

Hi Grade OCA for Bonding Resin Plates 「MGSRTD」 Reliability Data

May Clean Gel Lineup

Product	Thickness (t)	Peel strength	Optical properties	Reliability	Characteristic	Cost performance	Track record
General purpose (Resistive membrane type, Direct bonding)							
MGCS Seris	0.025~1.0	○	○	○	Cost benefit	◎	Resistive membrane type
Capacitance type							
MGSF Seris	0.025~1.0	◎	◎	◎	Reliability	×	Capacitance type GF, GFF
For automotive use, Plastic plate lamination							
MGSRT	0.025~1.0	◎	◎	◎	General purpose	×	Automotive
MGSRTR	0.025~1.0	◎	◎	○	Ink step absorption	×	Build to order
MGSRL	0.025~1.0	○	○	○	Cost benefit	○	Build to order
Secondary UV cure type							
MGU	0.025~1.0	◎	◎	◎	Ink step absorption	×	Automotive
150°C Heat resistance							
MGSRSB	0.025~1.0	◎	◎	◎	Heat resistance	×	Build to order

MGSRTD100 Reliability Test

■ Test Sample

- **MGSRTD100**

⇒

This is an upgraded version of OCA "MGSRT" for bonding resin plate.
High adhesion to PC. High adhesion under high temperature.

- **MGSRT100**

⇒

Mass-produced products for resin plate bonding.

- **Competitor**

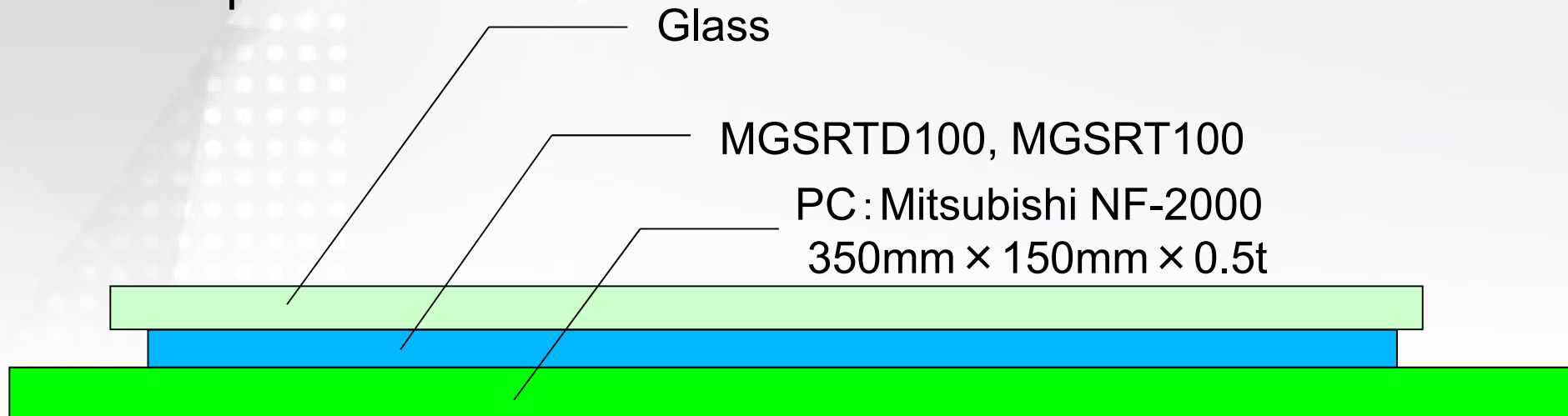
⇒

Nitto LUCIACS CS986 (125 μ m) *Stacking

※Each sample thickness 1000 μ m

MGSRTD100 Reliability Test

■ Test Sample Structure



■ Test Method

① 90°C High Temperature Test

24h、100h

② Cycle Test

-40°C (30min) ⇔ 90°C (30min) × 10cycle、100cycle

Switching Temperature 5min

⇒ Appearance check after tests

【MGSRTD】 Appearance Check : Whole Part

① 90°C Test

Before



24h



100h



② Cycle Test

Before



10cycle



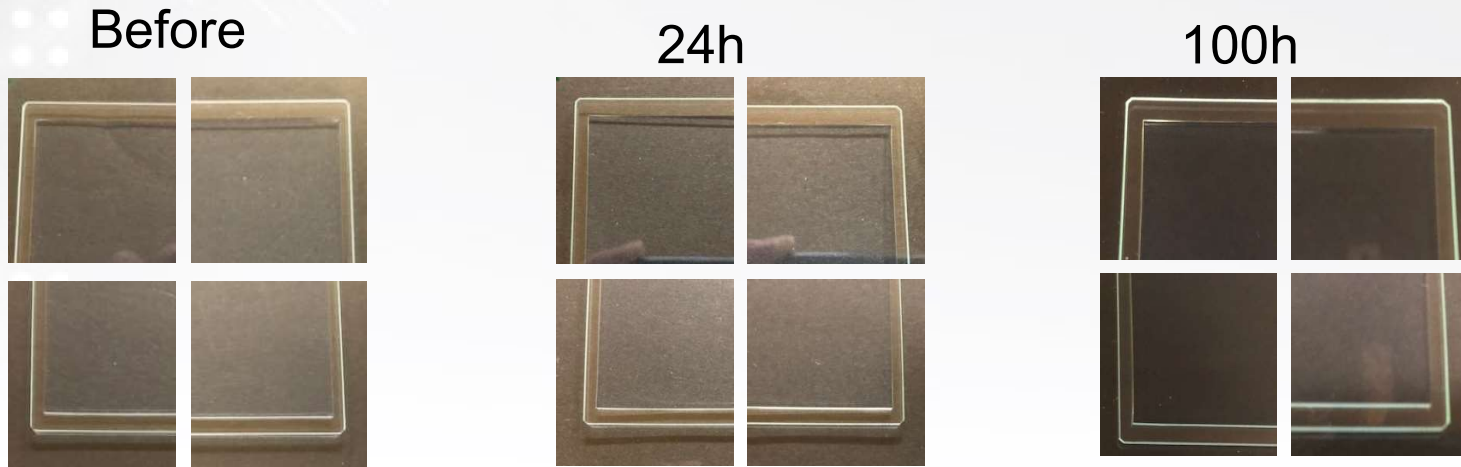
100cycle



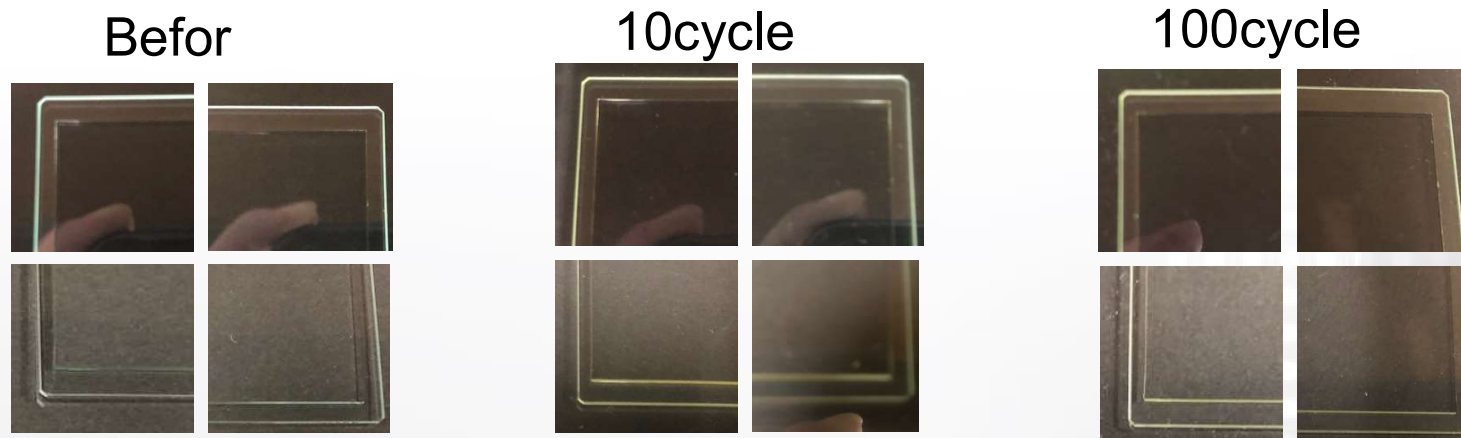
No bubble or peeling occurred in the whole parts.

【MGSRTD】 Appearance Check : Corner Parts

① 90°C Test



② Cycle Test



No bubble or peeling occurred at the corner parts.

Appearance Check : Whole Part Comparison

② Cycle Test (100cycle)

MGSRT100



Peeling



Bubble

MGSRTD100



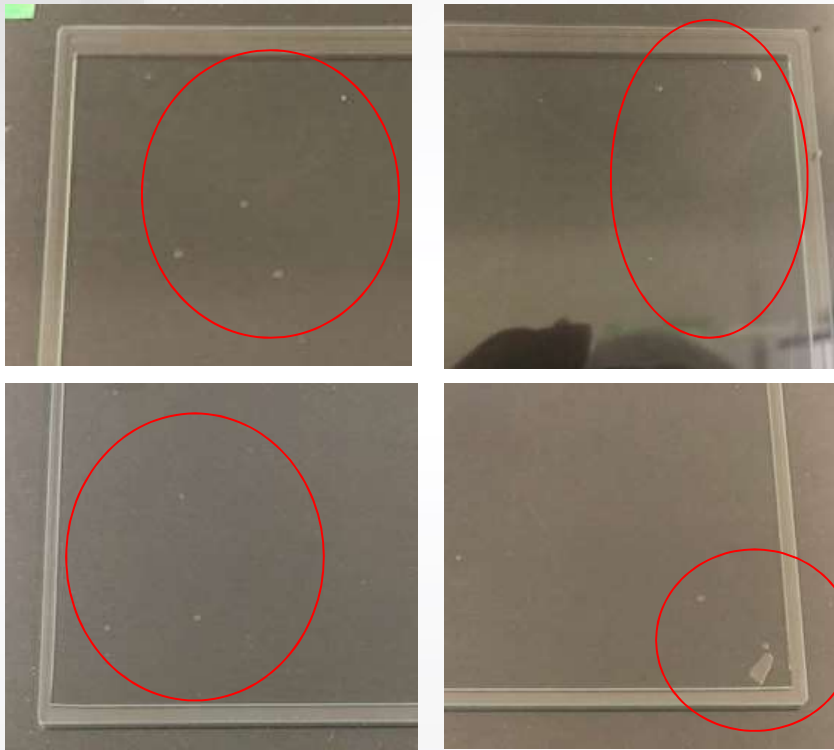
No peeling, No bubble

**In MGSRT, there were some bubbles and peeling.
MGSRTD had no bubbles or peeling.**

Appearance Check : Corner Parts Comparison

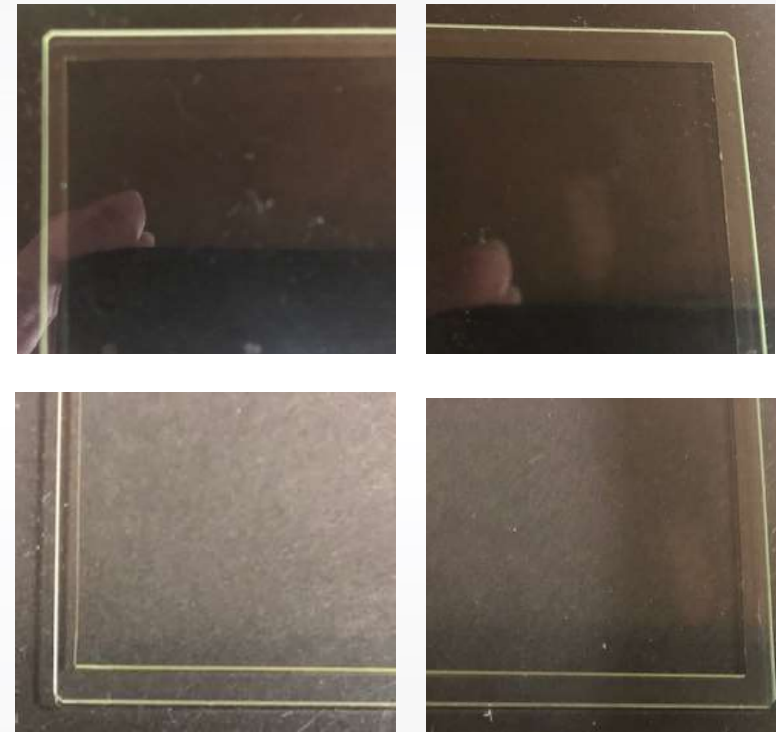
② Cycle Test (100 cycle)

MGSRT100



Air bubble and peeling

MGSRTD100



No peeling, No bubble

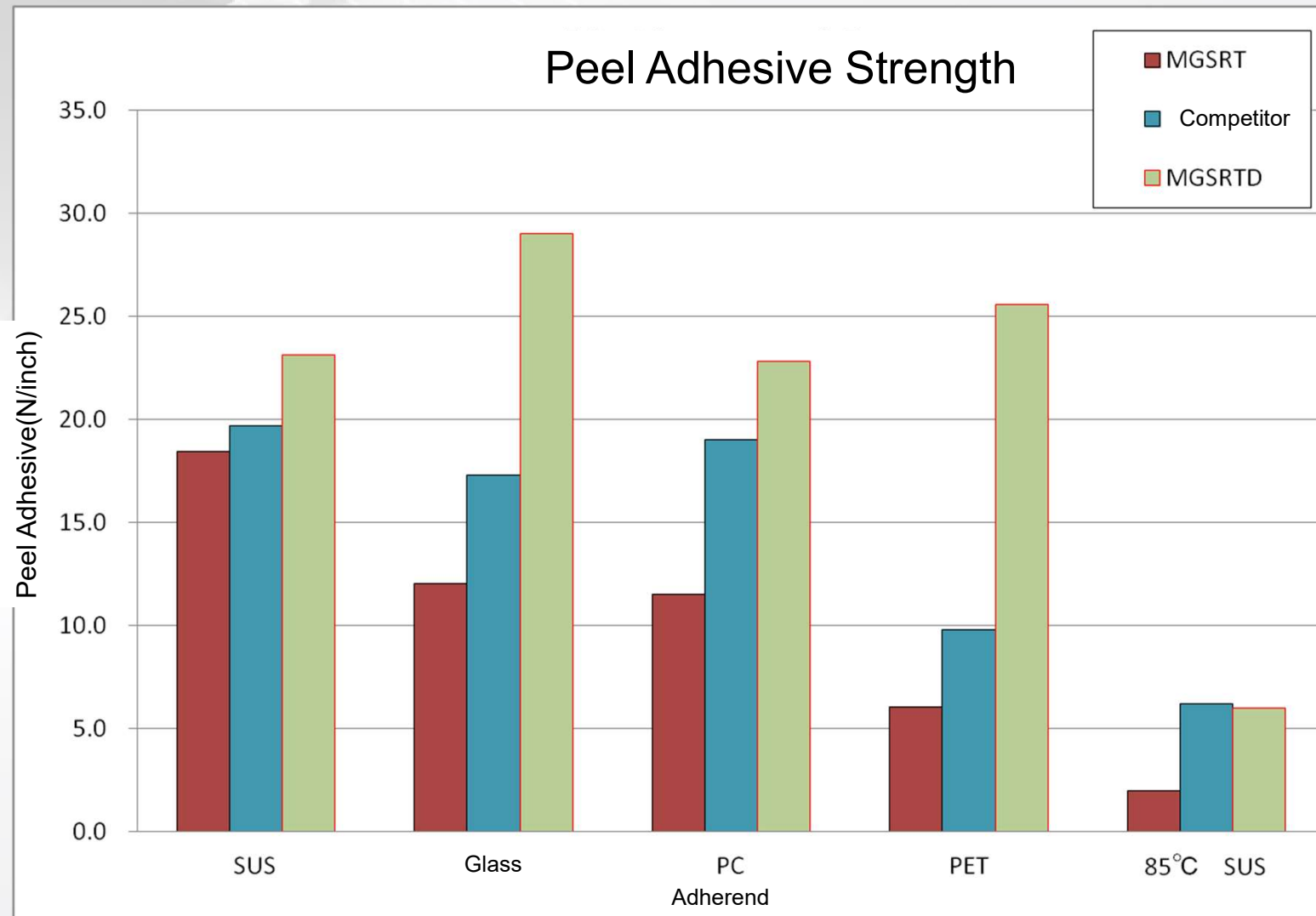
In MGSRTD, small bubbles generated in MGSRT disappeared.

Property Comparison

Sample	Thickness (μm)	Peel Adhesive (N/inch)					Optical Properties		Viscoelasticity (60°C)		Feature
		SUS	Glass	PC	PET	SUS 85°C	Tt(%)	HAZE	G'	G''	
MGSRT12.5	125	18.4	12.0	11.5	6.1	2.0	92.4	1.1	23000	3592	<ul style="list-style-type: none"> Gas absorbability by bisphenol skeleton Strong adhesion to PC than MGSRT Since the adhesive is soft, the followability is good. But it is easy to deteriorate at high temperature
Competitor	125	19.7	17.3	19.0	9.8	6.2	92.3	1.0	144697	27325	<ul style="list-style-type: none"> OCA for bonding resin plate
MGSRTD12.5	125	23.1	29.0	22.8	25.6	6.0	92.4	1.1	119640	67480	<ul style="list-style-type: none"> Excellent adhesion at high temperatures

→ Explain the details in the graph from the next page.

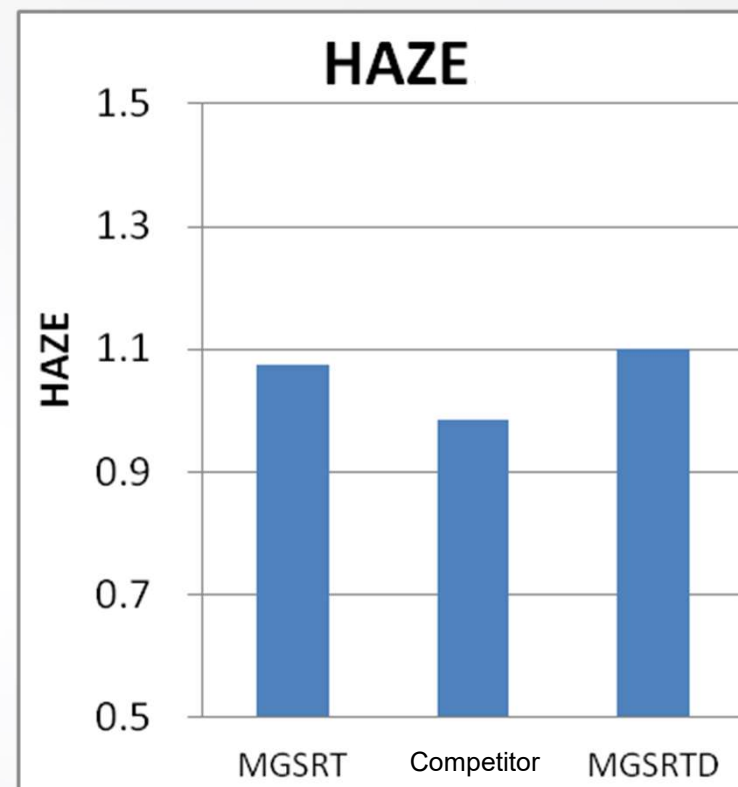
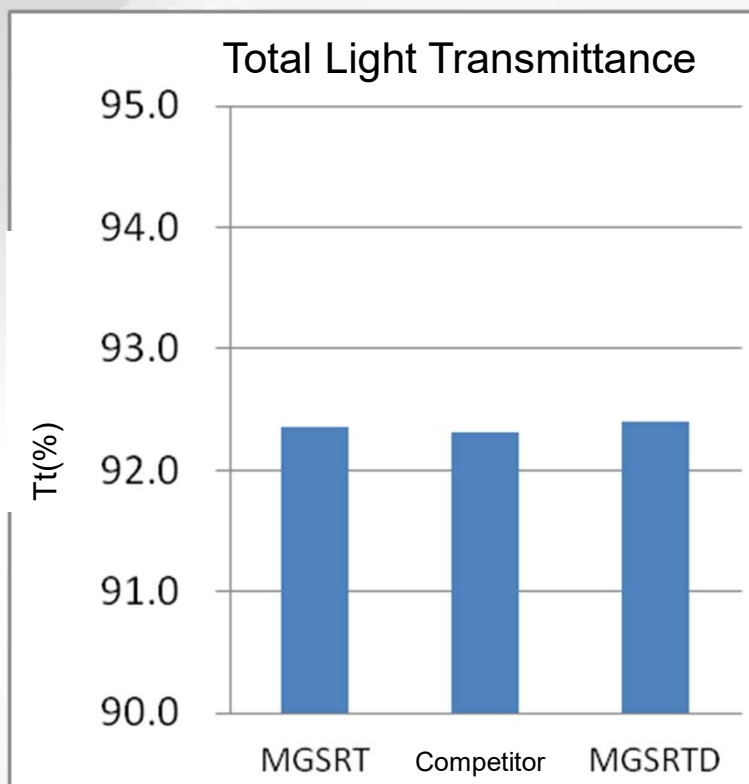
Peel Adhesive Strength Comparison



MGSRTD has the highest adhesion in each adherend

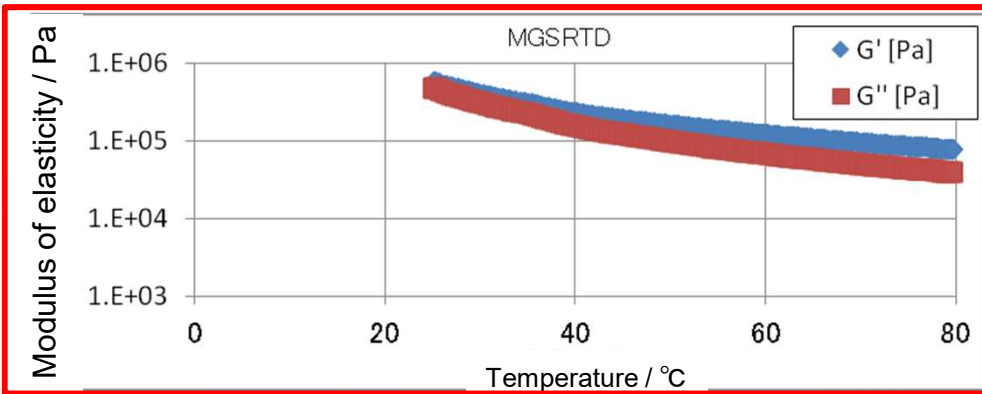
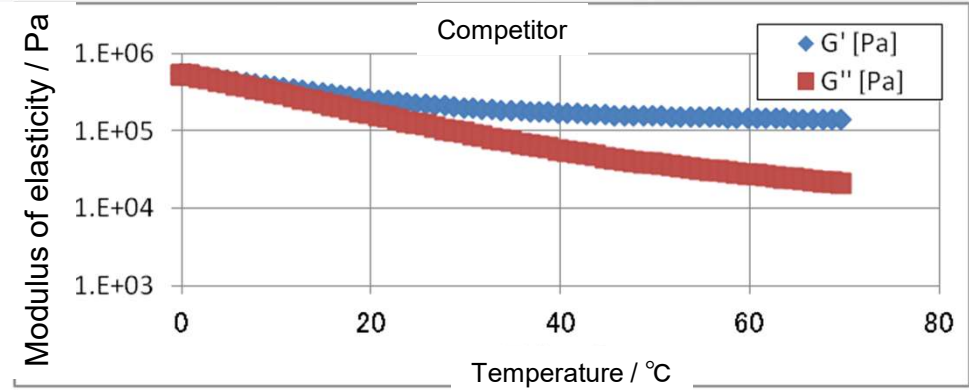
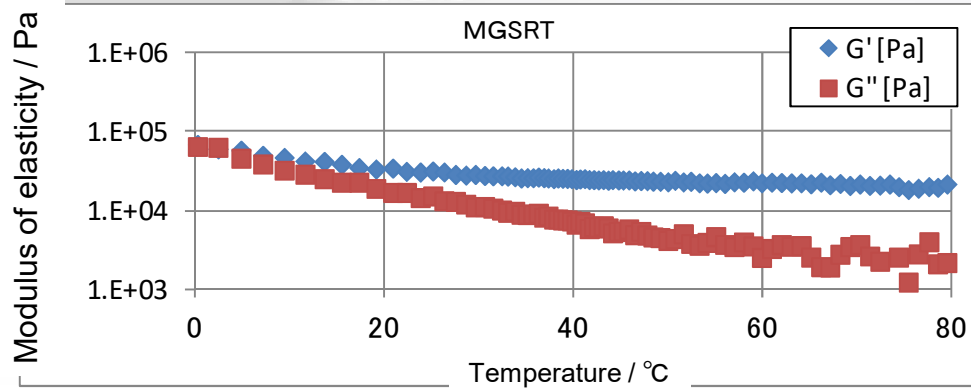


Optical Property Comparison



MGSRTD has optical properties close to MGSRT

Viscoelasticity Comparison



MGSRTD is hard to change its viscoelasticity under high temperature.

⇒ Maintain strong adhesion under high temperature

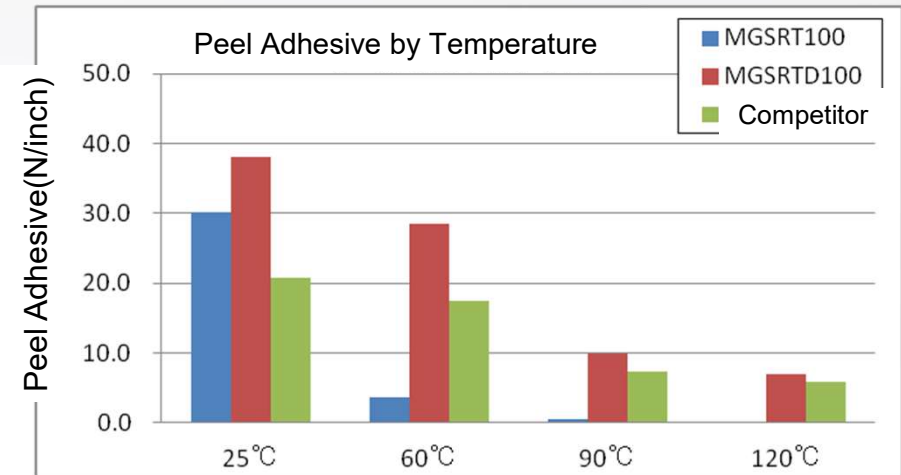
★ MGSRTD resists peeling and air bubbles under high temperature

Peel Adhesive Strength by Temperature

Peel Adhesive (N/inch) SUS	Sample	Thickness (μm)	Temperature ($^{\circ}\text{C}$)			
			25	60	90	120
	MGSRT100	1000	30.2	3.7	0.5	0.1
MGSRTD100	38.1		28.5	9.8	7.0	
Competitor	30.7		22.5	7.4	5.8	



Peeling from PET

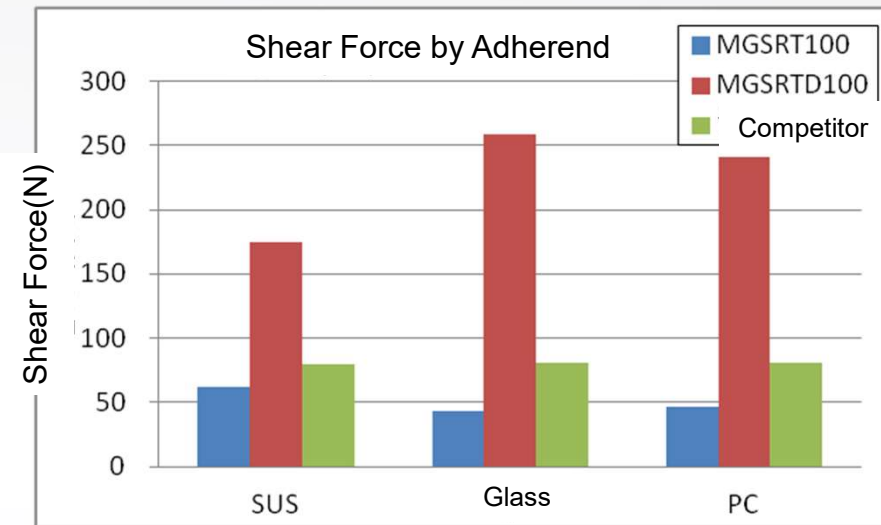


MGSRTD100 has high adhesion in all temperature range

The adhesion of MGSRTD at 120 $^{\circ}\text{C}$ is about 70 times that of MGSRT and about 1.2 times that of competition

Shear Force by Adherend

Shear Force (N)	Sample	Thickness (μm)	Adherend		
			SUS	Glass	PC
	MGSRT100	1000	62	43	47
MGSRTD100	175		259	241	
Competitor	80		81	81	



MGSRTD 100 has high shear force on all adherends
The adhesion of MGSRTD is about 3 times higher than MGSRT
and about 2 times higher than competition

Test Method

【Peel Adhesive by temperature】

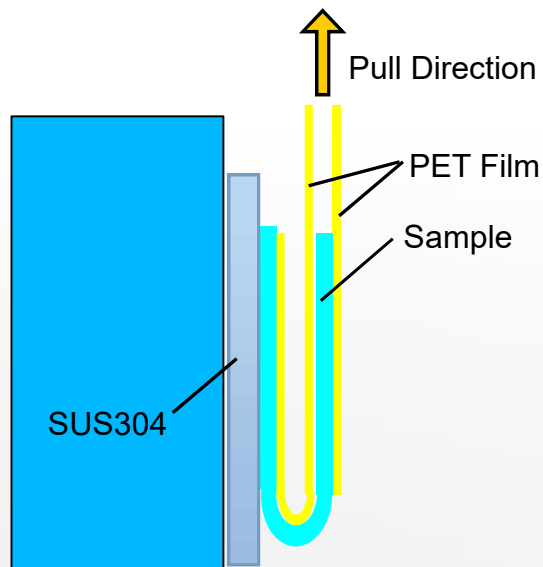
Size : 25mm \square

Peeling Speed : 300mm/min

Peeling Direction : 180°

Adherend : SUS304

Temperature : 25°C · 60°C · 90°C · 120°C

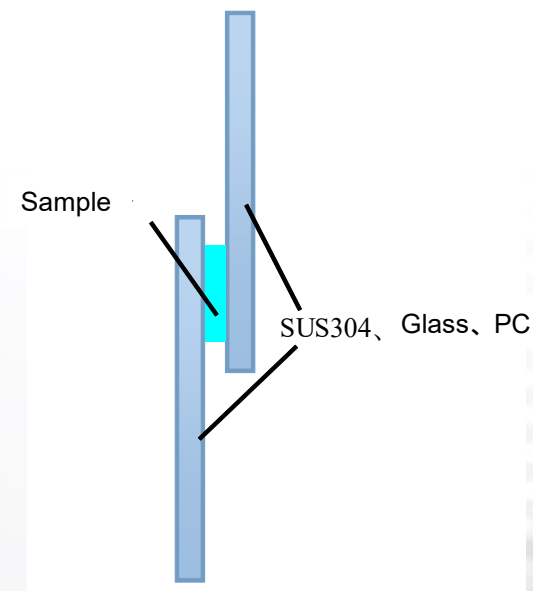


【Shear Force】

Size : 25mm × 25mm

Peeling Speed : 200mm/min

Adherend : SUS304, Glass, PC



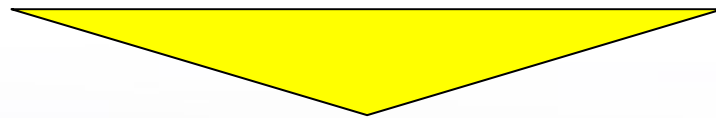
Summary

MGSRTD100 did not generate peeling or air bubbles in the cycle test

MGSRTD100 vs. Competitor

- 1 High adhesion in high temperature range
- 2 High adhesion in the shear direction

Also, MGSRTD has significantly improved performance over MGSRT



- The adhesion at high temperature is greatly improved, so bubbles and peeling can be suppressed in the cycle test
- Adhesive force at high temperature and adhesion in the shear direction has an advantage compared with competitor.

Thank you for your attention

User is responsible for determining whether the KGK product is fit for a particular purpose and suitable for user's method of application. Please remember that many factors can affect the use and performance of a KGK product in a particular application. The materials to be bonded with the product, the surface preparation of those materials, the product selected for use, the conditions in which the product is used, and the time and environmental conditions in which the product is expected to perform are among the many factors that can affect the use and performance of a KGK product. Given the variety of factors that can affect the use and performance of a KGK product, some of which are uniquely within the user's knowledge and control, It is essential that the user evaluate the KGK product to determine whether it is fit for a particular purpose and suitable for the user's method of application. KGK make no warranties on above data.