



SU-315V

Low curing type cross-linker

SU-315V is a blocked isocyanate type cross-linker which generates activated isocyanate by heat treatment. SU-315V shows excellent performance as adhesion accelerator or cross-linker or reinforcing agent. SU-315V can be emulsified easily when diluted with water and after mix with binder or adhesive it shows superior cross-linking performance by drying and curing.

SU-315V is low curing type. SU-315V shows excellent stability after mixing with binder compared with aziridine or water dispersed isocyanate or epoxy type cross linking agent which are low curing type cross-linker,

GENERAL PROPERTIES

Appearance	: Slightly yellowish ~ yellowish viscous liquid
Composition	: Glycolether-base solvent solution of blocked poly-isocyanate
Ionic activity	: Nonionic
pH (as product)	: Weakly alkaline(10% solution)
Solubility	: Soluble in water

CHARACTERISTICS

SU-315V has following characteristics.

1. It is low curing temp type cross-linker and also it will not generate aryl amine by heating.
2. It is solvent base product but it can be emulsified easily after dilute with water.
3. In combination with water-base adhesives such as acrylic type latex or SBR type latex, it improves adhesion strength significantly by thermal treatment. Especially if use it with the adhesive having active hydrogen functional group, it shows excellent performance.
4. After add it into resin emulsion and dry & cure, the strength of resin will be improved.
5. After add it into water-soluble resins and dry & cure, the water soluble resin becomes insoluble resin.
6. In combination with binder and pigment, It improve rubbing fastness and washing fastness of printed cloth remarkably.
7. In case of natural leather application, It improve rubbing fastness and peeling strength even if it is not able to apply high temperature.
8. It shows less-yellowing property since it is used aliphatic type isocyanate as raw material.
9. It shows excellent stability after mixed with resin emulsion. it does not cause ticking or gelling. After mixed it with resin emulsion shows much longer pot life than aziridine, isocyanate and epoxy type cross-linking agents.

APPLICATION

- Adhesion accelerator for various adhesives.
- Cross-linking agent
- Adhesive agent
- Reinforcing agent for various resins

HOW TO USE

1. Method of dilution

This product is viscous liquid. So it is better to dilute with two times water to make emulsion. It is self emulsify type product and after add water, it makes emulsion easily.

2. Dosage

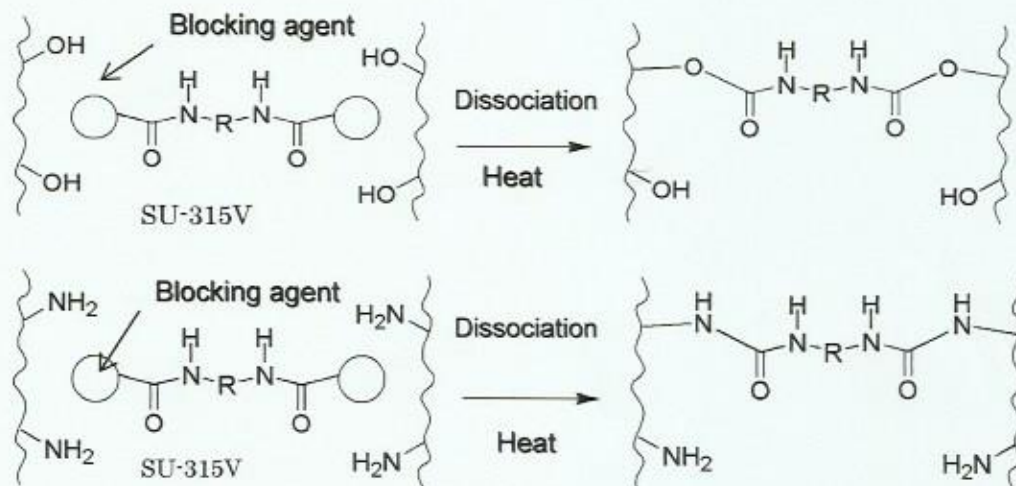
It will be varied depending on the substrate to be treated and the required performance. It is necessary to test in lab to determine suitable dosage.

(Caution for handling :)

1. When it is used with other chemicals, it is necessary to test compatibility before use both of lab and bulk process and conditions.
2. When open the lid of package, please put on protective equipment to avoid contact with splash caused by internal pressure.
3. After use, Keep container tightly sealed and store in 5-35°C and avoid exposure to sunlight.
4. Please stir the prepared solution slowly.
5. Handle carefully to avoid mixing of water into storage container because there is a possibility of deterioration of product and gelatin.
6. May appearance become cloudy at low temperature such as in winter time but not affect to quality and performance.

Mechanism of cross linking

SU-315V is blocked isocyanate type cross-linking agent. The blocking agent dissociate and activate isocyanate will be generate by thermal treatment and chemically react and cross-link with active hydrogen of polymer. (OH group and NH₂ group are illustrated in the below figure as an example.)



EXAMPLES FOR USE

EXAMPLE 1; (Rubbing fastness and Wear off of color)

Test conditions:

Tested sample; Cotton for standard test (Gabardine, White)
 Treated condition; Print → Dry → Thermal treatment
 (or no thermal treatment)

Printed condition; 100 mesh screen

Dry condition; 100°C x 2min.

Thermal treatment condition:

1: Room temp. x 7days

2: 110°C x 2min.

3: 130°C x 2min.

4: 150°C x 2min.

Table 1

(wt%)

Recipe No.	1		2		3	
Pigment paste (8%) containing acrylic binder	80.8		80.8		80.8	
SU-315V (65%)	-		1.5		3	
Water	19.2		17.7		16.2	
Total	100		100		100	
Rubbing fastness	Dry	Wet	Dry	Wet	Dry	Wet
Room temp. x 7days	3	1	3	1-2	3	1-2
110°C x 2min.	3	1	3	2	3	2-3
130°C x 2min.	3	1	3	3	3	3
150°C x 2min.	3	1-2	3	3-4	3	4
Wear off of color	Dry	Wet	Dry	Wet	Dry	Wet
Room temp. x 7days	5	1	5	3	5	3-4
110°C x 2min.	5	1	5	3-4	5	4
130°C x 2min.	5	1	5	4-5	5	5
150°C x 2min.	5	1-2	5	5	5	5

Evaluation method:

Rubbing fastness JIS L 0849-2013 type II (Gakushin-Type method)

Evaluation criteria:

Rubbing fastness: 5 (No color transfer to white cotton) ⇔ 1 (Terrible color
transfer to white cotton)

Wear off of color: 5 (No wear off) ⇔ 1 (Terrible wear off)

EXAMPLE 2; (washing fastness)

Test conditions:

Tested sample; Cotton for standard test (Gabardine, White)
 Treated condition; Print → Dry → Thermal treatment
 (or no thermal treatment)

Printed condition; 100 mesh screen

Dry condition; 100°C x 2min.

Thermal treatment condition:

1: Room temp. x 7days

2: 110°C x 2min.

3: 130°C x 2min.

4: 150°C x 2min.

Home laundering (HL) condition:

Domestic washing machine 40°C or 60°C for 30min.

Washing time: 30min. (Rinsing time: 2min. x 2 times)

Detergent: "ATTACK" (KAO Japan Co., Ltd) 0.65g/L

Table 2

	(wt%)					
Recipe No.	1		2		3	
Pigment paste (8%) containing acrylic binder	80.8		80.8		80.8	
SU-315V (65%)			1.5		3	
Water	19.2		17.7		16.2	
Total	100		100		100	
Rubbing fastness	40°C	60°C	40°C	60°C	40°C	60°C
Room temp. × 7days	1	1	3-4	3-4	3-4	3-4
110°C x 2min.	1	1	4	4	5	5
130°C x 2min.	2	1	5	5	5	5
150°C x 2min.	2	2	5	5	5	5

Evaluation method: Evaluated change of color after washed with above washing conditions.

Evaluation criteria:

Change of color 5

(No color change)



⇔

(Terrible color change)

Change of color 1



EXAMPLE 3: (Pot life after prepare printing past)

Regarding pot life after prepared printing paste, aziridine, isocyanate and epoxy type cross-linking agents cause performance degradation and gelation in a short time. (Figure 3)

SU-315V does not cause gelation and unlikely to occur performance degradation. To prevent performance degradation, increase dosage of SU-315V is effective. Even if performance dropped, it can be refreshed by adding SU-315V and shows good performance again. (Figure 4)

In case of use other cross-linker, one day after prepare printing paste, it has to be dispose because of gelation but SU-315V recipe past can be use.

*Please check the performance and physical properties at laboratory before use.

Figure 3 Prepared paste stability after mixed with pigment paste

Cross linking agent	SU-315V	Isocyanate compound	Epoxy compound	Aziridine compound
After 50°C×24hr	Not changed	Semi-gelled	Gelled	Increased viscosity.

Test conditions;

Tested sample; Cotton for standard test (Knit)

Treated condition; Print → Dry → Thermal treatment
(or no thermal treatment)

Printed condition; 100 mesh screen

Dry condition; 100°C x 2min.

Thermal treatment condition;

1: Room temp. × 7days 2: 110°C x 2min.
 3: 130°C x 2min. 4: 150°C x 2min.

Figure 4

	(wt%)					
Recipe	1		2		3	
Pigment paste(Solid content 8%) Containing acrylic binder	80.8	80.8	80.8	80.8	80.8	80.8
SU-315V (Solid content 65%)	1.5	1.5	1.5+1.5	3	3	3+3
Water	17.7	17.7	17.7	16.2	16.2	16.2
Total	100	100	101.5	100	100	103
Rubbing fastness	(Dry)	(Wet)	(Dry)	(Wet)	(Dry)	(Wet)
Room temp. × 7days	1-2	1	1-2	1-2	1	1-2
110°C x 2min.	2	1	2	2-3	1	2-3
130°C x 2min.	3	1	3	3	1-2	3
150°C x 2min.	3-4	1-2	3-4	4	2	4
Washing fastness	(Dry)	(Wet)	(Dry)	(Wet)	(Dry)	(Wet)
Room temp. × 7days	3	1	3-4	3-4	1	4
110°C x 2min.	3-4	1	4	4	2	4
130°C x 2min.	4-5	2	5	5	3	5
150°C x 2min.	5	2-3	5	5	4	5
Time after prepared paste	Right after prepared	After 24 hours at 50°C	Add SU-315 V again	Right after prepared	After 24 hours at 50°C	Add SU-315 V again

EXAMPLE 4: (Adhesive performance for Natural leather)

Test conditions:

Tested sample; Natural leather

Treated condition; brush painting → Dry → Thermal treatment
 (or no thermal treatment)

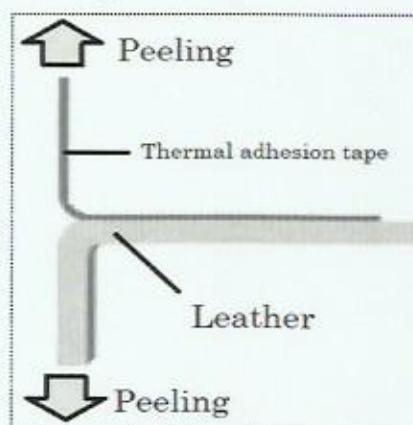
Coating amount 1g/15cm x 5cm leather

Dry condition; 90°C x 1min.

Thermal treatment condition;

1: 90°C x 1 min. 2: 40°C x 3 days

	(wt%)	
Recipe No.	1	2
Urethane binder (40%)	33	33
SU-315V (65%)		2.3
Water	67	64.7
Total	100	100

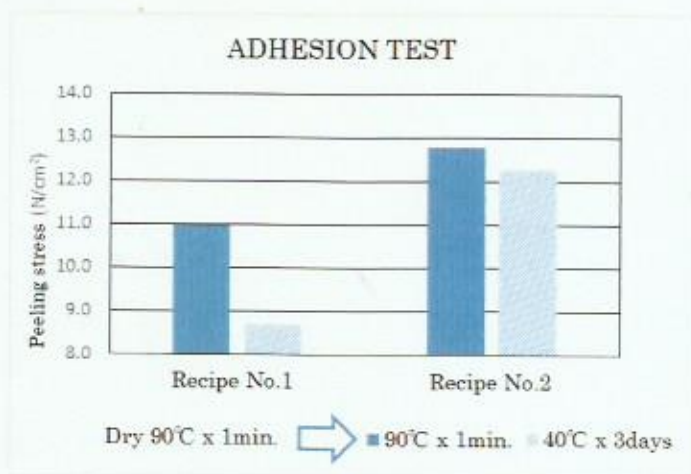


Evaluation method:

Apply prepared chemical to natural leather

Fuse thermal adhesion tape to natural leather

Then peeling strength is evaluated by Tensile testing machine



EXAMPLE 5: (Relation with temperature and viscosity)

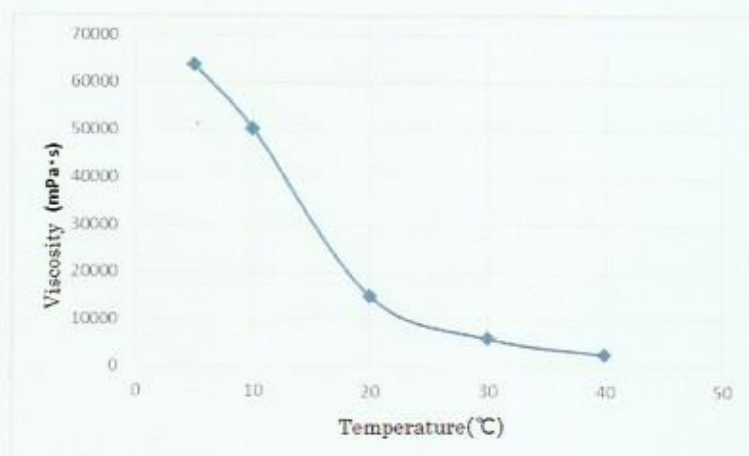
SU-315K has a property of increasing viscosity at low temperature.

(Please refer table 4)

Please warm up before if you have problem of handling.

*please avoid to keep high temperature or streamed storage conditions.

Table 4



FOR YOUR PRODUCTION

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