



# Imron® 2.1 HG-D™ + Polyurethane High Gloss Direct To Metal

*Product Data Sheet (Mix Quality SH)*

**Description:**

**Imron® 2.1 HG-D™ +** is the new generation high gloss, high build, two-package, VOC conforming, 2.1 lbs/gal., low HAPS, DTM Acrylic Polyurethane. The coating provides a highly durable one-step system suitable for non-corrosive exposures and selected harsher environments. The resulting product is a direct-to-metal acrylic polyurethane which can be brushed, rolled or sprayed providing maximum topcoat appearance and industry leading polyurethane performance.

**Suggested Uses:**

As a quality high build, high-gloss, polyurethane DTM on hot rolled carbon steel, weathered and properly treated galvanized, aluminum, dry wall, and wood where:

- A one-step DTM (direct-to-metal) application is desired
- High build either as a DTM or high build topcoat is desired
- Outstanding DTM color and gloss retention are required
- Excellent adhesion and flexibility are desired
- Application by brush and roller, in addition to spraying, may be necessary
- Application to 35°F may be required
- Excellent hiding is needed

**Not recommended for:**

- Immersion service or floors
- Severely corrosive environments (as a one coat system)

**COMPATIBILITY WITH OTHER COATINGS**

Imron® 2.1 HG-D™ + can be applied DTM (direct-to-metal) over properly prepared: aluminum, hot rolled carbon steel, and weathered galvanized surfaces, in non-corrosive exposures and selected harsher environments (contact DPC for specific recommendations). It 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. For more protection, Imron® 2.1 HG-D™ + can also be used over properly primed surfaces in exterior exposures. Recommended primers include: Imron® 2.8 PR™, Imron® 2.1 PR™, Tufcote® 3.3 PR™, Tufcote® 3.5 PR™, Corlar® 2.1 PR™, Corlar® 2.1 PR-P™, and Corlar® 2.8PR™. Contact your Performance Coatings Representative for specific recommendations.

**MAXIMUM SERVICE TEMPERATURE**

250°F (93°C) in continuous service.

**PERFORMANCE PROPERTIES**

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

### VOC (Theoretical less water and exempt compounds).

Imron® 2.1 HG-D™ + is designed to comply, under certain reduction condition to 2.08 lbs/gal. This product can also be used with additional flexibility, where 2.08 lbs/gal compliance is not required. Please see additional reduction conditions below.

	<u>VOC Lbs/Gal</u>	<u>Grams/Liter</u>
No accelerator or reducer	2.08	249
5% 9M01™	2.08	249
5% 9M02™	2.15	258
5% Y32401™	2.40	288
1 oz VG805™	2.13	255
1 oz VG805™ + 5% 9M01™	2.13	255
1 oz VG805™ + 5% 9M02™	2.20	264
1 oz VG805™ + 5% Y32401™	2.45	294
1 oz V389S™	2.08	249
1 oz V389S™ + 5% 9M01™	2.08	249
1 oz 9M05™	2.08	249
1 oz 9M05™ + 5% 9M01™	2.08	249

### HAPS Information – Theoretical

	<u>Lbs Volatile HAPs per gallon of solids</u>
No accelerator or reducer	0.367
5% 9M01™	0.367
5% 9M02™	0.367
5% Y32401™	1.032
1 oz VG805™	0.368
1 oz VG805™ + 5% 9M01™	0.367
1 oz VG805™ + 5% 9M02™	0.367
1 oz VG805™ + 5% Y32401™	1.038
1 oz V389S™	0.368
1 oz V389S™ + 5% 9M01™	0.368
1 oz 9M05™	0.373
1 oz 9M05™ + 5% 9M01™	0.374

### COLOR

Imron® 2.1 HG-D™ + is mainly a mix system using Custom Color Mix binder DTM-2100P™ and MultiTint™ tints to make Custom Color Mix Quality (SH). In addition, the following two factory package colors are available.

#### Color Availability: (Select Fac Pacs)

163-67632™ – White Factory Packaged

163-67640™ – Black Factory Packaged

### Gloss (ASTM D 523)

90 measured @ 60° angle

### Weight Solids – Average varies with color

68% +/- 3%

### Weight per gallon – Average varies with color

10 – 12 lbs

### Flash Point – Tag Closed Cup

Between 20° to 73° F (-6° to 23° C)

### Volume Solids -- Average varies with color

62% +/- 3%

### Packaging

- Select factory packaged colors – 163-XXXXX – 1 gallon container (100% fill, 128 oz.)
  - MultiTint™ Tints - 1 gallon container (100% fill, 128 oz)
  - Activator – 9T00-A™ – Quart container (100% fill, 32 oz.)
  - DTM-2100P™ Color Mix Binder -- 1 gallon container (100% fill, 128 oz.)
- \*Other sizes may be available -consult customer service rep.

### 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 35° F (2° C) and 120° F (48° C)

- Shelf Life: 1 year minimum.

### Cure Times – HOURS @ 5 mils suggested DFT

@ 77°F (25°C) 50% RH

@ 90°F (32°C) 50% RH

	Without Accelerator	With 1oz. VG805™	With 1oz. V389S™	Without Accelerator	With 1 oz. VG805™
To Touch	1.5	0.5	0.5	0.5	0.5
To Handle	6	5	4	3	2
To Recoat	4	2	1	2	1.5
Pot Life	3	2	1.5	2	1.5
Full Cure	7 days	6 days	6 Days	6 days	5 Days

### Theoretical Coverage Per Gallon

994 ft<sup>2</sup> /gal @ 1 mil dft

198 ft<sup>2</sup> /gal @ 5 mil dft

Material losses during mixing and application will vary and must be taken into consideration when estimating job requirements.

### Suggested Film Builds

6.0 – 8.0 mils (150-200 μm) wet

4.0 – 5.0 mils (100 – 125 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**

- Imron® 2.1 HG-D™ + can be applied as DTM (direct-to-metal) over properly prepared: aluminum, steel, and weathered galvanized surfaces. All surfaces should be cleaned with solvent (SSPC-SP1) to remove any grease or oil contamination prior to priming.
- For best results on steel, abrasive blast surface to an SSPC-SP-6 Commercial Blast. Profile should be 2.0 to 2.5 mils. Average peak to valley surface profile shall be 1.5 to 2.5 mils. If blasting is not possible or practical, then Hand Tool Clean to an SSPC-SP 2 or Power Tool Clean to an SSPC-SP 3 may be used with sacrifice in performance vs. blasted surfaces.
- Aluminum surfaces should be properly treated. Surface preparations may include sanding, brush off blasting (SSPC-SP7), alodine treatment or other preparation necessary to ensure adhesion.
- Can be applied over other surface preparations, such as phosphatizing.
- Galvanized steel surface preparation may include detergent washing, pre-treatment and abrasion for new surfaces; for weathered surfaces, detergent washing and sanding. For new galvanized surfaces, an appropriate primer such as Corlar® 2.1 ST™ should be used.
- For additional protection in exterior exposures, Imron® 2.1 HG-D™ + can also be used over properly primed surfaces.
  - Recommended primers include: Imron® 2.8 PR™, Imron® 2.1 PR™, Tufcote® 3.3 PR™, Tufcote® 3.5 PR™, Corlar® 2.1 PR™, Corlar® 2.1 PR-P™, Corlar® 2.8PR™.
  - Contact your DuPont Performance Coatings Representative for specific recommendations.

### **Activation**

Mix pigmented portion until uniform in color. Mix 6 parts 163-XXXXX color to 1 part Imron® 9T00-A™ activator. Measure out appropriate amounts and add activator with mixing. Material can be used immediately. There is no induction time. Addition of thinner is not recommended and may affect film build and VOC.

Note: Mix in ones yields 1.16 gallons.

### **Reduction**

- No reduction necessary to achieve 8 mils wet.
- When rolling Imron® 2.1 HG-D™ +, add 1 oz per activated gallon of 9M05™ Rolling Thinner to reduce bubbling.
- Any thinning may hamper ability to achieve high film builds and may cause sagging to occur.
- Application by brush or roller may require additional coats to achieve recommended dry film thickness.
- While no reduction is recommended to achieve recommended film builds, up to 5% 9M01™, 9M02™ or Y32401™ can be added for additional flexibility in application. Please check VOC limitations before using.

### **Application Thinners**

Spray, Brush	None recommended
Electrostatic Spray	None recommended
Rolling	9M05™

Note: 9M01™, 9M02™ and Y32401™ can be used as noted in the reduction section, if conditions dictate.

### **Clean Up Thinners**

T-1021™, Acetone, MEK

## APPLICATION CONDITIONS

Do not apply if material, substrate or ambient temperature is below 35°F (2°C) or above 110°F (43°C). The substrate must be at least 5°F (3°C) above the dew point. Relative humidity should be below 90%.

## 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.

## BRUSH & ROLL

- ¼" - ½" nap Wooster Pro/Doo-Z roller cover. Keep roll wet. Roll in one direction, rewet, then cross roll.
- 2"-4" Wooster China Bristle Brush

## CONVENTIONAL SPRAY

Manufacturer	Sata	DeVilbiss	Graco	Iwata	Binks
<b>Model</b>	K3 RP or LM 3000 RP	JGA, MBC, or FLG	DeltaSpray XT	W-77, W-71, or W-200	2001 or 95
<b>Tip Size</b>	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
<b>Model</b>	3000RP HVLP	JGHV, EXL, or FLG	AirPro	LPH 200 LVLP	MACH 1 & 1SL SV100 HVLP
<b>Tip Size</b>	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
<b>Model</b>	Silver or Plus	ALG or Airlesso	Airless 1	Airless 250 II
<b>Tip Size</b>	.011 - .015	.011 - .015	.011 - .017	.013 - .017
<b>Pump</b>	30:1 min	ALG 30:1 min	30:1 min	Orca 32:1

## AIR ASSISTED AIRLESS SPRAY:

Manufacturer	Graco	Iwata	Binks	
<b>Model</b>	AA4000 HVLP, AA10HP Cap	Alpha or Alpha Plus	MSG 200 or 2000	
<b>Tip Size</b>	.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
<b>Model</b>	PRO Xs3 Or XS4 Electrostatic Gun	Kinetix Systems AA, KVLP & Conventional	REA 90 or AA90

Orifice Size		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 for Imron® 2.1 HG-D™ + Direct To Metal (DTM) only. Properties may be enhanced by use of appropriate primers. For other system recommendations, please contact DPC.

Paint System	Imron® 2.1 HG-D™ +
Substrate	Grit blasted cold rolled steel (or Bonderite1000 depending on the test)
Type-Color	Polyurethane-White
DFT	4-5 mils

Test	Results	
Adhesion(ASTM D335)		
X-cut	5 A-No failures	
Cross hatch	5 B-No failures	
Impact (ASTM D 2794) 80 in lbs.- Forward	No failures	
Mandrel Bend (ASTM D522) 1/8 " mandrel	No cracking	
Pencil Hardness	5H	
Chip Resistance	9A	
	<b><u>500 hours</u></b>	<b><u>1000 hours</u></b>
Salt Fog (ASTM B117)	No creep from scribe, no blistering	Creep: 0.5 to 1.0 mm; Blistering:4-6 few along the scribe
Relative Humidity (ASTM D2247)	No blistering	No blistering
QUV Condensation (ASTM D4587/340A)	97 % gloss retention @ 60°	94 % gloss retention @ 60°
Cleveland Condensation (ASTM D-4585)	No blistering	No blistering

## SELECT CHEMICAL RESISTANCE

The following are chemical resistance ratings (1=poor, 10= excellent), after exposure to listed chemicals and 24 hour watch glass exposure.

<u>Chemical</u>	<u>Rating</u>	<u>Chemical</u>	<u>Rating</u>
Sulfuric Acid 1%	10	Diethylene Glycol Monobutyl Ether	8
Sulfuric Acid 10%	8	Sodium Hydroxide 10%	7
Phosphoric Acid 10%	10	Motor Oil (Mobil 10W-30)	10
Methyl Ethyl Ketone	9	Hydraulic Oil (Pennzoil)	10
Nitric Acid 1%	9	Cutting oil (Rigid)	7
Ammonium Hydroxide 5%	9	Unleaded Gas	8
Ammonium Hydroxide 28%	9	Skydrol (500B4L)	7
Sodium Hydroxide 1%	10	Tide Soap 10%	10
Sodium Hydroxide 5%	8	Fantastic	7
Ethanol	9	Bleach	7
Aromatic Controlled VM&P Naphtha	9	Break Fluid (DOT 3 Wagner Premium)	7
Isopropyl Alcohol	9	Cola	10

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