



SURFACE PREPARATION AND APPLICATION GUIDE

ENDURA-HEAT™
INCLUDES SERIES 1501, 1505, 1525, 1528
1552, 1556, 1558

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1.0 INTRODUCTION

The purpose of this guide is to acquaint contractors and applicators with the basic information necessary for properly ordering, storing and applying Endura-Heat high temperature coatings. 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, PACKAGING & COVERAGE RATES

The following contains information on the core components of the Endura-Heat product line.

2.1 SERIES 1501 ENDURA-HEAT PRIMER

Series 1501 is a corrosion-inhibitive, silicone alkyd primer that protects steel in service environments up to 600°F (315°C). Fast, ambient cure allows topcoats to be quickly applied and returned to service with hot application option up to 400°F (204°C).

2.1.2 PACKAGING

Series 1501 is packaged in a five-gallon pail yielding 5.0 gallons (18.9 L) or a one-gallon can yielding 1.0 gallon (3.79 L).

2.1.3 SERIES 1501 COVERAGE RATES

	DRY MILS (MICRONS)	WET MILS (MICRONS)	SQ. FT./GAL (M ² /GAL)
Minimum	2.0 (50)	4.0 (100)	409 (38.0)
Maximum	3.0 (75)	6.0 (150)	273 (25.3)

Allow for overspray and surface irregularities. Film thickness is rounded to the nearest 0.5 mils or 5 microns. Application of coating below minimum or above maximum recommended dry film thicknesses may adversely affect cure and coating performance.

2.2 SERIES 1505 ENDURA-HEAT ZR

Series 1505 is a high-performance, zinc-rich, silicone copolymer that offers galvanic protection for extended corrosion protection up to 1000°F (538°C). An excellent primer for use with selected topcoats as part of a corrosion- and heat-resistant coating system.

2.2.1 PACKAGING

	Part A (partially filled)	Part B (partially filled)	Yield (mixed)
Small Kit	1 gallon can	1 gallon can	1 gallon (3.79 L)

2.2.2 SERIES 1505 COVERAGE RATES

	DRY MILS (MICRONS)	WET MILS (MICRONS)	SQ. FT./GAL (M ² /GAL)
Minimum	2.0 (50)	5.0 (120)	379 (30.6)
Maximum	3.0 (75)	7.0 (185)	219 (20.4)

Allow for overspray and surface irregularities. Film thickness is rounded to the nearest 0.5 mils or 5 microns. Application of coating below minimum or above maximum recommended dry film thicknesses may adversely affect cure and coating performance.

2.3 SERIES 1525 ENDURA-HEAT DTM

Series 1525 Endura-Heat DTM is a direct-to-metal, corrosion inhibitive, aluminum silicone copolymer for steel substrates that reach elevated temperatures up to 1200°F (648°C). Its fast-cure capabilities allow for quick multi-coat application and return to service.

2.3.1 PACKAGING

Series 1525 is packaged in a five-gallon pail yielding 5.0 gallons (18.9 L) or a one-gallon can yielding 1.0 gallon (3.79 L).

2.3.2 SERIES 1525 COVERAGE RATES

	DRY MILS (MICRONS)	WET MILS (MICRONS)	SQ. FT./GAL (M ² /GAL)
Minimum	3.0 (75)	8.0 (210)	192 (17.9)
Maximum	5.0 (125)	13.5 (340)	115 (10.7)

Allow for overspray and surface irregularities. Film thickness is rounded to the nearest 0.5 mils or 5 microns. Application of coating below minimum or above maximum recommended dry film thicknesses may adversely affect cure and coating performance.

2.4 SERIES 1528 ENDURA-HEAT DTM

Series 1528 is an advanced multipolymeric coating that provides high-performance coating protection to steel and stainless steel substrates up to 1200°F (648°C). The coating is built to withstand severe thermal cycling (-300 to 1200°F) and is an excellent choice to combat corrosion under insulation (CUI).

2.4.1 PACKAGING

Series 1528 is packaged in a five-gallon pail yielding 3.0 gallons (11.35 L) or a one-gallon can yielding 1.0 gallon (3.79 L).

2.4.2 SERIES 1528 COVERAGE RATES

	DRY MILS (MICRONS)	WET MILS (MICRONS)	SQ. FT./GAL (M ² /GAL)
Minimum	4.0 (100)	6.0 (155)	261 (24.2)
Maximum	8.0 (200)	12.0 (310)	130 (12.1)

Allow for overspray and surface irregularities. Film thickness is rounded to the nearest 0.5 mils or 5 microns. Application of coating below minimum or above maximum recommended dry film thicknesses may adversely affect cure and coating performance.

2.5 SERIES 1552 ENDURA-HEAT

Series 1552 is an acrylic silicone topcoat available in a wide range of colors using thermally stable pigments for temperatures up to 500°F (260°C). This topcoat is used as the finish to high-temperature coating systems, imparting excellent resistance to weathering and UV-light degradation.

2.5.1 PACKAGING

Series 1552 is packaged in a five-gallon pail yielding 5.0 gallons (18.9 L) or a one-gallon can yielding 1.0 gallon (3.79 L).

2.5.2 SERIES 1552 COVERAGE RATES

	DRY MILS (MICRONS)	WET MILS (MICRONS)	SQ. FT/GAL (M ² /GAL)
Minimum	2.0 (50)	4.0 (100)	401 (37.3)
Maximum	3.0 (75)	6.0 (150)	267 (24.8)

Allow for overspray and surface irregularities. Film thickness is rounded to the nearest 0.5 mils or 5 microns. Application of coating below minimum or above maximum recommended dry film thicknesses may adversely affect cure and coating performance.

2.6 SERIES 1556 ENDURA-HEAT

Series 1556 is a modified silicone copolymer topcoat formulated for color stability and substrate protection in elevated temperatures up to 1000°F (538°C). Outperforms conventional high-temperature topcoats with exceptional resistance to thermal cycling and easy-to-handle cure requirements.

2.6.1 PACKAGING

Series 1556 is packaged in a five-gallon pail yielding 5.0 gallons (18.9 L) or a one-gallon can yielding 1.0 gallon (3.79 L).

2.6.2 SERIES 1556 COVERAGE RATES

	DRY MILS (MICRONS)	WET MILS (MICRONS)	SQ. FT/GAL (M ² /GAL)
Minimum	2.0 (50)	4.0 (100)	361 (33.5)
Maximum	3.0 (75)	6.5 (170)	241 (22.4)

Allow for overspray and surface irregularities. Film thickness is rounded to the nearest 0.5 mils or 5 microns. Application of coating below minimum or above maximum recommended dry film thicknesses may adversely affect cure and coating performance.

2.7 SERIES 1558 ENDURA-HEAT DTM

Series 1558 is a versatile modified silicone copolymer coating applied direct-to-metal or as a topcoat. Its high-build characteristics and corrosion-inhibitive pigments provide corrosion protection to steel substrates up to 1000°F (538°C) and its color options and superior adhesion to marginally prepared substrates make it an excellent choice throughout industrial facilities.

2.7.1 PACKAGING

Series 1558 is packaged in a five-gallon pail yielding 5.0 gallons (18.9 L) or a one-gallon can yielding 1.0 gallon (3.79 L).

2.7.2 SERIES 1558 COVERAGE RATES

STANDARD DIRECT TO METAL SERVICE

	DRY MILS (MICRONS)	WET MILS (MICRONS)	SQ. FT/GAL (M ² /GAL)
Minimum	6.0 (150)	11.0 (290)	139 (12.9)
Maximum	8.0 (200)	15.0 (390)	104 (9.7)

TOPCOAT SERVICE

	DRY MILS (MICRONS)	WET MILS (MICRONS)	SQ. FT/GAL (M ² /GAL)
Minimum	2.0 (50)	4.0 (100)	417 (38.8)
Maximum	3.0 (75)	6.0 (150)	278 (25.8)

Allow for overspray and surface irregularities. Film thickness is rounded to the nearest 0.5 mils or 5 microns. Application of coating below minimum or above maximum recommended dry film thicknesses may adversely affect cure and coating performance.

3.0 STORAGE TEMPERATURE

Products must be stored in a dry environmental in unopened containers. Storage temperatures should be between 30°F (-1°C) and 110°F (43°C).

4.0 SHELF LIFE

Shelf life in original, unopened packaging at recommended storage temperatures; Series 1552 and 1556, 12 months; Series 1501, 1505, 1525, 1528, 1558, 24 months.

5.0 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.

5.1 PRIMERS: SERIES 1501 AND 1505

Prepare steel surfaces in accordance with SSPC-SP6/NACE 3 Commercial Blast Cleaning or ISO Sa 2 Thorough Blast Cleaning. For 1501, make certain to achieve a minimum angular anchor profile of 1.5 mils and a maximum angular profile of 2.0 mils. For 1505, ensure a minimum angular anchor profile of 1.0 mil and a maximum angular profile of 2.0 mils.

5.2 DIRECT-TO-METAL (DTM) PRODUCTS: SERIES 1525, 1528, AND 1558

For 1525, prepare steel surfaces in accordance with SSPC-SP10/NACE 2 Near White Blast or ISO Sa 3 Blast Cleaning to Visually Clean Steel. Ensure a minimum angular anchor profile of 1.0 mil and a maximum angular profile of 1.5 mils.

For 1528, prepare steel surfaces subjected to exterior (atmospheric) exposure in accordance with SSPC-SP6/NACE 3 Commercial Blast Cleaning or ISO Sa 2 Thorough Blast Cleaning. Make certain to achieve a minimum angular anchor profile of 1.5 mils and a maximum angular profile of 3.0 mils. Abrasive blasting is the preferred method due to its ability to thoroughly profile the substrate and ensure the best adhesion and longevity of the coating system. However, if jobsite restrictions do not permit abrasive blast cleaning, steel substrates can be prepared in accordance with SSPC-SP2 Hand Tool Cleaning or SSPC-SP3 Power Tool Cleaning if all mill scale was previously removed from the surface as part of the surface preparation prior to the original coating system application. Mill scale, even tightly adhered, can disbond from the substrate during

the severe thermal cycling commonly encountered on equipment and structures exposed to high temperature.

When Series 1528 is used as a corrosion-resistant coating under insulation, prepare steel surfaces in accordance with SSPC-SP10/NACE 2 Near-White Blast Cleaning or ISO Sa 2.5 Very Thorough Blast Cleaning.

Series 1528 can be applied directly to stainless steel surfaces. Contact Tnemec Technical Services for specific surface preparation instructions.

For 1558, prepare steel surfaces subjected to exterior (atmospheric) exposure in accordance with SSPC-SP6/NACE 3 Commercial Blast Cleaning or ISO Sa 2 Thorough Blast Cleaning. Make certain to achieve a minimum angular anchor profile of 1.0 mil and a maximum angular profile of 2.0 mils. Abrasive blasting is the preferred method due to its ability to thoroughly profile the substrate and ensure the best adhesion and longevity of the coating system. However, if jobsite restrictions do not permit abrasive blast cleaning, steel substrates can be prepared in accordance with SSPC-SP2 Hand Tool Cleaning or SSPC-SP3 Power Tool Cleaning if all mill scale was previously removed from the surface as part of the surface preparation prior to the original coating system application. Mill scale, even tightly adhered, can disbond from the substrate during the severe thermal cycling commonly encountered on equipment and structures exposed to high temperature.

6.0 APPLICATION EQUIPMENT

6.1 BRUSH AND ROLLER APPLICATION

Although all Endura-Heat products can be brush or roller applied, these application techniques are recommended for small areas only and should not be considered suitable for large areas or entire projects. Special care should be taken when brushing or rolling to produce a uniform film at the specified dry-film thickness (DFT) and multiple coats may be required. Use ¼" to 3/8" (6.3 mm to 9.5 mm) high quality, synthetic woven nap rollers, and high quality, natural or synthetic bristle brushes.

6.2 SERIES 1501 & 1525 SPRAY APPLICATION EQUIPMENT

AIR SPRAY

GUN	DeVilbiss MBC or JGA
FLUID TIP	E
AIR CAP	765 or 78
AIR HOSE ID	5/16" or 3/8" (7.9 or 9.5 mm)
MAT'L HOSE ID	3/8" or 1/2" (9.5 or 12.7 mm)
ATOMIZING PRESSURE	60-80 psi (4.1-5.5 bar)
POT PRESSURE	15-20 psi (1.0-1.4 bar)

AIRLESS SPRAY

PUMP	30:1, 45:1, 60:1
TIP ORIFICE	0.011"-0.015" (279-381 microns)
ATOMIZING PRESSURE	1800 psi (124 bar)
MAT'L HOSE ID	3/8" (9.5 mm)

6.3 SERIES 1505 SPRAY APPLICATION EQUIPMENT

AIR SPRAY

GUN	DeVilbiss MBC or JGA
FLUID TIP	E
AIR CAP	765 or 78
AIR HOSE ID	5/16" or 3/8" (7.9 or 9.5 mm)
MAT'L HOSE ID	3/8" or 1/2" (9.5 or 12.7 mm)
ATOMIZING PRESSURE	60-80 psi (4.1-5.5 bar)
POT PRESSURE	15-20 psi (1.0-1.4 bar)

AIRLESS SPRAY

PUMP	30:1, 45:1, 60:1
TIP ORIFICE	0.021"-0.025" (533-635 microns)
ATOMIZING PRESSURE	1800 psi (124 bar)
MAT'L HOSE ID	3/8" (9.5 mm)

6.4 SERIES 1528 SPRAY APPLICATION EQUIPMENT

AIR SPRAY

GUN	DeVilbiss MBC-510
FLUID TIP	E
AIR CAP	704
MAT'L HOSE ID	3/8" (9.5 mm)
ATOMIZING PRESSURE	70 psi (4.8 bar)
POT PRESSURE	60 psi (4.1 bar)

AIRLESS SPRAY (STANDARD APPLICATIONS)

GUN	GRACO 205 - 591
PUMP	30:1, 45:1, 60:1
TIP ORIFICE	0.015"-0.021" (381-533 microns)
ATOMIZING PRESSURE	3000 psi (206 bar)
MAT'L HOSE ID	3/8" (9.5 mm)

AIRLESS SPRAY (DRY FALL APPLICATIONS)

GUN	GRACO 205 - 591
PUMP	30:1, 45:1, 60:1
TIP ORIFICE	0.017" (432 microns)
ATOMIZING PRESSURE	1800-2100 psi (124-145 bar)
MAT'L HOSE ID†	3/8" (9.5 mm)

†Whip line is not required.

6.5 SERIES 1552 SPRAY APPLICATION EQUIPMENT

AIR SPRAY

GUN	DeVilbiss MBC or JGA
FLUID TIP	E
AIR CAP	765 or 78
AIR HOSE ID	5/16" or 3/8" (7.9 or 9.5 mm)
MAT'L HOSE ID	3/8" or 1/2" (9.5 or 12.7 mm)
ATOMIZING PRESSURE	60-80 psi (4.1-5.5 bar)
POT PRESSURE	20 psi (1.4 bar)

AIRLESS SPRAY

PUMP	30:1, 45:1, 60:1
TIP ORIFICE	0.011"-0.015" (279-381 microns)
ATOMIZING PRESSURE	2100 psi (144 bar)
MAT'L HOSE ID	3/8" (9.5 mm)

6.6 SERIES 1556 SPRAY APPLICATION EQUIPMENT

AIR SPRAY

GUN	DeVilbiss MBC or JGA
FLUID TIP	E
AIR CAP	765 or 78
AIR HOSE ID	5/16" or 3/8" (7.9 or 9.5 mm)
MAT'L HOSE ID	3/8" or 1/2" (9.5 or 12.7 mm)
ATOMIZING PRESSURE	60-80 psi (4.1-5.5 bar)
POT PRESSURE	15-20 psi (1.0-1.4 bar)

AIRLESS SPRAY

PUMP	30:1, 45:1, 60:1
TIP ORIFICE	0.011"-0.013" (279-330 microns)
ATOMIZING PRESSURE	1800 psi (124 bar)
MAT'L HOSE ID	3/8" (9.5 mm)

6.7 SERIES 1558 SPRAY APPLICATION EQUIPMENT

AIR SPRAY

GUN	DeVilbiss MBC or JGA
FLUID TIP	E
AIR CAP	765 or 78
AIR HOSE ID	5/16" or 3/8" (7.9 or 9.5 mm)
MAT'L HOSE ID	3/8" or 1/2" (9.5 or 12.7 mm)
ATOMIZING PRESSURE	60-80 psi (4.1-5.5 bar)
POT PRESSURE	15-20 psi (1.0-1.4 bar)

AIRLESS SPRAY

PUMP	30:1, 45:1, 60:1
TIP ORIFICE	0.011"-0.013" (279-330 microns)
ATOMIZING PRESSURE	1800-2100 psi (124-144 bar)
MAT'L HOSE ID	3/8" (9.5 mm)

7.0 THINNING

Endura-Heat products can be applied without thinning. However, thinning with the recommended thinner can improve application properties and impart additional characteristics to the coating such as dry-fall and hot surface application. Reference individual product data sheets for specific thinning recommendations and to ensure compliance with local air districts regulations.

7.1 AIR & AIRLESS SPRAY

For improved spray pattern and film formation, all Endura-Heat products can be thinned with up to 10% with No. 80 thinner when ambient temperatures are below 80°F (27° C), and with up to 10% No. 81 thinner when ambient temperatures are above 80°F (27°C).

Series 1528 exhibits dry-fall characteristics when spray-applied and thinned 10% to 15% with No. 85 Thinner in temperatures below 80°F (27°C), and thinned 10% to 15% with No. 86 Thinner in temperatures above 80°F (27°C). Series 1528 will not properly dry-fall at temperatures below 45°F (7°C) or at relative humidity above 85%. Dry-fall characteristics help reduce the likelihood of overspray that can adhere to nearby structures or property.

7.2 BRUSH & ROLLER

Improved brush and roller application properties can be obtained with all Endura-Heat products by thinning between 5% and 10% with No. 82 thinner.

7.3 HOT SURFACE APPLICATION

Select Endura-Heat products can be applied by brush, roller, spray, and airless spray to hot surfaces above 200°F (93°C) with the use of No. 83 or No. 84 Hot Application Thinner. No. 83 thinner should be used with Series 1501, 1552, 1556 and 1558 and No. 84 Thinner should be used with Series 1528. Due to the extremely fast flash cure that occurs at temperatures above 200°F (93°C), special application techniques are required to produce a consistent, uniform film. When applying by brush or roller, apply coating in a single stroke in one direction only. Brushing or rolling back into previously applied product will tear or damage the coating film. Reload the brush or roller after each stroke to ensure ample coating is applied to the surface. Closely evaluate the brush or roller for build-up of coating as the elevated substrate temperatures can cause coating residue to develop which produce film defects.

8.0 AMBIENT CURE SCHEDULE

8.1 SERIES 1501 ENDURA-HEAT PRIMER

TEMPERATURE	TO TOUCH	TO HANDLE	TO TOPCOAT	TO PLACE IN SERVICE
75°F (24°C)	2 hours	3 to 4 hours	1 hour	12 hours

Curing time varies with surface temperature, air movement, humidity and film thickness.

8.2 SERIES 1528 ENDURA-HEAT DTM

TEMPERATURE	TO HANDLE	TO RECOAT	TO TOPCOAT	TO PLACE IN SERVICE
75°F (24°C)	12 hours	6 hours	24 hours	24 hours

Important: Allow Series 1528 to ambient cure for 24 hours prior to placing in service. Curing time varies with surface temperature, air movement, humidity and film thickness.

8.3 SERIES 1552 ENDURA-HEAT

TEMPERATURE	TO TOUCH	TO HANDLE	TO RECOAT	TO PLACE IN SERVICE
75°F (24°C)	15 minutes	1 to 2 hours	1 to 2 hours	12 hours

Curing time varies with surface temperature, air movement, humidity and film thickness.

8.4 SERIES 1558 ENDURA-HEAT DTM

TEMPERATURE	TO TOUCH	TO HANDLE	TO PLACE IN SERVICE
75°F (24°C)	30 minutes	4 to 6 hours	24 hours

Important: Allow Series 1558 to ambient cure for 24 hours prior to placing in service. Complete cure is achieved at 350°F (176°C).

9.0 HEAT CURE SCHEDULE

Series 1505, 1525 and 1556 require an ambient cure of 12 hours prior to placing in Service. The heat cure schedules below must be followed prior to exposure to maximum service temperatures.

Note: Operating temperatures must be slowly increased during this curing process.

9.1 SERIES 1505 ENDURA-HEAT PRIMER

TEMPERATURE	TO TOUCH	TO HANDLE	TO TOPCOAT	TO PLACE IN SERVICE
75°F (24°C)	1 hour	2 hours	1 to 2 hours	12 hours

Important: Allow Series 1505 to ambient cure for 12 hours prior to heat cure. Reference the heat cure table below. Curing time varies with surface temperature, air movement, humidity and film thickness.

HEAT CURE

CURE TIME	MINIMUM TEMPERATURE	MAXIMUM TEMPERATURE
4 hours	250°F (121°C)	500°F (260°C)
1 hour	475°F (246°C)	500°F (260°C)

9.2 SERIES 1525 ENDURA-HEAT DTM

TEMPERATURE	TO TOUCH	TO HANDLE	TO RECOAT	TO PLACE IN SERVICE
75°F (24°C)	1 hour	1 to 2 hours	1 to 2 hours	12 hours

Important: Allow Series 1525 to ambient cure for 12 hours prior to heat cure. Reference the heat cure table below. Do not cure

between coats. Curing time varies with surface temperature, air movement, humidity and film thickness.

HEAT CURE

CURE TIME	MINIMUM TEMPERATURE	MAXIMUM TEMPERATURE
4 hours	250°F (121°C)	500°F (260°C)
1 hour	475°F (246°C)	500°F (260°C)

9.3 SERIES 1556 ENDURA-HEAT

TEMPERATURE	TO TOUCH	TO HANDLE	TO RECOAT	TO PLACE IN SERVICE
75°F (24°C)	15 minutes	1 to 2 hours	1 to 2 hours	24 hours

Important: Allow Series 1556 to ambient cure for 24 hours prior to heat cure. Reference the heat cure table below. Curing time varies with surface temperature, air movement, humidity and film thickness.

HEAT CURE

CURE TIME	MINIMUM TEMPERATURE†	MAXIMUM TEMPERATURE
4 hours	250°F (121°C)	500°F (260°C)
1 hour	475°F (246°C)	500°F (260°C)

† 10HT White requires a heat cure of 500°F (260°C).

10.0 HEALTH & SAFETY

Endura-Heat high temperature coatings are for industrial use only and should be installed by qualified coating and lining application specialists only. Paint products contain chemical ingredients which are considered hazardous. Read container label warning and safety data sheet for important health and safety information prior to the use of this product. Keep out of reach of children.