

Aliphatic polyisocyanate based on hexamethylene diisocyanate

**Low curing temperature types blocked polyisocyanate**

DURANATE™ SBN-70D, SBB-70P

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DURANATE™ HP

<http://www.akcpc.jp/duranate/index.html>

※ DURANATE™ is a registered trademark in Japan.

**1. Basic properties**

	NCO% (wt%) ※1	Solids content (wt%) [Dilution solvent]	Viscosity (mPa-s)	Features
<b>SBN-70D</b>	10.1	70.0 [DPM]	3,300	Low temp. curing Low coloration High weatherability
<b>SBB-70P</b>	10.1	70.0 [PMA]	2,700	Low temp. curing Excellent adhesion

DPM: dipropyleneglycol monomethylether

PMA: propyleneglycol monomethylether acetate

※These value represent the typical characteristics only and are not based as any specification.

※1 as such.

**2. Film performances**

[Formulation]

Polyol : SETALUX1767 (acrylics polyols made by Nuplex Resins)

Solids contents =65%, OH%=4.5%

Catalyst : dibutyltin dilaurate 0.5% (a part for a paint solid)

Duranate / Polyol ratio : NCO / OH (eq. ratio) = 1.0

Paint solids : 50wt%

Film thickness : thickness(dry) : 10 μm

: 40 μm

2-1. Curability

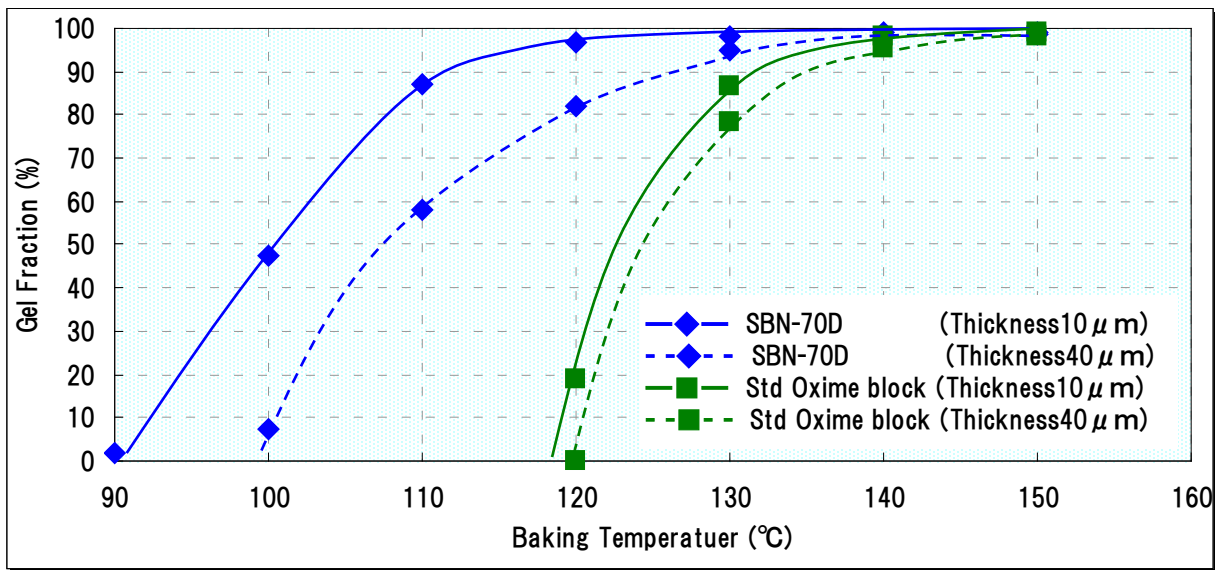
[Gel fraction]

: Ratio of the insoluble film (weight) in acetone for 24hr at 23°C.

1) Film thickness/Catalyst and Curability [curing condition : baking temperature x 30min]

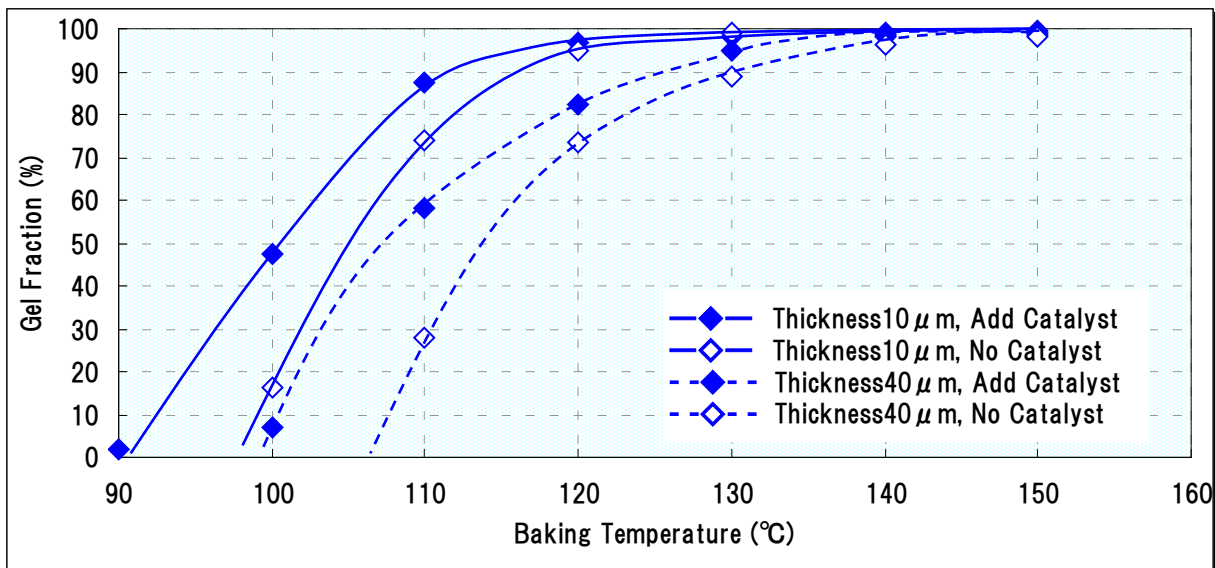
<Dependence on the film thickness >

=> Low temperature curing type SBN-70D shows outstanding high curability in a thin film.



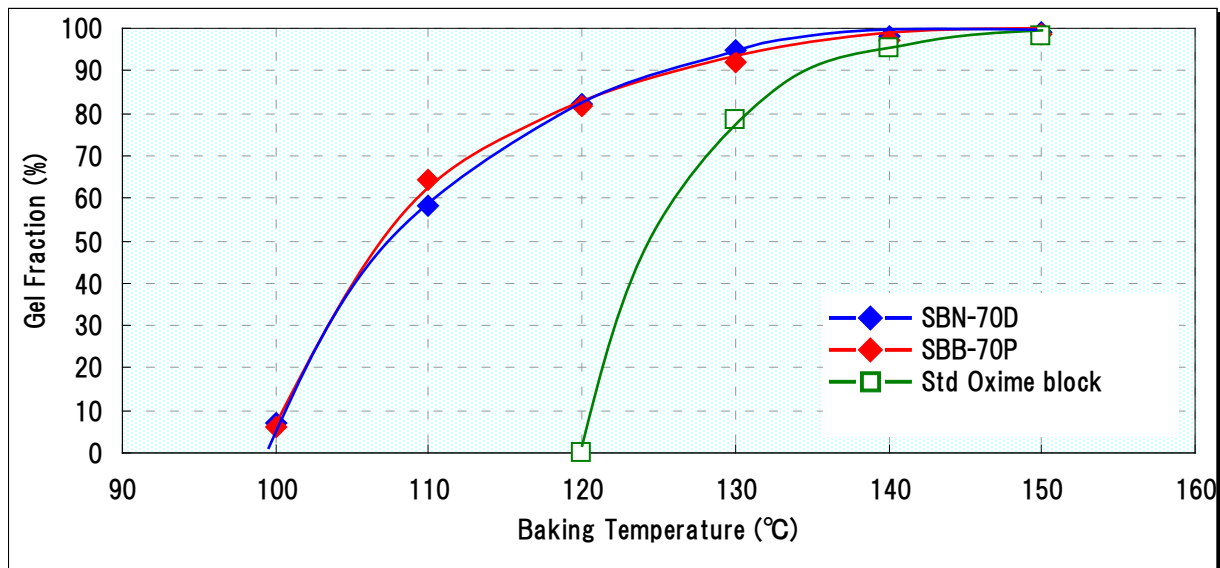
< Effect of the catalyst >

=> Low temperature curing type SBN-70D shows higher curability by adding catalyst.



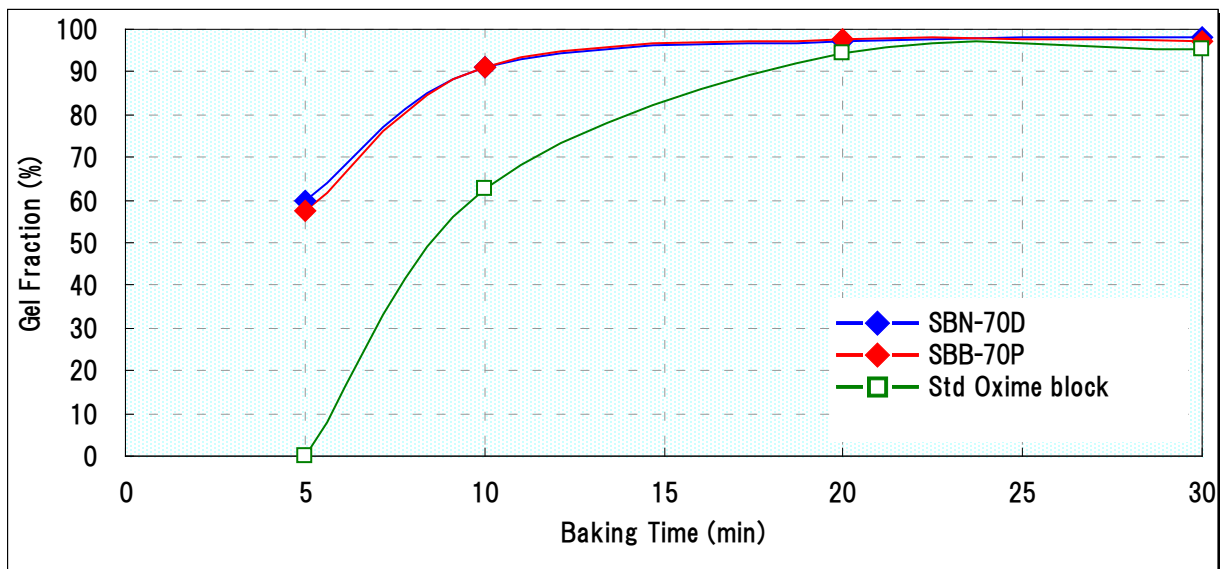
**2) Baking temperature** [curing condition : baking temperature x 30min / film thickness 40μm]

=> SBN-70D and SBB-70P show the outstanding high gel fraction at low temperature baking.



**3) Baking time** [curing condition : 140°C x baking time / film thickness 40μm]

=> SBN-70D and SBB-70P show the high gel fraction in short time baking.



**4) Curability with high molecular weight polyols** [curing condition : baking temperature x 30min]

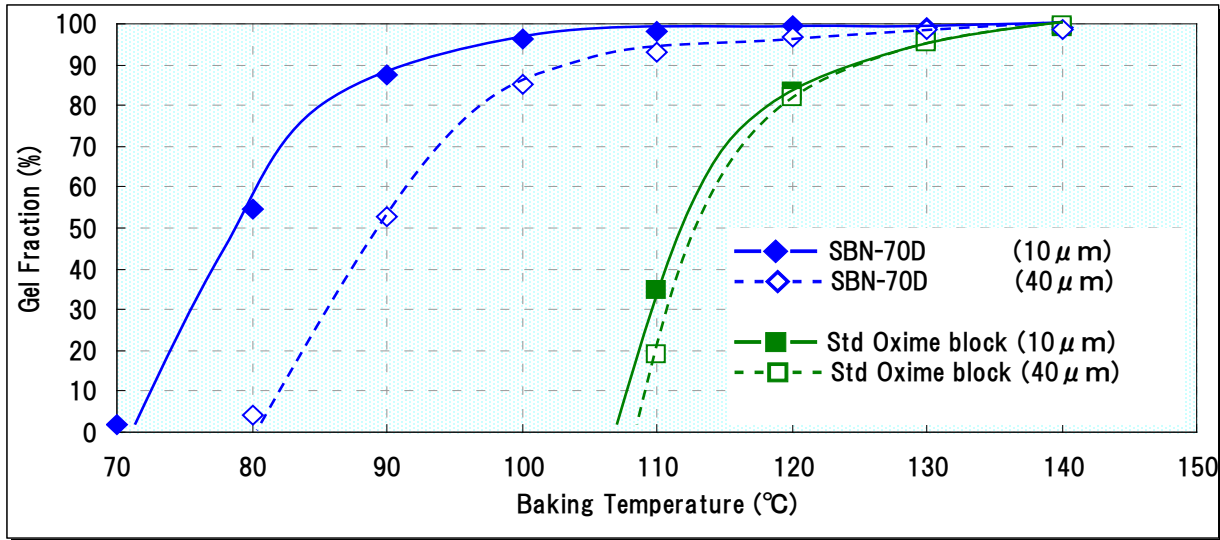
Polyol : Acrylic A-801 (acrylics polyols made by DIC corp.)

Solids contents = 50%, OH value = 100mgKOH/g

Catalyst : dibutyltin dilaurate 0.5% (a part for a paint solid)

=> Low temperature curing type SBN-70D shows higher curability

with high molecular weight polyols.



**5) Curability by FDOM (Free Damped Oscillation Method)**

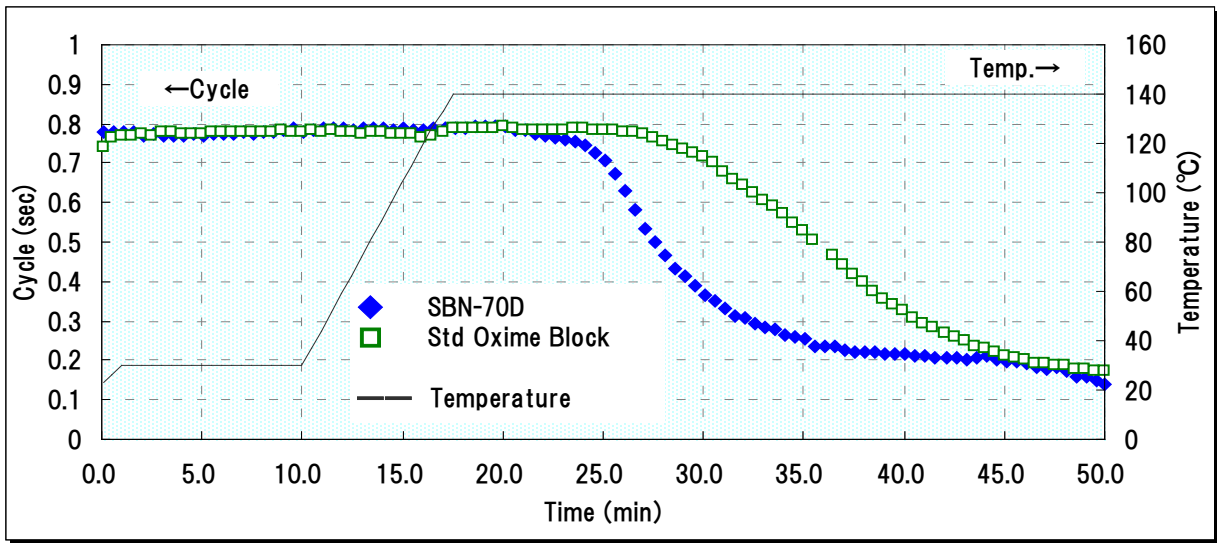
Equipment: Rigid body pendulum type physical properties testing instrument "RPT3000W"

(made by A&D Co., Ltd)

The time pendulum cycle starts decreasing in film curing process = the time cross linking starts

=> Low temperature curing type SBN-70D shows the pendulum cycle declines rapidly in a short time,

therefore cross linking starts at low temperature and in a short time.



**2-2. Adhesion**

[Cross cutting method]

[foundation : mild steel plate ; curing condition : 140°C x 30min / film thickness 40µm]

=> SBB-70P shows excellent adhesion.

	SBB-70P	SBN-70D	Standard oxime block
Adhesion	○	×	△

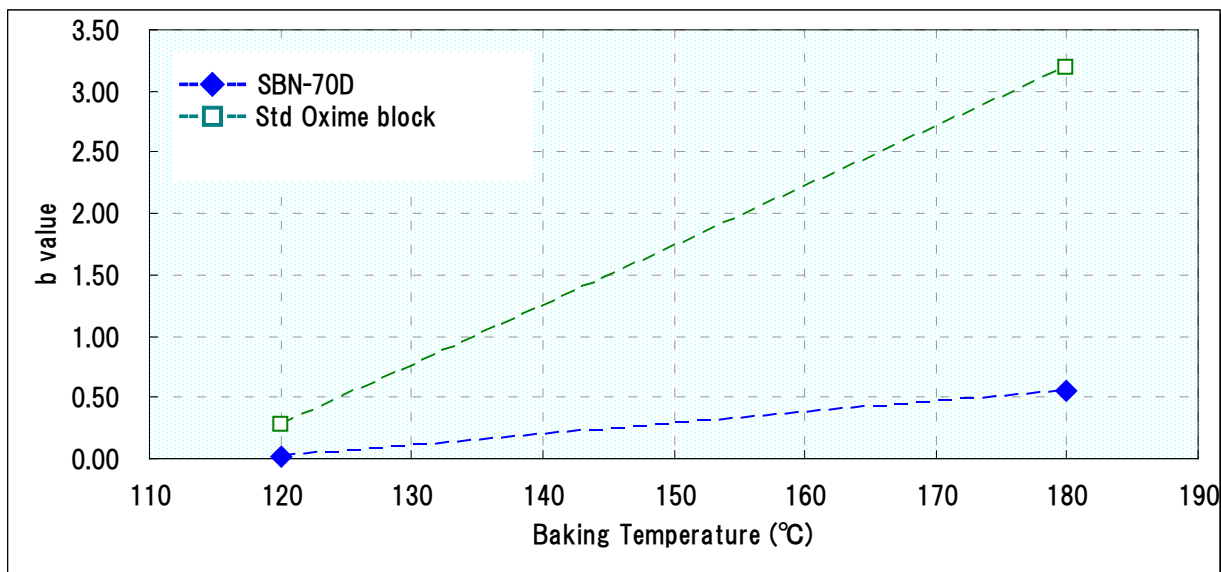
Remaining number after cross-cut test (1mm grid)

○ : 100, △ : 99-50, × : 49-0

**2-3. Coloration / Yellowing**

[curing condition : baking temperature x 30min / film thickness 40µm]

=> SBN-70D shows excellent low coloration at over baking.

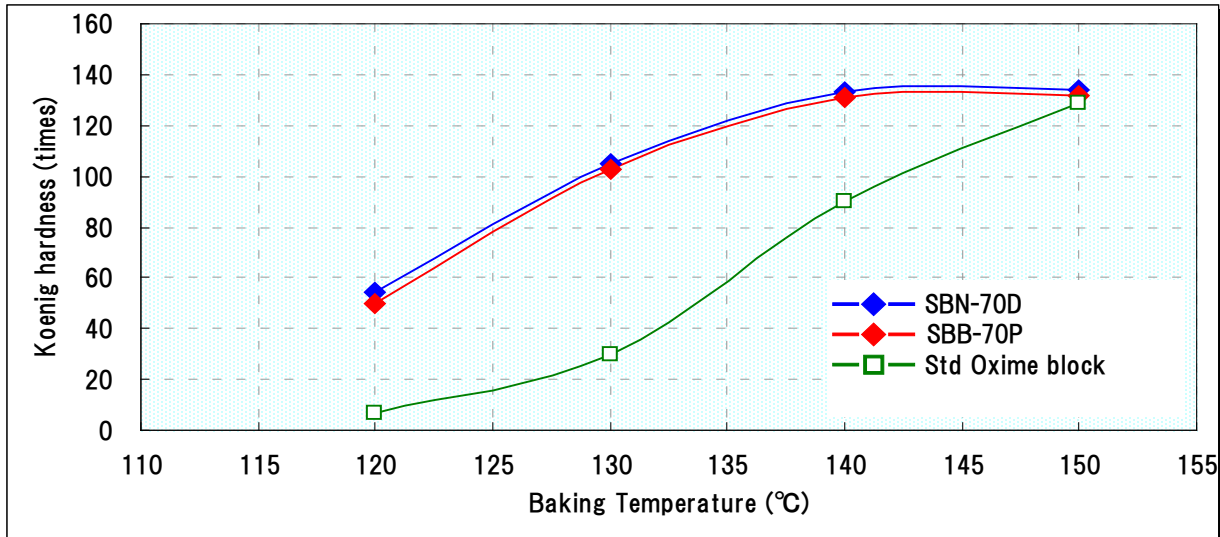


**2-4. Film hardness**

[Koenig pendulum hardness]

[curing condition : baking temperature x 30min / film thickness 40μm]

=> SBN-70D and SBB-70P show high hardness at low temperature baking.



**2-5. Accelerated weatherability**

[A gloss retention ratio (super xenon weather meter)]

[curing condition : 140 °C x 30min / film thickness 40μm]

Equipment : super xenon weather meter SX75 (made by Suga Test Instruments Co.,Ltd.)

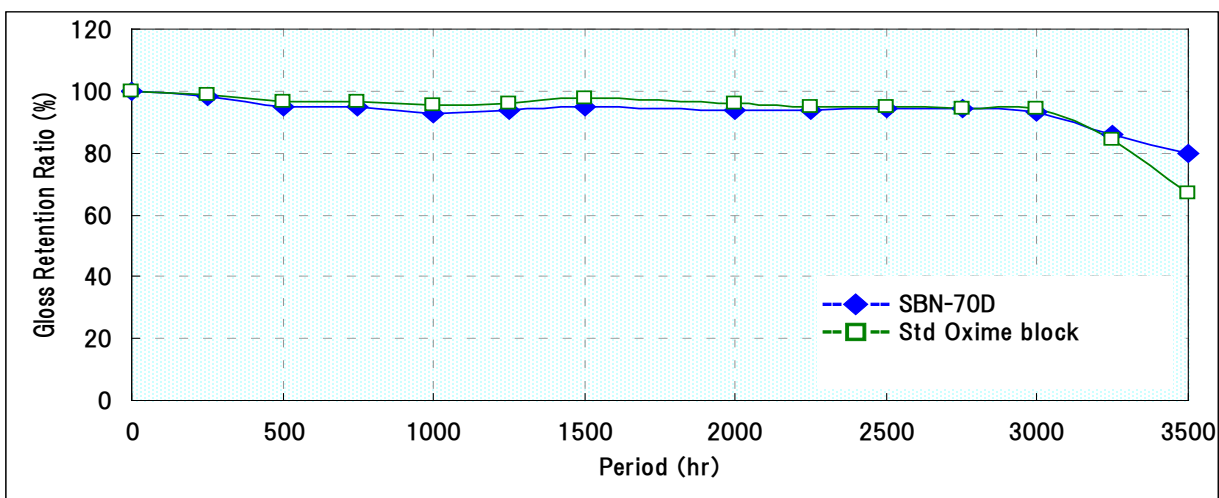
Condition : irradiance : 180 W/m2 (continuation)

Operating cycles : Dry (light only) / Spray (light & spray) = 102 / 18min cycle.

light : The black panel temperature 63°C, 50%RH

spray : 28°C (chamber temperature)

=> SBN-70D shows excellent weatherability.



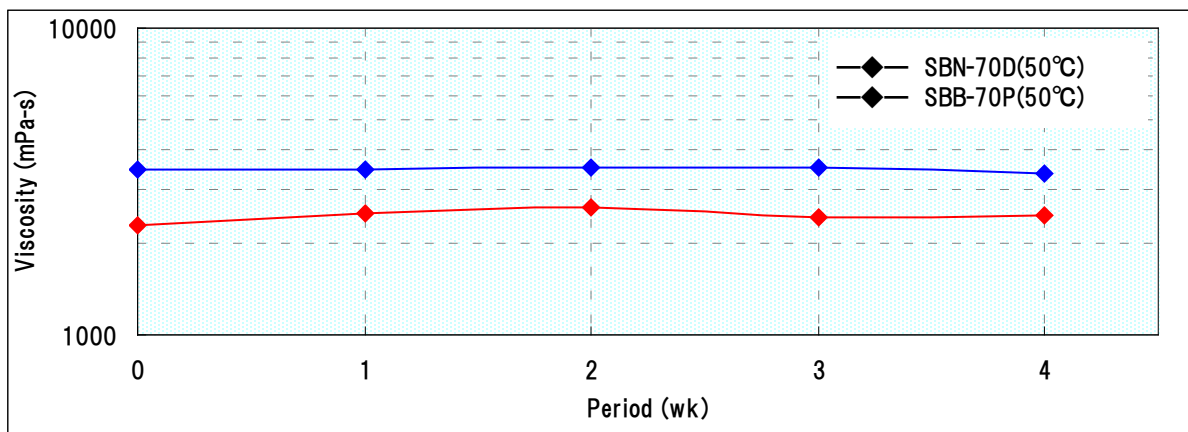


**2-6. Storage stability test**

[Storage condition : 50 °C x 4wk]

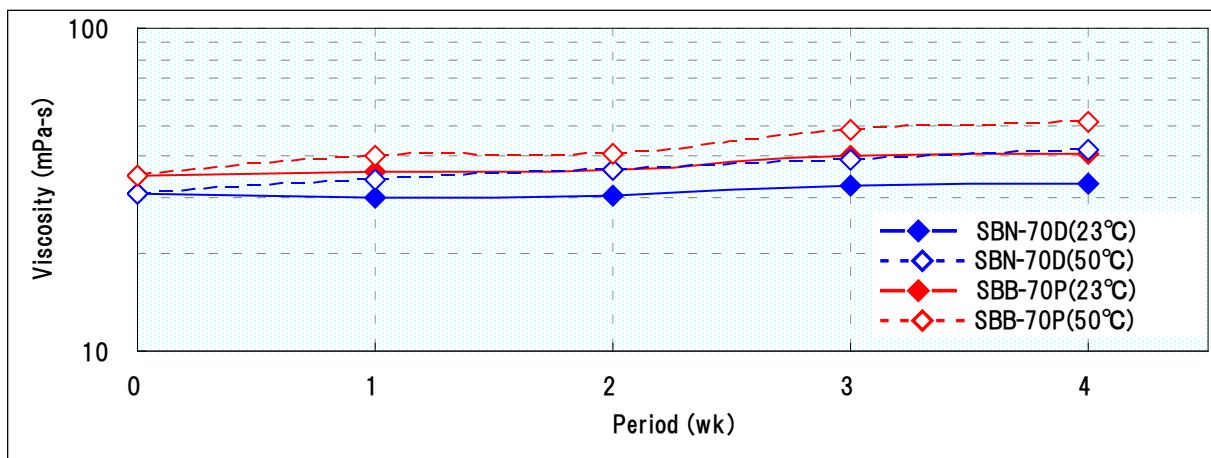
**[Viscosity changes of the products]**

No viscosity changes are shown in 50°C storage.



**[Viscosity changes of the paints]**

Remarkable viscosity changes are not shown at 23°C and 50°C in paints.



**[Curability changes of the paints]**

=> No gel fraction changes are shown after 50 °C x 4wk.

[curing condition : 120°C x 30min / film thickness 40µm]

Gel fraction (wt%)	Before storage	50 °C X 4wk
SBN-70D	81	80
SBB-70P	83	85