Improved UV Hybrid Ink Formulary Guide

December 15, 2020

To manufacture this new UV Hybrid ink, it is necessary to make the ink in a 2-step process. The first process is to make a pigment concentrate using the following formulation. The three components listed below should be milled until you have a homogeneous mixture with no scratches on a grind gauge:

Pigmented Base

Pigment of Choice	25 – 35%
KB-448 Hybrid Grinding Vehicle	30 – 50%
KS-307 Grinding Vehicle	10 – 25%
KB-149	03 – 05%
KS-266	03 – 10%
	100.0%

For an ink with faster curing and a harder cured film, use more of the KS-307 for the KB-448 in the Pigmented Based formulation above.

Final 4 Color Process Ink Formulation

Material	Yellow Ink	Red Ink	Blue Ink	Black Ink
Yellow Base	30 – 50%			
Red Base		45 – 60%		
Blue Base			45 – 60%	03 – 05%
Black Base				40 – 55%
KS-236 Free Flow	10 – 20%	05 – 15%	05 – 15%	03 – 06%
KS-370 Gel	05 – 20%	05 – 10%	05 – 10%	05 – 10%
KS-276 Gel	05 – 20%	20 – 30%	20 – 30%	20 – 30%
KS-226 Photoinitiator	03 – 06%	04 – 07%	05 – 08%	07 – 12%
KS-237Gel Monomer	01 – 05%	02 – 04%	02 – 04%	02 – 04%
KB-149	01 – 02%	01 – 02%	01 – 02%	01 – 02%

The above formulation need not be milled. It is possible to mix these materials together using a mixer that will make a homogeneous mixture. The KS-237 and KB-149 should be used to adjust tack to the desired level but a minimum of 1% of each should be added to the inks. Once mixed well, a mill should be used to remove air and fill containers.

For the best possible results, the use of KS-626 UV Coating over the Hybrid Inks is strongly recommended to be applied.

Technical
Data Sheet

KB-448

Hybrid Flushing/Grinding Varnish

Product Description

KB-448 is a soy-based vehicle developed specifically as a flushing/grinding medium for the development of hybrid energy curable inks**. KB-448** exhibits excellent compatibility when used in conjunction with **Kustom's Hybrid Letdown Vehicle System.**

Performance Characteristics

- Building block for high gloss hybrid ink system for in-line UV coating.
- Superior litho properties versus most energy curable inks
- Excellent pigment wetting properties

Physical Properties

Tack @ 400 RPMs/1':	19.0-23.0
Viscosity in Poises:	550-650
Yield Value in Dynes/cm2:	N/A
% Solids:	98-100

Technical Data Sheet

KS-307

Kustom Kure Low Viscosity Polyester Dispersion Vehicle

Product Description

KS-307 is Fatty Acid Modified Hexa-functional Polyester. KS-307 is recommended as an additive for flow or use to enhance flexibility and pigment wetting in place of epoxy acrylate. KS-307 has good pigment wetting, litho properties, and cure speed.
For additional information regarding formulary assistance and applications, please contact your KUSTOM SERVICES, INC. representative.

Performance Characteristics

- Excellent pigment wetting
- Good Litho Properties
- Good reactivity and low viscosity

Physical Properties

• Viscosity	65 – 85 Poise
• Specific Gravity	1.10
• Solids	> 99%

Suggested Starting Ink Formulary

Please refer to the SUGGESTED INK FORMULARY bulletin for starting ink formulations. These are intended as starting formulae only. Substrate, press and other variables must be addressed by the formulator for each application.

Storage and Handling Information

Care should be taken not to expose radiation curable products to temperatures exceeding 100°F for prolonged periods of time or to direct sunlight. Storage must be in a cool, shaded, well-ventilated and dry area. To do otherwise might cause uncontrollable polymerization of the product with generation of heat. Do not store this material under an oxygen-free atmosphere. This material should not be stored for more than six (6) months.

Certain precautions should be taken when handling this product. Please refer to the Material Safety Data Sheet (MSDS) for further details. This product contains materials that may cause moderate skin injury (reddening and swelling) and/or sensitization. Since irritation may not occur immediately, contact can go unnoticed. Consult the MSDS for appropriate equipment prior to using this or any other materials referred to in this Technical Data Sheet.

Technical Data Sheet

KB-149

Tridecyl Alcohol (TDA)

Product Description

KB-149 is been used in the ink industry for many years as a sweetner solvent to reduce thixotrophy and increase flow. **KB-149** is a very effective tack reducer.

Physical Properties

Property	
Molecular Weight:	200
Density, g/mL:	0.84
Boiling Point, C (F):	252 (486)
Appearance:	Clear Liquid

Technical Data Sheet

KS-266

Kustom Kure TMPTA

Product Description

KS-266 is recommended as a tack reducer for UV-curable lithographic and flexographic inks where high performance and fast cure are desired. Typical applications include inks for use on plastic, metal, paper, paperboard and other substrates. For additional information regarding formulary assistance and applications, please contact your KUSTOM SERVICES, INC. representative.

Performance Characteristics

- Good cure speed without brittleness
- Good solvency
- 100% reactive in UV ink systems

Physical Properties

- Viscosity 100 – 110 cps
- Specific Gravity 1.10
- Solids 100%

Suggested Starting Ink Formulary

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Storage and Handling Information

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Technical Data Sheet

KS-236

Gelled Fatty Acid Modified Hexa-Functional Polyester

Product Description

KS-236 properties include good pigment wetting, fast cure, and good lithographic performance. Good choice for hybrid with easy cleanup. KS-236 may have adhesion potential to some flexible plastic substrates. Typical applications include commercial sheet-fed and folding carton work on paper, paperboard and select plastic stocks. For additional information regarding formulary assistance and applications, please contact your KUSTOM SERVICES, INC. representative.

Performance Characteristics

- Improves transfer properties and roller stability
- Easy cleanup properties for use in hybrid ink.
- Excellent cure response
- Excellent printability
- Reduced misting versus typical straight polyester acrylates.

Physical Properties

• Viscosity	100 – 300 Poise
• Yield	1000 – 3000 dynes/cm^2
• Tack	4 – 8 @ 400 RPM @ 1 minute
• Specific Gravity	1.01
• Solids	> 99%

Suggested Starting Ink Formulary

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Storage and Handling Information

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Technical Data Sheet

KS-370

Kustom Kure UV Gelled Polyester Vehicle

Product Description

KS-370 is recommended as a low tack letback vehicle for UV-curable lithographic inks where high performance and fast cure are desired. Typical applications would include commercial sheet-fed and folding carton work on paper, paperboard and other substrates. For additional information regarding formulary assistance and applications, please contact your KUSTOM SERVICES, INC. representative.

Performance Characteristics

- Excellent cure response
- Excellent printability
- Reduced misting and enhanced gloss without the use of dry additives

Physical Properties

- Viscosity 150 – 300 Poise
- Yield 1300 – 1800 dynes/cm^2
- Tack 2 – 4 @ 400 rpm/1 minute
- Specific Gravity 1.01
- Solids > 99%

Suggested Starting Ink Formulary

Please refer to the SUGGESTED INK FORMULARY bulletin for starting ink formulations. These are intended as starting formulae only. Substrate, press and other variables must be addressed by the formulator for each application.

Storage and Handling Information

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Technical Data Sheet

KS-276

Kustom Kure Low Tack UV Gel Vehicle

Product Description

KS-276 is our flagship UV workhorse gel vehicle. KS-276 is a versatile energy cure vehicle system recommended for most UV/EB paste ink applications including lithographic inks, hybrid inks, letterpress inks, business form inks, carton inks, and label inks. Gel chemistry promotes sharper printing and better litho properties versus typical UV oligomers. Suitable for most paper, paperboard, and foil coated substrates. For additional information regarding formulary assistance and applications, please contact your KUSTOM SERVICES, INC. representative.

Performance Characteristics

- Excellent ink/water balance
- Good cure response
- Reduced misting and enhanced gloss without the use of dry additives
- Formulated for easy cleanup with less aggressive press washes
- Exceptional hold-out
- Low tack versus other comparable UV gel vehicles

Physical Properties

• Viscosity	700 – 1000 Poise
• Yield	6000 – 10,000 dynes/cm^2
• Tack	20 – 24 @ 400 rpm/1 minute
• Specific Gravity	1.11
• Solids	> 99%

Suggested Starting Ink Formulary

Please refer to the SUGGESTED INK FORMULARY bulletin for starting ink formulations. These are intended as starting formulae only. Substrate, press and other variables must be addressed by the formulator for each application.

Storage and Handling Information

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Technical Data Sheet

KS-226

UV Liquid Photoinitiator Blend

Product Description

KS-226 is a liquid photoinitiator blend, effective for flexo, litho, screen, especially recommended for darker colors, *whites and thicker films. For additional information regarding formulary assistance and applications, please contact your KUSTOM SERVICES, INC. representative.

Performance Characteristics

- Excellent cure response especially with darker colors
- For use with all standard organic and select carbon black pigments and white*
- Low viscosity liquid – easy to blend into ink system
- Blend of selected photoinitiators with broad cure response

Physical Properties

• Viscosity	20 – 35 Poise (TA Rheometer)
• Specific Gravity	1.10
• Solids	> 99%
• Appearance	Liquid

Suggested Starting Ink Formulary

KS-226 can be used at a concentration of 1-8% by weight of the total formula. KS-226 may also be used in combination with other photoinitiators. Please refer to the SUGGESTED INK FORMULARY bulletin for starting ink formulations. These are intended as starting formulae only. Substrate, press and other variables must be addressed by the formulator for each application.

Storage and Handling Information

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*High percentages in a white ink may affect whiteness, always test first.

DATE REVISED: 06/07/2018

Technical Data Sheet

KS-237

Kustom Kure Gelled EOTMPTA

Product Description

KS-237 is recommended as a gelled monomer for UV-curable lithographic, flexographic and silk-screen inks where high performance, fast cure and rheology modification are desired. Typical applications include inks for use on plastic, metal, paper, paperboard and other substrates. For additional information regarding formulary assistance and applications, please contact your KUSTOM SERVICES, INC. representative.

Performance Characteristics

- No splash low viscosity solid
- Easy to add at press side using an ink spatula
- Safer to use versus liquid monomer
- Minimal misting without the use of dry additives
- Very effective in reducing tack and viscosity of UV ink

Physical Properties

- Appearance Clear Tackless Gel
- Specific Gravity 1.11
- Solids 100%

Suggested Starting Ink Formulary

It is recommended that KS-237 be evaluated part-for-part versus ungelled EOTMPTA in an existing formula to determine changes in rheology and other performance. Please refer to the SUGGESTED INK FORMULARY bulletin for starting ink formulations. These are intended as starting formulae only. Substrate, press and other variables must be addressed by the formulator for each application.

Storage and Handling Information

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Technical Data Sheet

KS-626

High Gloss UV Coating

Product Description

KS-626 is recommended for use as a UV coating to be applied in-line over UV or hybrid UV ink systems. Typical applications include commercial sheet-fed printing on paper or paperboard substrates where excellent gloss and minimal gloss-back are desired. For additional information regarding assistance and applications, please contact your Kustom Services, LLC representative.

Performance Characteristics

- Excellent gloss and clarity
- Excellent cure response
- Not considered imprintable, foil-stampable, glueable, etc.

Physical Properties

• Viscosity	21 - 24 sec. #3 Zahn
• Specific Gravity	1.11
• Solids	> 99%

End Use Considerations

KS-626 should be evaluated in the laboratory using the actual ink system and substrate to ensure that leveling, intercoat adhesion, gloss and other performance characteristics are acceptable. In general, UV coatings may not exhibit complete intercoat adhesion over some ink systems. A primer may be considered for use if this property needs to be improved.

Storage and Handling Information

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DATE REVISED: 04/18/2018