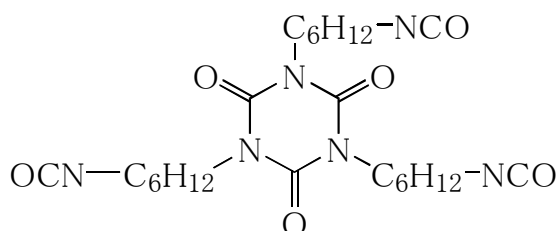


**Type** Aliphatic polyisocyanate (HDI Trimer)



## Features

- # High NCO content
- # Ultra-Low viscosity
- # Excellent weather resistance
- # Excellent compatibility
- # Good coating film appearance
- # Long pot-life for Waterborne 2K-PU applications

## Applications

- # High-solid 2K-PU applications
- # Waterborne 2K-PU applications
- # Non-solvent 2K-PU applications
- # Casting resin
- # Automotive OEM coatings
- # Automotive refinishes
- # Plastic coatings

## Typical properties

Appearance	Colorless to slightly yellowish clear liquid
Non-volatile	100 wt%
Solvent	None
NCO content	23.0 wt%
Viscosity	300 mPa · s at 25°C
Color value	< 1 (Gardner)
NCO equivalent weight	Approx. 183
Flash point	181°C
Relative density	1.15(20 °C) (H <sub>2</sub> O = 1)

These values provide general information and are not part of the product specifications.

## Comparison with Conventional Trimer and Low-viscosity trimer

	TUL-100	TLA-100	TKA-100
Viscosity mPa · s/25°C	300	500	2,600
NCO content %	23.0	23.3	21.7
NV %	100	100	100
Weather resistance of cured film	Excellent	Excellent	Excellent

## Storage

DURANATE™ TUL-100 is sensitive to moisture and should therefore always be stored in sealed containers.

## ●Evaluation results of solvent borne 2K-PU coating

### Curability ; gel-fraction, hardness of film:

#### Formulation 1

PI	90°C -30min.		120°C -30min.	
	Gel fraction %	Hardness	Gel fraction %	Hardness
TUL-100	85	80	96	129
TLA-100	87	91	96	132
TKA-100	90	109	98	134

- Polyol (Acrylic Polyol, Setlux1903, N.V.;75% supplier: Nuplex Resins, OH:4.5wt%(on resin))

#### Formulation 2

PI	23°C cure - Gel fraction %					23°C cure – hardness (Köning)				
	7Hr	1day	2day	5day	7day	7hr	1day	2day	5day	7day
TUL-100	<10	68	86	93	94	14	36	61	90	95
TKA-100	<10	71	87	93	93	15	36	59	90	97

- Polyol (Acrylic Polyol, Setlux1184,N.V.;51% supplier Nuplex Resins, OH: 2.0wt%(on resin))

#### Formulation & Film :

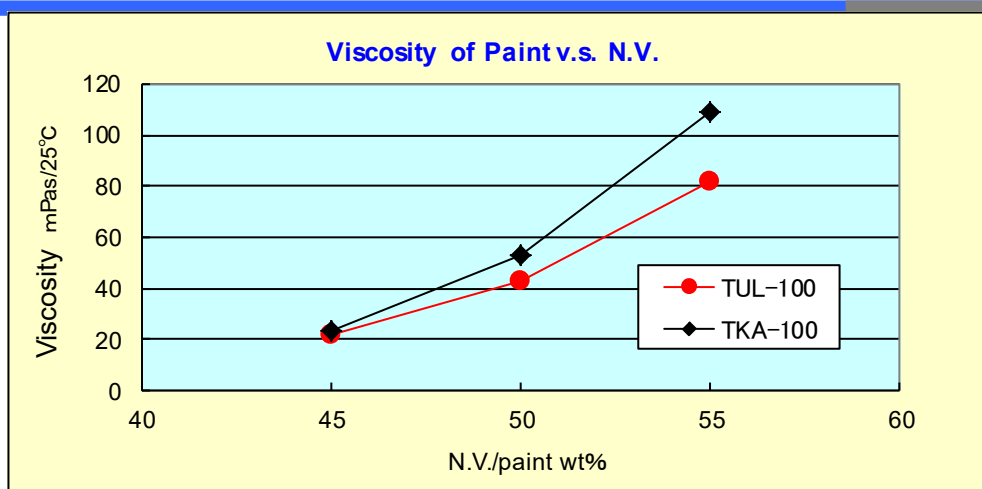
- NCO/OH=1.0
- No Catalyst
- Dry film thickness; 40 μ m

#### Method:

- Gel fraction; Ratio of the insoluble film weight in acetone before and after 24Hr at 23°C
- Hardness of film; Köning

**The coating solution using TUL-100 shows good curability almost the same as using standard Polyisocyanurate.**

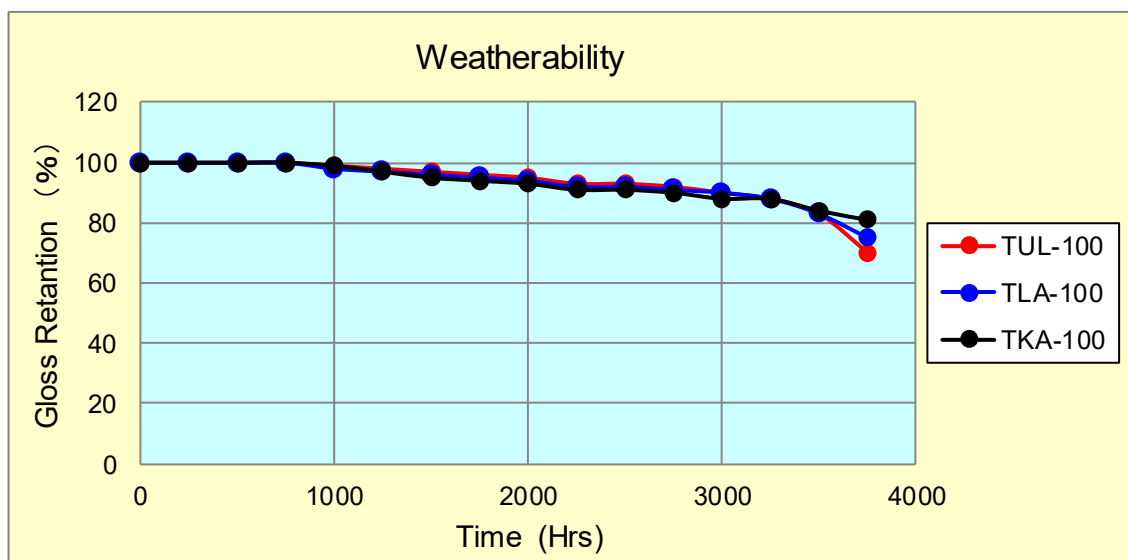
### N.V. vs. Viscosity of Paint ( For high solid ):

**Formulation & Film :**

- Polyol (Acrylic Polyol, Setlux1198 SS-70, N.V.;70% supplier: Nuplex Resins  
OH: 4.2wt% (on resin))
- NCO/OH=1.0
- diluted with Butyl acetate

**TUL-100 can reduce the amount of diluted solvent compared with using standard Polyisocyanurate.**

## Weatherability



## Formulation &amp; Film :

- Polyol (Acrylic Polyol, Setlux1767, N.V.;75% Supplier: Nuplex Resins  
OH: 4.5wt%(on resin))
- NCO/OH=1.0
- No Catalyst
- Dry film thickness; 40µm
- Cure condition; 120-30min.

## Device for Accelerate Weathering:

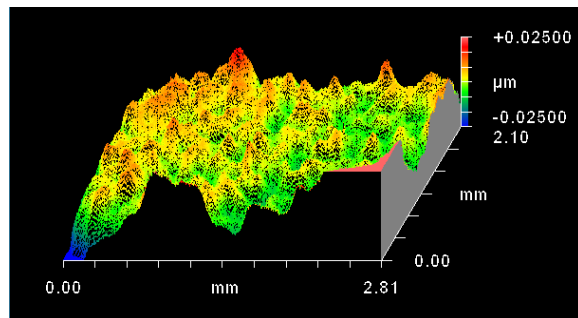
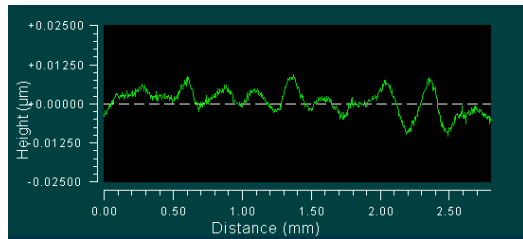
- 7.5-kW Super Xenon Weather meter
- Light source; water-cooled xenon arc lamp
- Irradiance 180 W/m<sup>2</sup>(300-400nm)
- Black panel temperature; 63°C
- Humidity; 50-60Rh%
- Light (102min.) & spray on front face(rain) (18min.)

**The film cured with TUL-100 shows excellent weatherability as the same cured with standard Polyisocyanurate.**

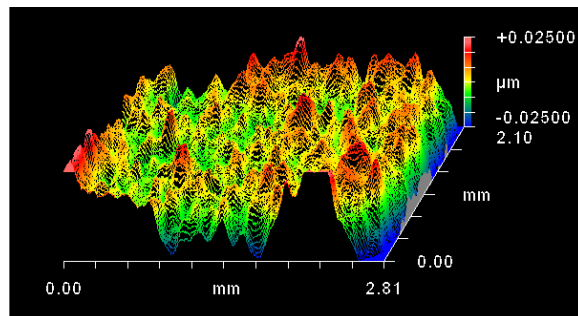
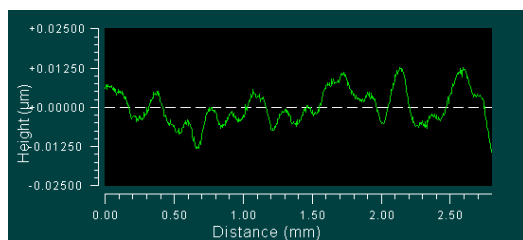
## Smoothness of Film

<NCO/OH=1.3, Cure condition; 60°C -30min.>

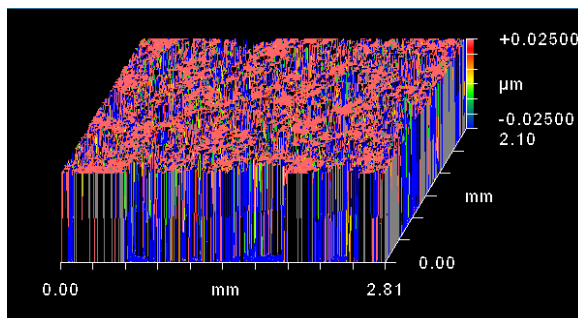
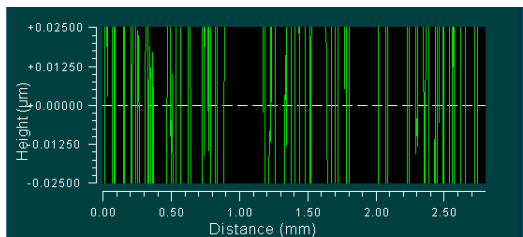
- TUL -



- TKA -



< Non coat substrate; ED Plate >



Formulation & Film :

- Polyol (Acrylic Polyol, Setlux1767, N.V.;75% supplier: Nuplex Resins  
OH: 4.5wt%(on resin))
- No Catalyst
- N.V: 70% diluted with butyl acetate
- Dry film thickness; 40μm

**The film cured with TUL-100 shows better film appearance than standard Polyisocyanurate.**

● Evaluation results of waterborne 2K-PU coating

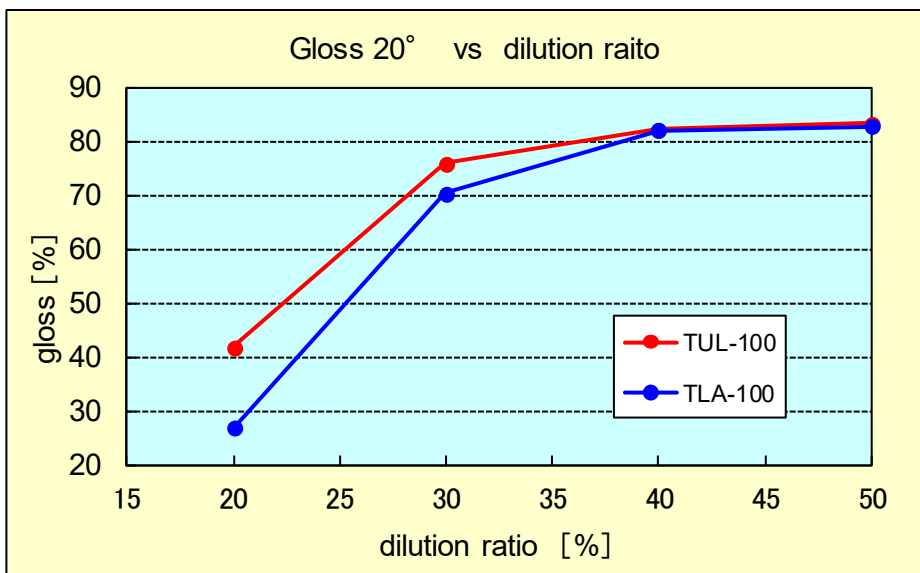
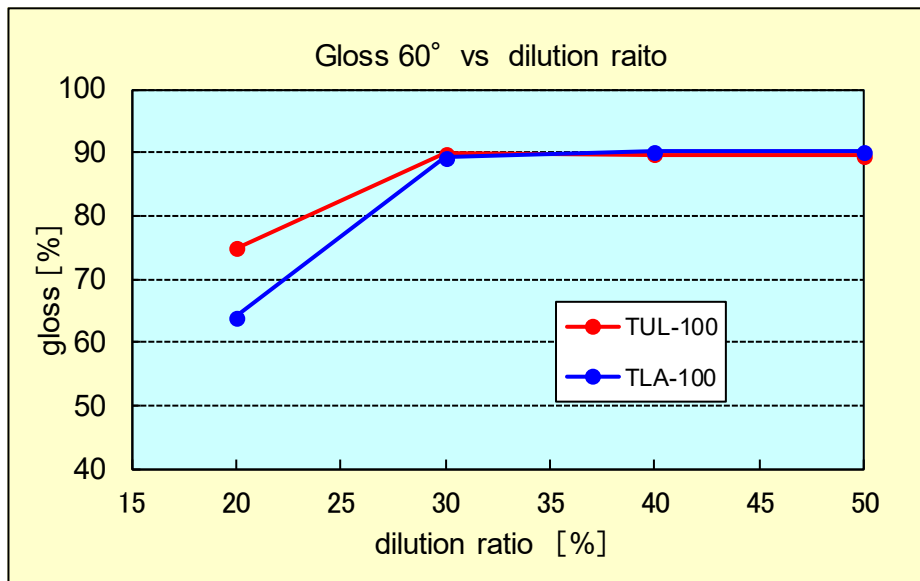
	TUL-100	TLA-100	TKA-100	WB40-100
Viscosity mPa · s/25°C	300	500	2,600	4,500
NCO content %	23.0	23.3	21.7	16.6
NV %	100	100	100	100
Type	Hydrophobic	Hydrophobic	Hydrophobic	water dispersible

**Formulation & Film :**

	Weight	Function	Supplier
< Part A >			
Setaqua 6515	693.7	Resin	Nuplex Resins
< Part B >			
<b><u>Hardener premix</u></b>	229.7		
Duranate TUL-100      60%		Hardener	Asahi-Kasei
Butyl glycol acetate    40%		Solvent	
< Part C >			
Demin. Water	76.6		
	1000.0		

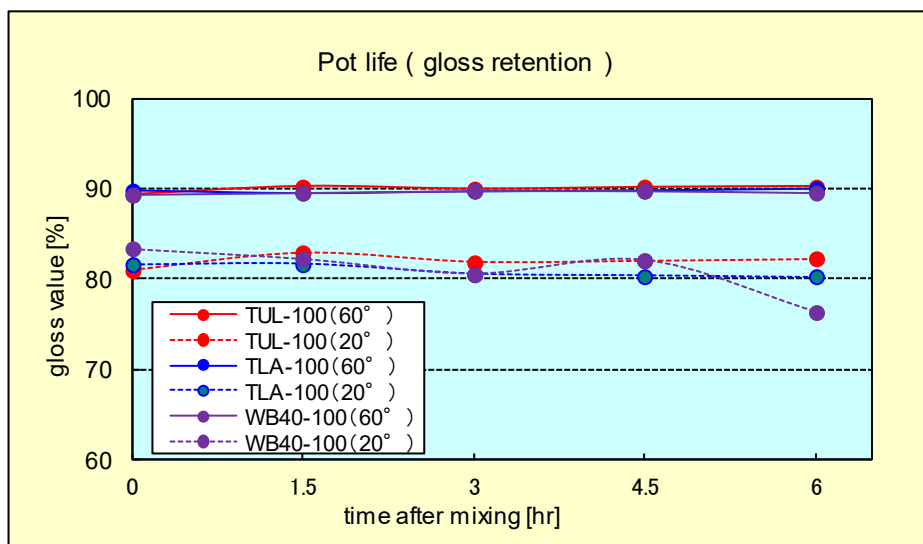
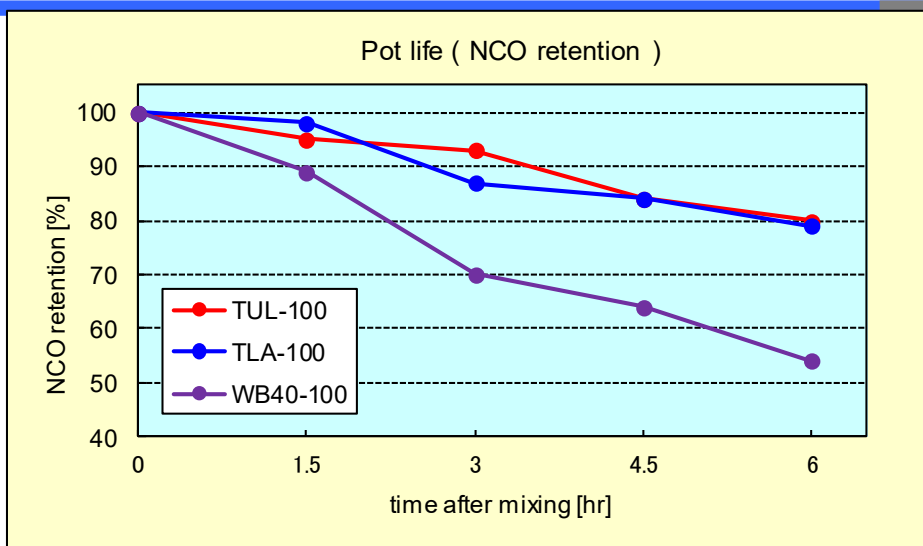
- Polyol (Acrylic Polyol, Setaqua6515, N.V.;45% , supplier: Nuplex Resins, OH: 3.3wt% (on resin))
- Non-volatiles: 45%
- NCO/OH=1.25
- Mixing ; 1000rpm/5min. (Labo-agitator with dispersion blade)
- Dry film thickness ; 50µm
- Drying ; 23°C /50%RH for 7days.

**Gloss value for different solvent dilution ratios**



The coating solution using TUL-100 can reduce the amount of solvent compared with others.

**Pot-life for Waterborne 2K-PU application**



The coating solution using TUL-100 has longer pot-life compared with water dispersible type.

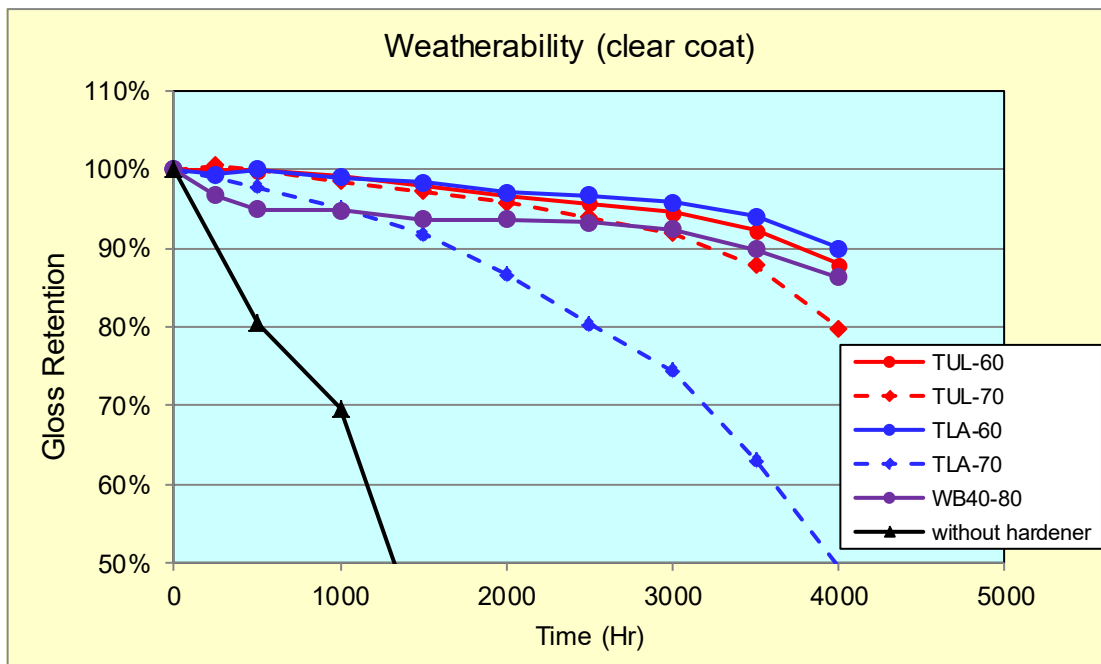
Coating film performance

	Haze	Haze (after W.A)	Water Absorption	Ethanol Resistance	Hardness (Köning)
TUL-100	0.1	0.2	5%	good	35
TLA-100	0.1	0.3	5%	good	44
WB40-100	0.1	5.9	9%	good	14

The film cured with TUL-100 shows excellent properties compared with water dispersible type.



Weatherability



※TUL-60 indicates TUL-100 diluted with 40% BGA

Device for Accelerate Weathering:

- 7.5-kW Super Xenon Weather meter
- Light source; water-cooled xenon arc lamp
- Irradiance 60 W/m<sup>2</sup>(300-400nm)
- Black panel temperature; 63°C
- Humidity; 60-80Rh%
- Light (102min.) & spray on front face(rain) (18min.)

**The film cured with TUL-100 shows excellent weatherability almost the same as film cured with other low viscosity trimer, even if using smaller amount of solvent.**

For further information:

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