

# PRODUCT GUIDE

Mimaki



**MUH-100-SI**

UV METALLIC INK

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# CONTENTS

- **MUH-100-Si is digital printing metallic ink exclusively formulated for UJF-7151 Flatbed UV printer**
- **The ink print at comparable production speed related to LH-100 and can be easily adopted in the existing printing process through a spot color channel**
- **The MUH-100-Si is designed for digital prints on various substrates and for many applications: rigid PVC, composite boards, labels, wood, carton and paper, marking & coding, glass, packaging, etc.**

# ■ CONCEPT

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- **Item code: MUH10-Si-B2**
- **Packing: 200ml bottle**
- **Supported printer: UJF-7151plus (from FW ver. 2.70)**
- **Supported UV-LED ink: LH-100**

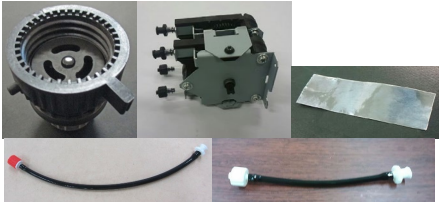

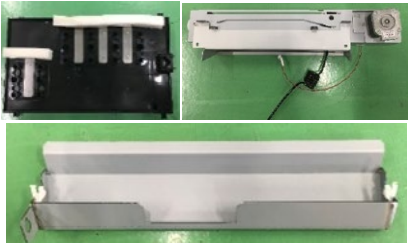



Ink bottle package: 200ml

# NEW INSTALLATION PROCEDURE



- Installation of MUH-100-Si in new UJF-7151plus requires:

				
<b>Item</b>	OPT-J0493	OPT-J0406	M019802	MUH-10-Si
<b>Name</b>	Silver ink kit	Ionizer S	Rubber wiper exchange assy	Silver ink Bottle
<b>Qty</b>	1	1	1	2
<b>Note</b>			only for machines below serial nr. V976B773	Ink fill-up requires approx. 300ml of silver ink

# CONVERSION AND UPGRADE PROCEDURE



## • Conversion of current installed UJF-7151plus to MUH-100-Si requires :

<b>Item</b>	OPT-J0493	OPT-J0406*	M019802*	MUH-10-Si
<b>Name</b>	Silver ink kit	Ionizer S	Rubber wiper exchange assy	Silver ink Bottle
<b>Qty</b>	1	1	1	2
<b>Note</b>		In case it is not installed	Only for machines below serial nr. V976B773	Ink fill-up requires approx. 300ml of silver ink
<b>Item</b>	LCF-22110	MAC-C-A100-7	FL007-Z-BA	M018103
<b>Name</b>	Filter	Ink-jet capsule	Cleaning liquid 07	Cleaning discharging assy
<b>Qty</b>	See "Qty" in table below	See "Qty" in table below	See "Qty" in table below	See "Qty" in table below

Existing ink set before conversion							Ink set after conversion						Qty
Ink type	Ink color set						Ink color set after conversion						
LH-100	W	Cl	M	C	Y	K	W	Si	M	C	Y	K	1
							Cl	Si	M	C	Y	K	2
	W	Pr	M	C	Y	K	W	Si	M	C	Y	K	1
							Cl	Si	M	C	Y	K	2
	Cl	Pr	M	C	Y	K	W	Si	M	C	Y	K	2
							Cl	Si	M	C	Y	K	1
LUS-120	All ink color sets						W	Si	M	C	Y	K	6
							Cl	Si	M	C	Y	K	
LUS-350	All ink color sets						W	Si	M	C	Y	K	6
							Cl	Si	M	C	Y	K	

### MUH-100-Si conversion policy:

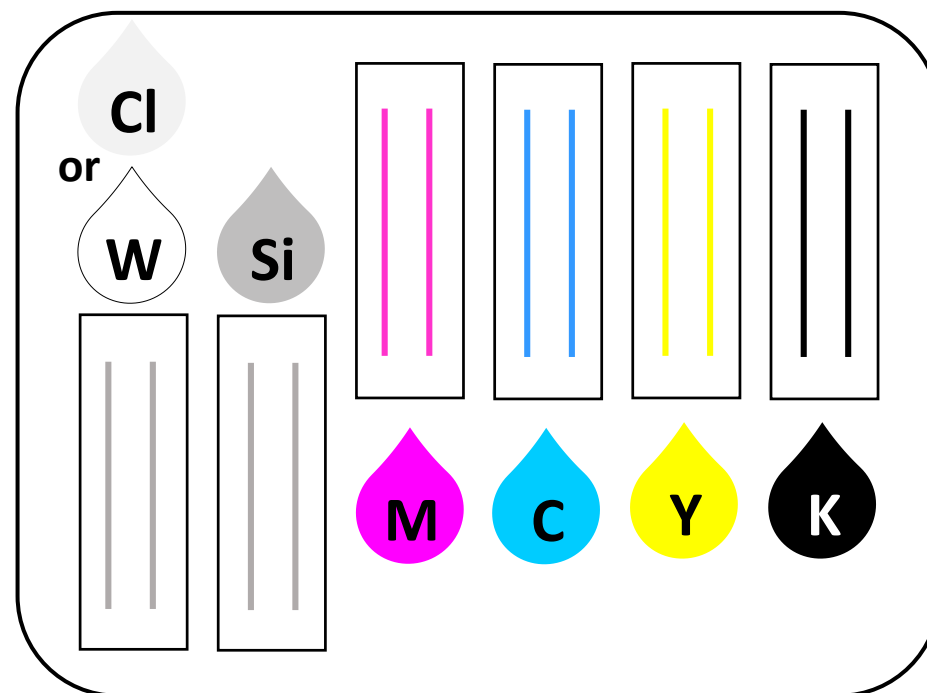
- Demo machines are allowed
- Conversion from color to metallic is allowed
- Conversion back from metallic to color is not allowed

# COMPATIBLE MACHINES AND INKS

- Mimaki UJF-7151\*
- LH-100 inks
- Ionizer OPT-J0406 is required



Print head configuration

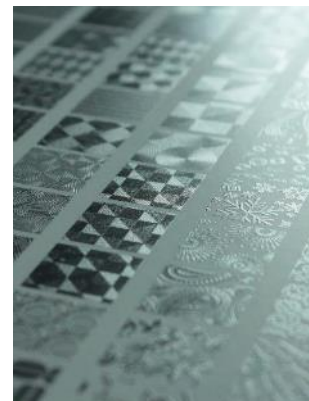


\* MUH-100-Si is not compatible with Kebab MkII L option

# FEATURES

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- **Matte and mirror metallic effect**
  - Different metallic effects are achievable thanks to Mimaki Control Technology for Surface Imaging "MMC" (*Mimaki Metallic Control*)
- **3-D Textured design effect**
  - Full control over the metallic ink jet process creates impressive texturized effects
- **Beautiful metallic effects**
  - Add the luxury of gold, silver or bronze colors to your graphics with various combinations of metallic and color inks
- **Various media and application choice**
  - Metallic ink is a popular graphic add-on value to design print
  - Create the illusion of "high definition print" at a relatively low cost
  - No special coating or media preparation is required





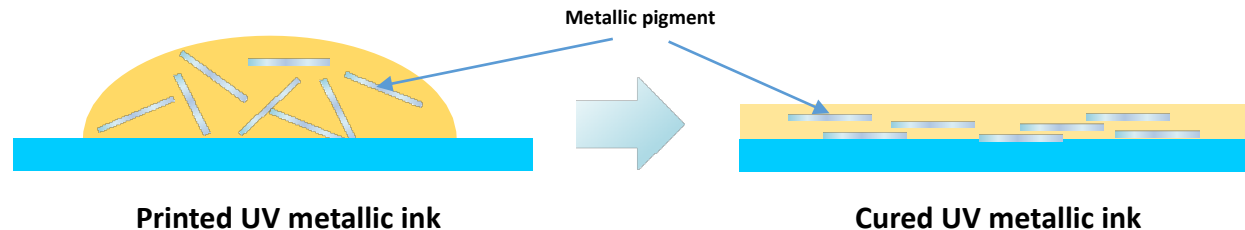
# METALLIC INK DESIGN

## • Optimal ink design

- Aluminum based pigment shape, its size and alignment are optimized to achieve the highest possible gloss
- Ink viscosity and brightness are optimized to create realistic metallic effect

## • Pigment shiny effect

- To achieve the maximum of light reflecting, the aim is to achieve the flattest possible alignment of metallic pigments in the film of ink
- If the pigments lie flat against each other, then they form a smooth, flat surface that reflects the light symmetrically, so in a strict direction. When this is the case, the surface appears shiny and uniform producing a mirror effect

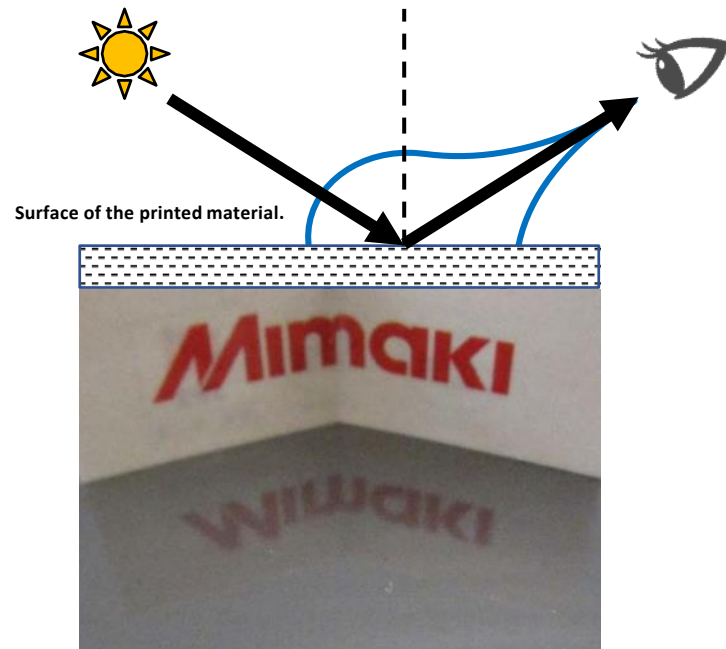


# MIMAKI METALLIC CONTROL

- MMC (*Mimaki Metallic Control*) optimizes Surface Imaging
- Realistic mirror and matte metallic effects

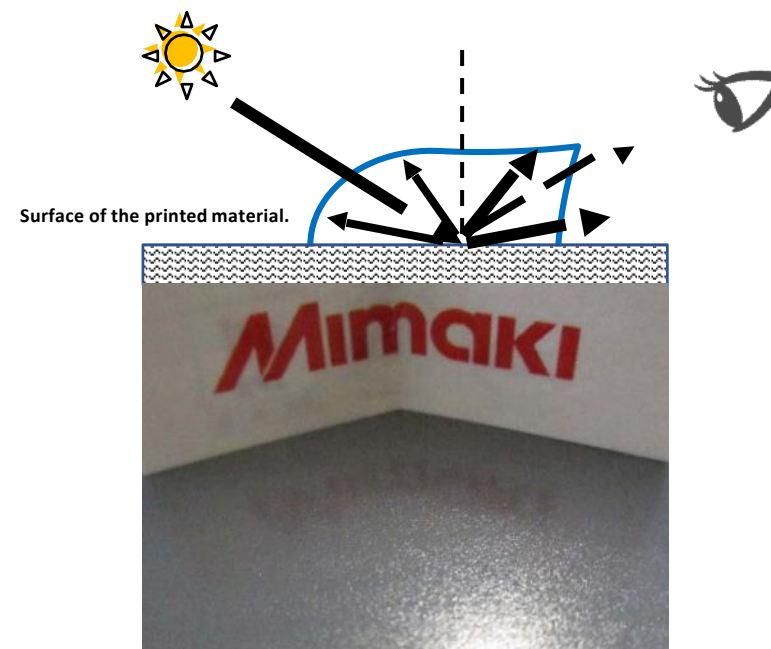
## Mirror effect

- Optimized horizontal position of metallic pigment creates a high reflective and mirroring effect on surface of printed material



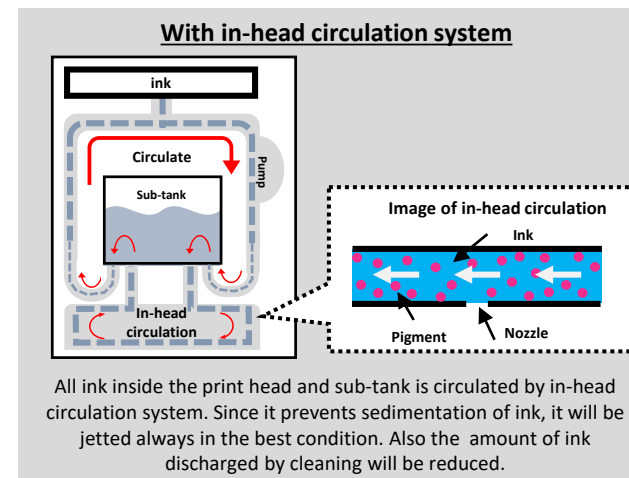
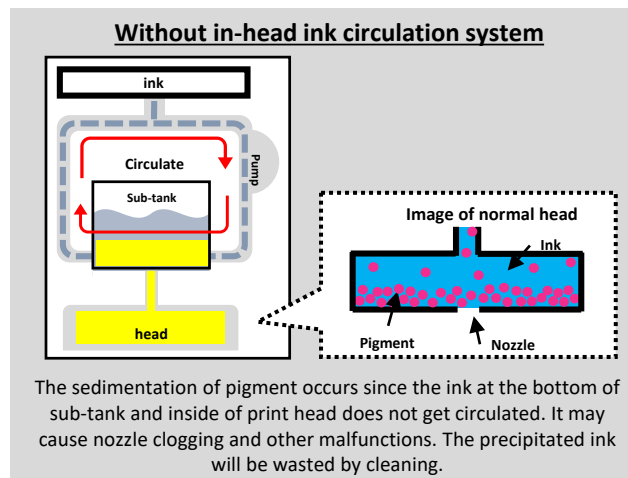
## Matte effect

- Controlled irregular placing of metallic pigments decreases the light reflection and produces smooth matte effect



# INK CIRCULATION SYSTEM

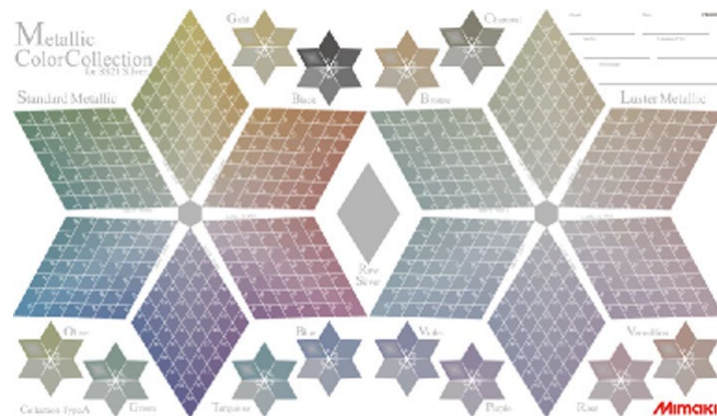
- Ink circulation system reducing missing nozzles
  - For preventing the pigment sedimentation and removing air bubbles which can occur near the nozzles
  - Resulting in a reduction of cleaning frequency and also providing the cost-effective and stable printing
- Prevents sedimentation of metallic ink pigment



# METALLIC COLOR COLLECTION

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- A rich collection of metallic colors
  - A pr-defined "Metallic color collection" offers a collection of 648 colors, including very popular colors such as gold, bronze and turquoise.
    - Standard Metallic: 294 colors created by focusing on colors based on the achievable color gamut
    - LusterMetallic: 294 colors focused on silvery taste, a version of a low concentration of Standard Metallic
    - Basic 12 colors (5 tones): 60 colors consisting of 5 tones, each of 12 corresponding basic colors including gold and bronze



# APPLICATION EXAMPLES

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- Highlight headlines on luxury packaging
- Add elegance to invitations with gold or silver metallic ink
- Create business card with subtle metallic highlights
- Use several different colors and metallic inks together to create an unique images on phone covers and trophy's, etc.



# TARGET GROUP EXAMPLES

- **Promotional Product Companies:** iPhone covers
- **Offset Printers:** Book covers
- **Designers/Lithographers:** Mock ups & small runs for packaging
- **Pad-Printers:** Personalized items
- **Copy-Shops:** Invitations & Report covers
- **Photo-labs:** Wedding-album cover
- **Awards/Sport Prizes producers:** Awards / Sports prizes
- **Sign makers:** Signs with special metallic effects

# COMPARISON TO OTHER METHODS

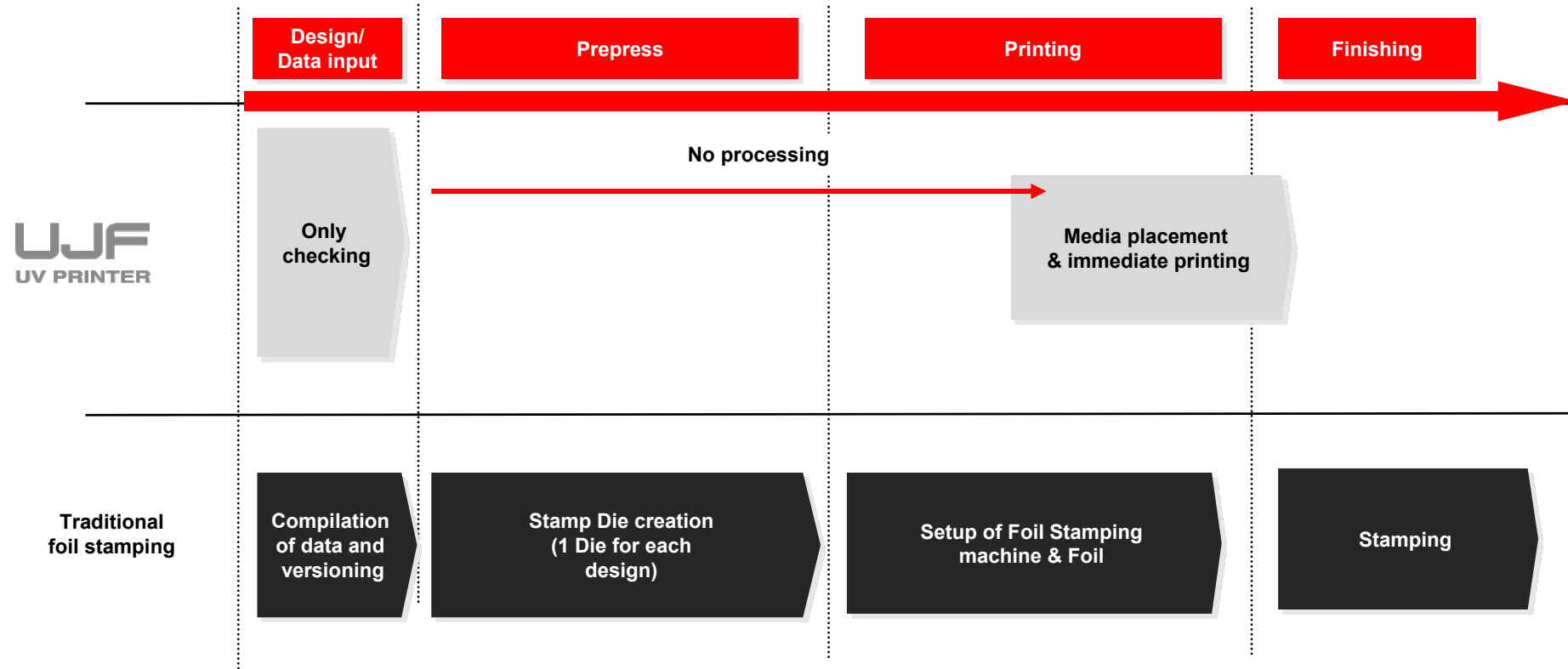
## • Advantages over other metal printing technologies:

- It can print on various unprepared materials, such as paper, plastic etc.
- Short preparation time limited only to print data design
- Superior reproducibility of small details and characters

	MUH-100-Si	Aluminum metalized paper	Foil press	Offset Silver	Paint, plating
On-demand	Excellent	Poor	Good	Good	Poor
Material versatility	Good	Poor	Good	Poor	Poor
Paper	Good	Good	Excellent	Good	Poor
Plastic molds	Excellent	Poor	Good	Poor	Good
Glossiness	Good	Excellent	Excellent	Fair	Excellent
Character/thin line reproducibility	Good	Poor	Poor	Good	Poor
Position alignment	Good	Poor	Poor	Fair	Poor
Cost (process, workload, molds)	Good	Poor	Poor	Good	Poor
Cost (ink, when producing small lot)	Fair	Fair	Poor	Fair	Good
Fastness	Poor	Fair	Fair	Poor	Excellent



# DIGITAL vs ANALOG WORKFLOW





# TRADITIONAL FOIL STAMPING vs DIGITAL PRINT

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The following items are required to make prints in traditional foil stamping:

- A. Offset press.
- B. Foil Stamping Machine.
- C. Foil Stamp Die.
- D. Foil.

**Follow up the next necessary steps:**

1. Create the Full Colour Artwork & Foil Design.
2. Make Offset Plates.
3. Setup the plates in the Offset Press.
4. Produce/Print the FC artwork.
5. Make the foil image artwork.
6. Make a Stamp Die.
7. Put the Stamp Die in the Foil Stamping Machine.
8. Set up the Die and the foil in the Foil Stamping Machine.
9. Start the foil Stamping production.
10. Job is done.



The following items are required to make prints with digital foil:

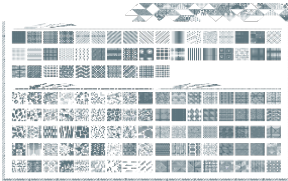
- A. Mimaki UJF-7151Plus printer.

**Follow up the next necessary steps:**

1. Create the Full Colour Artwork & Metallic Design.
2. Prepare the artwork & set up the media.
3. Print the Color and Metallic artwork.
4. Job is done.

# INK CONSUMPTION

- MUH-100-Si ink consumption reference






Data used	Print mode	UJF-7151 plus
	Standard mode	MUH-100-Si
		600x900dpi, 20pass
		1.120ml

**Print condition:**

Printer: UJF-7151plus  
 Ink set: LH-100 CMYKWSi  
 Resolution: 600x900dpi /20-P  
 Profile: UV-pet v3.5  
 Color matching: Mimaki-Expand\_Color

# PRODUCTIVITY

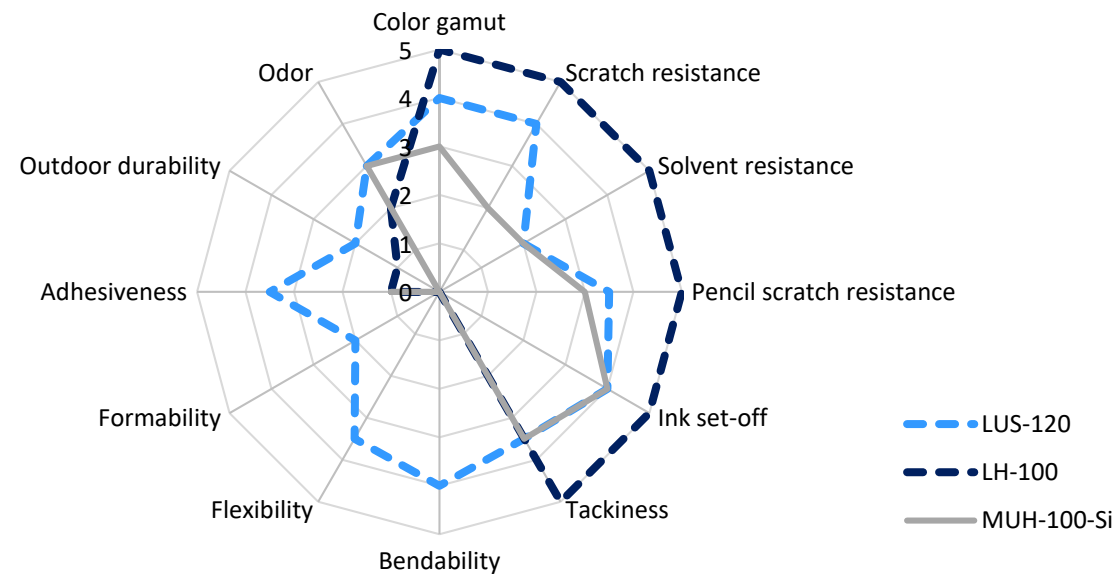
- Productivity can be set to speed or to image quality priority

Application	Print Condition	Print order	Print time (hh:mm:ss)										
Text characters and thin lines	 <table border="1" data-bbox="631 505 708 648"> <tr><td>Metallic</td></tr> <tr><td>Metallic Type:</td></tr> <tr><td>Base:</td></tr> <tr><td>Speed:</td></tr> <tr><td>UV Lamp:</td></tr> </table>  <table border="1" data-bbox="901 505 978 648"> <tr><td>Metallic</td></tr> <tr><td>Metallic Type:</td></tr> <tr><td>Base:</td></tr> <tr><td>Speed:</td></tr> <tr><td>UV Lamp:</td></tr> </table>	Metallic	Metallic Type:	Base:	Speed:	UV Lamp:	Metallic	Metallic Type:	Base:	Speed:	UV Lamp:	Single layer metallic matte	00:26:03
	Metallic												
Metallic Type:													
Base:													
Speed:													
UV Lamp:													
Metallic													
Metallic Type:													
Base:													
Speed:													
UV Lamp:													
Single layer metallic mirror	00:26:03												
Combination of metallic and color	 <p>← Metallic</p> <p>← Metallic + Color</p>	Multilayer: Color and Metallic matte	1 <sup>st</sup> layer: metallic matte 2 <sup>nd</sup> layer: color	00:40:03									
	Multilayer: Color and Metallic mirror	1 <sup>st</sup> layer: metallic glossy 2 <sup>nd</sup> layer: color	00:40:03										
Combination of color and metallic	 <p>← Metallic</p> <p>← Metallic + Color</p>	Multilayer: Color and Metallic matte	1 <sup>st</sup> layer: metallic matte 2 <sup>nd</sup> layer: metallic matte + color 3 <sup>rd</sup> layer: color	Speed priority: 00:46:27									
		Quality priority: 00:54:03											
	 <p>← Color</p>	Multilayer: Color and Metallic mirror	1 <sup>st</sup> layer: metallic glossy 2 <sup>nd</sup> layer: metallic glossy + color 3 <sup>rd</sup> layer: color	Speed priority: 00:46:27									
		Quality priority: 00:54:03											

**Print condition:**  
Metallic: 600x900dpi /20-P  
Color: 600x900dpi/16-P

# INK SPECIFICATION

	MUH-100-Si	LH-100
Number of colors	Si	M K C Y W or Cl
Features	<ul style="list-style-type: none"> <li>• Matte or mirror metallic effect</li> <li>• 3-D textured design effect</li> <li>• Various media and application choices</li> </ul>	<ul style="list-style-type: none"> <li>• Ink film is hard and resistant to scratches</li> <li>• Higher chemical resistance</li> <li>• Printed surface has less tackiness</li> </ul>
Applications	<ul style="list-style-type: none"> <li>• Phone covers</li> <li>• Luxury package</li> <li>• Decorative labels</li> <li>• Business cards and name plates</li> </ul>	<ul style="list-style-type: none"> <li>• Name plates</li> <li>• Novelty decorations etc.</li> </ul>



# ADHESION



## • List of adhesion depending on the substrate type

Material	Type of substrate		MUH-100-Si Adhesion		LH-100
			Mirror	Matte	Color only
Resin	Polycarbonate		✓	✓	✓
	Polystyrene		✓	No Data	✓
	ABS		✓	✓	✓
	Pre-treated PET	HK31WF	✗	✓	✓
		U292W	✗	✗	✗
	Acrylics		✗	✗	✗
	Glass epoxy		✗	No Data	✗
	6-nylon		✗	No Data	✗
PP/PE		✗	No Data	✗	
Inorganic	Glass		✗	No Data	✗
Metal	SUS		✗	No Data	✗
	Aluminium		✗	No Data	✗
	Copper		✗	No Data	✗
	Brass		✗	No Data	✗
Surface treated	Nickel		✗	No Data	✗

✓ : does not peel off  
 △ : peels off partly  
 ✗ : takes some time to peel off  
 ✗✗ : peels off immediately

\* The results above is based on the internal evaluation. The performance is not guaranteed.  
 Even if the substrate is the same type, adhesion may differ depending on its manufacture or brand.  
 It is recommended to test it in advance.

# INK SCRATCH RESISTANCE

		MUH-100-Si	LH-100	
		Color only	Color only	MUH-100
Scratch resistance*1	Pencil hardness*2	2H	5H	2H
Flexibility	Flexibility	110% (does not stretch)	100% (does not stretch)	
Chemical resistance*3 (Rubbing Test)	Water	X	LH100 is single or top layer: ✓	
			MUH-100 is single or top layer: X	
	Ethanol	X	LH100 is single or top layer: ✓	
			MUH-100 is single or top layer: X	
	IPA(100%)	X	LH100 is single or top layer: ✓	
			MUH-100 is single or top layer: X	
Xylene(100%)	X	LH100 is single or top layer: ✓		
		MUH-100 is single or top layer: X		
Chemical resistance*4 (Dipping test)	Water	X	X	X
	Hot water(60°C)	XX	X	XX
	Ethanol(100%)	X	✓	X

✓ : does not peel off  
 △ : peels off partly  
 X : takes some time to peel off  
 XX : peels off immediately

\*1 Scratch resistance tends to depend on hardness of ink film

\*2 The pencil hardness can be an index of if the ink film can be scratched off with nails. The hardness of nail is around "H", therefore the use of the ink which is harder than "H" is recommended, except for the case when the adhesion is poor

\*3 Evaluation method: Comprehensively evaluated by the test results of primary, secondary, and tertiary colors

\*4 When printing on less adhesive medias, UV ink tends to peel off by the penetration of water or chemicals from the print edge

# SCRATCH RESISTANCE AND DISCOLORATION

- The scratch resistance feature has been significantly improved compared to the SS21 silver.
- The printed material for long-term use can be protected by coating and laminating the printed surface

Rubbing method		MUH-100Si		SS21Si
Pressure (g)	Steps(x)	Matte Finish	Glossy Finish	-
5	10			
		No visible scratch	No visible scratch	Scratches visible on some parts of the film surface
	500			
		No visible scratch	Scratches visible on some parts of the film surface	Scratches and film detachment visible on entire area of the film surface
800	10			
		No visible scratch	Scratches visible on some parts of the film surface	Scratches visible on entire area of the film surface

**Print condition:**  
 MUH-100Si: UJF-7151plus 600x900 12-p  
 SS21Si: CIV300 720x1080 16-p (heater 50/45/60°C)

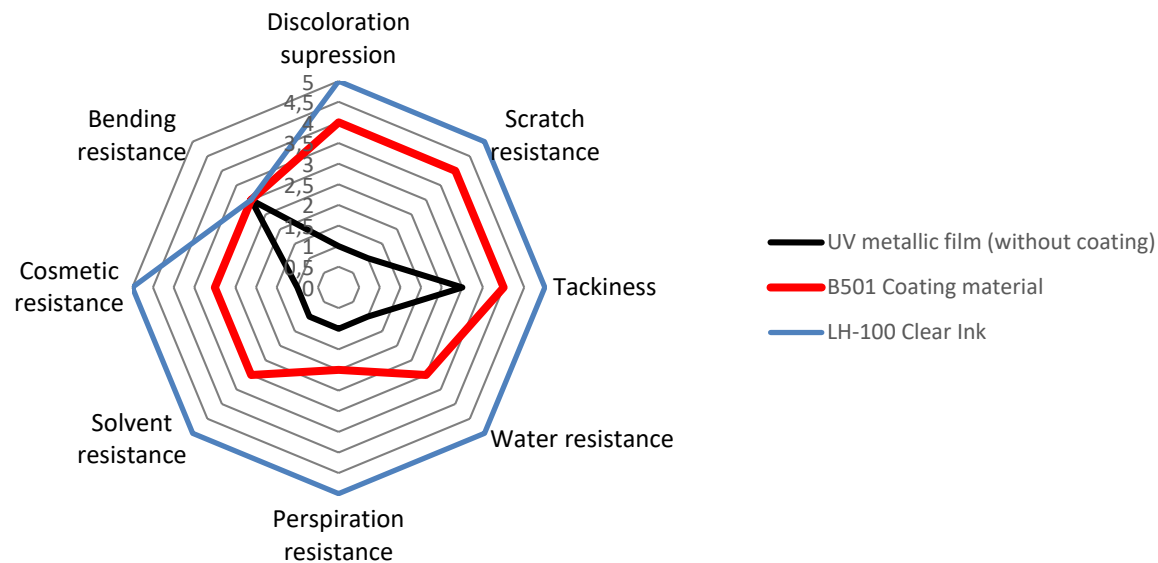
**Scratch test condition:**  
 Tester: JSPS tester  
 Method: Rubbing with dry cloth

- The results are based on the internal evaluation. The performance is not guaranteed.
- Even if the substrate is the same type, the result may differ depending on its manufacture or brand.
- It is recommended to test it in advance.

# SCRATCH RESISTANCE AND DISCOLORATION

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- Since MUH-100-Si uses aluminum as a pigment, it is sensitive for damage due to scratches as well as color changes due to hot water, oil, acids and alkalis
- For long-term use, the printed materials should be protected by coating the print layer or by laminating
  - Protection with LH-100 Clear ink
  - Coating with general purpose available coating material



MUH-100Si Ink performance chart

Example of discoloration without protection of printed surface:



Direct after printed

After being used for 1-month



# FAQ



	Question	Answer
1	Do I need to shake the silver ink before use?	Yes, you do. Please do so before starting operation because it is an important process to achieve stable image quality.
2	Is there anything I should be concerned when using the silver ink?	Do not turn off the main power of printer. The ink circulates within the printer to maintain the quality.
3	Is it possible to switch the ink from Si back to CL, PR?	No. Mimaki do not advice the ink switch once machine is converted to Metallic ink.
4	What is the volume of MUH-100Si ink pack?	It is supplied in 200ml bottles.
5	What is the shelf life of MUH-100Si ink?	12 months from manufacturing date.
6	How should I store the ink?	Store it in an airtight container under dry and ventilated condition in a cool dark place at a temperature between 0°C and 30°C.
7	Are the color profiles available for MUH-100Si?	Yes, the profiles are available for download from Mimaki website.
8	How difficult is to match the color and metallic ink RasterLink6?	Mimaki offers the Metallic Color Collection for easy reproduction of the desired color.
9	How can I specify a metallic color in Illustrator?	Load a swatch library to your Illustrator, and specify the desired metallic color.
10	Can MUH-100-Si be combined with other ink than LH100?	No
11	Can MUH-100-Si be installed in other UV printers than in UJF-7151plus?	No

## **MUH-100Si Metallic color sample collection**

# ■ MUH-100-SI PRINTING CONDITION

The Mimaki logo is located in the top right corner of the slide. It consists of the word "Mimaki" in a white, sans-serif font, set against a red rectangular background.

- **Printer:** UJF-7151
- **Ink type:** LH-100
- **Ink Set:** CMYKWSi
- **Resolution:** 600x900dpi

# SMARTPHONE COVER

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- **Media:** Polycarbonate
- **Size:** 140x70mm
- **Layers:**
  - 1<sup>st</sup> layer: Metallic Glossy
  - 2<sup>nd</sup> layer: Color
  
- **Points:**
  - Glossy expression of silver ink combined with color
  - Luxury effect
  - 3D texture
  - Digital metal ink print reduces production time performed by conventional procedures



# CARD

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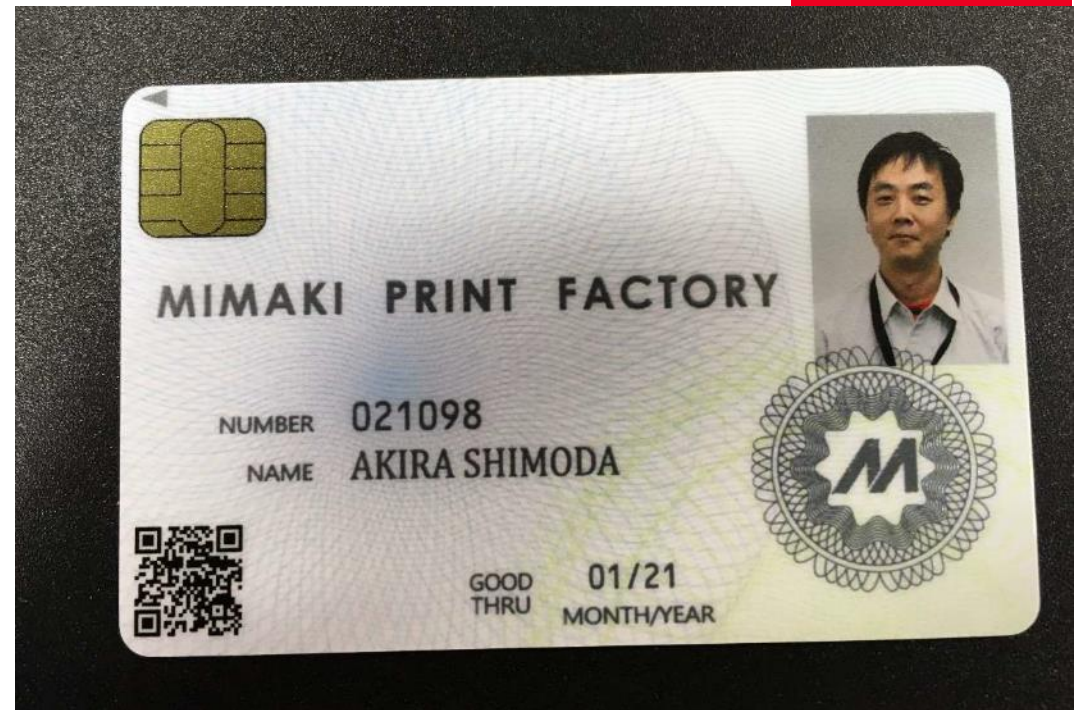
- **Media:** PVC
- **Size:** 85x54mm
- **Layers:**
  - 1<sup>st</sup> layer: Color
  - 2<sup>nd</sup> layer: Metallic Glossy
  
- **Points:**
  - Texturized metallic effect
  - Light reflection
  - Luxury effect and eye-catching appeal



# ID CARD

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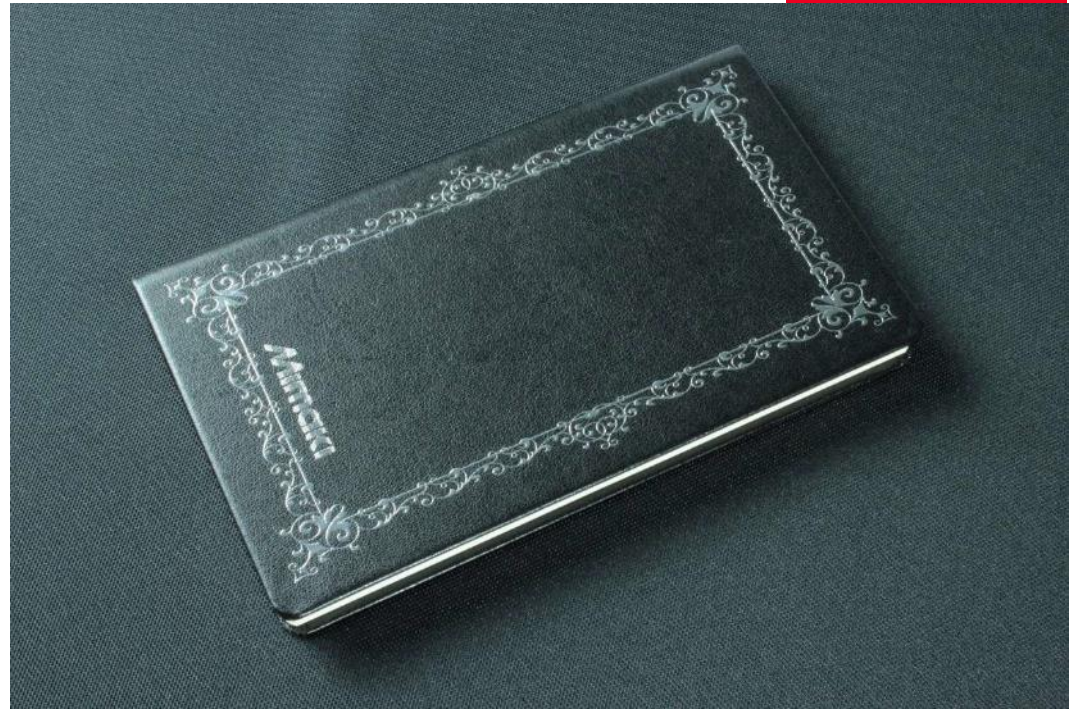
- **Media:** PVC
- **Size:** 85x54mm
- **Layers:**
  - 1<sup>st</sup> layer: Metallic Matte
  - 2<sup>nd</sup> layer: Color
  
- **Points:**
  - Security ID stamp effect
  - Variable data print possibility
  - Prevention of falsification



# NOTEBOOK



- **Media:** Syntethic Leather (PVC)
- **Size:** 165x95mm
- **Layers:**
  - 1<sup>st</sup> layer: Metallic Glossy
  
- **Points:**
  - Luxury decoration of black leather with metallic accent
  - Personalized look



# PEN

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- **Media:** Resin
- **Size:** 140x12mm
- **Layers:**
  - 1<sup>st</sup> layer: Metallic Glossy
  
- **Points:**
  - Luxury decoration of promotional material
  - Personalized message

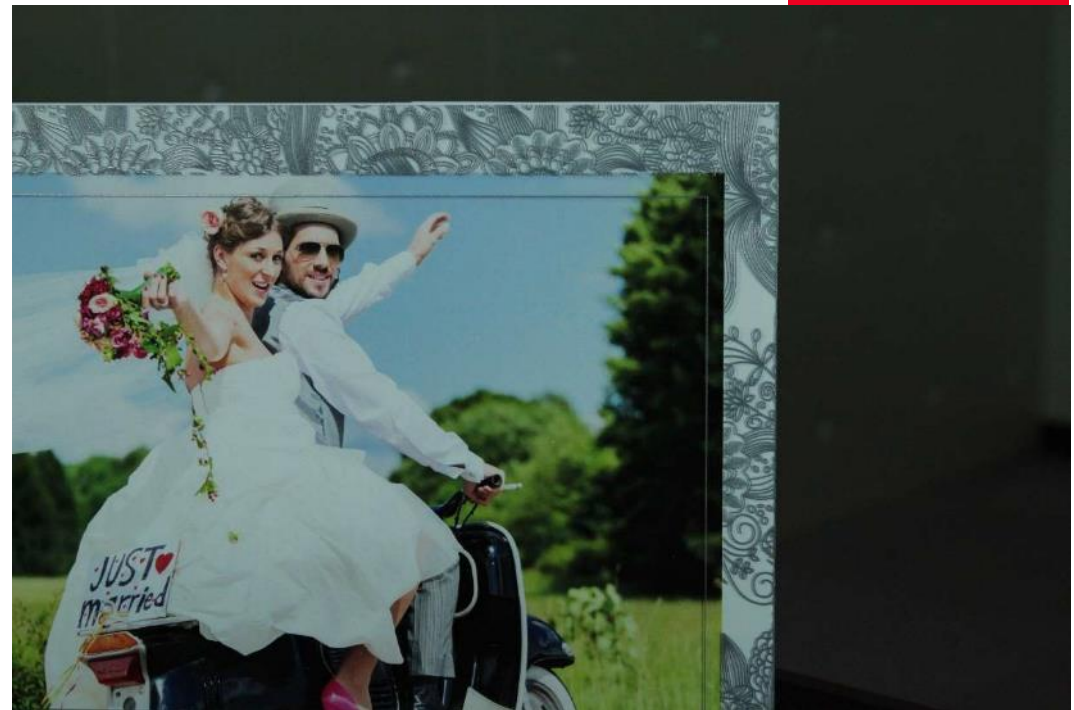




# PHOTO FRAME

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- **Media:** Acrylic
- **Size:** 300x220mm
- **Layers:**
  - 1<sup>st</sup> layer: Metallic Matte (front side)
  - Back layer: Color (Picture on back)
  
- **Points:**
  - Luxury decoration of events and memories
  - Depth feeling due printing on both sides of material



# PACKAGING

- **Media:** Coated paper
- **Size:** 233x183mm
- **Layers:**
  - 1<sup>st</sup> layer: Metallic Matte
  - 2<sup>nd</sup> layer: Color on Metallic
  - 3<sup>rd</sup> layer: Color
- **Points:**
  - Luxury decoration of packaging material
  - Possibility of expression small details in high quality
  - Quick production




# TICKETS AND VOUCHERS

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- **Media:** Coated paper
- **Size:** 175x75mm
- **Layers:**
  - 1<sup>st</sup> layer: Metallic Glossy
  - 2<sup>nd</sup> layer: Metallic Glossy
  - 3<sup>rd</sup> layer: Metallic Glossy
  - 4<sup>th</sup> layer: Color on Metallic
  
- **Points:**
  - Classy representation
  - Possibility of expression small details in high quality
  - Metallic Glossy effect



# INVITATIONS

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- **Media:** Coated paper
- **Size:** 380x345mm
- **Layers:**
  - 1<sup>st</sup> layer: Metallic Glossy
  - 2<sup>nd</sup> layer: Color on Metallic



- **Points:**
  - Gold effect
  - Possibility of expression small details in high quality
  - Reducing waste of material caused by other methods, such as Digi-foil print

# PLACE CARDS

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- **Media:** Coated paper
- **Size:** 130x90mm
- **Layers:**
  - 1<sup>st</sup> layer: Metallic Glossy
  - 2<sup>nd</sup> layer: Color on Metallic
  
- **Points:**
  - Applying different Metallic effect for each person
  - Possibility of variable data printing, such as name etc..



# TEXTURES

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- **Media:** PVC
- **Size:** 85x54mm
- **Layers:**
  - 1<sup>st</sup> layer: Metallic Glossy
  - 2<sup>nd</sup> layer: Color on Metallic
  
- **Points:**
  - 3-D Carbon like texture
  - Luxury effect
  - Easy applying of color patches



