

3D Glass Solution Introduction

DOME GLASS

ITCW,Inc.

100% Real Premium Tempered Glass

Thickness 0.33mm

Extreme impact & scratch protection

Surface Hardness 9H
Premium chemical strengthening process



Proposal Back Ground

Customer demands "Edge to edge full covering", "perfect 3D" protector with "REAL touch sensibility & design"

1. Since the launch of curved screens by Samsung, the mobile design trend has shifted toward "curved" design.
 - . More devices will be equipped with OLED as curved screen.

2. The current 3D screen protectors in the market have clear flaws and limit.
 - . BM(colored) + DOT glass : Decrease in touch sensibility, modifies mobile device design.
 - . Flat glass : Does Not protect Edge screen.
 - . PET Film : Vulnerable to scratch, Low visibility, Discoloration and Deform over time.

3. Competition is getting tough, which seriously affects revenue and profitability

3D Glass Characteristic

3D EDGE FULL COVER

A NEW type of Edge to Edge coverage without color and dot layers



OTHER GLASS

DOME GLASS

VS

- ✓ Non adhesive Screen
- ✓ Low Touch Sensibility

- ✓ Full Touch
- ✓ Protect Whole Screen



3D Glass Characteristic

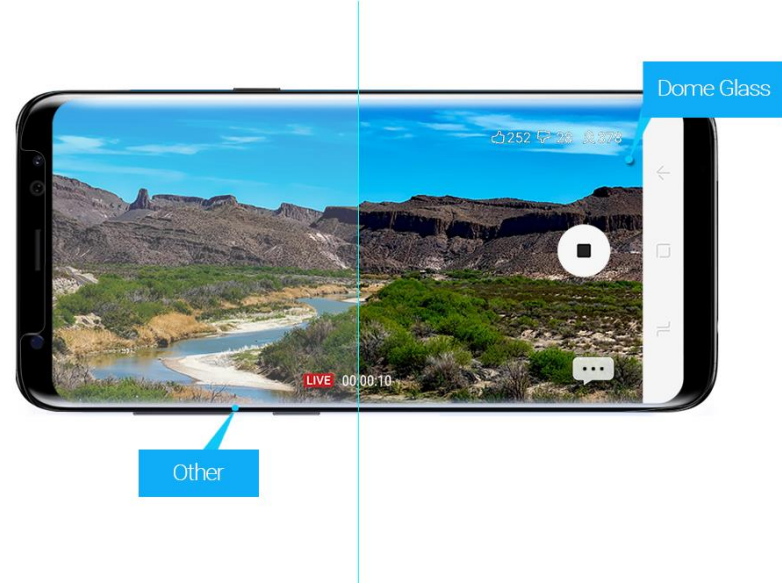
Glass, with Repair Service

Protect your screen even it is cracked.
Dome liquid will cover minor cracks and make it safety.



Keep your Screen Crystal Clear

Enhanced Transparency due to patented liquid adhesive technology.



3D DOME Glass Specification

GLASS Basic Specifications & Comparison

Type	Advantage	Material	Thickness	Remark
3D Glass	Full Cover / Full Touch (without BM & Dot) Full Clear / Full Fix for cracked display	Gorilla Glass	0.33mm (Glass)	2 ways

Patent Technology



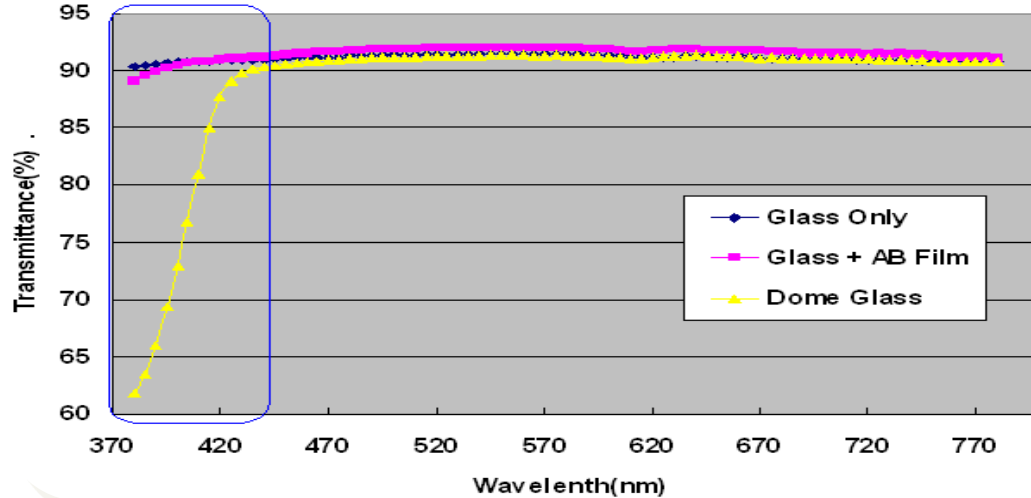
Index	GLASS	Other GLASS(BM / Double-side tape)	Film
Material	100% GLASS	GLASS + urethane (Bezel area)	TPU (Film)
Surface Hardness	9 H	6 – 7 H	3 – 4H
Touch sensibility	Fast and High Touch Sensibility - Full adhesive lamination	Touch Error - DOT type occurs Air gap	Low Touch Sensibility - Material's bubble
Design	High transparency - Liquid type, 93% ↑ transparency	Edge Color BM type - 90% ↓ Transparency due to DOT layer	Bubble and lifting problems - 80% ↓ transparency
Durability	Extreme impact/scratch resistant & Semi-permanent	Double side tape adhesive type - Unwanted peeling and Dust accumulation	Due to material specific, Discoloration & peels off over time

Specification – Reliability data

Mobile spec (Korea “S” Electronics company specification table)

Index	Detail test	Test condition (“S” company demand Spec.)	Result					EA
			SPL. 1	SPL. 2	SPL.3	SPL.4	SPL.5	
Environment	Thermo-hygrostat (60°C/90%)	Temp.:60°C Humidity:90% Time:168Hr	PASS	PASS	PASS	PASS	PASS	5
	High temp.	Temp :80°C Time:168Hr	PASS	PASS	PASS	PASS	PASS	5
	Low temp.	Temp :-40°C Time :168Hr	PASS	PASS	PASS	PASS	PASS	5
	Salt spray	35±2°C 5% NaCl 168Hr	PASS	PASS	PASS	PASS	PASS	5
	UV TEST	UV Lamp 15W(UV-B) ultra-violet emission: 280nm~360nm range condition : 120Hr	N/A	N/A	N/A	N/A	N/A	0
Durability	Scratch resistant	275g weight/ 5 time repeat action (33cycle / min)	PASS	PASS	PASS	PASS	PASS	5
	Ball Drop (Glass apply)	Glass 0.33T standard : 130g / 40Cm ↑	PASS	PASS	PASS	PASS	PASS	10
	Surface Hardness	GLASS : 9H Surface hardness	PASS	PASS	PASS	PASS	PASS	5

Specification – Blue Light Cut



- Blue Light Range: 380 ~ 500 nm
- 3D Glass Blue Light Blocking Ratio : 380~450nm – about 25% decrease of blue light
- Competitor: Available/ yellow color
- Whitestone: Available/ transparent

Specification – Reliability data

- SGS Certification info

Testing item summary (Dome glass - Adhesive)

California Proposition 65 - Cadmium (Cd)

California Proposition 65 - Lead (Pb)

California Proposition 65 - Phthalate : CPSC-CH-C1001-09.3 (MDL 50 mg/kg, 28 analytes)

Formaldehyde content

ROHS (6E) - Wet Chem.:

Cadmium (Cd)

Mercury (Hg)

Lead (Pb)

Cr 6+ (Hexavalent Chromium)

PBBs/PBDEs

168 SVHC Screening (Semi-quantitative)-Testing for article

Bisphenol-A (BPA Total)

Organotins Content (Formerly 2009/425/EC)- TBT, TPhT, TCyT, TOT, DBT, DOT

TVOC

VOCs(organic solvents) - Benzene, Toluene

**Material Safety and Testing Approved.
(For U.S California Prop65, EU, ROHS, ETC)**

SGS
Test Report No. F801611F-CTA10116-08881 Issued Date : 2016. 06. 08 Page 1 of 5

The following sample(s) was/were submitted and identified by/on behalf of the client as:-

SGS File No. : A10A16-06481
 Sample Description : Dome glass-A
 Style no./Item no. :
 Order No. :
 Buyer :
 Manufacturer : Whiststone Ltd
 Country of Origin : Korea
 Country of Destination :
 Received Date : 2016. 07. 29
 Test Period : 2016. 07. 29 ~ 2016. 08. 08
 Test Method : For further details, please refer to following page (1)
 Test Results : For further details, please refer to following page (1)
 Test Requested : As specified by client, selected items of the submitted sample(s) for compliance with "Total Lead", "Total Cadmium" and "Phthalate Content" requirement of US California Proposition 65.

Test Requested	Result	Conclusion
1. US California Proposition 65 - Total Lead Content		PASS
2. US California Proposition 65 - Total Cadmium Content		PASS
3. US California Proposition 65 - Phthalate Content		PASS

Notes 1: Conclusions on pass/fail are based on the test result from the actual sampling of the received sample(s).

SGS Korea Co., Ltd
 Jeff Jang
 Jeff Jang / Chemical Lab Mgr

SGS
Test Report No. F801611F-CTA10116-08881 Issued Date : 2016. 06. 08 Page 2 of 4

Sample No. : A10A16-06481-001
 Sample Description : Dome glass - A
 Batch No./Part No. : N/A
 Materials : N/A

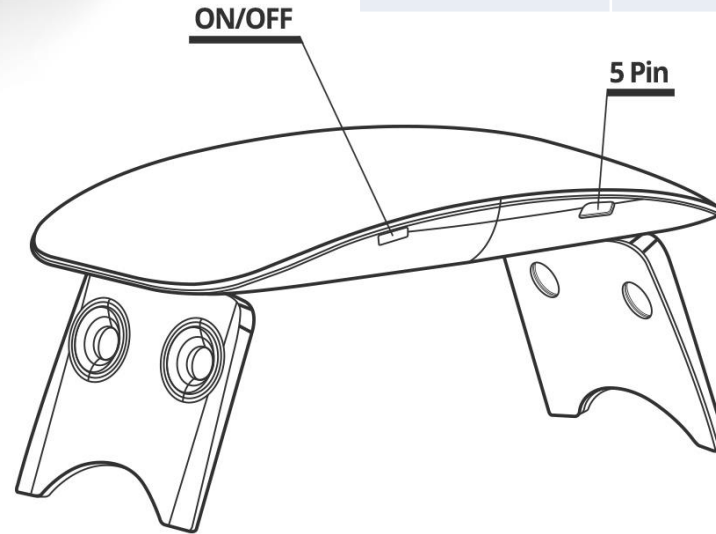
Heavy Metals	Test Item	Unit	Test Method	MEL	Result
Cadmium (Cd)	mg/kg	With reference to US EPA 820211989, US EPA 8210.108.101, US EPA 8210.108.102	US EPA 8210.108.101, US EPA 8210.108.102	0.1	N.D.
	mg/kg	With reference to US EPA 820211989, US EPA 8210.108.101, US EPA 8210.108.102	US EPA 8210.108.101, US EPA 8210.108.102	0.1	N.D.
	mg/kg	With reference to US EPA 820211989, US EPA 8210.108.101, US EPA 8210.108.102	US EPA 8210.108.101, US EPA 8210.108.102	0.1	N.D.
Lead (Pb)	mg/kg	With reference to US EPA 820211989, US EPA 8210.108.101, US EPA 8210.108.102	US EPA 8210.108.101, US EPA 8210.108.102	1	N.D.
	mg/kg	With reference to US EPA 820211989, US EPA 8210.108.101, US EPA 8210.108.102	US EPA 8210.108.101, US EPA 8210.108.102	1	N.D.

Phthalate/Phthalates (PHTHALATES)	Test Item	Unit	Test Method	MEL	Result
Monocyclic phthalate	mg/kg	US EPA 8240C, GC/MS	US EPA 8240C, GC/MS	5	N.D.
	mg/kg	US EPA 8240C, GC/MS	US EPA 8240C, GC/MS	5	N.D.
	mg/kg	US EPA 8240C, GC/MS	US EPA 8240C, GC/MS	5	N.D.
	mg/kg	US EPA 8240C, GC/MS	US EPA 8240C, GC/MS	5	N.D.
	mg/kg	US EPA 8240C, GC/MS	US EPA 8240C, GC/MS	5	N.D.
	mg/kg	US EPA 8240C, GC/MS	US EPA 8240C, GC/MS	5	N.D.
	mg/kg	US EPA 8240C, GC/MS	US EPA 8240C, GC/MS	5	N.D.
	mg/kg	US EPA 8240C, GC/MS	US EPA 8240C, GC/MS	5	N.D.
	mg/kg	US EPA 8240C, GC/MS	US EPA 8240C, GC/MS	5	N.D.
	mg/kg	US EPA 8240C, GC/MS	US EPA 8240C, GC/MS	5	N.D.
	mg/kg	US EPA 8240C, GC/MS	US EPA 8240C, GC/MS	5	N.D.
	mg/kg	US EPA 8240C, GC/MS	US EPA 8240C, GC/MS	5	N.D.
	mg/kg	US EPA 8240C, GC/MS	US EPA 8240C, GC/MS	5	N.D.
	mg/kg	US EPA 8240C, GC/MS	US EPA 8240C, GC/MS	5	N.D.
	mg/kg	US EPA 8240C, GC/MS	US EPA 8240C, GC/MS	5	N.D.
	mg/kg	US EPA 8240C, GC/MS	US EPA 8240C, GC/MS	5	N.D.
	mg/kg	US EPA 8240C, GC/MS	US EPA 8240C, GC/MS	5	N.D.
	mg/kg	US EPA 8240C, GC/MS	US EPA 8240C, GC/MS	5	N.D.
	mg/kg	US EPA 8240C, GC/MS	US EPA 8240C, GC/MS	5	N.D.
	mg/kg	US EPA 8240C, GC/MS	US EPA 8240C, GC/MS	5	N.D.
	mg/kg	US EPA 8240C, GC/MS	US EPA 8240C, GC/MS	5	N.D.
	mg/kg	US EPA 8240C, GC/MS	US EPA 8240C, GC/MS	5	N.D.
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	mg/kg	US EPA 8240C, GC/MS	US EPA 8240C, GC/MS	5	N.D.
	mg/kg	US EPA 8240C, GC/MS	US EPA 8240C, GC/MS	5	N.D.

Specification – UV machine



UV Lamp Specification	
Model	UV+LED (M01)
Time Setting	40 secs
Bulbs Quantity	6PCS LED
Power	9W (Output Power LED)
Wavelength	LED : 405nm, 365nm
Life Time	6W power LED : Semi permanent



SPECIFICATIONS

Model | UV LED Lamp
DC Power | 6W Max
Dimension | 131mm x 67mm x 19mm

NOTICE

Don't use acidic liquid to clear chips or else it will lead to failure of chips deads discoloration!

CE RoHS

Product Detail – B2C for online

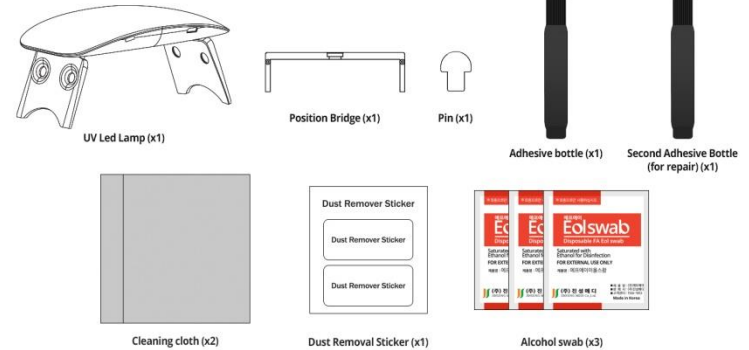
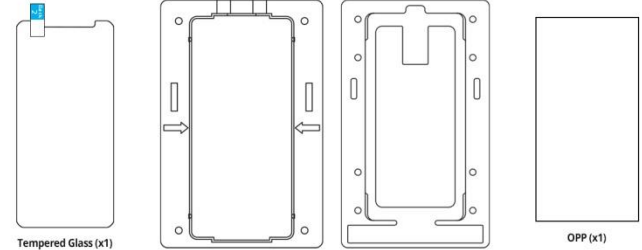
- Product Components

1. Product (3D Glass, 2 Liquid Adhesives, Installation Parts)
2. Install tray (Top/Bottom blister : 2 pieces)
3. UV machine

Box (PKG example)



Glass Packaging includings



(Product package & includings)

Product Detail – B2B for offline

- Product Components

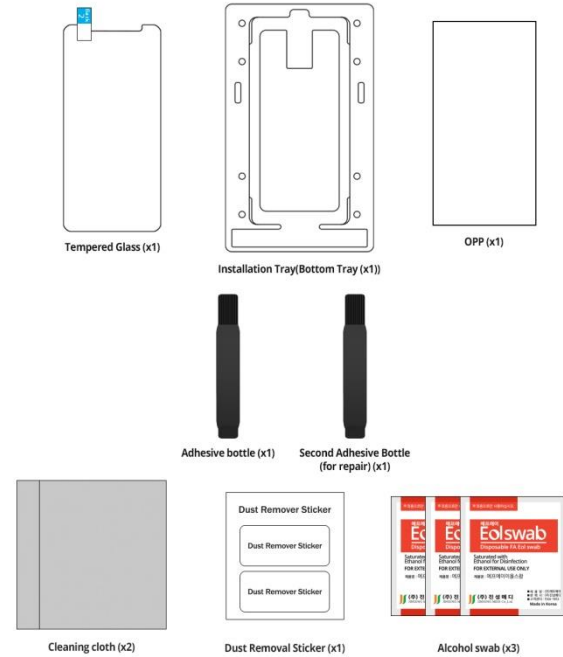
1. Product (3D Glass, 2 Liquid Adhesives, Installation Parts)
2. Big sized UV machine – only equipped at offline store

Box (PKG example)



(Product package & inclusions)

Glass Packaging inclusions



Patent information

- 3D GLASS Main Patent, comprehensive on 3D glass
 - . Glass protective film covering a curved surface of a portable display (3D GLASS)
 - . Device of adhering the glass protective films to the curved surface of the portable display (USING LIQUID)
 - . Method of adhering the glass protective film to the curved surface using the device (JIG METHOD)
- 3D GLASS patent countries
 - . Korea/US/Europe/Taiwan/Japan/ China (totally 6 countries and region)
- Detailed information will be provided, upon your request

Technical FAQ

Is the glass safe?

→ Using same anti-shatter film layer as the common tempered glass type.

Once installed, is the film permanently attached to the device?

→ No. It is Acrylic base. It's same adhesive level as the common Silicon.

Is the glass easily removable?

→ It is as easy to remove as the common silicon adhesive glass.

Does natural lifting occur after the glass is attached?

→ Given that no external force but gravity was applied during the adhesive process.

There will be no lifting unless the user uses an incompatible case or deliberately lifts it using external force.

Can they put the glass back on device once they lift it?

→ Yes, but it is not recommended since the Adhesive power will be dramatically reduced.

What glass is being used? Soda-lime? Aluminosilicate?

→ Gorilla glass is used for the dome products. If necessary it is possible to use any kind of glass through contract.

Technical FAQ

What is the liquid made of ?

- It's mainly Acrylic base. The main materials are Hydroxyethyl Acrylate and Propionic acid.
It's safe to human body and has been certificated by official test institute SGS.
(Attached : SGS certification report)

What damage will it cause to the device if it gets into any of the openings?

- Since the liquid base is an insulator, it does not affect the electrical circuit of device even if it flows inside, but it could affect the functionality if it is hardened inside of device.

Does the liquid damage the oleophobic coatings on the screens?

- It is same level as the common tempered glass method (silicon adhesive type)

Does the liquid have expiration date?

- 1 year in closed container, without direct sun light, at temperature -40 to +80 degrees

Does the UV damage the phone in any way? Discoloration?

- The UV light will do no harm to the device, such as discoloration.
The UV wavelength ranges are natural light levels. It's commonly used in Nail shop.
Some retail are even planning to provide the sanitizing service using the UV machine.

Thank you!