

Direct Printing Standard Plastisol Inks

Ultrasoft, Maxopake, Athletic Gloss, Polyester, Unimatch, Mixopake



Ink Application Chart

Name	Direct Printing Standard Color		Athletic Plastisols		Matching Systems	
	Ultrasoft	Maxopake	Athletic Gloss	Polyester	Unimatch	Mixopake
Product Codes ¹	PLUS, PLUE	PADM, PADE	PATH, PATE	POLY, ATHP	MACH, PTHF	MIXO, MIXE
General Information	Medium Opacity, wet-on-wet	Very High Opacity	High Opacity, Gloss	High Opacity, very low bleed for 100% Polyester	Pantone Approved Medium Opacity Color Matching System	Pantone Approved Very High Opacity Color Matching System
Colors	16 Standard + 9 Fluorescents 6 Metallics*	17 Standard Colors + Three Low Bleed Colors + 9 Fluorescents	30 Standard Colors + 8 Fluorescents + 5 Metallics*	2 Whites + 12 colors	15 RFU Colors	12 Standard RFU Colors + 7 Neon RFU Colors + 4 Low Bleed Compatible Colors
Substrates						
Cotton	Excellent (Light Colors, or Med Colors)	Excellent (Dark Colors or Light colors extended)	Not Recommended	Not Recommended	Excellent (Light Colors, or dark colors w/underbase)	Excellent (Dark Colors or Light colors extended)
Cotton/Polyester	Not Recommended	Not recommended unless printed on low-bleed underbase	Not Recommended	Not Recommended	Not recommended unless printed on low-bleed underbase	Not recommended unless printed on low-bleed underbase
100% Polyester	Not Recommended	Not recommended unless printed on polyester low-bleed underbase	Not recommended unless printed on polyester low-bleed underbase	Excellent	Not recommended unless printed on polyester low-bleed underbase	Not recommended unless printed on polyester low-bleed underbase
Athletic Nylon Mesh	Not Recommended	Good	Excellent	Not Recommended	Not Recommended	Good
Athletic Polyester	Not Recommended	Not recommended unless printed on polyester low-bleed underbase	Not recommended unless printed on polyester low-bleed underbase	Excellent	Not Recommended	Not Recommended
Waterproof Fabric	Not Recommended	Excellent w/Nylobond	Excellent w/Nylobond	Not Recommended	Not Recommended	Excellent w/Nylobond
Tight Woven denier cloths	Not Recommended	Excellent w/Nylobond	Excellent w/Nylobond	Not Recommended	Not Recommended	Excellent w/Nylobond
Properties						
Opacity	Moderate	Excellent	Very Good	Very Good	Moderate	Excellent
Bleed Resistance	None	None, except LB Colors	None	Excellent	None	None
Soft Hand	Excellent	Only w/softhand additive	No	No	Excellent	Only w/softhand additive
Wet on wet	Good	Only w/softhand additive	Fair, not recommended	No	Excellent	Only w/softhand additive
Flash Cure	Fair	Fair	Fair	Good	Excellent	Fair
Dry Cleaning/Ironing	No	No	No	No	No	No
Application						
Mesh	125-305 (48-120cm)	74-230 (29-92cm)	60-110 (24-43cm)	60-110 (24-43cm)	125-305 (48-120cm)	74-230 (29-92cm)
Stencil	Direct or Capillary	Direct or Capillary	Direct or Capillary	Direct or Capillary	Direct or Capillary	Direct or Capillary
Cure Temp	300-320°F /149-160°C	300-320°F /149-160°C	300-320°F /149-160°C	300-320°F /149-160°C	300-320°F /149-160°C	300-320°F /149-160°C
Wash Up	Plastisol Screen Wash	Plastisol Screen Wash	Plastisol Screen Wash	Plastisol Screen Wash	Plastisol Screen Wash	Plastisol Screen Wash
Additives						
Viscosity Reducer	0-15% PLUS or PLRE-9000	0-15% PLUS or PLRE-9000	0-15% PLUS or PLRE-9000	0-2% PLUS or PLUE-9100	0-15% PLUS or PLRE-9000	0-15% PLUS or PLRE-9000
Soft Hand Extender	0-99% MIXO or MIXE -9070	0-99% MIXO or MIXE -9070	0-99% MIXO or MIXE -9070	Not Recommended	0-99% MACH or PHTF-9070	0-99% MIXO or MIXE -9070
Opaque Extender	Not Recommended	MIXO or MIXE-9090	PATH or PATE 9090	Not Recommended	MACH or PHTF-9090 only as required in formulas	MIXO or MIXE-9090 only as required in formulas
Nylobond	Not Recommended	Excellent	Excellent	Not Recommended	Good	Excellent

¹ First Code is standard ink series, second code is Liberty EF Non-phthalate series

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* Metallics have different application requirements. See Page 2.

Direct Printing Metallics, Shimmers, Glitters, Process Plastisols

Ultrasoft Metallics, Athletic Metallics, Shimmers, Glitters, Halo Glitters



Ink Application Chart

Plastisol Metallics

Name	Ultrasoft	Brilliant and Athletic Gloss Metallics	Shimmers	Glitters	Halo Glitters	Tru-Tone Process
Product Codes ¹	PLUS, PLUE/PLFX,PLFE	PATH, PATE	PAGL, PAGE	PAGL, PAGE	HALO, HALE	PRPL, PRPE
General Information	Highly opaque true metallic ink	Highly Opaque true metallic, gloss finish	Non-tarnishing medium sized flake	Non-tarnishing large sized flake	Dry Dusted Look Large Non-Tarnishing Flake	True color transparent process inks
Colors	Copper, Silver, Washable Silver, Pale Gold, Rich Gold, Mirror Gold	Silver, Gold, Rich Gold, Mirror Gold	6 Standard Colors	8 Standard Colors	14 Standard Colors	Regular Strength, Triple Strength, Highlight White
		Extra Bright Silver, Extra Bright Gold				
Substrates						
Cotton	For Best Results, Use Underbase	For Best Results, Use Underbase	Excellent	Excellent	Excellent	White Fabric, All Other Colors w/Discharge Underbase
Cotton/Polyester	With Low-Bleed Underbase	With Low-Bleed Underbase	Excellent	Excellent	Excellent	White Only
100% Polyester	With Polyester LB Underbase	With Polyester LB Underbase	Only on Very Light Colors	Only on Very Light Colors	Light colors	White Only
Athletic Nylon Mesh	Not Recommended	Best Choice	Not Recommended	Not Recommended	Not Recommended	Not Recommended
Athletic Polyester	Not Recommended	With Polyester Underbase	Not Recommended	Not Recommended	Not Recommended	Not Recommended
Waterproof Fabric	With Nylobond Additive	With Nylobond Additive	With Nylobond Additive	With Nylobond Additive	With Nylobond Additive	Not Recommended
Tight Woven denier cloths	With Nylobond Additive	With Nylobond Additive	With Nylobond Additive	With Nylobond Additive	With Nylobond Additive	Not Recommended
Properties						
Opacity	High	Excellent	Good	Good	Good	Transparent
Bleed Resistance	None	None	None	None	None	None
Soft Hand	No	No	No	No	No	Excellent
Wet on wet	No	No	No	No	No	Excellent
Flash Cure	N/A, Print Last	N/A, Print Last	N/A, Print Last	N/A, Print Last	N/A, Print Last	Not recommended, but flashes well
Dry Cleaning/Ironing	Not Recommended	Not Recommended	Not Recommended	Not Recommended	Not Recommended	Not Recommended
Application						
Mesh	60-125 (24-49cm)	60-110 (24-43cm)	60-110 (24-43cm)	24-33 (10-12cm)	24-33 (10-12cm)	305-355(120-140cm)
Stencil	Direct or Capillary	Direct or Capillary	Direct or Capillary	Direct or Capillary	Direct or Capillary	Direct or Capillary
Cure Temp	300-320°F /149-160°C	300-320°F /149-160°C	300-320°F /149-160°C	300-320°F /149-160°C	300-320°F /149-160°C	300-320°F /149-160°C
Wash Up	Plastisol Screen Wash	Plastisol Screen Wash	Plastisol Screen Wash	Plastisol Screen Wash	Plastisol Screen Wash	Plastisol Screen Wash
Additives						
Viscosity Reducer	0-15% PLUS or PLRE-9000	0-15% PLUS or PLRE-9000	0-15% PLUS or PLRE-9000	0-15% PLUS or PLRE-9000	0-15% PLUS or PLRE-9000	0-15% PLUS or PLRE-9000
Soft Hand Extender	Not Recommended	Not Recommended	Not Recommended	Not Recommended	Not Recommended	PRPL,PRPE-9080 only
Opaque Extender	Not Recommended	Not Recommended	Not Recommended	Not Recommended	Not Recommended	Not Recommended
Nylobond	Excellent	Excellent	Excellent	Very Good	Very Good	Not Recommended

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Direct Printing Special Effects Inks, Transfer Mixing System Plastisols

Hi Gloss Gel, Hi Density, Suede, Phosphorescent, Photochromatic, Mixotrans



Ink Application Chart

Name	Hi Gloss Gel Clear	3DSQ High Density	Suede	Phosphorescent	Photochromatic	Mixotrans
Product Codes ¹	PLFX, PLFE	3DSQ, 3DSE	PLSE, NPSU	PLUS, PLUE	PHOT	MITR, MITE
General Information	High Gloss Gel Clear	Three Dimensional High Density Ink	Special Effect Suede Finish, Do not underbase	Glow in the Dark Ink	UV Sensitive Color Change Ink	High Opacity Color Matching System for Hot Split and Cold Peel Transfers
Colors	PLFX, PLFE - 9013,9040	12 Standard RFU Colors + 7 Neon RFU Colors	10 Standard Colors, Plus Base and Additive	Greenish White	Blue, Yellow, Purple	12 Standard RFU Colors + 7 Neon RFU Colors + 11 Standard Colors
Substrates						
Cotton	Excellent, best when printed on flashed underlayer	Excellent	Excellent	Best when printed on white or cotton white underbase	Best when printed on white or cotton white underbase	Excellent
Cotton/Polyester	Not Recommended	Only when printed on low-bleed underbase	Not Recommended	Only When Printed on Low-Bleed White Underbase, TEST	Only When Printed on Low-Bleed White Underbase, TEST	When Printed with Low Bleed Underbase and/or Barrier Clear
100% Polyester	Not Recommended	Not recommended unless printed on poly low-bleed underbase	Not Recommended	Not Recommended Unless Printed on Poly Low-Bleed Underbase, TEST	Not Recommended Unless Printed on Poly Low-Bleed Underbase, TEST	When Printed with Polyester Low Bleed Underbase and/or Barrier Clear, TEST
Athletic Nylon Mesh	Not Recommended	Not Recommended	Not Recommended	Not Recommended	Not Recommended	Not Recommended
Athletic Polyester	Not Recommended	Not Recommended	Not Recommended	Not Recommended	Not Recommended	Not Recommended
Waterproof Fabric	Not Recommended	Not Recommended	Not Recommended	With Nylobond Additive	Not Recommended	Not Recommended
Tight Woven denier cloths	Not Recommended	Not Recommended	Not Recommended	Not Recommended	Not Recommended	TEST
Properties						
Opacity	Transparent	Excellent	Very Good	Transparent	Transparent	Excellent
Bleed Resistance	None	None	None	None	none	Only with Low Bleed Underbase
Soft Hand	No	No	N/A, Print Last	No	Very Good	Good
Wet on wet	No	No	N/A, Print Last	No	No	No
Flash Cure	Not Recommended	Fair	Good	Not Recommended	Not Recommended	Yes
Dry Cleaning/Ironing	Not Recommended	Not Recommended	Not Recommended	Not Recommended	Not Recommended	Not Recommended
Application						
Mesh	70-86 (28-33cm) Thin Thread	70-86 (28-33cm) Thin Thread	110-160 (43-60 cm)	83-110 (32-43cm)	83-125 (32-49cm)	83-230 (32-92cm)
Stencil	200 Micron Thick Film or Capillary	200 - 400 Micron Thick Film or Capillary	Direct or Capillary	Direct or Capillary	Direct or Capillary	Direct or Capillary
Cure Temp	300-320°F /149-160°C	300-320°F /149-160°C	300-320°F /149-160°C	300-320°F /149-160°C	300-320°F /149-160°C	Gel @ 240-250°F/115-121°C [*]
Wash Up	Plastisol Screen Wash	Plastisol Screen Wash	Plastisol Screen Wash	Plastisol Screen Wash	Plastisol Screen Wash	Plastisol Screen Wash
Additives						
Viscosity Reducer	0-2% PLUS or PLUE-9100	0-15% PLUS or PLRE-9000	0-2% PLUS or PLUE-9100	0-15% PLUS or PLRE-9000	0-15% PLUS or PLRE-9000	0-15% PLUS or PLRE-9000
Soft Hand Extender	Not Recommended	Not Recommended	Not Recommended	Not Recommended	Not Recommended	Not Recommended
Opaque Extender	Not Recommended	Not Recommended	Not Recommended	Not Recommended	Not Recommended	As Needed
Nylobond	Not Recommended	Not Recommended	Not Recommended	Good	Not Recommended	Not Recommended

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Direct Print Special Effects, Transfer Inks, Key Additives - Plastisols

Unistretch, Plasticharge, Reflectives, Transfer systems



Ink Application Chart

Discharge Inks

Name	Barrier Clear	Unistretch	Plasticharge	W/B Discharge	Flashback	Flashtrans
Product Codes ¹	PLHE	UNST, UNSE	DSPCH, DSPCH-E	DSPP	REFL	FLTR
General Information	Supplemental Dye Blocking Underbase for difficult fabrics	Stretch additive and direct print ink	Hybrid Ink system that allows for Plastisol Discharge	Extremely Soft Hand Discharge	Retro Reflective Ink	Retro Reflective Transfer System for Safety Apparel
Colors	PLHE-9040	Clear Additive (9160) and RFU White (1000)	Clear Additive (9070) and Premixed White (1000)	Preprint Clear + Tintable Base + Extra Bright White	8 Standard Colors	Silver Gray
Substrates						
Cotton	Not Recommended	Excellent	On Reactive Dyed Fabric	Excellent	Best on Light Fabrics But OK on Dark Fabric	Excellent
Cotton/Polyester	As Needed	Only on colors over an Underbase	Not Recommended	Not Recommended	Best on Light Fabrics But OK on Dark Fabric	Excellent
100% Polyester	Excellent for Migration prone Fabric	Only on colors over a Poly Low-Bleed Underbase	Not Recommended	Not Recommended	Best on Light Fabrics But OK on Dark Fabric	Excellent
Athletic Nylon Mesh	Not Recommended	Excellent	Not Recommended	Not Recommended	Not Recommended	Excellent
Athletic Polyester	Excellent for Migration prone Fabric	Only on colors over an Underbase	Not Recommended	Not Recommended	Not Recommended	Excellent
Waterproof Fabric	Not Recommended	Not Recommended	Not Recommended	Not Recommended	Not Recommended	Not Recommended
Tight Woven denier cloths	Not Recommended	Not Recommended	Not Recommended	Not Recommended	Not Recommended	TEST
Properties						
Opacity	None, Transparent	Additive None, White Good	Transparent but replaces fabric color	N/A	Fair	Excellent
Bleed Resistance	Excellent	None	N/A	N/A	N/A	Excellent
Soft Hand	N/A	Good	Excellent	Very Soft	Fair	Fair
Wet on wet	No	Test	Good	Colors and Clear, Not White	No	N/A
Flash Cure	Good	Good	Very Good	Good	No	N/A
Dry Cleaning/Ironing	Not Recommended	Not Recommended	Not Recommended	OK	Not Recommended	Not Recommended
Application						
Mesh	60-86 (24-33cm)	83-125(32-49cm)	156-180 (61-71cm)	156-180 (61-71cm)	83-110 (32-43cm)	110 (43cm)
Stencil	Direct or Capillary	Direct or Capillary	Direct Water Resistant	Direct Water Resistant	Direct or Capillary	Direct or Capillary
Cure Temp	300-320°F /149-160°C	310-330°F /154-166°C	320-330°F /160-166°C	320-330°F /160-166°C	330-340°F /166-171°C	Gel at 240°F /116°C, TEST
Wash Up	Plastisol Screen Wash	Plastisol Screen Wash	Water or Water soluble screen wash	Water or Water soluble screen wash	Plastisol Screen Wash	Plastisol Screen Wash
Additives						
Viscosity Reducer	0-2% PLUS or PLUE-9100	Not Recommended	Not Recommended	N/A	Not Recommended	Not Recommended
Soft Hand Extender	Not Recommended	Not Recommended	0 to 50% for Natural Discharge Look	N/A	Not Recommended	Not Recommended
Opaque Extender	Not Recommended	Not Recommended	Not Recommended	N/A	Not Recommended	Not Recommended
Nylobond	Not Recommended	Not Recommended	N/A	N/A	OK for Jackets	Not Recommended

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White Inks - Plastisols

Cotton Whites, Low bleed Whites, Poly Whites, Athletic Whites



Ink Application Chart

Name	Bright Cotton White	Basic White	Diamond White	EZ Print White	Polyester White	Athletic White
Product Codes ¹	PADM, PADE	PADM, PADE	PLHT, PLHE	PADM, PADE	POLY, ATHP	PATH, PATE
General Information	Very High Opacity Underbase and Highlight White	High Opacity Underbase White	Premium High Opacity Low Bleed White for Poly Cotton Blends	Economy Low Bleed White for Cotton and Poly Cotton Blends	High Opacity very low bleed for 100% Polyester	High Opacity Gloss for Athletic Jerseys
Colors	Standard -1027 Premium - 1030	PADM, PADE - 1001	PLHT, PLHE - 1070, 1075	PADM, PADE - 1062	POLY, ATHP - 1050,1070	PATH, PATE - 1000
Substrates						
Cotton	Excellent (Dark Colors or Light colors extended)	Good (Dark Colors or Light colors extended)	Not Recommended	Good	Not Recommended	Not Recommended
Cotton/Polyester	Not Recommended	Not Recommended	Excellent	Good	Good	Not Recommended
100% Polyester	Not Recommended	Not Recommended	Not Recommended	Not Recommended	Excellent	Not Recommended
Athletic Nylon Mesh	Good	Not Recommended	Not Recommended	Not Recommended	Not Recommended	Excellent
Athletic Polyester	Not recommended unless printed on polyester low-bleed underbase	Not Recommended	Not Recommended	Not Recommended	Excellent	Not Recommended
Waterproof Fabric	Excellent w/Nylobond	Excellent w/Nylobond	Not Recommended	Not Recommended	Not Recommended	Excellent w/Nylobond
Tight Woven denier cloths	Excellent w/Nylobond	Excellent w/Nylobond	Not Recommended	Not Recommended	Not Recommended	Excellent w/Nylobond
Properties						
Opacity	Excellent	Very Good	Excellent	Very Good	Excellent	Excellent
Bleed Resistance	None	None	Excellent	Good	Excellent	None
Soft Hand	Only w/softhand additive	Only w/softhand additive	Fair	Fair	No	No
Wet on wet	Not Recommended	Not Recommended	Not Recommended	Not Recommended	Not Recommended	Not Recommended
Flash Cure	Excellent	Good	Excellent	Good	Fair	Fair
Dry Cleaning/Ironing	No	No	No	No	No	No
Application						
Mesh	83-230 (32-92cm)	83-230 (32-92cm)	83-156 (32-61cm)	83-230 (32-92cm)	60-110 (24-43cm)	60-110 (24-43cm)
Stencil	Direct or Capillary	Direct or Capillary	Direct or Capillary	Direct or Capillary	Direct or Capillary	Direct or Capillary
Cure Temp	300-320°F /149-160°C	300-320°F /149-160°C	300-320°F /149-160°C	300-320°F /149-160°C	300-320°F /149-160°C	300-320°F /149-160°C
Wash Up	Plastisol Screen Wash	Plastisol Screen Wash	Plastisol Screen Wash	Plastisol Screen Wash	Plastisol Screen Wash	Plastisol Screen Wash
Additives						
Viscosity Reducer	0-2% PLUS or PLUE-9100	0-2% PLUS or PLUE-9100	0-2% PLUS or PLUE-9100	0-2% PLUS or PLUE-9100	0-2% PLUS or PLUE-9100	0-2% PLUS or PLUE-9100
Soft Hand Extender	As Needed	As Needed	Not Recommended	Not Recommended	Not Recommended	PATH,PATE - 9090
Opaque Extender	Not Recommended	Not Recommended	Not Recommended	Not Recommended	Not Recommended	Not Recommended
Nylobond	Excellent	Excellent	Not Recommended	Not Recommended	Not Recommended	Excellent

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Waterbase Ink Systems

Aerotex, Unidye, Pavonine Systems, Discharge



Ink Application Chart

Name	Aerotex	Unidye	Pavoclear	Pavoopaque	Pavostretch	Pavorelect, Nyloreflect
Product Codes ¹	ATEX	UNDY	PPPC	PPPO	PPPS	PORF,NYRF
General Information	Soft Hand Waterbase Ink	Water/Oil Emulsion Ink	Soft Hand Waterbase Ink	Opaque Waterbase Ink	Very Elastic Standard and Opaque Waterbase Ink	Durable High Opacity Reflective Ink
Colors	21 Standard + 8 Fluorescent Colors + 9 Shimmers	20 Standard + 4 Process + 8 Fluorescent colors	24 Standard + 7 fluorescents + 4 process colors	24 Standard Colors	24 Standard + 4 fluorescents	15 Standard Colors + 7 fluorescent colors + Tintable Base
		Excellent Towel Ink				
Substrates						
Cotton	Excellent on White, test on lights	Excellent on White, test on lights	Excellent on White, test on lights	Good	Excellent on white, test on lights	Excellent
Cotton/Polyester	Excellent on White, test on lights	Excellent on White, test on lights	Excellent on White, test on lights	Good	Excellent on white, test on lights	Excellent
100% Polyester	Excellent on White, test on lights	Excellent on White, test on lights	Excellent on White, test on lights	Good	White Fabrics Only	Excellent
Athletic Nylon Mesh	Not Recommended	Not Recommended	Not Recommended	Not Recommended	Not Recommended	Not Recommended
Athletic Polyester	Not Recommended	Not Recommended	Not Recommended	Not Recommended	Not Recommended	Not Recommended
Waterproof Fabric	Not Recommended	Not Recommended	Not Recommended	Not Recommended	Not Recommended	NyloReflect
Tight Woven denier cloths	Not Recommended	Not Recommended	Not Recommended	Not Recommended	Not Recommended	NyloReflect
Properties						
Opacity	Low	Low	Low	Good	Good	Fair
Bleed Resistance	N/A	N/A	N/A	N/A	N/A	N/A
Soft Hand	Excellent	Excellent	Excellent	Fair	N/A	N/A
Wet on wet	Yes	Yes	Yes	Yes	No	No
Flash Cure	Fair	Fair	Fair	Fair	Fair	No
Dry Cleaning/Ironing	OK	OK	OK	OK	OK	OK
Application						
Mesh	110-160 (43-60cm)	110-160 (43-60cm)	110-160 (43-60cm)	83-160 (32-60cm)	83-160 (32-60cm)	74-110 (29 -43cm)
Stencil	Direct Water Resistant	Direct Water Resistant	Direct Water Resistant	Direct Water Resistant	Direct Water Resistant	Direct Water Resistant
Cure Temp	320-330°F /160-166°C or Air dry w/ Catalyst	320-330°F /160-166°C or Air dry w/ Catalyst	320-330°F /160-166°C or Air dry w/ Catalyst	320-330°F /160-166°C w/ Catalyst	320-330°F /160-166°C w/ Catalyst	320-330°F /160-166°C w/ Catalyst
Wash Up	Water or Water soluble screen wash	Water with Mild Detergent	Water or Water soluble screen wash	Water or Water soluble screen wash	Water or Water soluble screen wash	Water or Water soluble screen wash
Additives						
Extender Base	yes	yes	yes	yes	yes	yes
Retarder	yes	yes	yes	yes	yes	yes
Air Dry Catalyst	yes	yes	yes	yes	yes	yes
Other Catalyst	no	no	yes	yes	yes	yes

¹All Union Waterbase Inks are Non-phthalate

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