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Award Winning Energy Saving and Asset Protection Coatings

APPLICATION HANDBOOK for INDUSTRIAL COATINGS

for Thermal Insulation & Corrosion Prevention

Heat Shield™ High Heat

Heat Shield™ Translucent PT

This is the general specification covering materials and procedures for the thin-film thermal insulation and protective coatings by Synavax™. More detailed, job-specific specifications may be obtained from info@synavax.com

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Typical Thickness by Application

Measuring your overall thickness is important during your application to ensure you achieve your desired results. Each “coat” of Synavax™ coating is actually equivalent to a particular wet (applied) film thickness and dry film thickness. Each single “coat” of the Coatings correspond to the following approximate thickness.

	Wet Film Thickness (WFT)	Dry Film Thickness (DFT)
High Heat, PT, GP Coatings	100 microns (4 mils)	19 microns (0.75 mils) (DFT is 19% of wet film thickness)
Heat Shield™ EPX	254 microns (10 mils)	254 microns (10 mils) (DFT is similar due to pebbled surface)

All square foot coverage rates are based upon the applied thickness, which is the wet film thickness (WFT).

IMPORTANT: DO NOT apply each coat more than 4-5 wet mils/100-127 microns in thickness. If you are experiencing cracking, peeling, or flaking while the application is drying, this indicates your coat application is too thick.

ALSO, DO NOT apply the full layered number of coats at less than the final specified DFT. For example: It may only be the DFT equivalent of a one coat application, instead of a three or more coat application. **Therefore to avoid applications that are applied at less than the suggested thickness target, it is important to measure your film thickness during each coating pass.**

The thicknesses on the following tables represent those that are most typically used for a particular type of application, you may use a lower or higher thickness to obtain a desired result. You may find additional coats are needed to achieve the desired results for your specific application.

Film Thickness Gauge Type	Recommended To Be Used With	Critical Factors
Wet Film Thickness Gauge	Applications **below** 100℃/212℉	If applying the coatings to surfaces below 100℃/212℉, it is best to measure the applied wet film thickness immediately after you apply each coat. This is because the time it will take the coating to reach the expected DFT will differ according to overall number of coats and humidity in the environment. It could take several days for a multiple coat application to reach the expected final DFT, therefore measuring WFT is suggested.
Dry Film Thickness Gauge	Applications **at or above** 100℃/212℉	If applying the coatings to surfaces at or above 100℃/212℉, the coating film will dry much faster, and you can achieve a very close measure to the expected DFT with a DFT gauge when the coating is completely dry to touch and non-tacky. Final DFT is reached at full cure.

Typical Thickness by Application

	Building Envelope (walls, ceilings roofs, skylights)	Pipes, Tanks, Equipment, Surfaces up to 256F/125C		Pipes, Tanks, Equipment, Boilers, Surfaces up to 400F/204C	
Typical Applied Film Thickness	3 coats, applied at 4 mils/100 microns wet film thickness each ROOF (non-metal) - 2 coats, applied at 5 mils/127 microns each	PT or GP - 6 to 8 coats, applied at 4 mils/100 microns wet film thickness each OR for chemical resistance: Heat Shield™ EPX - 2-4 coats, applied at 10 mils/254 microns wet film thickness each		High Heat - 8 to 12 coats, applied at 4 mils/100 microns wet film thickness each OR for chemical resistance: Heat Shield™ EPX - 2-4 coats, applied at 10 mils/254 microns wet film thickness each	
Typical Insulation Product/Option Choices	HomeProtect™ Heat & UV Shield, Crystal Roof Coating, Energy Protect™	Translucent PT or Translucent GP	Heat Shield™ EPX-H2O Note: If applying out doors where there is a high UV, use 1-coat of the High Heat or PT as a UV resistant top coat.	Heat Shield™ High Heat	Heat Shield™ EPX-H2O Note: If applying out doors where there is a high UV, use 1-coat of the High Heat or PT as a UV resistant top coat.

	Lead Encapsulation	Corrosion Prevention Only
Typical Applied Film Thickness	2 coats applied at 4 mils/100 microns per coat	2 coats applied at 4 mils/100 microns per coat
Typical Insulation Product/Option Choices	LeadX™	PT, High Heat, Heat Shield™ EPX-H2O

Surface Preparation

Proper surface preparation must be done to ensure proper adhesion of the coatings. All surfaces must be clean, free of any residue, and dry prior to application.

Metallic Surfaces:	Remove all loose contamination by wire brushing. Remove all dirt, grease, oil, soluble salts and other contamination by using a suitable cleaner/degreaser and clean water rinse. Remove all loose, flaking rust and/or paint by one of the following standards: SSPC-SP 2 Hand Tool Cleaning or SSPC-SP 3 Power Tool Cleaning (http://www.sspc.org/standards/spscopes.html) If able to sandblast use one of the following: SSPC-SP 6/NACE No. 3 Commercial Blast Cleaning, SSPC-SP 7/NACE No. 4 Brush-Off Blast Cleaning, or SSPC-SP 10/NACE No. 2 Near-White Blast Cleaning. (http://www.sspc.org/standards/spscopes.html) (http://www.nace.org) Profile shall be 1-1.5 mils in depth and angular in appearance.
Painted/Coated Surfaces:	Ensure paint is not flaking or peeling. Remove all loose dirt, oil, grease or other contaminates. Abrade the surface prior to Synavax™ coating application if necessary. If applying over wood paneling or other surface with u/v cured or urethane coating use appropriate primer for that surface, which is compatible with water-based coatings. If you are painting Synavax™ coatings over a pre-painted surface, make sure that the paint, coating, or sealant is compatible with a water-based acrylic latex. If it is not, then a suitable primer may be necessary (check with that product manufacturer for information). **IMPORTANT:** If you are unsure of the surface that you are overcoating, try the coating on a small area first to ensure it is suitable for your application and has proper adhesion before coating a larger area. If painting over a non-water-based paint, you should test a small area for adhesion first by coating the area with three coats (1-2 hours dry time between each) and observing adhesion after 72 hours. Certain paints will not be compatible with water-based acrylic latex coatings, and require a suitable primer (such as Kilz or similar) to be used prior to coating Synavax™ product over them.
Concrete and Porous Surfaces:	Concrete or other material should be fully cured. Be sure there is no moisture in the substrate that will escape after application, and interfere with proper adhesion of the coatings. Moisture escaping from the underlying surface causes loss of adhesion. Follow same surface preparation procedures as 'other surfaces'.
Glass/Smooth Non-Porous Surfaces:	Ensure you do not apply the coat more than 4 mils/100 microns in thickness. Allow the first coat to dry for a full 24 hours before applying the next coat. Allow ample complete dry time between the 2nd and 3rd coats (2-4 hours) This aids adhesion to these types of difficult to adhere to surfaces.
Lead Paint Surfaces: (LeadX™ coating)	Ensure paint is adhering well to surface. If there is any flaking of paint, it should NOT be abated by encapsulation, as any encapsulant can only adhere as well as the surface to which it is applied. DO NOT sand or abrade surface, otherwise you could release dangerous lead dust into the air. If lead paint is adhering well with no peeling, cracking or flaking, clean the surface so it is free of any contaminates, and dry thoroughly.
Other Surfaces:	Remove all loose contamination by wire brushing. Remove any dirt, oil, grease, etc. using a suitable cleaner/degreaser that does not leave a residue. Surface should be clean and dry.

Equipment, Mixing and Dry/Cure Times

PRODUCT DESCRIPTION:

One component water-based acrylic latex thermal insulation and protective coatings designed for use on a variety of metal and non-metal surfaces.

EQUIPMENT:

Preferred application method is by brush, roller or paint sprayer. Use either airless sprayer at low pressure, or HVLP (high volume low pressure) sprayer.

Synavax™ High Heat, PT, and GP coatings can be applied with standard paint spray equipment. Equipment size and performance varies widely, so it is our intention to provide the following suggestions for various sizes of equipment which may be used for the coatings, in addition to other important items to ensure proper application.

Airless or H.V.L.P. sprayer:

a) Graco Silver Gun, 395, Titan 440i (or similar)
   Wagner/Spraytech hand held sprayers are suitable for small areas.
b) Wagner Project Pro 115, or Paint Crew
c) Graco Minimax-battery operated is also suitable.

Tips & Extensions for Airless Sprayers:
You may need various tip fan sizes depending upon surface; such as 2, 4, 8 inch, and a 0.015-0.019 tip. Smaller surfaces require smaller fan widths, larger surfaces require larger fan widths. Refer to your paint sprayer documentation for suggested tip fan sizes according to surface area to be coated.

Suggested PSI: Between 20-30 PSI.

Tape over or cover any surfaces that you do not want coated to protect them from any overspray.

NOTE: if using the two part EPX product, refer to that product's mixing and application guide:
http://content.synavax.com/assets/s/application/HeatShield-EPX-H2O-APPLICATION-GUIDE.pdf

MIXING AND PREPARATION:

DO NOT thin the product with paint thinner or other medium. Thinning product can negatively effect insulating properties and void warranty.

Product should be stirred in the can prior to application or after sitting overnight. Care should be taken during stirring prior to application not to cause particle shear of the nanocomposite. Preferred method of stirring is using a mixing paddle (also known as hurricane mixer) at slow speed for approximately 3-5 minutes.

SUBSTRATE APPLICATION TEMPERATURE:

The temperature extremes for the substrate to which the material can be applied are 4℃ to 99℃ (40℉ to 210℉). If applying to surfaces over 100℃ (212℉), see special HOT MISTING TECHNIQUE on page 9 under "Hot Surface Application Method".

DRY AND CURE TIMES:

The touch dry time between individual "coats" of approximately 4 mils (100 microns) in thickness is 1-2 hours, depending upon humidity and air movement.

DO NOT apply the next coat/pass until the surface is completely dry to touch and non-tacky.

If applying to surfaces below 100℃/212℉, take wet film thickness measurements immediately after application. If applying to surfaces at or above 100℃/212℉, take dry film thickness (DFT) measurements after the coating is non-tacky. Track the overall coating wet film or dry film thickness buildup and adjust passes to be as near as possible to the final application thickness target.

Hard dry/return to service is in approximately 72 hours (normal humidity) and 6 days (high humidity).

Full cure time is approximately 30-60 days, depending on climate, overall thickness of application, and humidity.
If you want a faster cure product, the Heat Shield™ EPX-H2O cures in just 1-2 days.

NOTE: In most cases the coating can be applied while equipment is in operation. The coating reaches full insulating ability AFTER a cure time of approximately 30-60 days, which is dependent upon environmental variables, humidity, and number of coats used. Test of thermal performance should be performed after full cure. Thermal benefits will typically begin to be seen approximately two weeks after application, and will continue to improve as the cure time completes. Final cure is complete when thermal performance has reached a steady state. Cure time won't interfere with normal operations, you can continue to use your equipment as usual while the product cures.

IMPORTANT: DO NOT APPLY EACH COAT MORE THAN 4-5 WET MILS/100-127 MICRONS IN THICKNESS. If you are experiencing cracking, peeling, or flaking this indicates your coat application is too thick. Each coat/pass should be approximately 4 wet mils (100 microns) in thickness or thinner if you are using the Hot Surface Application Method. Use a Wet Film Thickness Gauge (see page 15) as you are applying to ensure each coat is being applied within that range.

ALSO, DO NOT apply the coatings too thinly or the final DFT may be less than your target. For example: It may only be the DFT equivalent of a one coat application, instead of a three or more coat application. **Therefore to avoid applications that are applied at less than the suggested thickness target, it is important to measure your film thickness during each coating pass.**

PAINTING OVER/COVERING THE COATINGS:

The product can be painted over with a water-based paint after it has dried for at least 72 hours. It can be painted over with a non-water-based paint after it has fully cured (approximately 30 days).

The product can be covered with tile, carpet, or other building material, after it has fully cured (approximately 30 days). Thicker coverages and higher humidity will increase dry and cure times. Application on warm or hot surfaces, and air movement (such as using fans) will decrease dry and cure times.

COVERAGE RATES FOR ONE GALLON (3.79 LITRES):

(For all coatings except Heat Shield™ EPX.)
Coverage rates are dependent upon surface texture, and may vary according to the substrate.

Applied Wet Film Thickness (WFT)	Coverage - Square Feet	Coverage - Square Meters	Number of Coats
4 mils/100 microns WFT	450 S.F.	42 m2	1
8 mils/200 microns WFT	225 S.F.	21 m2	2
12 mils/300 microns WFT	150 S.F.	14 m2	3
16 mils/400 microns WFT	112.5 S.F.	10.5 m2	4
20 mils/500 microns WFT	90 S.F.	8.4 m2	5
24 mils/600 microns WFT	75 S.F.	7 m2	6
28 mils/700 microns WFT	64.3 S.F.	6 m2	7
32 mils/800 microns WFT	56.3 S.F.	5.2 m2	8
36 mils/900 microns WFT	50 S.F.	4.6 m2	9
40 mils/1000 microns WFT	45 S.F.	4.2 m2	10
44 mils/1100 microns WFT	41 S.F.	3.8 m2	11
48 mils/1200 microns WFT	37.5 S.F.	3.5 m2	12
52 mils/1300 microns WFT	34.6 S.F.	3.2 m2	13
56 mils/1400 microns WFT	32.1 S.F.	2.9 m2	14
60 mils/1500 microns WFT	30 S.F.	2.7 m2	15

For information on Heat Shield™ EPX coverage rates, please see the Heat Shield™ EPX Mixing and Application Instructions.
http://content.synavax.com/assets/s/application/HeatShield-EPX-H2O-APPLICATION-GUIDE.pdf

Application Methods

TWO APPLICATION METHODS
There are two main application methods for Synavax™ coatings - depending upon whether the coatings are applied to a surface over or under the boiling point of water (100℃/212℉). These are the “Hot Surface Application Method” and the “Cool Surface Application Method”.

1. Hot Surface Application Method

- For surface temperatures between 100℃ and 190℃ (212℉ and 375℉)
(i.e. steam pipes, heat exchangers, boilers, manufacturing equipment)

This is the preferred method if you have equipment that runs at 100℃/212℉ and above, and desire no downtime. Application to hot surfaces will provide faster dry and cure time, however more and thinner passes will be needed to complete the same application thickness. The coating is non-toxic, however there is also a more noticeable odor when applying to a hot surface. Equipment must remain over 100℃/212℉ throughout the application, and for at least 6-8 hours after the last coating pass of the day has been completed.

The HOT MISTING TECHNIQUE is used for this Method and requires applying the coating in thinner passes with a paint sprayer to ensure that the coats are not applied too thickly so blistering does not occur. The coats are misted onto the hot surface which causes the water to evaporate rapidly and prevents blistering and loss of adhesion. It will take approximately 16 passes to build to a typical 7.5 mils/190 micron DFT (10 coats), versus 10 passes when the equipment is cold. Apply a first pass of 1 wet mil/30 microns to the entire substrate, allow area to completely dry. It should be non-tacky.

Measuring passes with a wet film gauge will be very difficult using this Application Method due to the passes being misted on very lightly and the faster dry time on the hot surface, we suggest measuring passes with a dry film gauge after the surface completely dries, and is non-tacky prior to applying the next pass. Measure the DFT after each coating pass and record on Project Log Application Sheet (See page 10)

Take dry film thickness (DFT) measurements after the coating is completely dry, and non-tacky to track the overall coating DFT buildup and to adjust passes to be as near as possible to the final DFT per pass as stated on the Project Log Application Sheet for HOT SURFACE Applications.

Apply your next pass at a thickness of 1.7 wet mils/45 microns to the entire surface, allow to completely dry. The surface should be non-tacky. Repeat passes using the guide on our Project Application Log Sheet until you have built up your target dry film thickness (DFT). Whenever possible, always apply the next coat in a cross-coat method to the previous coat.

NOTE: When applied to a HOT surface, the coatings will appear more opaque (white) rather than clear.

Be sure to adhere to each product’s published high temperature limit. Found on the product label and at www.synavax.com

Use the Project Log Application Sheet for the Hot Surface Application Method found on page 10.

PROJECT LOG APPLICATION SHEET

For Use With Hot Surface Application Method

Surface Temperatures between 100℃-190℃/212℉-375℉ during application

Date: _____ Plant Location: _____

Project Leader Name: _____ Applicator Name(s): _____

Surface Temperature: _____ Target Dry Film Thickness (DFT): _____

Machine Identification: _____ Square Foot or Meter Surface Area: _____

Measure each pass with a **Dry Film Thickness Gauge** after it is completely dry and non-tacky. Adjust thickness per pass as needed, using the log as a guideline, and to reach your final DFT Target. Do not apply a coat too thick, it is better to apply thin and do more passes. After the last spray pass of the day, surface temperature must remain above 100℃/212℉ for 6-8 hours, and be returned to that temperature before continuing the application.

Passes with Sprayer	Apply Pass at Wet Film Thickness Of Approximately		Accumulated Dry Film Thickness Should Measure When Completely Dry		Note Time Spray Pass is Completed	When Completely Dry - Note Measured Accumulated DFT	Wait AT LEAST This Long Before Applying Next Coat (Always check surface first. It must be completely dry before the next coat)
1	2 mils	50 microns	0.375 mils	9.5 microns			20 minutes
2	2 mils	50 microns					20 minutes
3	2 mils	50 microns					30 minutes
4	2 mils	50 microns					30 minutes
5	2 mils	50 microns					30 minutes
6	2 mils	50 microns					30 minutes
7	2 mils	50 microns					1 hour
8	2 mils	50 microns					1 hour
9	4 mils	100 microns					1 hour
10	4 mils	100 microns					1 hour 30 minutes
11	4 mils	100 microns					1 hour 30 minutes
12	4 mils	100 microns					1 hour 30 minutes
13	4 mils	100 microns					2 hours
14	4 mils	100 microns					2 hours
15	4 mils	100 microns					2 hours
16	4 mils	100 microns					2 hours
17	4 mils	100 microns					2 hours
18	4 mils	100 microns					2 hours

2. Cool Surface Application Method

- For surface temperatures between 4℃ and 99℃ (40°F and 210°F)
(i.e. walls, ceilings, fuel tanks, silos, water pipes, etc..)

Application to cool surfaces will have a longer dry and cure time, however fewer passes will be needed to complete the same application thickness. Application can be done via brush, roller, or sprayer.

Apply a first pass of 4 wet mils/100 microns to the entire substrate, measure wet film thickness immediately after applying the coating, note whether you need to increase, decrease, or maintain the pass thickness, and adjust accordingly to meet the applied wet film thickness of 4 mils/100 microns. Allow coat to completely dry to non-tacky (1-2 hours) before applying the next coat.

If you are applying the coatings to surfaces below 100℃/212℉, it is best to measure the applied wet film thickness as you are applying each coat. This is because the time it will take the coating to reach the expected DFT will differ according to overall number of coats and humidity in the environment. It could take several days for a multiple coat application to reach the expected DFT, therefore measuring Wet Film Thickness while applying each pass is suggested. Measure the WFT during each coating pass and record on Project Log Application Sheet (See page 12).

Apply your next pass at a thickness of 4 wet mils/100 microns to the entire surface, allow to dry to non-tacky. Repeat passes at 4 wet mils/100 microns each until you have achieved your target film thickness. Whenever possible, always apply the next coat in a cross-coat method to the previous coat.

IMPORTANT: If applying to cool surfaces (surface temperatures between 4℃ - 99℃ (40°F - 210°F), the surface cannot be subject to a temperature of 100℃/212°F or above for 30 days, to allow the application to fully cure and ensure no blistering or loss of adhesion occurs. If the surface is raised to 100℃/212°F or above before the coating has completely cured (with too much moisture still in the system) cracking or peeling may occur.

Be sure to adhere to each product's published high temperature limit. Found on the product label and at www.synavax.com

Use the Project Log Application Sheet for the Cool Surface Application Method found on page 12.

PROJECT LOG APPLICATION SHEET

For Use With Cool Surface Application Method

Surface Temperatures between 4℃-99℃/40°F-210°F during application

Date: _____ Location: _____

Project Leader Name: _____ Applicator Name(s): _____

Surface Temperature: _____ Target Dry Film Thickness (DFT): _____

Machine Identification: _____ Square Foot or Meter Surface Area: _____

Measure each pass with a **Wet Film Thickness Gauge** immediately after application, note whether you need to increase, decrease, or maintain the pass thickness, and adjust accordingly to meet the applied wet film thickness of 4 mils/100 microns. Do not apply a coat too thick, it is better to apply two passes at less than your target WFT, than to apply a pass too thick. When applying to cool surfaces (between 4℃ - 99℃ /40°F - 210°F), the surface cannot be subject to a temperature of 100℃/212°F or above for 30-60 days, to allow the application to fully cure and ensure no blistering or loss of adhesion occurs.

Passes with Sprayer, Brush or Roller	Apply Each Pass at Wet Film Thickness Of Approximately		Accumulated Dry Film Thickness Should Measure When FULLY Cured (Note: this could be several days or weeks to reach full cure)		Note Time Pass is Completed	Confirm Wet Film Thickness Measured During Pass	Wait AT LEAST This Long Before Applying Next Coat (Always check surface first. It must be completely dry before the next coat)
1	4 mils	100 microns	0.75 mils	19 microns			1 hour
2	4 mils	100 microns	1.5 mils	38 microns			1 hour
3	4 mils	100 microns	2.25 mils	57 microns			1 hour 30 minutes
4	4 mils	100 microns	3.0 mils	76 microns			1 hour 30 minutes
5	4 mils	100 microns	3.75 mils	95 microns			2 hours
6	4 mils	100 microns	4.5 mils	114 microns			2 hours
7	4 mils	100 microns	5.25 mils	133 microns			2 hours 30 minutes
8	4 mils	100 microns	6.0 mils	152 microns			2 hours 30 minutes
9	4 mils	100 microns	6.75 mils	171 microns			3 hours
10	4 mils	100 microns	7.5 mils	190 microns			3 hours
11	4 mils	100 microns	8.25 mils	209 microns			3 hours 30 minutes
12	4 mils	100 microns	9.0 mils	228 microns			3 hours 30 minutes

Limitations and Safety Precautions

Substrate must be structurally sound, cured and free of bond inhibiting contaminates.
During installation and initial cure cycle substrate and ambient air temperature must be at a minimum of 4℃/40°F. Substrate temperature must be at least 3℃/5°F above the dew point. When required, adequate ventilation and proper clothing shall be used.

Synavax™ coatings are not meant to be used in an underwater or submerged environment.

Do not allow an application to be subject to rain, condensation, or moisture within the first 72 hours after application. Exposure to rain, condensation, or moisture within the first 72 hours may result in cracking, blistering or peeling.

No application should be done while substrate is wet from rain, dew, or other moisture.

The application should not go below freezing (0ºC/32℉) until it has had a chance to cure for at least 30 days after application, or you may experience blistering, cracking and/or peeling. Once fully cured, the coatings can withstand low temperatures of -40℃/-40℉.

For exterior painting be sure to check upcoming weather and overnight temperatures ahead of time.

Strictly adhere to published coverage rates.

Do not thin product with paint thinner, water or other medium.

DO NOT ALLOW PRODUCT IN THE CAN TO FREEZE.

SAFETY PRECAUTIONS

Follow all SDS/label precautions even after container is emptied because it may retain product residues. Avoid contact with skin and eyes.

FIRST AID: In case of skin contact, flush with plenty of water. Remove contaminated clothing. Seek medical attention if irritation develops or persists. For eye contact, flush immediately with large amounts of water. Obtain medical treatment. If swallowed, DO NOT induce vomiting, obtain medical treatment immediately. If inhalation causes physical discomfort remove to fresh air. If symptoms persist, get medical help. KEEP OUT OF THE REACH OF CHILDREN. Wear gloves and goggles during application. For additional safety information, refer to Material Safety Data Sheet for this product. IMPORTANT! Spray equipment must be operated with care in strict accordance with manufacturer's instructions. Use of an approved dust/mist respirator during spray application is recommended. Wear approved dust respirator when grinding or sanding on cured product. Follow respirator manufacturer's directions for respirator use.

IN CASE OF SPILL: Keep material away from drains. Absorb with inert material and dispose of in accordance with applicable regulations.

DISPOSAL: Contains no chromium, lead or mercury. Consult your sanitation department for more information on disposal of empty containers. Disposal of waste containing free-liquids in landfills is prohibited. Contact your state-designated environmental agency for information concerning re-use, recycling or disposal of unused paint.

Clean Up

Synavax™ coatings are water-based and cleanup can be done with soap and water. Purge and clean spray equipment within thirty (30) minutes of final spray to avoid hardening of coating inside equipment. Flush with water and/or water and mild detergent. Disassemble and clean equipment per manufacturer's recommendations. Material left in spray equipment could solidify.

Warranty

You can find a full copy of product warranty information at www.synavax.com or request a printed copy by calling 1-800-858-3176 or +1-303-228-3701.

Rework/Repair

The need for Rework/Repair of the coating would be indicated by the following:

- Cracking, peeling, or blistering (bubbling) of coating surface
- Scratch or other damage on coating surface
- Other non-coating related rework to parts which cause a loss of coating adhesion or film to become damaged. (For example, if dyes or chemicals were spilled on the coating before it had a chance to properly dry and cure.)

1. Total Removal and Recoat:

This would be indicated by large scale damage to coating, where repair could not be limited to only one area.

- The coating can be removed by paint strippers/removers made for water-based paints or by sanding.
- Area should be washed and dried thoroughly.
- Coating should be reapplied.

2. Repair of Damaged Area:

This would be indicated by damage to only a small area of the coating surface.

- The damaged coating can be removed by solvents or small scale sanding.
- Area should be washed and dried thoroughly.
- Coating should be reapplied over area.

Measuring Film Thickness

For water-based coatings, the Dry Film Thickness (after moisture has dissipated) is typically less than the applied Wet Film Thickness. Coverage rates are always specified in wet film thickness, as applied.

	Wet Film Thickness (WFT)	Dry Film Thickness (DFT)	
Synavax™ High Heat, PT, GP Coatings	100 microns (4 mils)	19 microns (0.75 mils)	(DFT is 19% of WFT)

All square foot coverage rates are based upon the applied thickness, which is the wet film thickness (WFT).

IMPORTANT: DO NOT apply each coat more than 5-6 wet mils/127-152 microns in thickness. If you are experiencing cracking, peeling, or flaking while the application is drying, this indicates your coat application is too thick.

ALSO, Measure either the applied Wet Film Thickness or cured Dry Film Thickness to ensure you've got the correct coverage. For example: It may only be the DFT equivalent of a one coat application, instead of a three or more coat application. Therefore to avoid applications that are applied at less than the suggested thickness target, it is important to measure your film thickness during each coating pass.

Dry Film Thickness Gauge

Suggested for use with applications at or above 100℃/212°F.

The dry film thickness gauge is used after the coating has completely dried to touch (non-tacky) for hot surface applications, when the expected DFT will be reached sooner, due to the surface temperature. It is placed on the surface of the coating and will display the thickness in either microns or mils on the display.

This method is not recommended for applications below 100℃/212°F, because the time it will take the coating to reach the expected DFT may be several days, depending upon overall number of coats and humidity in the environment.

Wet Film Thickness Gauge

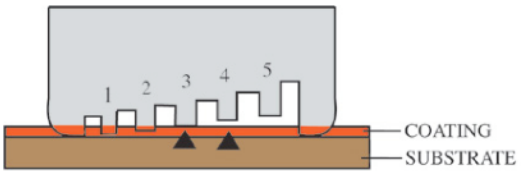
Suggested for use with applications below 100℃/212°F

The wet film thickness gauge is used when the coating is still wet, immediately after application. It is placed into the surface of the coating and will leave a mark on the gauge which can be read. One side measures in microns, and the other side measures in mils.

It is difficult to read clear coatings with this gauge, however a light source can assist in reading the wet coating marks on the gauge. You an also hold the gauge upright and slightly drag it to make small marks on th surface to read.

How to read a Wet Film Thickness gauge:

1. Place gauge on wet film at 90° angle
2. Press into film
3. Withdraw and note deepest tooth having paint on it and next higher tooth that is not coated
4. The wet film thickness lies between these two readings



The drawing indicates that tooth marked 3 mils is covered with the wet paint and tooth marked 4 mils is not covered. This indicates that the true wet film thickness of the material is between 3 & 4 mils thick.

Typical Painting Issues and Solutions

ISSUE	DESCRIPTION	POSSIBLE CAUSE	SOLUTION
Alligatoring	Patterned cracking in the surface of the paint film resembling the scales of an alligator.	1) Application of a top coat before the undercoat is completely dry.	Remove loose and flaking coating with a scraper or wire brush, sand the surface smooth. Thoroughly clean and dry surface. Reapply.
Blistering	Bubbles resulting from localized loss of adhesion and lifting of the coating film from the underlying surface.	1) Exposure of the coating film to moisture shortly after paint has been applied and/or before it has thoroughly dried.	Remove blisters by scraping and sanding. Thoroughly clean and dry surface. Remove source of moisture. Reapply.
Cracking/Flaking	The splitting of a dry coating film through at least one coat. Begins as cracking of coating film which results in flaking.	1) Thinning or over spreading of the coating. 2) Inadequate surface preparation.	Remove loose and flaking coating with a scraper or wire brush, sanding the surface. Thoroughly clean and dry surface. Repaint. Ensure no thinning of the coating is being done.
Mud Cracking	Deep, irregular cracks resembling dried mud, in dry paint film.	1) Coating is applied too thickly, can occur with inexperienced use of airless sprayer. 2) Coating is allowed to build up in corners or crevices upon application.	Remove excess coating by scraping and sanding. Thoroughly clean and dry surface. Reapply.
Sagging	Downward drooping/ movement of the coating immediately after application, resulting in an uneven coating.	1) Application of too heavy a coat. 2) Application in excessively humid and/or cool conditions. 3) Thinning of coating. 4) Airless spraying with the gun too close to the substrate being painted or moving the gun too slowly.	If coating is still wet, immediately brush out to redistribute the excess evenly. If the coating has dried, sand, thoroughly clean and dry surface, and reapply. The coating should be applied at its recommended spread rate: avoid "heaping on" the coating. Two coats at the recommended thickness are better than one heavy coat.
Wrinkling	Rough, crinkles in the coating surface, which occurs when uncured paint forms a "skin."	1) Coating applied too thickly. 2) Painting during extremely hot weather or cool damp weather, which causes the coating film to dry faster on the surface than under the surface. 3) Exposing uncured coating to excess moisture. 4) Painting over a contaminated surface (e.g. dirt or wax).	Scrape or same to remove wrinkled coating. Thoroughly clean and dry surface. Reapply.

Source: The Paint Quality Institute℠

Measuring Temperatures and Performance Indicators

Measurements for surface temperature difference and/or energy consumption reduction should be done after the coating has fully cured, as this is when it reaches full insulating ability. Full cure is approximately 30 days after application, depending upon thickness and environment.

Tools For Measuring Performance

Synavax™, Inc. through its Gold Standard Application Program has Performance Measurement Log Sheets available to our customers. Call us at 800-858-3176 to request a copy.

Surface Temperature Performance Log

The Surface Temperature Performance Log is a chart for measuring and comparing surface temperatures of insulated pipes and equipment.

Mark and measure two different points on the exterior surface area, and measure those same points each time for accurate comparison. Use surface or probe thermometers not laser/infrared (which can give false readings on light or shiny surfaces). If you must use a laser thermometer, color the measurement target black with a marker and aim at that area.

Energy Consumption Performance Log

The Energy Consumption Performance Log provides a chart for measuring and comparing energy consumption data on any surfaces or equipment where the entire envelope is coated.

For accuracy of measurement, the entire envelope (building, pipe or equipment) should be coated in order to properly gauge performance. Any “holes” in the thermal envelope, for example, if you only coat a small section, instead of an entire pipe, will not give you an accurate measure of energy efficiency. Chart by comparable month or day energy consumption for accurate pre and post application comparisons.