product data sheet for various topcoat options.

8.0 VERTICAL AND COVING

8.1 SERIES 243 ULTRA-TREAD V

The wall must be first primed to improve adhesion and assist in hanging the material on to the wall. Mixing the Part A and B liquids will create a priming material. The two may be mixed together at a 1:1 ratio and brushed on the vertical surface to be trowelled. The primer should be allowed to tack up but not completely dry, approximately 15-30 minutes. Dependent upon the porosity of the vertical surface the primer is being applied to, an additional prime coat may be required to provide a tacky surface. Once the Series 243 kit is mixed, it may be placed on the vertical surface with a trowel. A brush, dampened with water, may be used to seal and smooth the surface of the mortar.

9.0 CURING

Series 242, 243, 244 and 245 should be ready to return to light duty service within 8 hours dependant upon temperatures and humidity. This includes decontamination of area as well as dry processing and foot traffic. The material should be allowed to cure an additional 4 hours before being returned to full service where exposed to fork lift traffic and where water and/or chemicals are used. Allow a full 24 hrs. cure when immediate exposure to harsh chemical or steam cleaning is a critical part of the area's processing/production.

10.0 CLEANUP

Clean all tools and equipment immediately with Xylene or MEK.

11.0 HEALTH & SAFETY

These products may contain solvents and/or other chemical ingredients. Adequate health and safety precautions should be observed during storage, handling, application and curing. For information regarding these potential hazards associated with these products please refer to the container label or request a Safety Data Sheet from Tnemec Company Inc.. Please direct your inquiries to the attention of our Safety D