

Confidential

May.19

Double-sided tape for narrow bezel of automotive display

® Molecule Gradient Tape



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Design Philosophy

★ **Structure: Multi layer gradation structure**

1st layer : low molecular acrylic adhesive layer

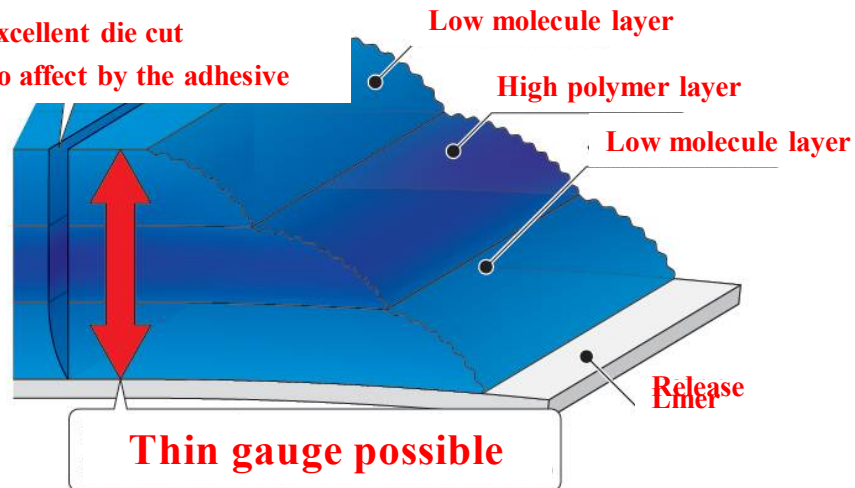
2nd layer : polymer special adhesive layer

3rd layer : low molecular acrylic adhesive layer

Structure :

Excellent die cut

No affect by the adhesive



Products & Characteristic

Product	Thickness (t=mm)	Color	Peel adhesive SUS	Heat holding power °C
200A30 (954-3)	0.03	Transparent	9	150
200A50 (954-5)	0.05	Transparent	17	150
300Z300B	0.3	Black / White	44	150
400Z300B	0.3	Black / White	28	150

Product dvantage

Molecular gradient Double-coated tape is superior to substrate-less and double-sided tape with substrate.

【Evaluated】

Molecule Gradient tape (300A100/954-10)

PET carrier tape

Non carrier tape

0.1mm thickness

0.1mm thickness

0.1mm thickness

Peel adhesive

Sample	N	Peel force(180°)	Shearing force	Shear creep resistance	Impact resistance
		N/inch	(N/cm ²)	(mm)	(J/3.2cm ²)
300A-100 (954-10)	1	28.6	>100	0.0	0.04
	2	30.5	>100	0.0	0.03
	3	29.8	>100	0.0	0.02
	Ave	29.6	>100	0.0	0.03
PET Carrier Tape	1	20.1	99.0	0.0	0.02
	2	19.7	95.0	0.0	0.02
	3	21.1	92.0	0.0	0.02
	Ave	20.3	96.0	0.0	0.02
Non Carrier Tape	1	21.4	90.0	1.0	0.01
	2	23.3	90.0	1.0	0.01
	3	23.2	85.0	1.0	0.01
	Ave	22.6	88.0	1.0	0.01

Test Parameters		
Materials	SUS plate	
Assembly Procedure-Rolled	Rolled	2-times
	Force	20N
	Speed	300mm/s
Test Conditions	Dwell Time	1h
	Peel Speed	300mm/min
	Temperter	23°C

Shearing force

Test Parameters		
Materials	SUS plate	
Assembly Procedure-Rolled	Rolled	2-times
	Force	20N
	Speed	300mm/s
Test Conditions	Dwell Time	1h
	Peel Speed	200mm/min
	Temperter	23°C

Shear creep resistance

Test Parameters		
Materials	SUS plate	
Assembly Procedure-Rolled	Rolled	2-times
	Force	20N
	Speed	300mm/s
Test Conditions	Dwell Time	1h
	test time	1h
	Load	1kg
	temperter	23°C

Impact resistance test.

①Acrylic plate that was cut like a figure (2.0t) and Lenny plate (1.0t) bonded in the processed sample to 2mm frame.

②The test piece is allowed to stand at room temperature for 24 hours.

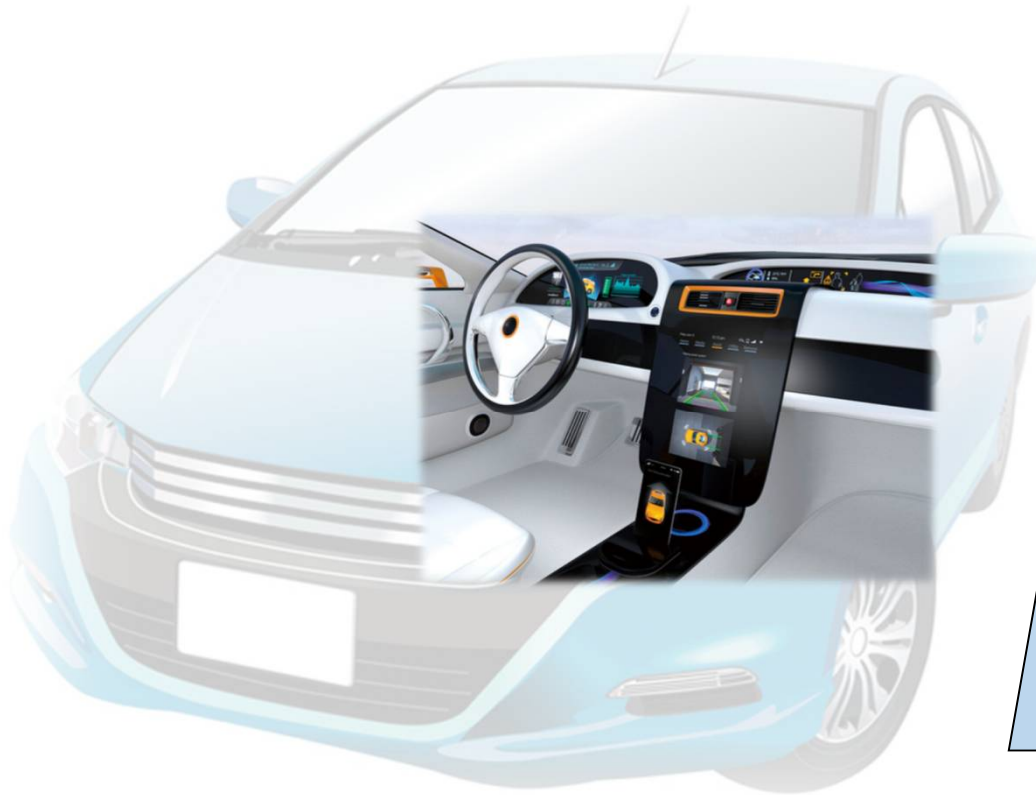
③Weight (100-200g) is dropped, and to check the sample of the dirt.

※ Fall (100-50-5) → (100-100-5) → (100-150-5) → (100-200-5) → (200-150-5) → (200-200-5) carried out of the order.

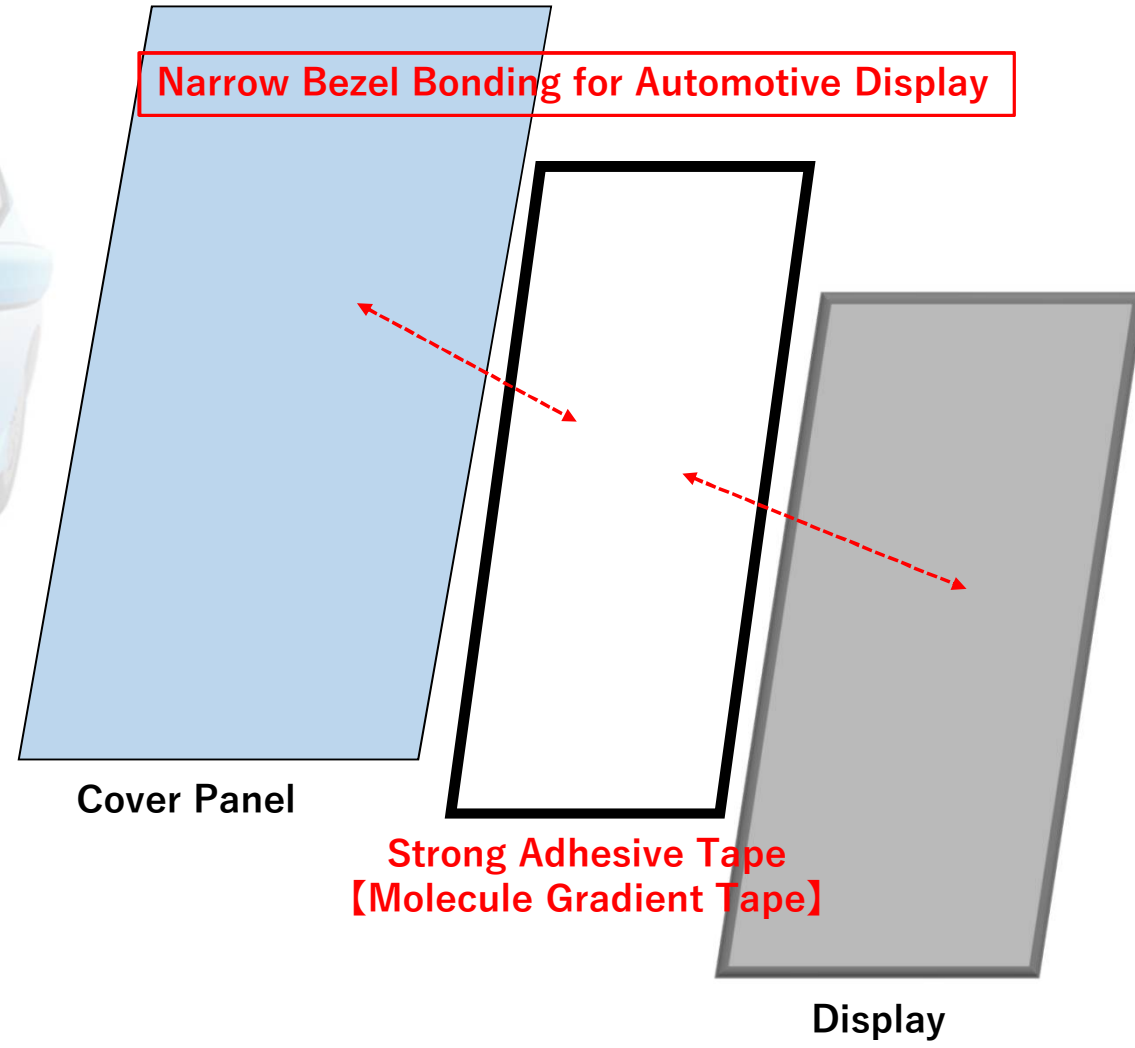
※ [J / 3.2 cm 2] = weight of weight [kg] × falling height [m] × gravitational acceleration [9.8 m / s 2] × number of times



Application



Narrow Bezel Bonding for Automotive Display



Cover Panel

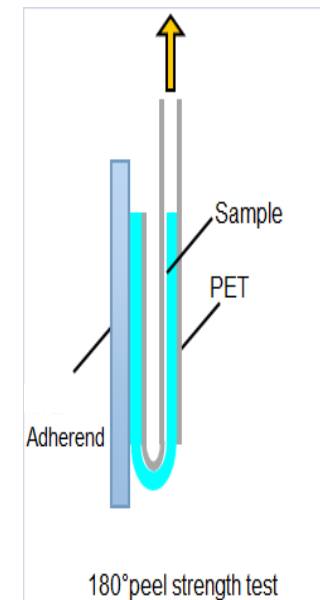
**Strong Adhesive Tape
[Molecule Gradient Tape]**

Display

180° Peel Strength (N/inch)

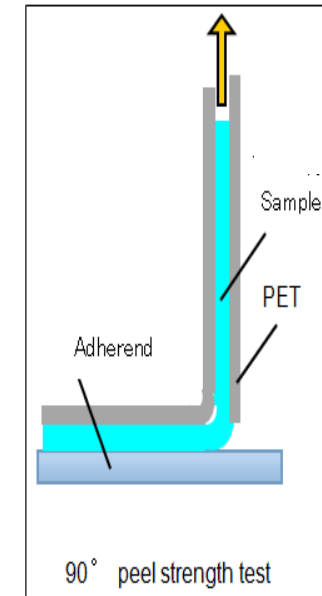
Test Parameters		
Materials	substrate	SUS304, PMMA, PC, ABS, Al
	reinforcement	PET25 μ m
	Adhesive	25mm wide
Assembly Procedure-Rolled	Rolled	2-times
	Force	20N
	Speed	300mm/min.
Test Conditions	Dwell Time	1 h
	Peel Speed	300mm/min.
	Temperature	23°C

	180° peel strength (N/inch)				
	SUS	PMMA	PC	ABS	Al
300Z400B	42.8	47.4	35.0	26.4	32.6
400Z400B	27.4	15.6	26.1	14.7	17.3
Y4920	43.1	33.6	31.0	17.7	20.7
VHX1701-04	21.8	15.3	17.7	11.1	10.2



90° Peel Strength (N/cm)

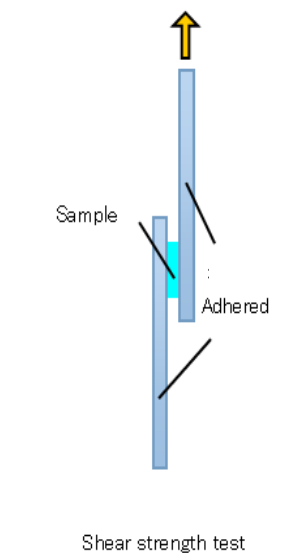
Test Parameters		
Materials	substrate	SUS304, PMMA, PC, Al
	reinforcement	PET 25 μ m
	Adhesive	10mm wide
Assembly Procedure-Rolled	Rolled	2-times
	Force	20N
	Speed	300mm/min.
Test Conditions	Dwell Time	1h
	Peel Speed	300mm/min.
	Temperature	23°C



	90° peel strength [N/cm]			
	SUS	PMMA	PC	Al
300Z400B	11.2	7.7	7.8	8.3
400Z400B	7.9	6.9	6.3	6.9
Y4920	15.9	8.6	5.9	4.4
VHX1701 -04	7.9	4.5	5.6	3.8

Shear Strength (N/cm²)

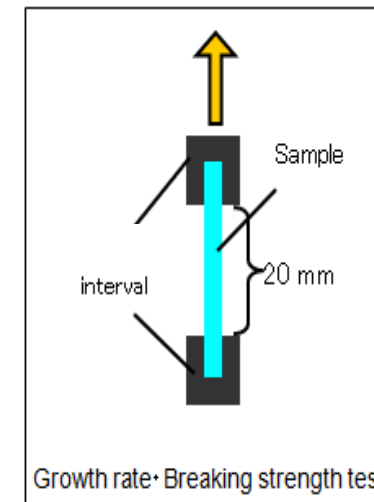
Test Parameters		
Materials	substrate	SUS304,PMMA,PC,ABS,Al
	Adhesive	10×10mm
Assembly Procedure- Rolled	Rolled	2-times
	Force	20N
	Speed	300mm/min.
Test Conditions	Dwell Time	1 h
	Peel Speed	200mm/min.
	Temperature	23°C



	Shear strength [N/cm ²]				
	SUS	PMMA	PC	ABS	Al
300Z400B	272.8	232.8	220.9	103.3	221.4
400Z400B	343.0	250.2	225.0	104.0	292.6
Y4920	340.9	200.8	190.0	110.9	134.8
VHX1 701 - 04	211.1	131.9	165.2	83.1	82.5

Tensile Strength (MPa)

Test Parameters		
Materials	Chuck distance	20mm
	width	10mm wide
Test Conditions	Peel Speed	200mm/min.
	Temperature	23°C



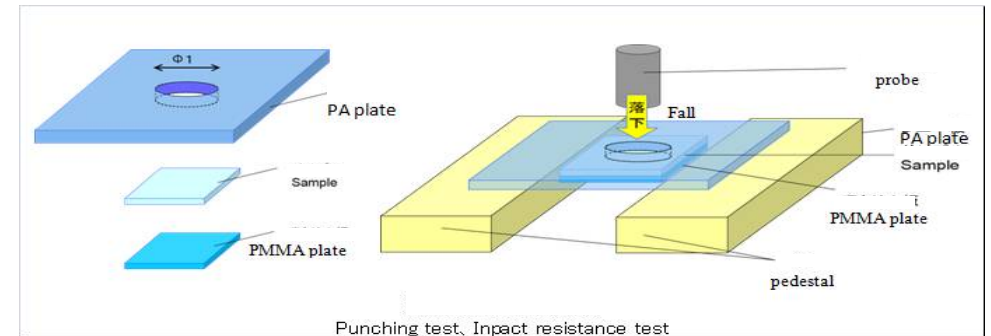
	Tensile strength
	[MPa]
300Z400B	693.4
400Z400B	1435.0
Y4920	119.9
VHX1701 - O4	161.8

Punching Test (MPa)

Test Parameters

Materials	substrate	PMMA/sample /PA
	Standing time	24h
Test Conditions	Probe falling rate	6mm/sec

	Punching test
	MPa
300Z400B	1.0
400Z400B	0.7
Y4920	1.0
VHX1701-04	0.8

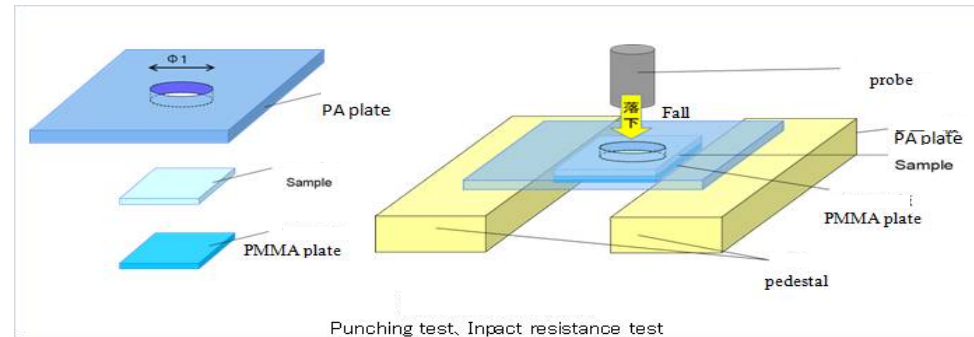


Impact Resistance

Test Parameters		
Materials	substrate	PMMA/sample /PA
	Standing time	24h
Test Conditions	weight	100, 200, 300g
	height	50, 100, 150, 200mm

Order (weight g - height mm - times):

(100-50-5) → (100-100-5) → (100-150-5) → (100-200-5) → (200-150-5)
 → (200-200-5) → (300-150-5)



dissociation: 1 RENY interfacial peeling, 2 PMMA interfacial peeling, 3 tape material destruction, 4 PMMA cracking, - not peeling

Impact resistance test

- (1) Bond them as shown on the left, and make a test piece.
 - (2) Press the test piece back and forth twice with a 2 kg roll.
 - (3) Leave the test piece at normal temperature (23 ° C) for 24 hours.
 - (4) Drop the weight until the tape is peeled off as shown on the right.
- At this time, change the weight and height of the weight to be dropped in the following order and drop the weight.
 (weight g - height mm - times)
 (100-50-5) → (100-100-5) → (100-150-5) → (100-200-5) → (200-150-5)
 → (200-200-5) → (300-150-5)
 Measure the cumulative energy of the impact that we have endured.

	impact (weight g - height mm - times)							dissociation	Cumulative energy [W/3.2cm ²]
	(100-50-5)	(100-100-5)	(100-150-5)	(100-200-5)	(200-150-5)	(200-200-5)	(300-150-5)		
300Z400B	○	○	○	○	○	○	○	-	8.1
400Z400B	○	○	○	○	○	○	5	4	7.6
Y4920	○	○	○	○	3			1	3.0
VHX1701-04	○	○	○	○	○	2		4	4.3

Summary

	180° peel strength [N/inch]					90° peel strength [N/cm]				Shear strength [N/cm ²]					Tensile strength	Punching test	Impact resistance	
	SUS	PMMA	PC	ABS	AI	SUS	PMMA	PC	AI	SUS	PMMA	PC	ABS	AI	[MPa]	MPa	-	[N/3.2cm ²]
300Z400B	42.8	47.4	35.0	26.4	32.6	11.2	7.7	7.8	8.3	272.8	232.8	220.9	103.3	221.4	693.4	1.0	(300-150-5)	8.1
400Z400B	27.4	15.6	26.1	14.7	17.3	7.9	6.9	6.3	6.9	343.0	250.2	225.0	104.0	292.6	1435.0	0.7	(300-150-5)	7.6
Y4920	43.1	33.6	31.0	17.7	20.7	15.9	8.6	5.9	4.4	340.9	200.8	190.0	110.9	134.8	119.9	1.0	(200-150-3)	3.0
VHX1701-04	21.8	15.3	17.7	11.1	10.2	7.9	4.5	5.6	3.8	211.1	131.9	165.2	83.1	82.5	161.8	0.8	(200-200-2)	4.3

KGK's 300Z series has an advantage when considered comprehensively.

- ①KGK's 400Z and other products (Y4920)
There was no big difference
Shear strength : 300Z、400Z ≒ Y4920 > VHX1701-04
(Reference : Shear strength)
- ②KGK's 300Z is equivalent to other companies' products (Y4920) except SUS
The 400Z is stronger than other companies' products (VHX1701-04)
90° peel strength:
Y4920 ≒ 300Z400B > 400Z400B > VHX1701-04
(Reference : 90° peel strength, Punching test)
- ③In terms of impact resistance, 300Z and 400Z are higher than Y-4920 and VHX1701-04.
Impact resistance :
300Z400B > 400Z400B > VHX1701-04 > Y4920
(Reference : Impact resistance)
- ④Because tensile strength of 300Z and 400Z have stronger than Y4920 and VHX1701-04, KGK's 300Z and 400Z series have high processability and reworkability.
Tensile strength:
400Z400B > 300Z400B > VHX1701-04 > Y4920
(Reference : Tensile strength)

Other Product Applications

★Fixing human machine interface parts



★Fixing human machine interface parts

★Fixing of seat heat sensor



★Waterproof fixing of smartphone / Tablet parts

★Waterproof fixing of digital camera parts

Panasonic



OLYMPUS



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End of Presentation

- 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.



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