

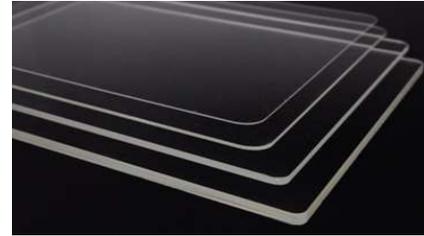


## <Resin Sheet Alternative to Glass>

# ARONIX® Sheet X-157

### 1. Feature

- ◆ High Transparency Total light transmittance=**92%**
- ◆ Low Retardation Re <**4nm**
- ◆ High Hardness Pencil hardness **4H**
- ◆ High Heat Resistance Elastic modulus at **200°C > 1GPa**
- ◆ Easy cutting Cutting by NC router



Thickness =0.5 - 2.0mm

### 2. Applications

- Cover sheets which need heat resistance
- Cover sheets with touch sensor substrate for Smart -Phone, Tablet, Car-navigation system. (i.e. OPS : One Plastic Solution)



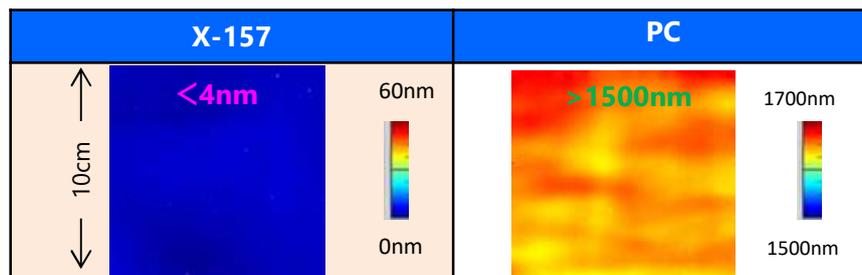
### 3. Properties

		X-157	PMMA	PC
Optical properties	Total light transmittance	<b>92%</b>	92%	89%
	HAZE	<b>0.25</b>	0.16	0.91
	Refractive Index	<b>1.52</b>	1.49	1.59
	Retardation <sup>1)</sup>	<b>&lt;4nm</b>	20nm	500 - 2000nm
Physical properties	Specific gravity	<b>1.2</b>	1.2	1.2
	Flexural modulus <sup>2)</sup>	<b>3.0GPa</b>	3.5GPa	2.5GPa
	Fracture strain <sup>2)</sup>	<b>7.0%</b>	5.0%	8.5%
Scratch resistance	Pencil hardness, 750gf	<b>4 H</b>	H	<H
	Steel wool test <sup>3)</sup>	○ <b>no scar</b>	×	×
Electric properties	Dielectric constant <sup>4)</sup>	<b>4.0</b>	3.2	3.2

1)Thickness=1mm. 2)3point-bending test: rate=0.2mm/s, L=30mm, thickness=1mm, 23°C, 50%RH. 3)Steel wool # 0000, 1kg/4cm<sup>2</sup>, 20cycle. 4)1MHz

### 4. Retardation

#### Low and Uniformity Retardation



Measured by "KAMAKIRI" (PHOTORON Limited), thickness: 1mm

## 5. High Scratch Resistance

Higher hardness is available by hard coating

	X-157	X-157 Hard coated	PMMA	PC Hard coated
Pencil hardness, 750g	4H	5~6H	H	4H
Steel wool test #0000, 1kg/4cm <sup>2</sup> , 20cycle	○	○ (500cycle)	×	○
				

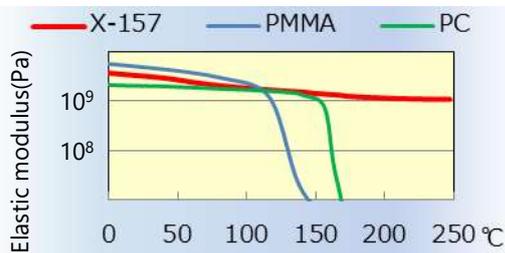
## 6. High Heat Resistance

Keep its shape at 120°C



Geometry: t1×10×50mm, Weight=50 g

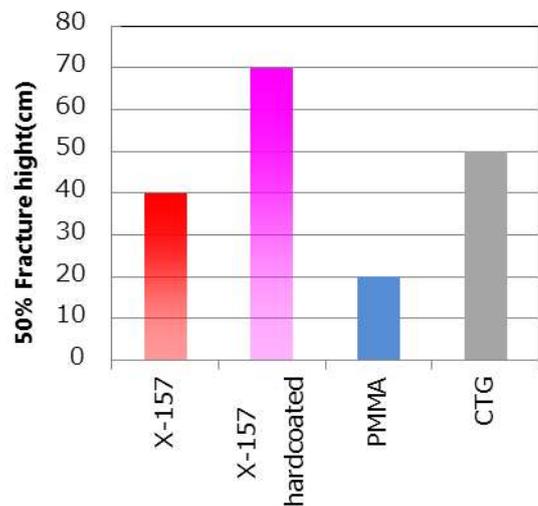
Elastic modulus(200°C) > 1 GPa



Dynamic mechanical analysis: 1Hz, 2°C/min

## 7. High Impact Resistance

Comparable to Chemically-Toughened-Glass(CTG)



Drop impact test: R=5mm, Weight=40g  
CTG: DOL>40μm, 6-face toughened

## 8. Cutting by NC router

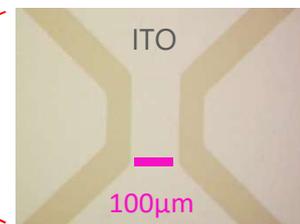
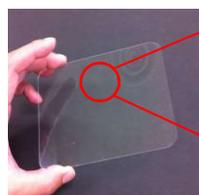
Easy to cut like PMMA or PC



## 9. Application ITO-patterning

Possible to deposit ITO layer onto X-157 by sputtering at 200°C.

X-157(thickness: 1mm)



Thickness of ITO Layer :20nm  
Transmittance :89%(550nm, ITO/X-157)  
Sheet resistance :100Ω/□

This Technical Information is designed to serve as an introduction to the use of our products. Information about physical and chemical characteristics, hazardousness and toxicity stated herein is based on materials and data available at the time of preparing this Technical Information, and does not represent a guarantee. To ensure safety when storing, using and disposing of any products featured in this Technical Information, Please consult your TOAGOSEI representative. TOAGOSEI assumes no liability for the evaluation or patents regarding any final products containing any of its products.

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