Industrial Coatings

Imron® 2.1 HG™ + Polyurethane High Gloss Topcoat

Product Data Sheet (Mix Quality QH)

Description:

DuPont™ Imron® 2.1 HG™ + is the new generation of Imron® technology. Based upon unique DuPont formulations and resin technology, Imron® 2.1 HG™ **+** is the newest Imron® yet, providing the "Wet Look that Lasts" with compliant environmental features. Imron® 2.1 HG™ **+** is a high gloss and high solids aliphatic polyurethane enamel. It may be applied by brush, roll or spray application. This high performance, two-package, low VOC (2.1 lbs/gal VOC) product, produces properties of both polyester and acrylic polyurethanes suitable for use in any environment where long term color and gloss retention are desired.

Suggested Uses:

As a high performance, tough, industrial polyurethane topcoat over properly prepared and primed steel, galvanized steel, stainless steel, aluminum, concrete, concrete block, fiberglass, plastics, or wood where:

- Outstanding long term gloss and color retention are desired
- Excellent resistance to chemicals is required
- Use in corrosive or industrial marine environments is needed
- Outstanding abrasion resistance and flexibility are required
- Application by brush and roller, in addition to spraying, may be necessary
- Application can be applied at temperatures as low as 35°F
- Mechanical surface preparation will be prohibited or impractical later when recoating
- Compliance with 2.1 lb/gal VOC regulations is required

Not recommended for: Immersion service or floors

COMPATIBILITY WITH OTHER COATINGS

- Aged Imron® 2.1 HG™ **+** may be re-coated with itself following washing with clean, fresh water – no mechanical surface preparation is required.
- Imron® 2.1 HG™ **+** can be applied over other DuPont Industrial Coatings including, but not limited to, Imron® Industrial Strength primers and other Imron® primers, Imron® Waterborne Polyurethane Copolymer coatings, Corlar® epoxies, Tufcote® acrylics, Tufcote® alkyd primers.
- Imron® 2.1 HG™ **+** may be used over most aged and hard-cured coatings in good condition. Testing for lifting, bubbling and adhesion is recommended to assure compatibility with unknown coatings. Contact your DuPont Performance Coating representative for specific recommendations.

MAXIMUM SERVICE TEMPERATURE

250°F (93°C) in continuous service.
300°F (148°C) in intermittent heat.

Some yellowing of light colors may occur at elevated temperatures.

PERFORMANCE PROPERTIES

Abrasion & Mechanical	Excellent	Color & Gloss Retention	Excellent
Alkalis	Excellent	Acids	Excellent
Humidity	Excellent	Salts	Excellent
Solvents	Excellent	Weather	Excellent

* For more information please see ASTM Information section.

VOC (Theoretical less water and exempt compounds).

Compliant at 2.1 lbs/gal VOC

Imron® 2.1 HG™ +

	Normal			Hot		
	Less than 85°F	**VOC**	**VOC (TBAc exempt)**	**Higher than 85°F**	**VOC**	**VOC (TBAc exempt)**
+ Y-32401™	2%	2.01 lbs/gal	1.72 lbs/gal	2%	2.01 lbs/gal	1.72 lbs/gal
+ 9M01™	8%	2.01 lbs/gal	1.73 lbs/gal	8%	2.01 lbs/gal	1.73 lbs/gal
+ VG-805™	1 oz / mixed gal	2.07 lbs/gal	1.79 lbs/gal	1 oz / Mixed gal	2.07 lbs/gal	1.79 lbs/gal
+ 9M05™	1 oz / mixed gal	2.08 lbs/gal	1.80 lbs/gal	1 oz / Mixed gal	2.08 lbs/gal	1.80 lbs/gal
				Or instead of Y-32401™		
+ 9M02™				5%	1.99 lbs/gal	1.71 lbs/gal

This product contains T-Butyl Acetate (TBAc).

HAPS Information – Theoretical

Imron® 2.1 HG™ +

	Normal		Hot	
	Less than 85°F	**HAPS lbs/gal solids**	**Higher than 85°F**	**HAPS lbs/gal solids**
+ Y-32401™	2%	0.4	2%	0.4
+ 9M01™	5%	0.4	8%	0.4
+ VG-805™	1 oz / Mixed gal	0.4	1 oz / mixed gal	0.4
+ 9M05™	1 oz / Mixed gal	0.4	1 oz / mixed gal	0.4
			Or instead of Y-32401™	
+ 9M02™			5%	0.1

COLOR

Imron® 2.1 HG™ + consists of a mixing system, mix quality QH, utilizing 19 tints and 1 binder to specific mixing formulas. Select Factory Package colors are also available.

Gloss (ASTM D 523)

@90 measured @ 60°angle

Note: **Imron® 2.1 +** can also be made into variable gloss ranges using 9T20™ Flattener. Imron® 2.1 + can be formulated into Semi Gloss (QM), Satin Gloss (QA) and Flat (QF). Please consult the specific product data sheet for the low gloss qualities**.** Please also note that the mix ratio for reduced qualities of Imron® 2.1 +, changes from 3 to 1 for QH, High Gloss quality, to 6 to 1 with all reduced gloss qualities.

Weight Solids – Average varies with color

70% +/- 3%

Weight per gallon – Average varies with color
10 – 12 lbs

Flash Point – Tag Closed Cup
Between 20º to 73º F (-6º to 23º C)

Volume Solids -- Average varies with color
65% +/- 2%

Packaging

- Factory packaged colors – 133-XXXXX – 1 gallon container 75% full (96 oz.)
- Tints 1 gallon containers- Full filled
- Activator – 9T00-A™ – Quart container 100% full (32 oz.) (other sizes available-consult customer service rep)
- 2100P™ Color Mix Binder 100% full

Shipping Weight – lbs – approximate

Enamel:	1 gallon container:	10 - 12 lbs depending upon color
Activator:	1 quart container:	2 - 3 lbs

SHELF LIFE & STORAGE CONDITIONS
Store in a dry, well-ventilated area. Storage conditions should be between 35º F (2º C) and 120º F (48º C)

- Shelf Life: 1 year minimum.

Cure Times – HOURS @ 1.5 – 2.0 MILS SUGGESTED DFT

	@ 77°F (25°C) 50% RH		@ 90°F (32°C) 50% RH	
	2% Y-32401™ Reducer Without Accelerator	2% Y-32401™ Reducer with 1 oz. VG-805™ Accelerator	5% 9M02™ Reducer Without Accelerator	5% 9M02™ Reducer with 1 oz. VG-805™ Accelerator
To Touch	3	1.5	2.5	1.5
To Handle	7	4.5	7	4.5
To Recoat	5	3	5	3
Pot Life	2	1	2	1.5
Full Cure	7 days	6 days	6 days	5 days

Theoretical Coverage Per Gallon
1042 ft^2 (25.4 m^2/l) @ 1 mil dft
521 ft^2 (12.7 m^2/l) @ suggested DFT of 2 mils
Material losses during mixing and application will vary and must be taken into consideration when estimating job requirements.

Suggested Film Builds
2.0 – 3.0 mils (50-75 µm) wet
1.5 – 2.0 mils (37 – 50 µm) dry
Application by brush and roller may require additional coats to achieve recommended films thickness.

SAFETY
Consult the Material Safety Data Sheet for this product prior to use. All Imron® products are intended for professional use only.

APPLICATION INFORMATION

SURFACE PREPARATION

Newly primed surfaces should be clean and dry. If contaminated, detergent/water wash, then blow dry. Previously painted surfaces should have all loose paint removed and the edges feathered. Prime bare spots with appropriate primer.

Activation

Directions for use: Thoroughly mix all colored portions until uniform. To 3 parts 133-XXXXX base or Imron® 2.1 HG™ **+** (QH quality) mixing formula, add 1 part 9T00-A™ Activator. If using a mix formula, follow specific color formulas for color desired. Measure out appropriate amounts, add activator and mix thoroughly. Reductions can be done using either Y-32401™, Imron® 9M01™ or 9M02™ Thinners. Special attention must be paid to reduction amounts to stay within VOC compliance. Mix thoroughly using a mechanically powered sheer "Jiffy" mixer with variable RPM settings; use medium speed RPM. Move mixer up and down through paint to assure uniform mixing. No induction period is necessary.

DO NOT SHAKE.

Reduction

For Spray Use: Normally 0-2% Y-32401™ and up to 8% Imron® 9M01™ (10% max), or 8-10% 9M01™ can be used for spray application less than 85°F. For applications greater than 85°F, use 5% max Imron® 9M02™ and 5% max Imron® 9M01™. Y-32401™ 2% max can be used in place of 9M02™.

For Brush & Roll Use: Normally 0-2% Y-32401™ and up to 8% Imron® 9M01™ (10% max), or 8-10% 9M01™ can be used for brush and roll application less than 85°F. For applications greater than 85°F, use 5 % max Imron® 9M02™ and 5% max Imron® 9M01™. Y-32401™ 2% max can be used in place of 9M02™. In addition, when rolling only, use 1 oz per mixed gallon of Imron® 9M05™ Rolling Additive to help eliminate bubbles. After addition of 9M05™ Rolling Additive, allow 5 minutes induction before applying. If faster re-coats are required, use VG-805™ Accelerator, 1 oz per mixed gallon.

DO NOT USE Lacquer thinners for reduction. **Use only recommended reduction solvents.**

Application Thinners

Spray, Brush and Roll – Below 85°F	Imron® Y-32401™ , 9M01™
Spray, Brush and Roll – Above 85°F	Imron® Y-32401™ , 9M02™
Rolling Additive - Imron® 9M05™	

Clean Up Thinners

DuPont T-1021™, Acetone, MEK

APPLICATION CONDITIONS

Do not apply if the application surface temperature is below 45℉ (7℃) or above 110℉ (43℃), or if the atmospheric temperature is within 5℉ of the dew point. For application temperatures below 45℉, the use of Imron® VG-805™ is recommended. Relative Humidity should be below 90%.

Dry times can be improved by adding up to 1 oz Imron® VG-805™ Accelerator per activated gallon.

If accelerators have been used, recoating must be done within 48 hours. If more time has elapsed, scuff sand to ensure adhesion.

May be recoated by spray when tack-free.

APPLICATION EQUIPMENT

- Apply by spray, brush or roll
- Manufacturers listed below are a guide. Others may be used. Changes in pressure and tip size may be required to achieve proper application.

ROLL

Manufacturer: Wooster® Pro/Doo-Z™ ¼" – ½" nap

Additions:
- Add 1 oz./gallon Imron® 9M05™ Rolling Additive to eliminate bubbles.
- Normally, 0-2% Y-32401™ and up to 8% Imron® 9M01™ (10% max), or 8-10% 9M01™ can be used for roll application less than 85°F. For applications greater than 85℉, use 5% max Imron® 9M02™ and 5% max Imron® 9M01™. Y-32401™ 2% max can be used in place of 9M02™.
- Cross-roll with 50% overlap.
- For best results, allow 5 minutes mix time after adding Imron® 9M05™.
- Do not use Imron® 9M05™ in spray applications.

BRUSH

Manufacturer: Wooster® China Bristle

Additions:
- Normally, 0-2% Y-32401™ and up to 8% Imron® 9M01™ (10% max), or 8-10% 9M01™ can be used for brush application less than 85°F. For applications greater than 85°F, use 5% max Imron® 9M02™ and 5% max Imron® 9M01™. Y-32401™ 2% max can be used in place of 9M02™.
- Do not cross brush to reduce lap marks.

CONVENTIONAL SPRAY

Additions:
- Normally, 0-2% Y-32401™ and up to 8% Imron® 9M01™ (10% max), or 8-10% 9M01™ can be used for brush application less than 85°F. For applications greater than 85°F, use 5% max Imron® 9M02™ and 5% max Imron® 9M01™. Y-32401™ 2% max can be used in place of 9M02™.
- May be recoated by spray when tack-free.
- Imron® 9M02™ Rolling Additive is not recommended for spray application.

Manufacturer	**Sata**	**DeVilbiss**	**Graco**	**Iwata**	**Binks**
Model	K3 RP or LM 3000 RP	JGA, MBC, or FLG	DeltaSpray XT	W-77, W-71, or W-200	2001 or 95
Tip Size	1.0 – 1.3 mm	1.1 - 1.4 mm	1.0 - 1.5 mm	1.2 – 1.4 mm	1.2 – 1.3 mm

*Fluid lines 3/8" ID or larger are required for proper fluid delivery.

HVLP PRESSURE FED:

Manufacturer	**Sata**	**DeVilbiss**	**Graco**	**Iwata**	**Binks**
Model	3000RP HVLP	JGHV, EXL, or FLG	AirPro	LPH 200 LVLP	MACH 1 & 1SL SV100 HVLP
Tip Size	1.0 – 1.3 mm	1.1 - 1.4 mm	1.1 – 1.5 mm	1.2 – 1.4 mm	1.2 – 1.4 mm

AIRLESS SPRAY:

Manufacturer	**Graco**	**Iwata**	**Binks**	**Kremlin**
Model	Silver or Plus	ALG or Airlesso	Airless 1	Airless 250 II
Tip Size	.011 - .015	.011 - .015	.011 - .017	.013 - .017
Pump	30:1 min	ALG 30:1 min	30:1 min	Orca 32:1

AIR ASSISTED AIRLESS SPRAY:

Manufacturer	**Graco**		**Iwata**	**Binks**
Model	AA4000 HVLP, AA10HP Cap	Alpha or Alpha Plus	MSG 200 or 2000	AA 1500

Tip Size .021 - .027 .015 - .021 Adjustable Tip .013 - .019

- Fluid lines > ¼" ID are recommended for lengths up to 25', 3/8" ID or larger are required for proper fluid delivery at lengths longer than 25'.
- Minimum pressure: 2500 – 4500 psi
- Filter 60 Mesh.

ELECTROSTATIC:

Manufacturer	**Graco**	**Nordson**	**Ransburg**
Model	PRO Xs3 Or XS4 Electrostatic Gun	Kinetix Systems AA, KVLP & Conventional	REA 90 or AA90

Orifice Size

in.	(mm)	in.	(mm)
.031	(0.8)	.055	(1.4)
.042	(1.0)	.067	(1.7)
.043	(1.1)	.070	(1.8)
.051	(1.3)	.080	(2.0)

ASTM INFORMATION

Physical properties are average. Properties listed are for a system of Corlar® 2.1 ST™ and DuPont Imron® 2.1 HG **+**. Total dry film thickness 7.5 mils.

Salt Fog (ASTM B-117)	500 hours	No rust, no blistering
	1000 hours	No rust, no blistering
	2000 hours	No rust, no blistering
	3000 hours	No rust, no blistering
Humidity Resistance (ASTM D2247)	500 hours	No rust, no blistering
	1000 hours	No rust, no blistering
	2000 hours	No rust, no blistering
	3000 hours	No rust, no blistering
Adhesion (ASTM D4541 -02)		Excellent
Adhesion (ASTM D3359-02 A/B)	5/5	Excellent
QUV A (ASTM D4587)	3000 hours	Gloss before exposure: 91 Gloss after exposure: 91
Cleveland Cond. (ASTM D4585)	1000 hours	No rust, no blisters, no delamination
Impact (ASTM D2794)	14 inch pounds	
Mandrel Bend (ASTM D522)	% Elongation	0%
Tabor Abrasion (ASTM D4060)	Weight loss in grams	0.11

SELECT CHEMICAL RESISTANCE

The following chemicals had no effect (24 hours watch glass)

	Rating
Sulfuric Acid	10% (50% slight color change)
Hydrochloric Acid	10 & 20%
Nitric Acid	10 & 20%
Acetic Acid	10% (Slight change in gloss)
Sodium Hydroxide	10 & 50%
Ammonium Hydroxide	10%, concentrated
Distilled Water	
MEK	
Toluene	
Cyclohexane	
Methanol	
Isopropanol	
Gasoline	
5% Gasahol Acetic Acid	

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