SUPERCHLON / AURORENN

Adhesion Promoter for “hard adhere” Substrates

- Nippon Paper Industries -

Distributed by: GSI Creos

SUPERCHLON- What is it?

- Chlorinated Polyolefin resin (solid pellet)
- Excellent adhesion to low surface energy substrate containing olefinic material.
  - Ex….Polypropylene (PP), Thermoplastic olefin elastomer (TPO)
- Applicable as an additive to various resin system after diluted by solvents:
  - Recommended dosage for Ink application: 0.1% ~ 1% (solid/solid)
    *Superchlon diluted solution Solid = 15%
  - Recommended dosage for paint/coating/adhesive application: 4% ~ 5% (solid/solid)
    *Superchlon diluted solution Solid = 15%
- Applicable as a primer or as a binder (main polymer) after diluted by solvents

SUPERCHLON- How to choose?

1. **Chlorine Content –**

   - Higher: Better Solubility to Solvents & Compatibility to binder polymer
   - Lower: Stronger Adhesion to Substrates

2. **Molecular Weight –**

   - Higher: Stronger Adhesion to Substrates
   - Lower: Better Solubility to Solvents & Compatibility to binder polymer

SUPERCHLON- GRADES (Pellets)

GRADE	Chlorine Content (%)	Molecular Weight (Reference Value)	Softening Temperature (℃)	Characteristic
JF2211S	20~23	110000	55~70	Good chemical resistance
S-2426S	18~21	110000	65~75	Excellent chemical resistance
JF721S	19~22	70000	60~70	Suitable for lower baking temperature
822S	23~26	60000	70~80	Standard grade, widely used
814HS	39~43	15000	80~90	For urethane ink / adhesive. UV system
390S	33~37	30000	55~65	For urethane ink / adhesive, UV system
JFM2029S	28~31	20000	80~90	For vinyl ink / adhesive

SUPERCHLON- Solubility①

Solvent Formulation (%)	A	B	C	D	E	F
Toluene or Xylene or Aromatic 100	97	87	50	50	50	
Cyclohexane		10	40	40	40	40
MAK (Ketone)			10			50
MEK or MIAK (Ketone)				10		
Butyl Acetate					10	
Iso-butanol						10
IPA (Alcohol)	3	3				

SUPERCHLON pellets solid content= 15%

SUPERCHLON- Solubility②

Non-Aromatic Solvents

	814HS*1	390S*1	JFM2029S*2
Ethyl Acetate	Excellent	Good	Good
Propyl Acetate	Good	Good	Good
MEK	Good	Good	Good

*1: SUPERCHLON 390S&814HS solid content = 50%
*2: SUPERCHLON JFM2029S solid content = 10%

*3: 814HS shows better solubility due to its higher chlorine content and lower Mw.
But 390S or JFM2029S tends to show better adhesion to substrates due to its lower chlorine content and higher Mw.

*4: 390S&814HS are also soluble with UV-monomers such as HDDA, NDDA and TPGDA.

SUPERCHLON- Primer application

Starting Formulation Guide as a Primer for automotive plastics

	%
Superchlon 822S or JF721S or other	15
TiO2	5
Stabilizer (Ex: Epikote 828)	1
Solvent (Xylene)	79

*For other solvent combination, please refer to page 5 of this presentation.

SUPERCHLON- INK①

Starting Formulation Guide as an additive to Inks

PU based Ink	%
PU Resin	8
TiO2	20
(*2)Solvent	70
(*3)Superchlon	2

Vinyl based Ink	%
(*1)Vinyl Copolymer	7
TiO2	20
Methyl Ethyl Ketone	20
Toluene	50
(*3)Superchlon	3

*1: Blend of LAROFLEX MP45 and EVAFLEX, ratio of 5:3

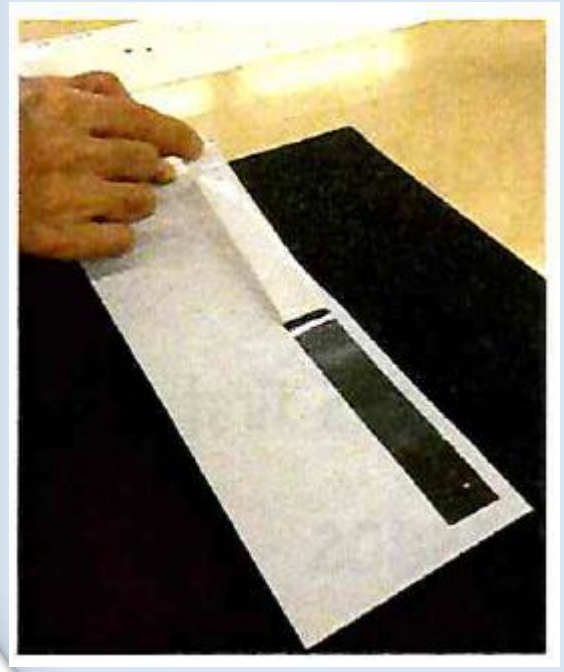
*2: MEK, Ethyl Acetate, Propyl Acetate or blend of these solvents

*3: 814HS or 390S or JFM2029S diluted solution

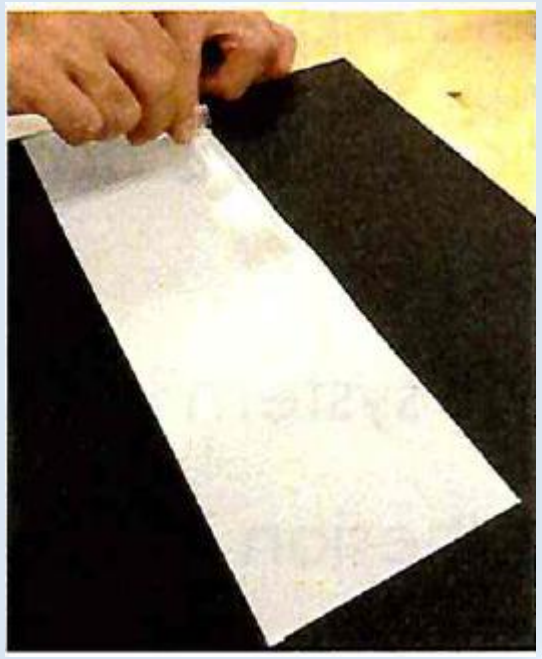
SUPERCHLON – INK②

As an additive in PU Ink

Without Superchlon



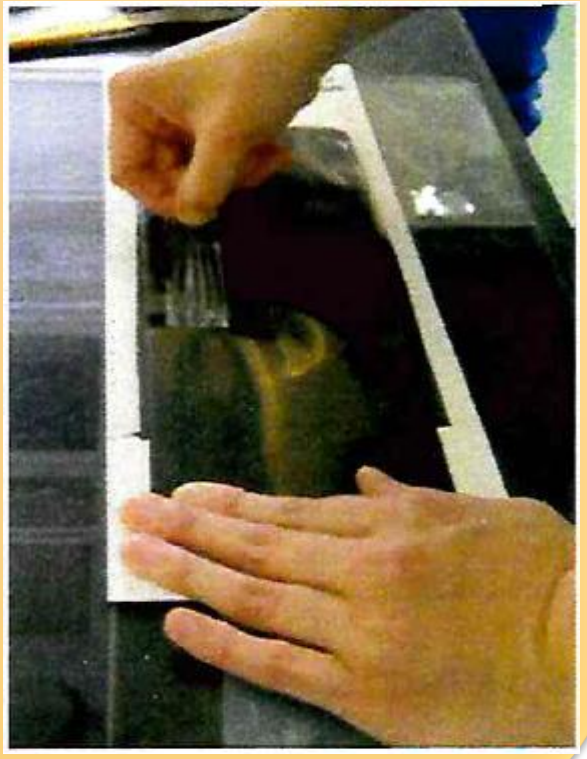
With Superchlon



As an additive in Vinyl Ink

Without Superchlon

With Superchlon



*1: Substrate – Non treated PP Film

SUPERCHLON- Adhesive (PSA) application

Starting Formulation Guide as an undercoat for adhesive layer

	%
Superchlon 822S or JF721S	2.5
EVA (Elvax 210)	7
Alkyl Phenolic Resin	0.5
Solvent (toluene, xylene..etc)	90

*For other solvent combination, please refer to page 5 of this presentation.

SUPERCHLON- Primer for shoe adhesive

Starting Formulation Guide as a primer for EVA & PP shoe adhesive

	%
Superchlon 814HS or 390S	3
Xylene Or UV monomers (HDDA or NDDA)	97

*Curing condition: Room temperature cure with few minutes.

*Over this primer, normal shoe adhesives can be applied

SUPERCHLON- GRADES (Waterborne)

GRADE	Chlorine Content (%)	Molecular Weight (Reference Value)	Softening Temperature (℃)
E-480T	21	70000	60~70
E-415	15	110000	80~90
S-4625	15	110000	80~90

*Neutralizer
E-480T, E-415: morpholine, S-4625: DMEA

SUPERCHLON- Waterborne application

Starting Formulation Guide as a water based coating

	% -A	% - B
Superchlon waterborne (30% solids)	20	25
Acrylic waterborne (30% solids)	45	
Polyurethane waterborne (30% solids)		40
Water	15	15
Coalescing Agent*	5	5
Pigment / Color**	15	15

*Coalescing agent : EDG, DEGEA

*Dispersion process :
Superchlon waterborne / Pigment / Dispersion agent / Antifoaming agent
(Blend ration : 20-30 / 15 / 2 / 5)

AUROREN- What is it?

- Non-chlorinated polyolefin resin(solid pellet)
  - Specially modified polyolefin
- Excellent adhesion promoter for various substrates:
  - Polypropylene, TPO, “hard adhere” plastic substrates, Aluminum-foil
- Applicable as an additive or as a primer or as a binder (main polymer) after diluted by a solvent
- Gives soft feel coating

AUROREN- How to choose?

1. **Molecular Weight –**

   - Higher: Stronger Adhesion to substrates
   - Lower: Better Solubility to Solvent & Compatibility to binder

2. **Acid Modification degree –**

   - Higher: Better Solubility to Solvent & Compatibility to binder
   - Lower: Stronger Adhesion to substrates

AUROREN- GRADES (Pellets)

GRADE	Molecular weight (X 10000)	Softening Temperature (C)	Degree of acid modification	Specialty
100S	4~8	75~85	High	Standard grade for lower temp curing. Better solubility.
150S	4~8	105~135	High	Standard grade for higher temp curing. Better solubility.
350S	5~10	65~75	Medium	Better adhesion to various substrate

AUROREN- Solubility

Solvent Formulation (%)	A	B	C	D	E
MethylCycloHexane	80				
Toluene				70	50
n-Heptane		90	100		
Cyclohexane				27	40
Butyl Acetate					10
MEK or MAK	20	10			
IPA				3	

AUROREN pellets solid content= 15%

How to make a solution?

1.Put “SUPERCHLON OR AUROREN pellets" into the dissolution tank.

↓

2.Pour solvent(s) into the dissolution tank.

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3.Stir the solution at 50C ~ 60C and dissolve completely.

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4.Filtering

*1: Using either acid proof stainless or glass lined tank are recommended for dissolution tank materials.
*2: If heating cannot be done to the tank, it will take more time to dissolve completely.
*3: Do NOT keep pellets and solvents in the tank too long before stirring. Start of the step 3 right after step 2 is highly recommended for best performance.