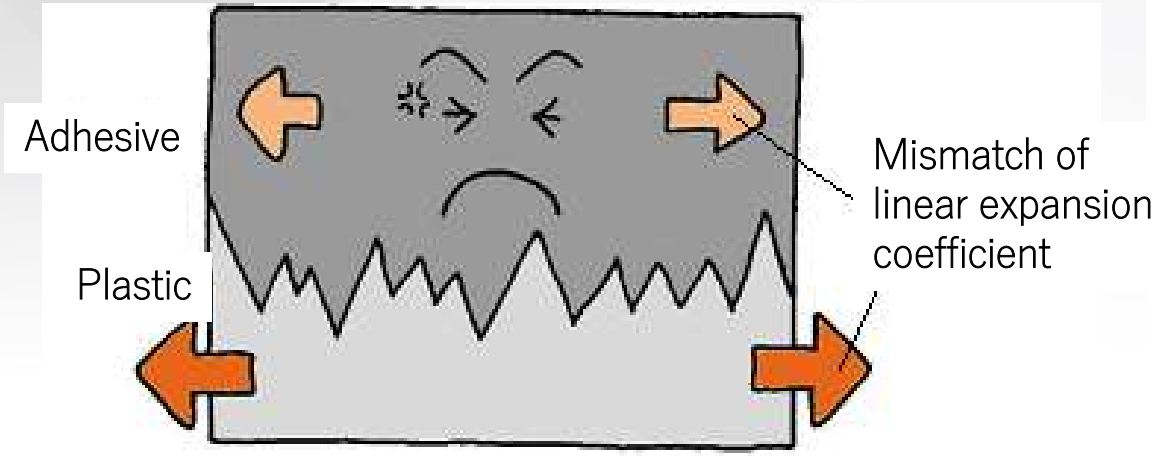
OCA for Automotive
MGSRT

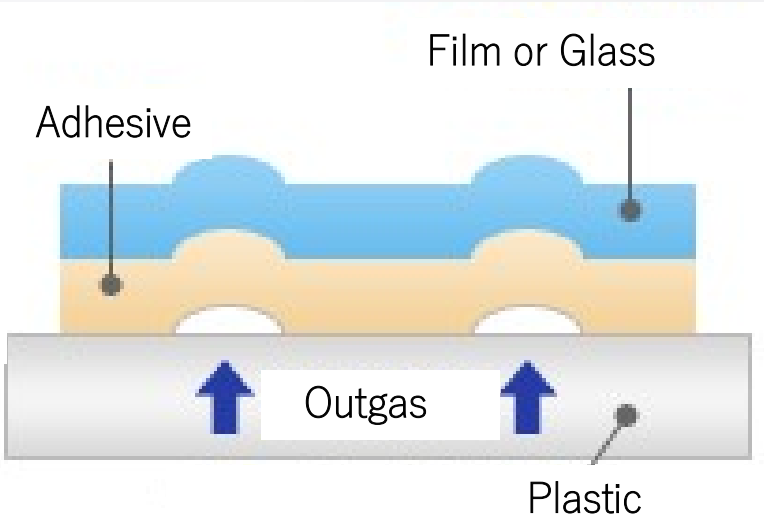
What is the cause of the Bubble

Delay bubbles are generated when bonding the resin sheets.

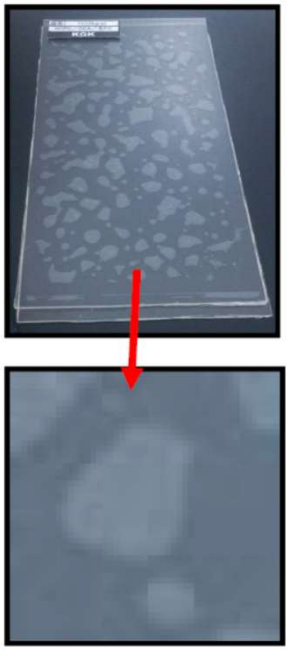
【Causes of bubbles】

- **Peeling**
- **Outgas**

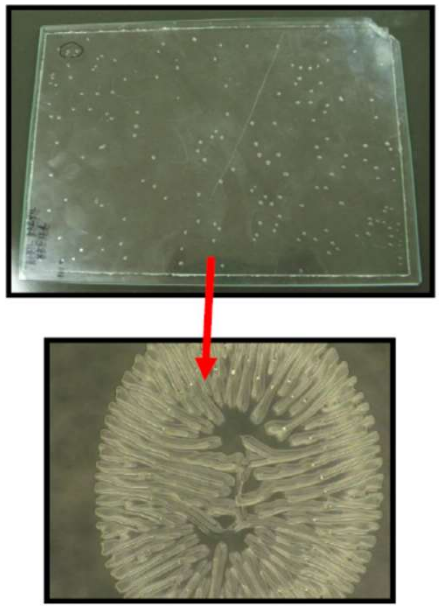




Peeling



Outgas



New OCA【MGSRT】were develop

Conventional products are subject to lowering of adhesive strength and instability of viscoelasticity under high temperature conditions.

As a result, bubbles and peeling occured from the Plastic substrates.

MGSRT has succeeded in improving the performance compare to the conventional product.

★ Strong adhesion to resin (PC, PMMA)

★ Stable viscoelasticity at 100℃ high temperature range.

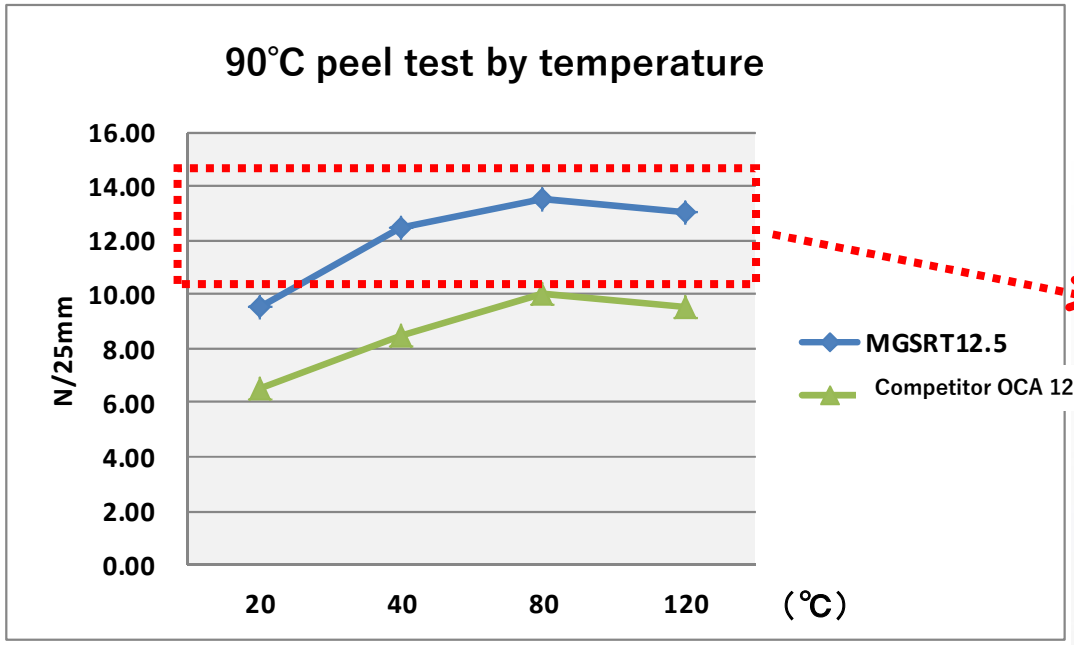
MGSRT Comparison Data

Property	Condition	Unit	Conventional	MGSRT12.5	Other	Standard
Peel adhesive	25℃（PMMA）	N/25mm	11.4	17.6	12.3	JIS Z0237
Peel adhesive	25℃(PC)	N/25mm	11.2	12.6	8.8	JIS Z0237
Peel adhesive	25℃(Glass)	N/25mm	15.0	11.9	11.2	JIS Z0237
Holding power	105℃	Min	59.5	>360	>360	JIS Z0237
Heat holding power	1℃/min	℃	148	180	140	KGK Method
Elongation	25℃	%	423	443	590	JIS K7162 JIS K6251
Breaking strength	25℃	N/10mm	1.5	2.0	1.4	JIS K7162 JIS K6251
Hardness	25℃	Asker C	37	36	42	JIS K6253
Viscoelasticity Tanδ	25℃	—	0.19	0.45	0.21	JIS K6394
Viscoelasticity Tanδ	105℃	—	0.06	0.22	0.19	JIS K6394
Actual evaluation	85℃/85%	Check babble	X	○	X	KGK Method

Adhesive strength by temperature of MGSRT

・Test results
90℃ peel test

Product / Peel adhesive 【PC】	Temperature (℃) 20	40	80	120
MGSRT12.5	9.50	12.50	13.50	13.00
Competitor OCA 125μ	6.50	8.50	10.00	9.50



Excellent heat resistance of MGSRT

Adhesive strength by adherend

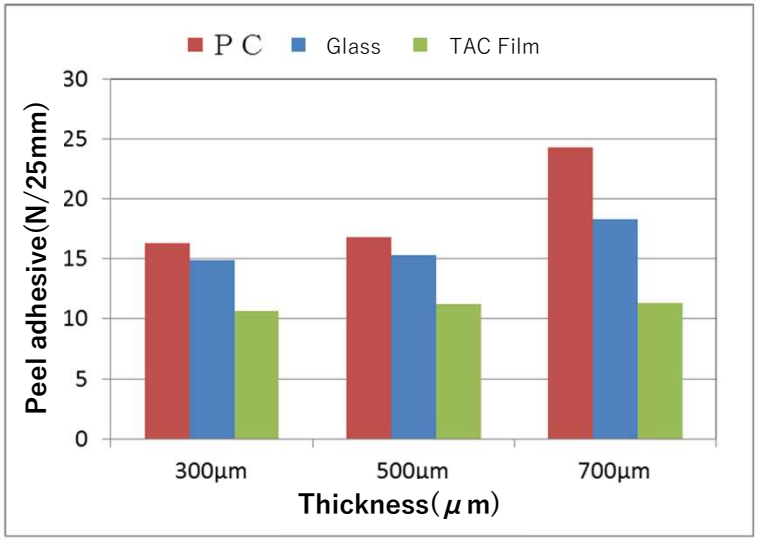
- Adhesive strength by Adherend 【PC, Glass, TAC Film】

【Test method】

25 mm width cut
Laminate OCA on adherend
2Kg roll 2 round trips
Leave at room temperature for 1 hour
180 ° peeling speed 300 mm / min

- Test results

Adherend	OCA Thickness	①	②	③	Ave.
PC	300 μm	17.02	15.75	16.10	16.29
	500 μm	16.94	16.50	16.88	16.78
	700 μm	22.40	26.93	23.65	24.33
Glass	300 μm	14.71	15.25	14.79	14.91
	500 μm	14.87	15.38	15.63	15.29
	700 μm	17.09	19.72	18.11	18.31
TAC Film	300 μm	10.77	10.80	10.40	10.66
	500 μm	11.05	11.30	11.43	11.26
	700 μm	11.54	11.40	11.13	11.36

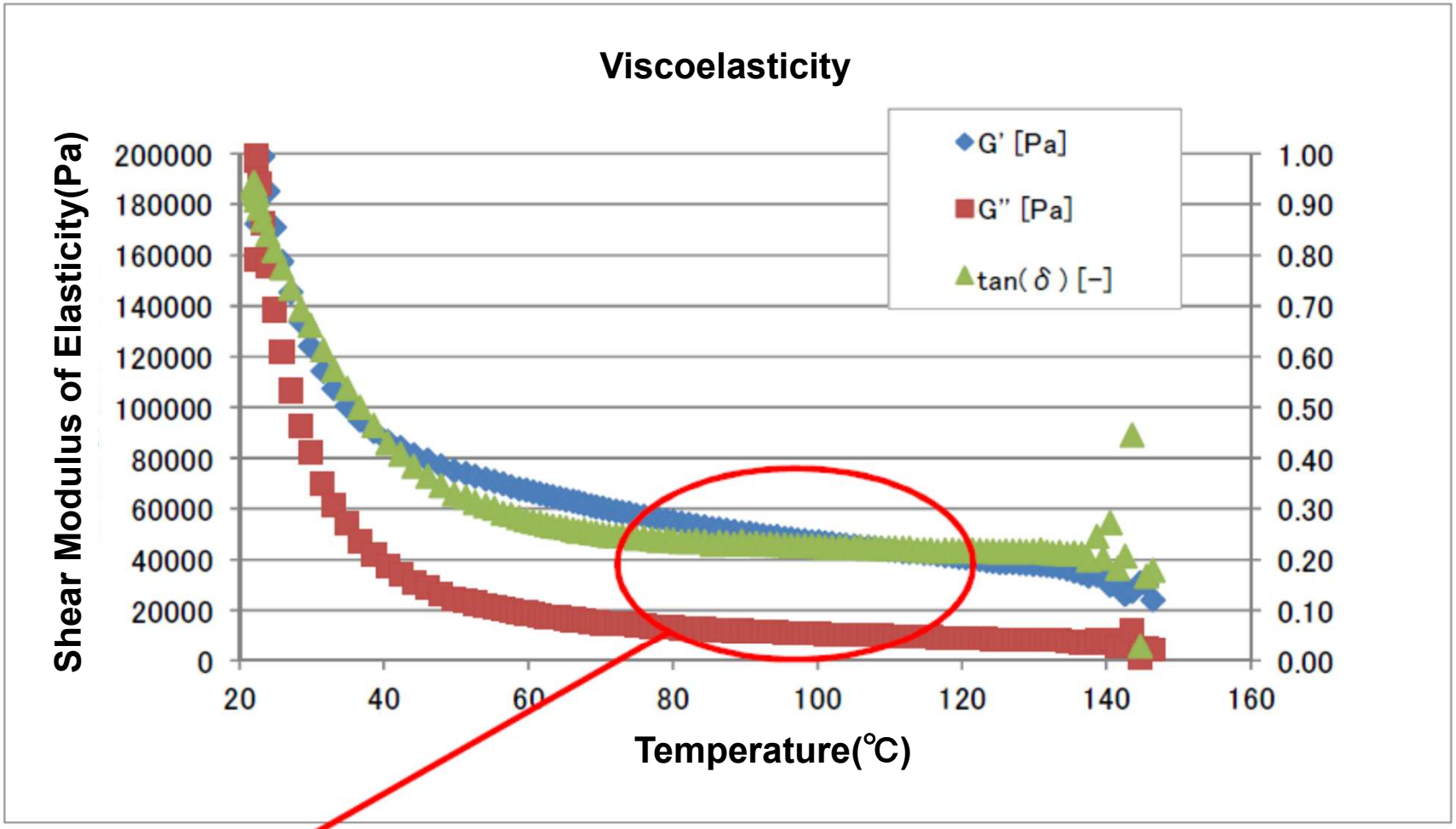


General physical properties

Product	Unit	May Clean Gel
Part number		MGSRT
Hardness	Penetration(1/10mm)	0.5
	Asker C	36
Transmittance	550nm	93%※(99%)
Refractive index	550nm	1.47
HAZE(%)		0.3
Specific gravity		1.19
Young's modulus (KPa)		58
Poisson's ratio		0.3
Compression set (%)		52
Thermal conductivity (W/m・K)		0.18
Volume resistivity (Ohm・cm)		$>10^{16}$
Surface resistivity(Ω)		1E12以上
Dielectric breakdown voltage(KV/mm)		28
Dielectric constant	50Hz	3.3
	1kHz	3.2
	1MHz	2.5
Dissipation factor	50Hz	0.049
	1kHz	0.047
	1MHz	0.037
Glass-transition temperature (℃)		−32℃
Elongation (%)		1020
Breaking strength(N)		2.3
Viscoelasticity(Tan δ)	25℃	0.45
	105℃	0.22

※Calculated value without interface reflection loss

Viscoelasticity by temperature

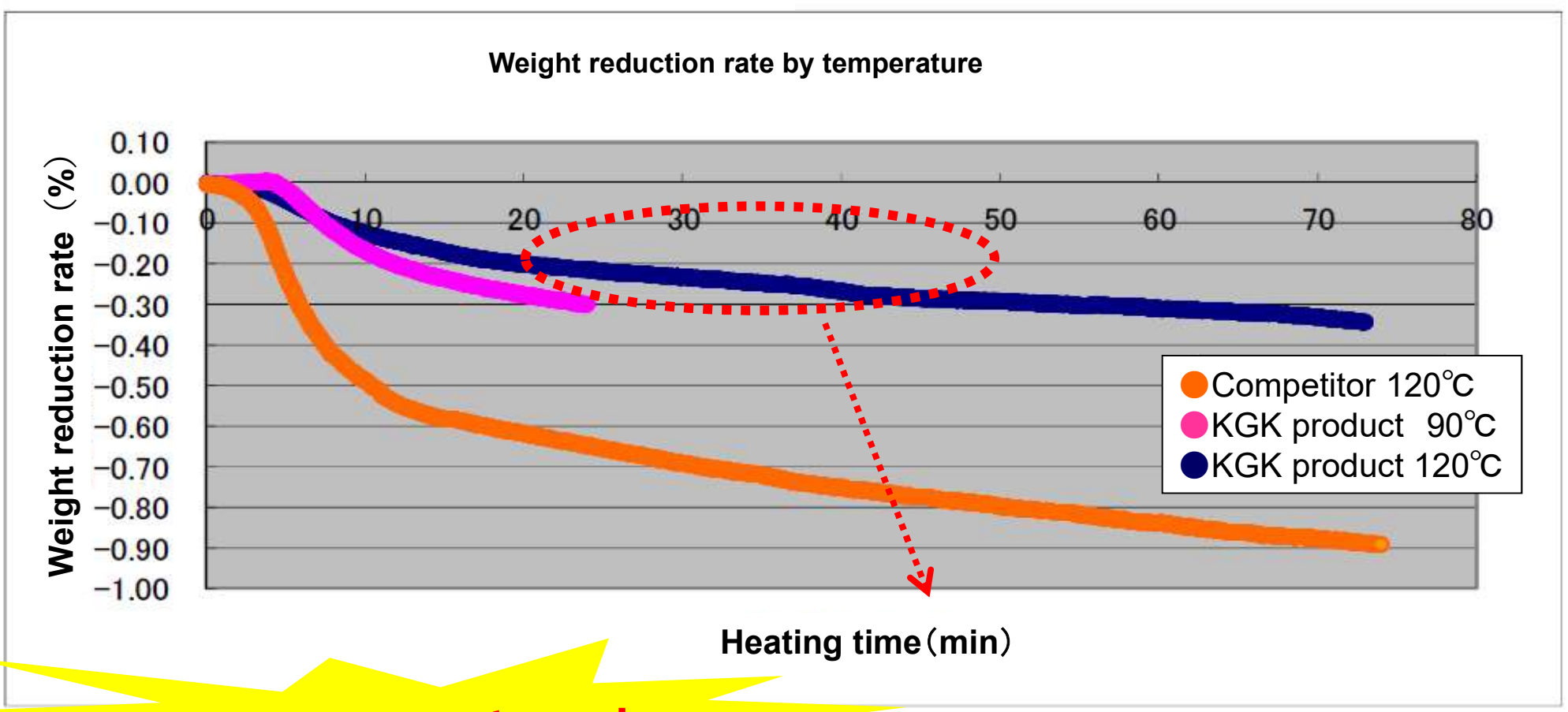


No peeling of specimen

Outgas suppression

MGSRB suppress outgassing by strengthening of cross-linked polymer

・Measuring method
Measured by thermogravimetric analyz



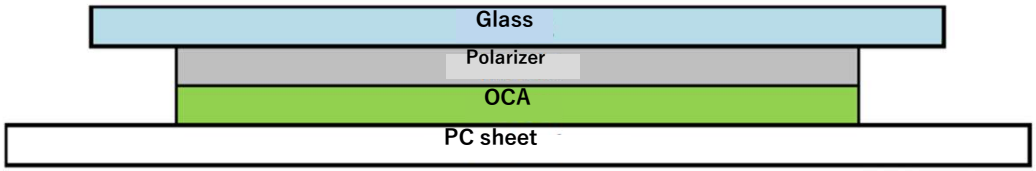
suppress outgassing

Reliability Test

PC (1.0 t) / OCA (MGSRT 100 1.0 t) / Glass with polarizing plate 0.5 t

Appearance test : − 40℃⇔90℃（Temperature change @5min）x 500 cycle testing

Test sample : Structure



Before

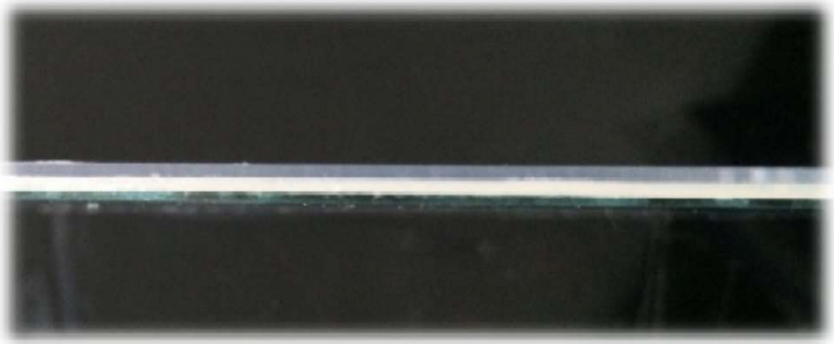
After

No defect

Low temperature impact test

・Test condition

Perform a vertical drop test at a height of 20 cm in an oven at -40 ° C environment.



No peeling of specimen

=Laminate Conditions=

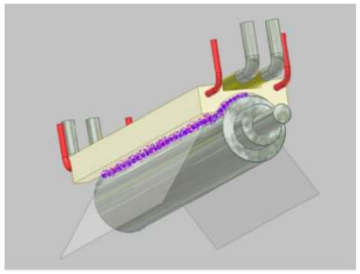
Preprocessing :

1. Resin panel heat curing (degassing) 100 ℃ x 1 hour.
2. Plasma treatment was used to reinforce the adhesion between the resin panel and the glass substrate.

Lamination condition :

- Temperature: 25℃
- Pressure: About 50Kg
- Degree of vacuum: ≦100Pa
- Time: 20sec
- Use lamination Jigu

Plasma treatment



Auto-clave condition :

- Temperature: 50℃
- Pressure: 0.5Mpa
- Time: 20min

=Laminate Method=

vacuum bonding method.

Order of Lamination :

①Laminate OCA to glass（Atmosphere）

②Laminate to resin panel（Vacuum）

③Auto-grave processing.

About Resin plate for Automotive

【Polycarbonate Lineup】
Teijin Panlite PC 1151 2 layer PC
Mitsubishi Gas Chemical Company Iupilon D02U PC/PMMA
Asahi Glass Carboglass (polished) 2 layer PC
Kuraray MT 3 LTR 2 layer PC

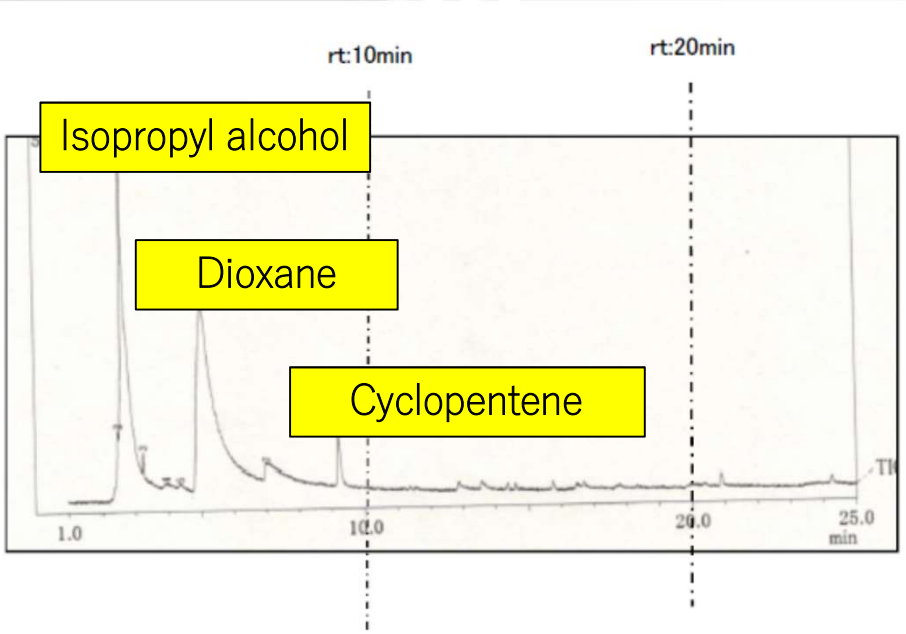
	Trend	Cost	Heat resistance	Optical properties	Electrical properties
Resin cover	↗	◎	×	×	△
Glass cover	↘	×	◎	◎	×

	Hardness	Warp	Crack	Cost	Trend	Remarks
PMMA	◎	×	×	◎	→	Low-end Smart phone
PC	×	×	◎	○	↘	Smart phone
PMMA/PC	○	○	○	△	→	Automotive display
PMMA/PC/PMMA	◎	◎	○	×	↗	High-end Automotive display

Most automotive manufacturers perform anti-glare treatment and hard coat treatment on the resin plate.

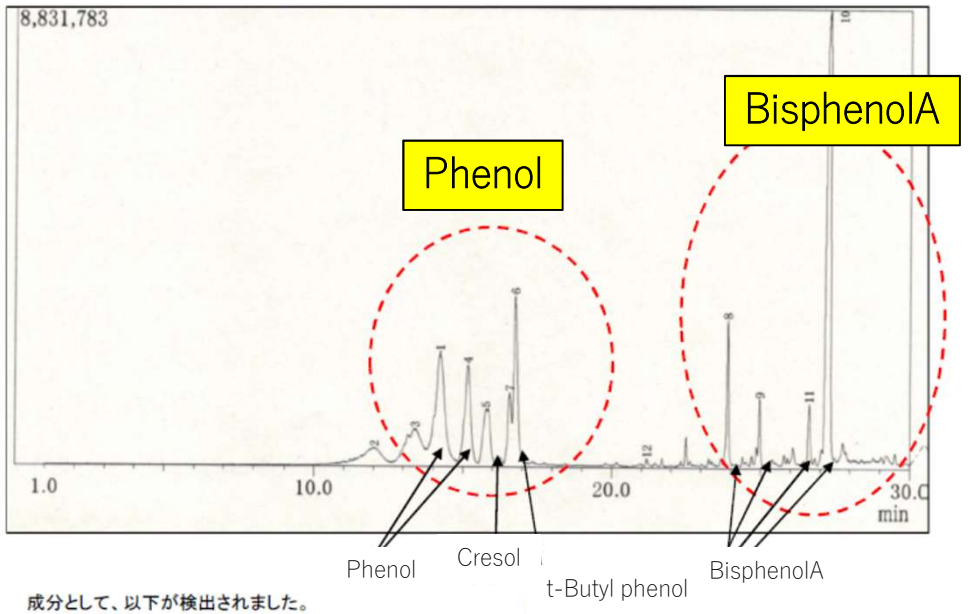
Outgas data of PMMA Plate and PC Plate

PMMA Plate



	沸点(℃)
①Cyclopentene	44
②Isopropyl alcohol	82.5
③Dioxane	101

PC Plate



成分として、以下が検出されました。

	沸点 ℃
①Phenol	182
②Cresol	191
③t-Butyl phenol	223
④BisphenolA	251

Component analysis by Gas Chromatograph Mass Spectrometer

End of presentation

User is responsible for determining whether the KGK product is fit for a particular purposeand suitable for user's method of application. Please remember that many factors canaffect 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.

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