Tennant ESD Conductive ECE

30 mil Static Control Conductive

DESCRIPTION – A three-component high solids, solvent-free system. It is designed to be conductive and dissipate a 5000 volt charge to zero in less than 0.1 seconds. This product maintains conductive performance over the life of the coating.

RECOMMENDED SYSTEM			
Application Steps	**Tennant Product**	**Application Thickness mils [mm]**	**Coverage Rate ft²/gal [m²/3.78 L]**
Primer	Eco-MPE™	3-5 [0.08-0.13]	321-535 [29.8-49.7]
Build Coat	Eco-MPE	8-15 [0.20-0.38]	107-200 [9.9-18.7]
Topcoat	Eco-ECE™	12 [0.30]	133 [12.36]

Other Tennant products may be used for the application steps; contact your Tennant Coatings Specialist. See appropriate product bulletin for application instructions or contact Tennant Technical Support. The alternate systems below use different products for the primer and build coat.

ALTERNATE SYSTEM #1			
Application Steps	**Tennant Product**	**Application Thickness mils [mm]**	**Coverage Rate ft²/gal [m²/3.78 L]**
Primer	Eco-RCE	3-5 [0.08-0.13]	321-535 [29.8-49.7]
Build Coat	Eco-RCE	8-15 [0.20-0.38]	107-200 [9.9-18.7]

ALTERNATE SYSTEM #2			
Application Steps	**Tennant Product**	**Application Thickness mils [mm]**	**Coverage Rate ft²/gal [m²/3.78 L]**
Primer	Eco-RCE/M	3-5 [0.08-0.13]	321-535 [29.8-49.7]
Build Coat	Eco-RCE/M	8-15 [0.20-0.38]	107-200 [9.9-18.7]

ALTERNATE SYSTEM #3			
Application Steps	**Tennant Product**	**Application Thickness mils [mm]**	**Coverage Rate ft²/gal [m²/3.78 L]**
Primer	Eco-GPE	3-5 [0.08-0.13]	321-535 [29.8-49.7]
Build Coat	Eco-GPE	8-15 [0.20-0.38]	107-200 [9.9-18.7]

- **LEED® CREDIT** – LEED Green Building Certification Program credits may be available:
  - **Indoor Environmental Quality**
    - 4.2 Low-Emitting Materials, Paint & Coatings
- **ELECTROSTATIC DISCHARGE CONTROL** – Furnishes conductive properties in accordance with the latest ESD Association guidelines and in accordance with EOS and ANSI/ESD specifications.

ENVIRONMENTALLY & USER FRIENDLY

- Low Odor. Can be applied during normal business hours.
- Superior resistance to many harmful chemicals.
- Consistent readings.

PRIMARY APPLICATIONS

Manufacturing / Automotive Manufacturing	Avionics
Electrical Assembly / Production	Clean Room / Lab
Packaging	Warehouse / Distribution
Data Processing	Photographic, Graphic Arts
Hazardous Industries (dust or explosive environments)	

SYSTEM PROPERTIES

ELECTRICAL PROPERTIES	Test Method	Results
Body Voltage Generation	ESD STM 97.2	<15 volts
Static Decay	MIL-STD-3010 4046	0.01 seconds
Surface Resistance Point to Point / Point to Ground	EOS/ESD Assoc. ANSI/ESD 7.1-2013	25,000-1,000,000 Ohms
MATERIAL PROPERTIES	**Test Method**	**Results**
Abrasion Resistance Taber Abraser CS-17 Taber Abrasion Wheel, 1,000 gram load, 1,000 revolutions.	ASTM D4060	75 mg/loss
Adhesion to Concrete, psi [MPa]	ASTM D4541	450 [3.10] (concrete failed)
Adhesion to Concrete, psi [MPa]	ASTM D7234	732 [4.48] (concrete failed)
Coefficient of Friction - Wet Static, BOT 3000	ANSI/NFSI B101.1	0.85 (High Traction)
Compressive Strength, psi [MPa] (epoxy)	ASTM D695	11,200 [77.22]
Flexibility	ASTM D522	¼" passes test
Gloss 60 Degree	ASTM D523	80°
Impact Resistance	ASTM D2794	80 in.-lbs. direct and reverse
Indentation	MIL-D-3134	Passes
Shore D Hardness	ASTM D2240	80
Tensile Strength, psi [MPa]	ASTM D2370	6,000 [41.37]
Percent Elongation	ASTM D2370	5%
Volatile Organic Compound, VOC, lb/gal [g/L]	ASTM D3960	**Eco-MPE** A+B = 0.41 [49] **Eco-ECE** 1.55 [186]
Water Absorption (24-hour immersion)	ASTM C413	0.2% weight increase

Results are based on conditions at 77°F [25°C].

CHEMICAL RESISTANCE PROPERTIES

Eco-ECE	1 Day			1 Day
Acids, Inorganic			**Solvents (Ketones & Esters)**	
10% Hydrochloric Acid	E		Methyl Ethyl Ketone (MEK)	P
10% Nitric Acid	E		**Miscellaneous Chemicals / Solutions**	
10% Phosphoric Acid	E		Ammonia	E
10% Sulfuric Acid	E		Bleach	E
25% Sulfuric Acid	E		10% Sugar Solution	E
Acids, Organic			Tincture of Iodine	E, S
10% Acetic Acid	G		AFFF	E
10% Citric Acid	E		Water	E
10% Lactic Acid	E			
Alkalies				
50% Sodium Hydroxide	E			
Solvents (Alcohols)				
Isopropyl Alcohol	E			
Solvents (Aliphatic)				
Mineral Spirits	E			

Results are based on a 1-day spot test. Coating cured 2 weeks prior to testing.
Spot Test IAW ASTM D1308, Pencil Hardness Test IAW ASTM D3363.

Legend:

E – Excellent. No change in pencil hardness.
G – Good. 1-2 units change in pencil hardness.
F – Fair. 3 units change in pencil hardness.
P – Poor. 4 or more units change in pencil hardness.
S - Stains

GENERAL PRODUCT INFORMATION

STORAGE:	Materials should be stored indoors between 65ºF [18ºC] and 90ºF [32ºC].	
SHELF LIFE:	One year from date of manufacture.	
PACKAGING OPTIONS / PART NUMBERS:	**Eco-MPE** 3.0 gallons (11.34 litres) / 370503 15.0 gallons (56.7 litres) / 370650	**Eco-ECE** (3.9 gallons including colorant) 3.65 gallons (14.8 liters) / 9015214 (2 gallons-A, 1 gallon-B, 12 lbs.-C) Colorant (1 pint) / 9015216, 9015489, 9015496 or 9017511
OPTIONS:	**NOTE:** *The conductive filler is gray, so colors will appear darker and will not match other products with the same colorant: Some other colors can be achieved, but we strongly recommend the use of a gray listed below.* ***Colors in Eco-MPE:*** Use colorants (for primer--in parenthesis below) at a rate of one unit per 3-gallon (11.34 litres) mix.	

	Colors in Eco-ECE: Use 1 unit [0.47 litres] Misty Gray (Canada Gray), Heather Gray (Medium Gray), Slate Gray (Battleship Gray) or White (Canada Gray) per 3.6 gallon mix. **NOTE:** *Due to the gray filler, the use of White Colorant will not result in a white floor.*
LIMITATIONS:	*Colors:* Colorant must be used in Eco-ECE. *Hide:* The topcoat must be applied over a pigmented primer or existing coating of similar color to obtain color hide in Eco-ECE. *Contamination (Fisheyes):* Product may fisheye if oil, silicones, mold release agents or other contaminants are present.

IMPORTANT: READ AND FOLLOW ALL PRECAUTIONS AND INSTRUCTIONS BEFORE PROCEEDING.

PLEASE SEE SAFETY DATA SHEET (SDS) FOR SAFETY AND PRECAUTIONS.
USE PRODUCT AS DIRECTED.
KEEP OUT OF THE REACH OF CHILDREN.

PRELIMINARY FLOOR INSPECTIONS

CHECK THE TEMPERATURE AND HUMIDITY: Floor temperature and materials should be between 65°F (18°C) and 90°F (32°C). Humidity must be less than 80%. **DO NOT** coat unless floor temperature is more than five degrees over the current, local dew point.

CHECK THE CONCRETE: Concrete must be structurally sound and free of curing membrane, paint and/or other sealer. If you suspect that the concrete has been previously sealed, call Tennant Company Tech Support for further instructions.

CHECK FOR MOISTURE: Concrete must be dry before application of this floor coating material. Concrete moisture testing must occur. In-situ relative humidity testing is recommended. Readings must be below 75% relative internal concrete humidity. Test methods can be purchased at www.astm.org, see F2170, or follow manufacturer's instructions. If moisture issues are present, the use of a moisture mitigation system may be a consideration. Please call Tennant Company Technical Support for further information / instructions.

NOTE: Although moisture testing is critical, it is not a guarantee against future problems. This is especially true if there is no vapor barrier or the vapor barrier is not functioning properly and/or you suspect you may have concrete contamination. Additional testing may be necessary to determine the vapor barrier and any contamination.

APPLICATION EQUIPMENT

• Protective clothing	• Mohair Roller and Refill (18”)
• Jiffy® mixer blade [Tennant Part No. 08643-5] (Registered trademark: Jiffy® Mixer Co. Inc.)	• Roller assembly (18")
• Slow speed drill (500 rpm or less)	• Disc machine
• 18-24" (457.2-609.6 mm) Flat rubber squeegee	• 60 grit sandpaper
• 18-24" 1/16" Notched rubber squeegee	• Dust Mask
• Spiked shoes	

ASSEMBLE EQUIPMENT: Due to the limited pot life of the material, all application equipment, etc. should be ready for immediate use. (Clean roller with tape to remove any residual lint.)

PREPARATION

Detergent scrub and rinse with clean water to remove surface dirt, grease, oil and contaminants.

THICK FILM APPLICATIONS (25 mils / 0.64 mm):
Steel Shot Blast: Use magnetic broom to remove excess shot, sweep to remove large debris and vacuum to remove fine dust.
Diamond Grind: Sweep to remove large debris and vacuum to remove fine dust.

JOINTS: Depending on the preference of the facility owner, joints may or may not be filled. If the joints are filled, non-moving joints, i.e. contraction or control joints, can be hard filled with thickened, 100% solids epoxy or with a semi-rigid joint filler such as Eco-PJF™ or Eco-EJF™. Construction joints less than one inch wide may also be filled with Eco-PJF. Isolation or expansion joints must be filled with a flexible material designed for this purpose.

APPLICATION - PRIMER - ECO-MPE

A thin coat of primer will wet out concrete, help seal off concrete pores and minimize outgassing bubbles. Apply a tight coat of primer with a clean, flexible squeegee. Backrolling is not recommended. There should be no mil build over the high spots of the concrete. **NOTE:** *If faster cure times are required, use Eco-RCE or Eco-RCE/M.*

COVERAGE RATE: Much of this will soak into porous concrete. One gallon (3.78 litres) of Eco-MPE will cover:
535 ft^2 (49.7 m^2) at 3 mils (0.08 mm) wet/dry film
400 ft^2 (37.2 m^2) at 4 mils (0.10 mm) wet/dry film
321 ft^2 (29.8 m^2) at 5 mils (0.13 mm) wet/dry film

PREMIX PART A using a Jiffy® mixer blade and slow speed drill. (This is required for both 3-gallon (11.34 litres) and full-filled 5-gallon (18.9 litres) units.) For full-filled 5 gallon pails (18.9 litres), pour out 2 gallons (7.56 litres) into a measuring container. Then, pour the measured Part A into a mixing pail.

ADD ECO-MPE PART B TO PART A (3 GALLONS / 11.34 LITRES TOTAL MIX). For full-filled 5-gallon pails (18.9 litres), pour out 1 gallon (3.78 litres) Part B into a measuring container that is separate from the one used with the Part A. Then, add the measured Part B to the Part A already in the mixing pail. ***POTLIFE:*** *Mix only enough material which can be applied within the work time (time between the addition of Part B to Part A and the completion of all application actions). Check the following chart for work times at various temperatures. For smaller quantities, use 2 parts PART A to 1 part PART B by volume.*

APPROXIMATE WORK TIME (minutes) - °F (°C):	**65 (18.3)**	**70 (21.1)**	**75 (23.9)**	**80 (26.7)**	**90 (32.2)**
	40	30	25	20	15

MIX FOR 2 MINUTES using a Jiffy® mixer blade and slow speed drill. (Failure to do so could result in lower/diminished coating properties.)

IMMEDIATELY POUR ALL OF THE MIXED MATERIAL onto the floor in a single bead.

PUSH THE FLAT SQUEEGEE at an even speed with sufficient down pressure to apply the thinnest coat. **NOTE:** *The use of spiked shoes will allow freedom of movement on the wet floor.* **CAUTION:** *The surface will be slippery.*

START THE SECOND AND REMAINING PASSES by pushing material parallel to the first stroke. Hold the bead of material near the center of the bar. ***NOTE:*** *Eco-MPE applied thin may "bridge" holes and cracks momentarily before soaking in--make sure the previously squeegeed area is overlapped (halfway).*

TO REDUCE OUTGASSING BUBBLES, it is best to wait until the primer has set up enough to walk on before applying the build coat of Eco-MPE.

The primer must be coated within 24 hours at floor temperatures 65°F-90°F (18°C-32°C).

APPLICATION – BUILD COAT - ECO-MPE

COVERAGE RATE: At least 8 mils (0.20 mm) on top of the primer are recommended for complete hide.
One gallon (3.78 litres) of Eco-MPE will cover:
200 ft^2 (18.6 m^2) at 8 mils (0.20 mm) wet/dry film
133 ft^2 (12.4 m^2) at 12 mils (0.30 mm) wet/dry film
107 ft^2 (9.9 m^2) at 15 mils (0.38 mm) wet/dry film

REPEAT STEPS used for mixing and spreading of the primer coat.

COLORS: Premix Tennant Colorants to ensure uniform color. Colorant is added at the rate of 1 unit per 3-gallons (11.34 litres) mix. **NOTE:** *When using colorant in the bulk units, add the colorant to the Part A that has been measured into the "mixing pail".*

BACKROLL THE MATERIAL with a 3/8" (10 mm) nap roller for a smooth uniform appearance. Backrolling is required to remove the puddles and squeegee lap marks in order to obtain uniform texture and a consistent mil thickness.

If Eco-MPE is topcoated with Eco-ECE at floor temperatures of 65-90°F (18-32°C), it does not need to be sanded if the Eco-ECE is applied within 24 hours.

If epoxy is not coated within 24 hours, it must be sanded with 60 grit paper. We recommend thorough sanding with a swing-type buffer so that multiple scratch marks cause an obvious gloss loss on all areas (depressions will remain shiny), and the floor is uniformly dulled. The ability to see individual scratch marks is an indication that sanding is not adequate. Scrub with detergent and rinse with clean water before coating and tack rag to remove fine dust.

ELECTRICAL GROUNDING

If Eco-ECE is the primary ground, then a grounding system that meets the customer's specifications needs to be connected to the common ground of the facility. If copper tape is used, install the copper tape on the primer or build coat, underneath the Eco-ECE. Consult Tennant Coatings Technical Support concerning grounding tape before proceeding.

APPLICATION – TOPCOAT – ECO-ECE

COVERAGE RATE: One 3.9 gallon (14.74 litres) unit of Eco-ECE will cover:
518 ft^2 (48.1 m^2) at 12 mils (0.30 mm) wet/dry film

PREMIX THE TWO CANS OF ECO-ECE PART A using a Jiffy mixer blade and 1/2" (13 mm) slow speed drill.

IN A SEPARATE CLEAN, DRY MIXING CONTAINER POUR THE TWO CANS OF ECO-ECE PART A. SLOWLY ADD THE THREE CANS OF ECO-ECE PART C TO ECO-ECE PART A. Blend together for 2-3 minutes using a Jiffy mixer blade (this combination will become a thick paste). Allow mixture to rest for 5-10 minutes.

REMIX PART A AND PART C SOLUTION. ADD ONE CAN OF ECO-ECE PART B AND ONE UNIT OF COLORANT. Mix thoroughly for 3 minutes using a low-speed mechanical mixer.

POTLIFE: Mix only enough material which can be applied within the work time (time between the addition of the Part B/Colorant to Part A and C and the completion of all application actions.

IMMEDIATELY POUR ALL MIXED MATERIAL onto the floor in a single bead. **DO NOT** tip pails upside down to let them drain; the result will likely be soft spots.

PUSH THE NOTCHED SQUEEGEE at an even speed with down pressure.
*1/8" (3.18mm) notched squeegee to apply 12 mils
*These guidelines were arrived at by using new squeegees on smooth concrete with moderate applied pressure. The application rate is affected by worn squeegees, applied pressure and texture of the concrete.
NOTE: *The use of spiked shoes will allow freedom of movement on the wet floor.* **CAUTION:** *The surface will be slippery.*

START THE SECOND AND REMAINING PASSES by pushing material parallel to the first stroke. Hold the bead of material near the center of the bar and push at an even speed with slight down pressure.

WHEN ECO-ECE IS BEING APPLIED and there is room to roll, a second person will **BACKROLL THE MATERIAL** with a 3/8" nap, high-quality mohair-type roller to a smooth and uniform appearance. **NOTE:** Get off the Eco-ECE as soon as possible.

ALLOW COATING TO CURE FOR A MINIMUM OF 24 HOURS before opening floor to foot traffic and 48 hours before allowing equipment to be moved back in. Allow a full seven days cure for complete chemical resistance.

TECHNICAL SUPPORT

For any preparation or application questions, please call Tennant technical support at 800-228-4943, option 3 (US & Canada), 800-832-8935 (International).

DISPOSAL

Dispose of all excess material, packaging and other waste in accordance with federal, state and local regulations.

MAINTENANCE GUIDELINES

Allow floor coating to cure at least one week before cleaning by mechanical means (e.g., sweeper, scrubber, disc machine).

Care: Proper maintenance will increase the life and help maintain the appearance of your new Tennant floor coating. Sweep and scrub your new coating regularly, as dirt and dust are abrasive and can quickly dull the finish, decreasing the life of your coating. Remove spills quickly as certain chemicals may stain and could possibly permanently damage the finish.

Use soft nylon brushes or white pads on your new floor coating. Any brush more abrasive than a soft nylon or white pad can cause premature loss of gloss.

Detergent: Tennant has a full range of detergents--general purpose to heavy duty--for your cleaning needs. For assistance in determining which detergent is right for your facility or for additional technical information call: 800-228-4943, option 3 (US & Canada), 800-832-8935 (International).

Caution: Avoid scratching or gouging the surface. All floor coatings will scratch if heavy objects are dragged across the surface.

Do not drop heavy or pointed items on the floor as this may causing chipping or concrete popouts in the case of a weak cap.

Rubber tires can permanently stain the floor coating from plasticizer migration. Plexiglass® between the tire and the floor coating can prevent discoloration.

Rubber burns from quick stops and starts can heat the coating to its softening temperature, causing permanent marking.

Repair: Repair gouges or scratches or chip outs as soon as possible to prevent moisture or chemical contamination.

CONDITIONS OF SALE AND LIMITATION OF WARRANTY AND LIABILITY

Eco-ECE™ (Electrostatic Conductive Epoxy), Eco-SCT™ (Electrostatic Control Topcoat) and Eco-SDS™ (Static Dissipative System) ONLY.
The management and control of electrostatic charge is complicated and involves many factors. **BUYER ASSUMES ALL RISK AND LIABILITY ASSOCIATED WITH THE USE OF THIS PRODUCT.**
TENNANT COMPANY MAKES THE FOLLOWING LIMITED WARRANTY: (1) that this product is free from defects of manufacture, improper formulation, and defective ingredients and conforms to Tennant's manufacturing standards and (2) that the technical data furnished is true and accurate to the best of its knowledge (but no guarantee of accuracy is expressed or implied and all such data is to be used only as a general guide). **Warranty covers replacement of materials only.**
THIS WARRANTY IS EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.
In no event shall Tennant or Seller be liable for any incidental, consequential, or special damages arising out of the use of Tennant Specialty Surface Coatings. **THE ONLY REMEDY OF THE USER OR BUYER, AND THE ONLY LIABILITY OF TENNANT AND SELLER FOR ANY AND ALL CLAIMS, LOSSES, INJURIES, OR DAMAGES (INCLUDING CLAIMS BASED ON BREACH OF WARRANTY, CONTRACT, NEGLIGENCE, STRICT LIABILITY, OR OTHERWISE) SHALL BE REPLACEMENT OF THE PRODUCT OR, AT THE ELECTION OF TENNANT OR SELLER, RETURN OF THE PURCHASE PRICE.**
No representative of Tennant has authority to give any other warranty or assume other liability.
The presence of a Tennant employee during the application of Tennant's Specialty Surface Coatings does not extend or alter the warranty or limitations in any manner whatsoever.