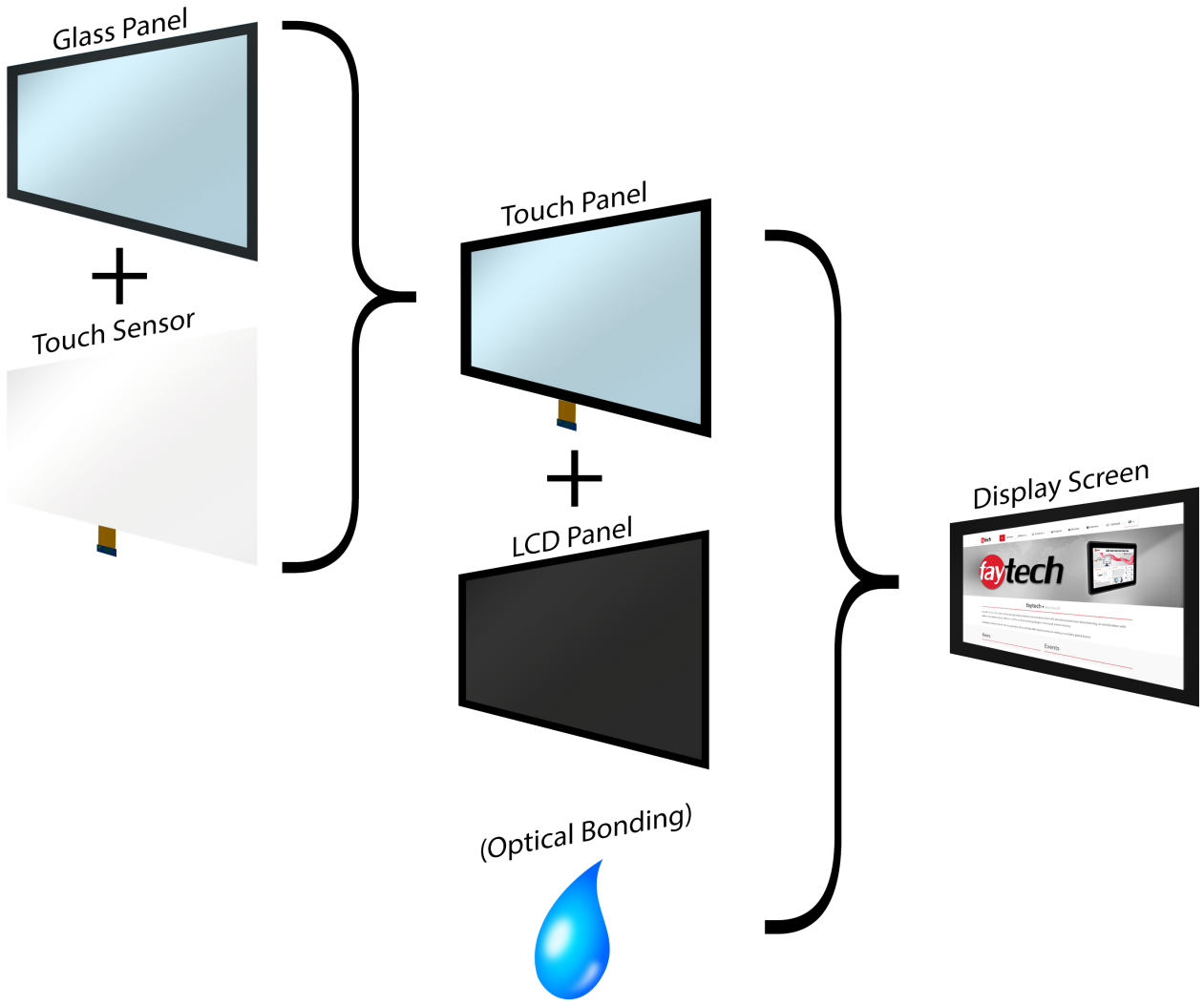
faytech's Display Quality

In order for faytech to provide the best quality products to the customers, we make sure the entire supply chain is controlled. Each single component is precisely selected and thoroughly inspected in order to meet the highest quality standards in the market. This way faytech is able to only produce the best quality devices for the customers.

The quality of the screen is very important part of faytech's devices, thus also requires to meet certain criteria. On the following pages are texts and tables which explain the amount and size of cosmetic defects allowed in the components before it is being used for faytech's manufacturing process. These components include:

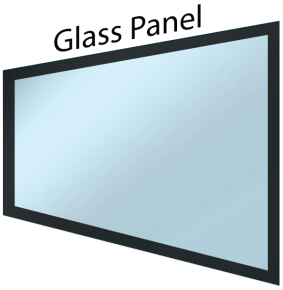
- Glass Panel
- Touch Sensor
- LCD Panel

In order to fully understand the components used for the display screens of faytech devices, the process is visualized in the diagram below:



Glass Panel Inspection Criteria

The glass panel is a cover glass for the device, which in faytech's case is standard to be coated with an anti-glare chemically etched solution to provide the best see-through quality to be used for the display. Other standards with which the glass should comply with is at least 7H hardness and 4% haze transparency.



The quality of the glass panels received from faytech's suppliers is inspected for several criteria, before being used. By thoroughly inspecting the glass quality, faytech ensures that the panels used for the production of the devices meet the highest standards possible. Below and on the next page is the inspection criteria for the glass panel summarized in two tables.

Glass Panel Inspection Criteria (7" - 32")

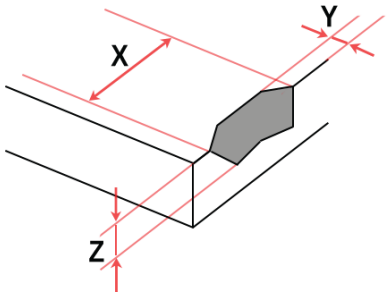
		7" – 12.5"	***13.3" – 32"***
Circular	***Acceptable defects***	D < 0.15mm 0.15mm ≤ D ≤ 0.30mm N ≤ 2	D < 0.15mm 0.15mm ≤ D ≤ 0.60mm N ≤ 2
	Unacceptable defects	D > 0.30mm	D > 0.60mm
		Bubbles, blotches or salient dots	
Line	***Acceptable defects***	W < 0.025mm 0.025mm < W ≤ 0.08mm N ≤ 2, L ≤ 2.0mm	W < 0.025mm 0.025mm < W ≤ 0.08mm N ≤ 2, L ≤ 5.0mm
	Unacceptable defects	W > 0.08mm	W > 0.08mm
		Scratches detectable with the finger	
Edge breakage	***Acceptable defects***	Reverse side: X ≤ 6.0mm, Y ≤ 1.0mm, Z ≤ ½ t	
	Unacceptable defects	Obverse side irregularities	
Angle breakage	***Acceptable defects***	Reverse side: X ≤ 0.5mm, Y ≤ 0.3mm, Z ≤ t	
	Unacceptable defects	Obverse side irregularities	
Cracks	***Unacceptable defects***	No cracks are allowed	
Glass Hardness	***Acceptable defects***	Pass if Hardness ≥ 7	
	Unacceptable defects	Fail if Hardness < 7	
Peak to peak printing	***Acceptable defects***	Visual area: W ≤ 0.06mm, other area: W ≤ 0.04mm N ≤ 2	
	Unacceptable defects	Visual area: W > 0.06mm, other area: W > 0.04mm	
Transmittance of printing area	***Unacceptable defects***	Light leakage is not allowed	
Dimensions	According to drawing of the individual product		
Transmittance	According to drawing of the individual product		
Glossiness	According to drawing of the individual product		
Ball drop test	Tests done according to drawing / individual product		

N = Number of defects
D = Diameter of circular defect
L = Length of line defect
W = Width of line defect
X = Length of breakage
Y = Width of breakage
Z = Thickness of breakage

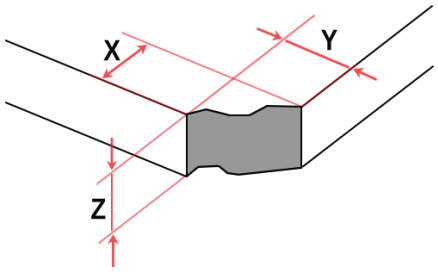
Glass Panel Inspection Criteria (42" - 86")

		42" – 55"	65" – 86"
Circular	***Acceptable defects***	D < 0.25mm 0.60mm ≤ D ≤ 1.00mm N ≤ 3	D < 0.35mm 1.00mm ≤ D ≤ 1.30mm N ≤ 4
	Unacceptable defects	D > 1.00mm	D > 1.30mm
Line	***Acceptable defects***	W < 0.05mm 0.05mm < W ≤ 0.08mm N ≤ 2, L ≤ 15.0mm	W < 0.05mm 0.05mm < W ≤ 0.13mm N ≤ 3, L ≤ 25.0mm
	Unacceptable defects	W > 0.10mm	W > 0.10mm
		Scratches detectable with the finger	
Edge breakage	***Acceptable defects***	Reverse side: X ≤ 6.0mm, Y ≤ 1.0mm, Z ≤ ½ t	
	Unacceptable defects	Obverse side irregularities	
Angle breakage	***Acceptable defects***	Reverse side: X ≤ 0.5mm, Y ≤ 0.3mm, Z ≤ 2/t	
	Unacceptable defects	Obverse side irregularities	
Cracks	***Unacceptable defects***	No cracks are allowed	
Glass Hardness	***Acceptable defects***	Pass if Hardness ≥ 7	
	Unacceptable defects	Fail if Hardness < 7	
Peak to peak printing	***Acceptable defects***	Visual area: W ≤ 0.06mm, other area: W ≤ 0.04mm N ≤ 2	
	Unacceptable defects	Visual area: W > 0.06mm, other area: W > 0.04mm	
Transmittance of printing area	***Unacceptable defects***	Light leakage is not allowed	
Dimensions	According to drawing of the individual product		
Transmittance	According to drawing / individual product		
Glossiness	According to drawing / individual product		
Ball drop test	Tests done according to drawing / individual product		

N = Number of defects
D = Diameter of circular defect
L = Length of line defect
W = Width of line defect
X = Length of breakage
Y = Width of breakage
Z = Thickness of breakage

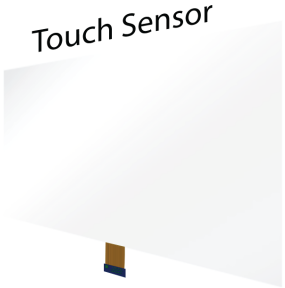


Edge breakage visualized



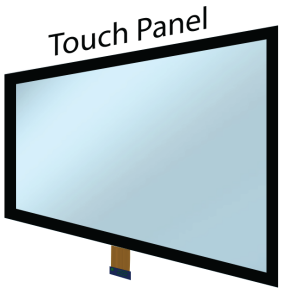
Corner breakage visualized

Should any of the standards for the inspection criteria not be met, then the glass panel will not pass the quality inspection and thus will not be used for any of faytech's devices. However, if it passes, the touch sensor is applied to the glass panel and in combination will become the touch panel.



Touch Panel Inspection Criteria

The touch sensor will be inspected thoroughly once it is combined with the glass panel. This is to make sure both the attachment process and the sensor itself is of the highest quality. Below and on the next page is the inspection criteria for the touch panel summarized in two tables.



Touch Panel Inspection Criteria (7" - 32")

		7" – 15"	15.6" – 32"
Circular	***Acceptable defects***	D ≤ 0.15mm 0.15mm ≤ D ≤ 0.30mm N ≤ 4 0.40mm ≤ D ≤ 0.60mm N ≤ 2	D ≤ 0.30mm 0.40mm ≤ D ≤ 0.60mm N ≤ 8
	Unacceptable defects	D > 0.60mm	D, > 0.60mm
		2 defects within a 50mm diameter area	
		Point-like defects found within 5 seconds of observation	
Line	***Acceptable defects***	W ≤ 0.05mm, L ≤ 2mm 0.05mm < W ≤ 0.15mm, 2 ≤ L ≤ 10mm, N ≤ 4	W ≤ 0.05mm, L ≤ 2mm 0.05mm < W ≤ 0.15mm, 2 ≤ L ≤ 10mm, N ≤ 8
	Unacceptable defects	W > 0.15mm	W > 0.15mm
		Point-like defects found within 5 seconds of observation	
Edge / corner breakage	***Acceptable defects***	Reverse side: X < 1.5mm, Y ≤ 1.5mm, Z < ½ t	
	Unacceptable defects	If breakage affects silver printing	
Cracks	***Unacceptable defects***	No cracks are allowed	
Surface dirt / prints	***Unacceptable defects***	Fingerprints & surface dirt is not allowed	
Warpage	***Acceptable defects***	WA ≤ 0.30mm (for 2.80mm cover glass) WA ≤ 0.50mm (≤ 2.00mm cover glass)	
	Unacceptable defects	WA > 0.30mm (2.80mm cover glass) WA > 0.50mm (≤ 2.00mm cover glass)	
FPC defects	***Unacceptable defects***	Sharp creases, burrs, wavy edges and oxidation is not allowed	
Etched grain	***Unacceptable defects***	Etched grain visibility under natural light is not allowed	
Adhesive / glue	***Unacceptable defects***	Leakage of insulating glue in not allowed	
		Sealing adhesive being higher than FOG glass is not allowed	
Dimensions	According to drawing of the individual product		

N = Number of defects
D = Diameter of circular defect
L = Length of line defect
W = Width of line defect
X = Length of breakage
Y = Width of breakage
Z = Thickness of breakage
WA = Warpage of glass

Touch Panel Inspection Criteria (42" - 86")

		42" – 55"	65" – 86"
Circular	***Acceptable defects***	D ≤ 0.60mm D ≤ 1.00mm N ≤ 10	D ≤ 1.30mm 1.30mm ≤ C ≤ 1.50mm N ≤ 12
	Unacceptable defects	D > 1.00mm	D > 1.50mm
		2 defects within a 50mm diameter area	
		Point-like defects found within 5 seconds of observation	
Line	***Acceptable defects***	W ≤ 0.05mm, L ≤ 2mm 0.05mm < W ≤ 0.15mm, 2 ≤ L ≤ 10mm, N ≤ 4	W ≤ 0.05mm, L ≤ 2mm 0.05mm < W ≤ 0.15mm, 2 ≤ L ≤ 10mm, N ≤ 8
	Unacceptable defects	W > 0.15mm	W > 0.15mm
		Point-like defects found within 5 seconds of observation	
Edge / corner breakage	***Acceptable defects***	Reverse side: X < 1.5mm, Y ≤ 1.5mm, Z < ½ t	
	Unacceptable defects	If breakage affects silver printing	
Cracks	***Unacceptable defects***	No cracks are allowed	
Surface dirt / prints	***Unacceptable defects***	Fingerprints & surface dirt is not allowed	
Warpage	***Acceptable defects***	WA ≤ 0.30mm (for 2.80mm cover glass) WA ≤ 0.50mm (≤ 2.00mm cover glass)	
	Unacceptable defects	WA > 0.30mm (2.80mm cover glass) WA > 0.50mm (≤ 2.00mm cover glass)	
FPC defects	***Unacceptable defects***	Sharp creases, burrs, wavy edges and oxidation is not allowed	
Etched grain	***Unacceptable defects***	Etched grain visibility under natural light is not allowed	
Adhesive / glue	***Unacceptable defects***	Leakage of insulating glue in not allowed	
		Sealing adhesive being higher than FOG glass is not allowed	
Dimensions	According to drawing of the individual product		

N = Number of defects
D = Diameter of circular defect
L = Length of line defect
W = Width of line defect
X = Length of breakage
Y = Width of breakage
Z = Thickness of breakage
WA = Warpage of glass

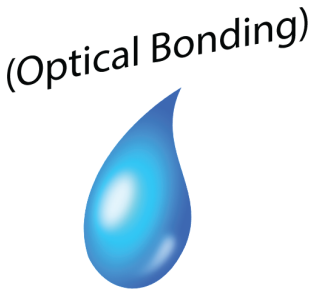
LCD Panel Inspection Criteria

The LCD panels purchased from faytech's suppliers are also inspected thoroughly, and no other than A+ quality is allowed. faytech ensures that the LCD panels used within the devices are of the best quality in the market.

Each LCD panel size being used by faytech has their own inspection criteria regarding the pixel defects. For sizes up to 10.1" faytech guarantees no pixel defects, while the larger sized each have their own criteria to pass the inspections. Specific LCD panel criteria can be acquired by requesting it for the specific size you wish to use for the project.

Optically Bonded / Non-Optically Bonded

After the touch panel and LCD panel passed all the tests and criteria, it moves on to the next stage to be combined together into the display screen. This process can be either done with or without the silicone glue, thus resulting in either an optically bonded device or a non-optically bonded device.



faytech's own silicone glue formula is used to optically bond the selected device. This glue is specifically designed for this purpose in order to meet the highest industry standards in the market.

Display Screen

After this process of combining the touch panel with the LCD panel a final quality control check is performed to make sure the final result is an A+ quality panel.

Once this is done, the display screen can be assembled into our renowned faytech devices according to standard specifications or customized projects to meet the customer's requirement.

Inspection of an 86" optically bonded display screen