



SURFACE PREPARATION AND APPLICATION GUIDE

SERIES 971 AEROLON® ACRYLIC INSULATING COATING SYSTEM

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Published technical data, instructions, and pricing are subject to change without notice. Contact your Tnemec technical representative for current technical data, instructions, and pricing. Warranty information: The service life of Tnemec's coatings will vary. For warranty, limitation of seller's liability, and product information, please refer to Tnemec's Product Data Sheets at www.tnemec.com or contact your Tnemec Technical Representative. 4/2015

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INNOVATION IN EVERY COAT.™

1.0 INTRODUCTION

The purpose of this guide is to acquaint contractors and applicators with the basic information necessary for properly ordering, storing and installing Tnemec's Series 971 Aerolon Acrylic. Prior to starting work, please read this entire guide carefully. This application guide cannot cover every issue that may be encountered in the field. If you have questions, please contact your Tnemec representative or call 1-800-TNEMEC1 for assistance. It is important that you obtain answers to any questions before work begins.

Please review all pertinent product data sheets prior to starting. Also, reference the project specifications and compare them with the product data sheet. Resolve any inconsistencies prior to starting work.

2.0 PRODUCTS AND PACKAGING

The following contains information on the core components of this product.

2.1 SERIES 971 AEROLON ACRYLIC

Series 971 Aerolon Acrylic is an innovative, fluid applied, thermal insulating coating utilizing aerogel particles that imparts exceptional insulative properties to a variety of substrates. Ideal for insulating pipes, valves, tanks, structural steel, or other substrates where thermal improvement or personnel protection is desired. Part of a durable, corrosion-resistant coating system that bonds to the primed substrate, greatly reducing the issues associated with corrosion under insulation (CUI).

2.2 PACKAGING

Series 971 is a one-component product with the aerogel particles contained in the mix. It is packaged in a five-gallon pail yielding 3.5 gallons (13.25 L) or a one-gallon can yielding 0.70 gallons (2.6 L).



2.3 SERIES 971 COVERAGE RATES

	DRY MILS (MICRONS)	WET MILS (MICRONS)	SQ. FT./GAL (M ² /GAL)
Minimum	30.0 (762)	40.0 (1016)	41 (3.8)
Maximum	50.0 (1270)	65.0 (1650)	24 (2.3)

Practical coverage rates per coat. Allow for overspray and surface irregularities. Application of coating below minimum or above maximum recommended dry film thicknesses may adversely affect cure and coating performance.

2.4 STORAGE TEMPERATURE

Product must be stored in a dry environment in unopened containers. Storage temperatures should be between 40°F to 110°F (4°C to 43°C). **PROTECT FROM FREEZING.**

2.5 SHELF LIFE

Twelve (12) months in original, unopened packaging at recommended storage temperature.

3.0 SURFACE PREPARATION

Remove all oil, grease, tar and other residues or contaminants from the surface. Solvent cleaning (per SSPC-SP1 or NAPF 500-03-01) and high pressure water or steam cleaning are effective methods for removing hydrocarbon residues and other by-products. Fresh water rinse to ensure complete removal of soluble salts and cleaning chemicals. The surface should be clean, dry, and contaminant free.

3.1 PREPARATION OF CONCRETE

Allow new cast-in-place concrete to cure a minimum of 28 days at 75°F (24°C). Verify concrete dryness and prepare concrete surfaces in accordance with NACE No. 6/SSPC-SP13 Joint Surface Preparation Standards and ICRI Technical Guidelines. Moisture vapor transmission should not exceed three lbs per 1,000 sq. ft. in a 24 hour period. (Reference ASTM F 1869 "Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Sub floor Using Anhydrous Calcium Chloride.") Relative humidity should not exceed 80%. (Reference ASTM F 2170 "Standard Test Method for Determining Relative Humidity in Concrete using in situ Probes.") 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 2-4 surface profile. Refer to the appropriate primer product data sheet for more information regarding the recommended surface preparation for concrete.

3.2 CMU

Allow mortar to cure for 28 days. For optimum results and/or immersion services, abrasive blast referencing SSPC-SP13/NACE 6 to level protrusions and mortar splatter and remove other contaminants. Refer to the appropriate primer product data sheet for more information regarding the recommended surface preparation for CMU.

3.3 NON-FERROUS METAL

Surface preparation recommendations will vary depending on substrate and exposure conditions. Contact Tnemec Technical Service for more information on applying Series 971 over non-ferrous metals.

3.4 STEEL (NON-IMMERSION SERVICE)

The preferred method of surface preparation should be a minimum SSPC-SP6/NACE 3 Commercial Blast Cleaning. When blasting is not an option, other surface preparation techniques may be appropriate. Contact Tnemec Technical Services for more information. Refer to the appropriate primer product data sheet for more information regarding the recommended surface preparation for steel.

4.0 COATING SYSTEM - PRIMERS & TOPCOATS

4.1 PRIMERS

A variety of primers are available for use under Series 971 depending on the required corrosion resistance and operating temperatures. Series 1224 Epoxoline WB is an inorganic hybrid water based epoxy that provides good corrosion protection and resists operating temperatures up to 350°F (177°C). Series 90-97 Tneme-Zinc, an organic zinc-rich urethane, and Series 90E-92 Tneme-Zinc, an inorganic zinc-rich coating, provide galvanic protection to carbon steel substrates and are therefore recommended for areas where excellent corrosion protection is required. Both Series 90-97 and 90E-92 are typically recommended for use in operating temperatures less than 120°F (49°C). This is due to a phenomenon sometimes encountered under insulation called “reverse polarity”, or “galvanic reversal”, whereas the zinc becomes cathodic to the carbon steel substrate resulting in increased corrosion rates. Tnemec recommends referring to NACE SP0198-2010 (Subsection 4.3.5) for more information on this topic and consulting with the owner or engineer. Please reference the corresponding product data sheet for specific information on the primers mentioned above. Additional primers may be acceptable, please contact your Tnemec representative or Tnemec Technical Services for more information.

4.2 TOPCOATS

Tnemec offers several topcoats for Series 971 that can be selected based on the expected exposure conditions. Series 72T, an aliphatic acrylic polyurethane; Series 1028T, a high-dispersion pure acrylic; and Series 1224, an inorganic water based epoxy; provide excellent service in both interior and exterior environments. Each of these products may be applied by brush, roll, or spray; however, due to the textured surface of Series 971 it is recommended that the topcoat be back-rolled after spray application to achieve proper coverage. Please refer to the appropriate product data sheet for specific product information. Other topcoats may be available depending on project requirements.

Be aware that the surface temperature of Aerolon will be less than the original substrate temperature due to the product’s insulative qualities. Reference the Aerolon surface temperature table below to ensure the specified insulation thickness is sufficient to meet the topcoat’s application and in-service temperature requirements.

Substrate Temperature	Series 971 Dry Film Thickness Surface Temperatures			
	50 Mils	100 Mils	150 Mils	200 Mils
150°F (66°C)	128°F (53°C)	116°F (47°C)	108°F (42°C)	103°F (39°C)
200°F (93°C)	160°F (71°C)	141°F (61°C)	129°F (54°C)	121°F (49°C)
250°F (121°C)	190°F (88°C)	164°F (73°C)	147°F (64°C)	136°F (58°C)
300°F (149°C)	215°F (102°C)	182°F (83°C)	163°F (73°C)	149°F (65°C)
350°F (177°C)	234°F (112°C)	196°F (91°C)	174°F (79°C)	159°F (71°C)

5.0 MIXING

Tnemec Series 971 Aerolon Acrylic is supplied in five-gallon pails and one-gallon cans. The five-gallon pail includes a foil vapor barrier that must be removed before mixing. Each container is partially filled to provide additional space for mixing the material. Mix thoroughly under low agitation using a box blade (H-paddle). Thoroughly clean

the box blade (H-Paddle) and equipment with clean water directly following mixing to avoid product build-up.

5.1 SURFACE TEMPERATURE

Minimum surface temperature is 45°F (7°C) and maximum is 200°F (93°C) during application. The surface should be dry and at least 5°F (3°C) above the dew point.

5.2 THINNING

Do not thin.

6.0 CURE SCHEDULE

TEMPERATURE	TO TOUCH	TO HANDLE	TO RECOAT†	TO TOPCOAT
75°F (24°C)	4 Hours	16 Hours	16 Hours	24 Hours

†Recoat times listed are with itself. Curing time varies with surface temperature, air movement, humidity and film thickness. **Note:** A cure time of 24 hours at 75°F (24°C) is required before topcoating Series 971. Extended cure time may be required at lower temperatures.

7.0 APPLICATION EQUIPMENT

Series 971 can be applied using a wide array of low pressure equipment ranging from a texture spray gun with hopper assembly to low pressure displacement ratio pumps of 1:1 to 10:1. The selection of the appropriate equipment will depend upon the size and scope of the project.

7.1 TEXTURE SPRAY GUN

The texture spray gun with hopper and 3/16” tip is recommended for use on small area applications or for product demonstrations. A 1.5 gallon (5.7 L) heavy duty plastic hopper should be used with a 2.4 CFM air supply. See figure 1.0 below. Maintain a distance between substrate and spray gun of 12” or less to achieve a continuous film and avoid a highly textured surface due to dry-spray. Atomizing pressure normally ranges from 60 to 90 psi (4-5 bar).

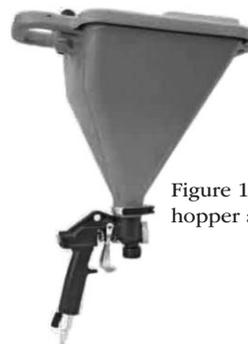


Figure 1.0 Spray Gun with 1.5 Gallon (5.7 L) hopper attached.

7.2 LOW PRESSURE DISPLACEMENT PUMPS

Product application rates will vary depending upon the equipment selected and can range from one pint (16 oz) per minute to 1.5 gallons per minute. Below are a few readily available pumps that can be used. Contact Tnemec Technical Services for recommended equipment modifications.

7.2.1 GRACO GTX 2000

The Graco GTX 2000, equipped with diaphragm pump, is the standard application equipment recommended for small, medium, and large area spray applications.

Series 971 can be spray-applied by the Graco GTX 2000 as supplied by the pump manufacturer. However, the product application rates will be limited to approximately one pint (16 oz.) per minute. Optimum application rates of up to 3/4 gallon (96 oz.) per minute can be achieved with relatively minor pump modifications. Specific equipment and pump requirements, including modifications, are available by contacting Tnemec Technical Services.



Pump	Graco GTX 2000 Diaphragm
Gun	Texspray Air Spray Gun
Material Hose ID	1" ID Hose (25' - 50')
Nozzle	4 mm or 6 mm†

† Nozzle size will be dependant on application. The 4 mm nozzle is recommended for small application areas to avoid material waste. The 6 mm nozzle is recommended for use on large applications.

7.2.2 GRACO M680

The Graco M680 is recommended for large area applications where material control is less important and production rates can be maximized. Series 971 is sprayed by the Graco M680 without any modifications to the equipment. The pump offers three different gun options, including a Flex Hose Applicator, Pole Applicator, and HTX 680 Applicator. The Flex Hose is most often recommended, however all three guns are suitable for spray application of Series 971. Specific pump parameters are available by contacting Tnemec Technical Services.



Pump	Graco M680
Gun	Flex Hose Applicator
Material Hose ID	25' 1" Diameter, then 10' 3/4" Diameter
Nozzle	No. 5

7.2.3 WIWA 410

The WIWA 410 is recommended for large area applications where material control is less important and production rates can be maximized. Series 971 is sprayed by the WIWA 410 without any modifications to the equipment. The pump consists of a 6.5 gallon stainless steel hopper, and is sprayed through a straight shot nozzle. Application rates up to 1.5 gallons per minute can be achieved. Contact Tnemec Technical Services for specific equipment and pump requirements.



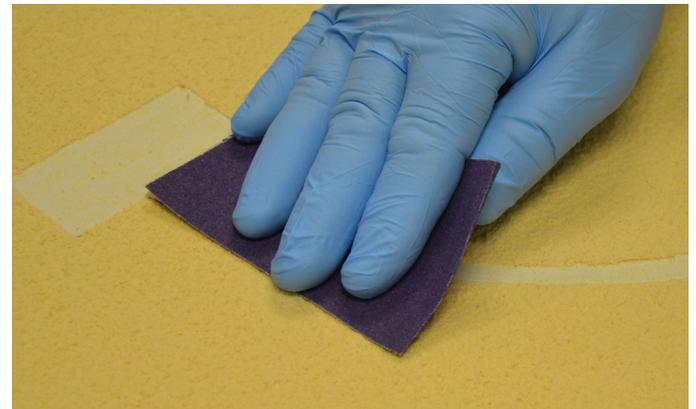
Pump	WIWA 410
Gun	Straight Shot
Material Hose ID	25' 1" Diameter, then 10' 3/4" Diameter
Nozzle	1/4"

7.3 PRECONDITIONING OF PUMP AND LINES

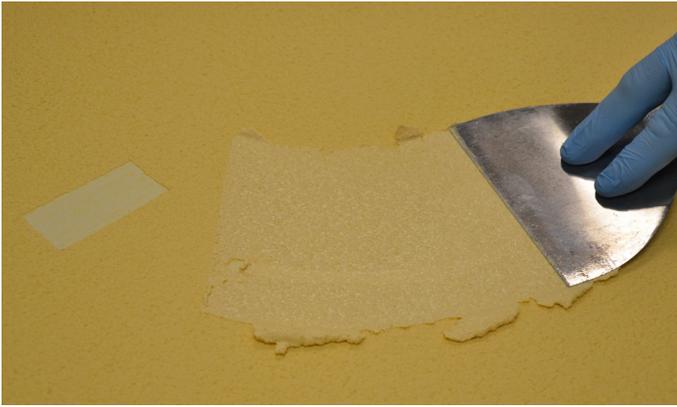
Prior to application, precondition the pump and lines by thoroughly flushing with clean water. Add Series 971 to hopper and spray material into waste bucket until the consistency is that of mixed Aerolon and the preconditioning water is clearly flushed. Do not reuse the material diluted with water.

8.0 DAMAGE AND CORROSION REPAIR

Series 971 is easily repaired if physically damaged or if substrate corrosion is evident. The following steps can be taken to repair the Series 971 coated surface.



Step 1: Identify the area of the coating where corrosion or damage has occurred. Using a utility or sharp putty knife, remove the Series 971 coated surface around the affected area. Lightly sand the edges of the trimmed surface and prepare the substrate according to SSPC-SP 2 or SP 3 Hand or Powering Tool cleaning. Apply the specified primer according to the product data sheet.



Step 2: Once the primed surface has properly cured, use a putty knife to apply Series 971 ensuring the surface is fully covered. Backroll with a loop roller or lightly coat the repaired area with a hopper gun to achieve a consistent appearance with the surrounding coating. Do not exceed 50 mils DFT per lift to avoid cracking due to surface cure. Multiple applications may be required to achieve the original Aerolon thickness.



Step 3: The specified topcoat may be applied by brush or roller. Reference the appropriate product data sheet for return to service times.

9.0 HEALTH & SAFETY

Series 971 Aerolon is for industrial use only and should be installed by qualified coating and lining application specialists only. The aerogel particles found in Aerolon can irritate eyes, nose, and throat when spray-applied. The application area should be contained using plastic sheeting and applicators should use proper personal protection equipment (PPE) including respirators and safety goggles. It is also recommended to cover any exposed skin to prevent irritation.

Series 971 contains chemical ingredients which are considered hazardous and proper containment and ventilation are required when applied within an enclosed area. Read container label warning and material safety data sheet for important health and safety information prior to the use of this product. Keep out of reach of children.