

Textile Effects

TERATOP[®] XKS HL DISPERSE INKS

Disperse inks for digital printing on automotive and outdoor fabrics



Sustainability
Innovation
Collaboration



TERATOP® XKS HL

The ink range for high lightfast polyester prints

Why TERATOP® XKS HL inks?

- First-in-class disperse inks capable of printing on technical textiles that require extremely high color fastness performance
- The only ink range that meets the automotive industry's light-fastness standards
- Long standing experience in developing and manufacturing disperse dyes for the automotive industry
- Complete ink range for full coverage of color space and fastness requirements and metamerism consistency
- Tone-on-tone color fading
- Deepest black levels
- Compatibility with Huntsman UV absorbers and finishing products
- Excellent reliability, runnability and reproducibility
- Training, testing and technical support by a team of automotive experts

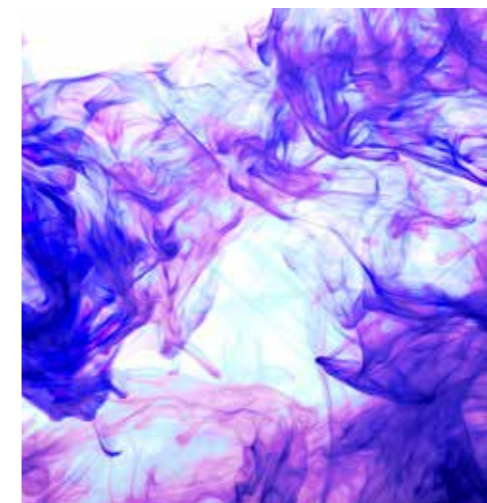
Process

Digital printing		
Textile preparation		
Padding with	2g/l 20–50g/l 5–10g/l 50g/l	ALBAFLOW® PAD PREPAJET™ UNI ALBATEX® AR UV-FAST® P
Pick-up	50–80%	
Printing conditions		
Temperature	20–22°C 68–72°F	with TERATOP® XKS HL inks
Humidity	≥ 60%	
Fixation	8min	170 –180°C/338–356°F in the HT steamer
Washing off		
Rinse	cold	with soft water
Soap	40°C/104°F	with 1–2 g/l ERIOPON® OS
Reduction clear (2x)	60–65°C 140–149°F	with 1–2 g/l caustic soda 36°Bé/66Tw (40% w/v), 2–3 g/l sodium hydrosulfite conc. powder and 1–2 g/l ERIOPON® OS
Soap		with 1–2 g/l ERIOPON® OS
Rinse	50°C/122°F cold	with 1–2 g/l ERIOPON® OS Neutralize, if necessary

Note: CLEANJET PLUS is used as prefilling and cleaning agent



Ink selection



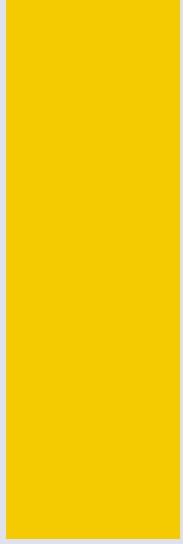

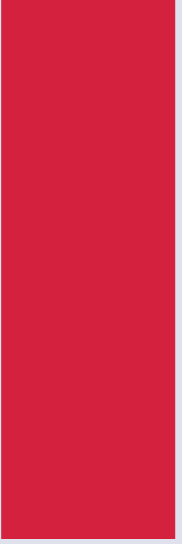


TERATOP® XKS HL inks for industrial printing using Kyocera print head technology

TERATOP® Yellow XKS HL 110
TERATOP® Scarlet XKS HL 190
TERATOP® Red XKS HL 201
TERATOP® Blue XKS HL 455
TERATOP® Jet Black XKS HL 2020

Additional TERASIL® XKS inks are available to enlarge color space if required.

- TERASIL® Cyan XKS 400
- TERASIL® Violet Blue XKS 600
- TERASIL® Grey XKS 700
- TERASIL® Magenta XKS 300

Ink range

TERATOP® XKS HL					
	Yellow XKS HL 110	Scarlet XKS HL 190	Red XKS HL 201	Blue XKS HL 455	Jet Black XKS HL 2020
TERATOP® XKS HL range					
Pattern	100%	100%	100%	100%	100%
Color Values (on PES)					
L*	83	53	47	33	21
a*	3.9	63, 6	66.1	-4.4	1.8
b*	84.5	52, 0	32, 7	-37.2	-0.1
Properties					
Shade change: A / TL 84 / CWF - light source	RR/ R/ R	YBrBr/ RBr/ Y	YBr/ -/ -	RD/ RD/ D	Y/ Y/ Y
Automotive light fastness with 50 g/l UV-FAST® P					
Xenonlight	7-8	7-8	7-8	7-8	7-8
VDA 75202 (Fakra), 5 periods	4	4-5	3-4	4-5	4-5
SAE J1885, 488 kJ	4-5	4	4-5	4-5	4-5
TS L9900 G, Toyota, 750 kJ	4-5	4-5	3-4	4	4-5
Hyundai / Kia, 700 kJ	4-5	4-5	3-4	4-5	4-5
JASO M346-93, 84 MJ	4-5	4-5	3-4	3-4	4-5
GMW 3414 TM, 1354 kJ	4-5	4-5	3-4	3-4	4-5
D47 1431, Renault / PSA, 240h	4-5	4-5	4	3-4	4-5
General fastness					
Dry heat fastness (PES)					
30s at 165°C/329°F	4-5	4-5	4-5	4-5	4-5
30s at 180°C/356°F	3-4	3-4	4-5	3-4	3-4
Rubbing fastness*					
Rubbing dry	4	4	4	4	4
Rubbing wet	4	4	4	4-5	4

*After post setting, 30 sec at 180° / 356° F

Key: **R** redder **RR** much redder **Y** yellower **Br** brighter **BrBr** much brighter **D** Duller — no change

Pretreatment

Pre-washing

To ensure trouble-free dyeing, printing and finishing of polyester automotive fabrics, the goods must be thoroughly prepared. Spinning oils, sizes and contaminants have to be completely removed.

	Ionic character	Description
INVADINE® DA Surfactant	Nonionic	Low-foaming detergent with excellent emulsifying and detergent properties. Removes oily and greasy impurities as well as sizing and soil particles from the fiber. For exhaust application.
INVATEX® CS Cracking agent	Anionic	Ensure the removal of all kinds of fiber impurities such as alkaline earth and heavy metal ions. Prevents precipitation of metal hydroxides, carbonates and silicates on goods and machinery. For both exhaust and continuous/semi-continuous application.
ULTRAVON® PRE Surfactant	Nonionic	Low-foaming, highly effective detergent with outstanding emulsifying and degreasing properties. For continuous and semicontinuous application.

Discontinuous scouring

1.0–2.0 ml/l INVADINE® DA
0.5–1.0 ml/l INVATEX® CS
1.0–2.0 g/l Soda ash

20–30 min at 80–90°C/176–194°F
Rinse
Neutralize, if necessary

Continuous and semi-continuous scouring

2.0–5.0 ml/l ULTRAVON® PRE
1.0–2.0 ml/l INVATEX® CS
x g/l soda ash

1–4 min at 80–90°C/176–194°F
Hot and cold wash off

Note: For scouring and desizing, the pH-range should be adjusted with soda ash or caustic soda 100% in both methods as follows:

PVA-sizes: pH 6.0–8.0 (soda ash)
PES-sizes: pH 7.5–9.5 (soda ash)
Acrylates: pH 10.0–12.0 (soda ash or caustic soda 100%)



UV absorbers

Lightfastness improvers

UV-FAST® HLF NEW and UV-FAST® P ultra-violet (UV) absorbers improve the light fastness and fiber stability of polyester dyeings. On critical substrates such as PES microfiber, texturized and dull yarn and in severe conditions of exposure (high amount of UV, high irradiation energy, long exposure time, high temperature) the amount of UV absorber must be increased. If the fabric is submitted to a heat treatment (post setting, application of a finishing product at high temperature, thermosol dyeing or moulding) or severe fogging tests, the use of UV-FAST® HLF NEW and UV-FAST® P heat-stable UV absorbers is strongly recommended.

	UV-FAST® HLF NEW	UV-FAST® P
Chemistry	Triazine	Triazine
Ionic character	Anionic	Anionic
AOX free	Yes	Yes
Aspect	White Viscous Dispersion	White Viscous Dispersion
Exhaustion rate Conc.: 2% o.w.f.	> 95%	> 95%
Shade change during exposure	Yellower	No
Fiber and dye protection	■	■
Fastness to sublimation at 180°C/356°F	■	■
Dispensing	□	■
Suitability for exhaust	■	■
Suitability for continuous	□	■
Suitability for printing	□	■
Fogging DIN 75201	■	■
Fogging VDA 278	■	■

Effects

Product	Ionic character	Description
DICRYLAN® AS Abrasion protector	Anionic	Aqueous polyacrylate dispersion for coating and padding of textiles.
DICRYLAN® TA-GP Abrasion protector	Nonionic	Aqueous polyacrylate dispersion for coating and padding. Good compatibility with FR and FC.
ZEROSTAT® FC NEW Antistatic agent	Anionic	Non-durable antistatic agent, particularly suitable for combination with oil and water repellents.
FLOVAN® CGN Flame retardant	Nonionic	Non-durable, halogen- and antimony-free flame retardant. Highly effective, very good heat stability and excellent fogging behavior. Compatible with other finishing products.
SAPAMINE® SFC Softeners	Amphoteric	Hydrophilic, silicone-free softener with antistatic properties for all fiber types. Recommended for napping before dyeing, easy to wash off.
TURPEX® ACN NEW Softeners	Nonionic	Cost-effective softener and additive to improve abrasion resistance and sewability.
SAPAMINE® SEW Softeners	Cationic / Nonionic	Silicone-free softener with excellent napping properties. Recommended for best sewability.
MEGASOFT® JET LF 01 Softeners	Nonionic / Cationic	Silicone-containing softener with excellent compatibility with PHOBOL® repellents. Low influence on dye thermomigration.
PHOBOL® CP-S Oil and water repellent	Nonionic / Slightly cationic	Excellent oil and water repellent properties. For stain and soil repellent finish of synthetic fibers.
PHOBOL® CP-U Oil and water repellent	Nonionic / Cationic	For oil, water and soil repellent finish with excellent resistance to mechanical abrasion. Particularly recommended for car upholstery fabrics.
PHOBOL® EXTENDER XAN Extender	Cationic / Nonionic	Extender that enhances the performance of PHOBOL® CP-S and PHOBOL® CP-U.
INVADINE® PBN Wetting agent	Slightly anionic	Particularly recommended for car upholstery fabrics.

Important Xenon arc lightfastness test methods

VDA 75202 (FAKRA)	Guideline 2000 to ISO 105-B06/3; 1998	
Black standard temperature (BST)	100 ± 3°C (212 ± 5.4°F)	
Test chamber temperature (Dry Bulb T.)	65 ± 3°C (149 ± 5.4°F)	
Relative humidity	20 ± 10%	
Irradiance (420 nm)	1.0 to 1.4 W/m²	
Filter system (water cooled)	borosilicate S/soda lime	
Determination of 1 test cycle	4.3 DE* (CIELab) on ISO Blue Wool Ref. No.6	
Number of test cycles d	depending on customer requirements	
Backing	yes (see note)	

SAE J1885 (March 1992)		
	Light cycle	Dark cycle
Length of cycle	3.8 h	1.0 h
Black panel temperature (BPT)	89 ± 3°C (192 ± 5.4°F)	38 ± 2°C (100 ± 3.6°F)
Test chamber temperature (Dry Bulb T.)	62 ± 2°C (144 ± 3.6°F)	38 ± 2°C (100 ± 3.6°F)
Relative humidity	50 ± 5%	95 ± 5%
Irradiance (340 nm)	0.55 W/m²	–
Filter system (water cooled)	quartz/borosilicate S	
Light dosage (radiant exposure)	depending on customer requirements in kJ/m²	
Backing	no	

Toyota TS L9900 G (Toyota method B)		
	Light cycle	Dark cycle
Length of cycle	3.8 h	1.0 h
Black panel temperature (BPT)	89 ± 3°C (192 ± 5.4°F)	38 ± 2°C (100 ± 3.6°F)
Test chamber temperature (Dry Bulb T.)	62 ± 2°C (144 ± 3.6°F)	38 ± 2°C (100 ± 3.6°F)
Relative humidity	50 ± 5%	95 ± 5%
Irradiance (340 nm)	0.55 W/m²	–
Filter system (water cooled)	quartz/borosilicate S 3mm glass filter in front of sample (10mm distance)	
Light dosage (radiant exposure)	400 or 750 kJ/m² depending on application	
Backing	yes (see note)	

JASO M346-93	
Black panel temperature (BPT)	89 ± 3°C (192 ± 5.4°F)
Test chamber temperature (Dry Bulb T.)	not defined
Relative humidity	50 ± 5%
Irradiance (300–400 nm)	48 to 162 W/m²
Filter system	UV component below 320 nm must be less than 1.5% of the whole irradiance between 300 and 400 nm
Light dosage	depending on customer requirements in MJ/m²
Backing	yes (see note)

Note: if the samples are supplied without backing material, they should be mounted on a PET nonwoven fleece (minimum 5 mm).

Important Xenon arc lightfastness test methods

Renault/PSA D47 1431: Ci3000	
Black standard temperature (BST)	100°C, min 98°C (212°F, min 208°F)
Test chamber temperature (Dry Bulb T.)	66°C (151°F)
Relative humidity	30%
Irradiance (420 nm)	1.4 W/m²
Filter system (water cooled)	borosilicate S/soda lime
Test duration	150, 200 or 240 h dependent on application
Backing	yes (see note)

GMW3414 TM (General Motors)		
	Light cycle	Dark cycle
Length of cycle	3.8 h	1.0 h
Black panel temperature (BPT)	105 ± 3°C (221 ± 5.4°F)	38 ± 2°C (100 ± 3.6°F)
Test chamber temperature (Dry Bulb T.)	65 ± 2°C (149 ± 3.6°F)	38 ± 2°C (100 ± 3.6°F)
Relative humidity	25 ± 5%	95 ± 5%
Irradiance (420 nm)	2.2 W/m²/nm (± 0.02)	–
Filter system (water cooled)	CIRA inner/soda lime outer plus (lantern using 3mm float glass long pass filter, 320 nm cut-on)	
Light dosage (radiant exposure)	903.0 – 1053.5 – 1204.0 – 1354.5 kJ/m²	
Reference	Polystyrene plastic or Blue Wool	
Backing	PES Fleece	

DVM-0067-MA (Ford)		
	Light cycle	Dark cycle
Length of cycle	3.8 h	1.0 h
Black panel temperature (BPT)	89 ± 3°C (192 ± 5.4°F)	38 ± 2°C (100 ± 3.6°F)
Test chamber temperature (Dry Bulb T.)	62 ± 2°C (144 ± 3.6°F)	38 ± 2°C (100 ± 3.6°F)
Relative humidity	50 ± 5%	95 ± 5%
Irradiance (420 nm)	1.06 W/m²/nm	–
Filter system (water cooled)	Quartz inner/borosilicate outer plus (lantern using 335 nm long pass filters type "SF5")	
Light dosage (radiant exposure)	–	
Reference	–	
Backing	no	

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