1. Panda-MN228 Product introduction

An environmentally friendly high-aluminosilicate ultra-thin cover glass, suitable for protective glass for high-end portable display devices (smartphones, wearable devices, tablet computers, etc.).

2.1 Panda-MN228 Property

·Panda-MN228 has the following superior performance:

→Flexibility.

→Bending strength.

→Scratch resistance.

→Impact resistance.

2.2 Glass specifications and dimensions

·Supply thickness: 0.3～2.0 mm.

·Supply size

→Standard size: 1300×1100 mm (G5)

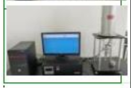
1850×1500 mm (G6)

Note: The shipping size can be adjusted according to customer needs.

2.3 Glass performance related data

■ Mechanical and Electrical Properties

·density	×10-7/℃	98.0±2
·Thermal expansion coefficient	℃	830±10
·Softening Point	℃	606±10
·Annealing point	℃	558±10
·Strain point	GPa	75.6
·Young's modulus		
·Shear modulus	GPa	30.7
·Poisson's ratio		
·Vickers hardness (after strengthening)	/	0.23
·Pencil hardness	MPa	
·Volume resistivity		700
·Dielectric constant	/	



Three Point Measuring Instrument

※ Panda-MN228 Recommended range of surface stress:

Thickness	CS (MPa)	DOL (μ m)	CT (MPa)	Remark
0.40T	≥700	≥30	≤105	Camera cover recommendations: CS≥700MPa; DOL：24±5μ m
0.45T		≥30	≤103	
0.50T	≥750	≥35	≤88	
0.55T		≥35	≤82	
0.60T		≥35	≤75	
0.65T		≥35	≤72	
0.70T		≥35	≤67	
0.75T		≥35	≤65	
0.80T		≥37	≤61	
0.90T		≥40	≤55	
0.95T		≥40	≤53	
1.00T		≥40	≤51	
1.10T		≥40	≤49	
1.20T		≥40	≤47	
1.30T		≥40	≤44	
1.40T		≥40	≤42	
1.50T		≥40	≤40	
1.60T		≥40	≤39	
1.80T		≥40	≤37	
2.00T		≥40	≤35	

Universal Testing Machine

※ When the sample specification is: 145×73×0.70 mm, its strengthening properties are as follows:

·Four point bend	MPa	⩾500 （2.5D Recommend ⩾600）
——Lower Span：40 mm，Upper span：20 mm，Pressure speed 10mm/min。		
·Ball drop Properties	J	≥0.30
·Warpage	mm	≤0.15

Drop ball test machine

■ Processing Properties

※ The edge quality affects 4PB and ball drop performance, so the following parameters are recommended for CNC processing of Panda-MN228 0.55T products:

Item	Spindle speed (rpm)	Amount of knives taken (mm)	Feed rate (mm/min)	Grinding wheel particle size (mesh)
Drilling	40000-45000	0.01-0.02	150-200	400-450
Expansion	40000-45000	/	100-150	400-450
Finishing holes	40000-45000	0.02-0.04	1320-180	1000-1200
Rough appearance	40000-45000	0.15-0.25	650-800	400-450
Refined appearance	40000-45000	0.05-0.10	1000-1200	1000-1200

Precision Engraving Machine

Note: The clamping runout of the grinding head is less than 0.01mm. Add appropriate concentration (4%-7%) grinding fluid to the cooling water for better edge grinding effect.

■ Chemical Properties

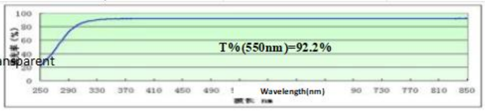
Reagents	Concentration(%)	Time	**Temperature(℃)**	Quality Loss**(mg/cm2)**
NaOH	5%	6h	95±0.5	0.75
HCl	5%	24h	95±0.5	0.12
HF	10%	20min	20±0.5	17.18

■ Optical Properties

·Refractive index	/	1.51
·Photoelastic coefficient	nm/cm/MPa	27.2
·Light transmittance (see the picture below, sample thickness: 0.55 mm)		

T%

Transparent



UV-visible spectrophotometer

■ Enhance Properties

※ Panda-MN228 Chemical strengthening efficiency table：

Time / Temperature	4h		5h		6h	
	CS	DOL(μ m)	CS	DOL(μ m)	CS （MPa）	DOL(μ m)
400	840	32	830	37	820	41
405	833	35	823	40	813	43
410	826	38	816	42	806	46
415	818	40	808	45	798	49
420	806	42	800	47	788	53
Remark	Strengthening conditions can be selected as needed. (Above Na+ concentration: 1000~1500PPM)					

Stress Tester