



## Avoiding the Two Biggest Pitfalls of Touch Screens

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### The Pitfalls

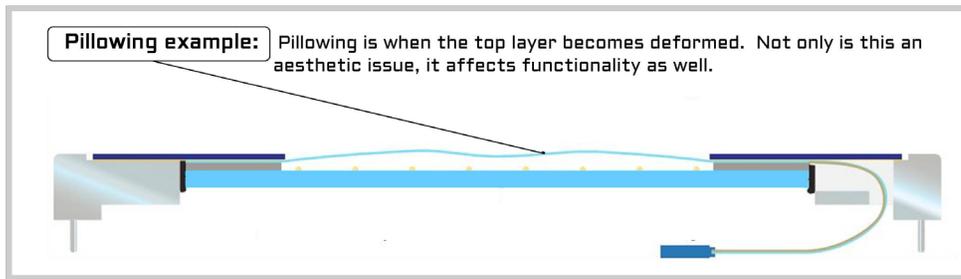
The ever growing drift by product designers to integrate touch screens into the products they design is undeniable. In fact, many of these products now have a history in the field providing useful empirical data as to how well they are performing in their respective environments. Unfortunately, some engineers are learning the hard way that all touch screens simply do not perform at the same level. In fact, the most profound difference in touch screens can be found in how well the touch screen holds up when subjected to rigorous environments.

The two failure modes that are most often recognized by companies integrating touch screens into their products are: pillowing and tail delamination.

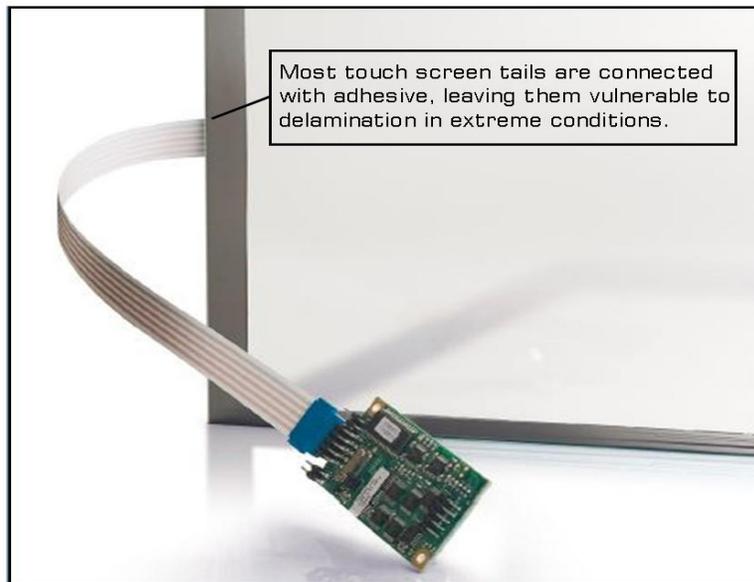
An explanation of these common pitfalls are described below:

**Pillowing.** On a typical 5-wire resistive touch panel, there is a thin layer of PET or PC as the first surface that we touch. This surface and the glass substrate behind it, are separated by very small printed dots, or spacer dots. When a finger or other item touches the panel in a certain area, this creates a circuit closure which sends the location to the controller via the printed ITO which is non-viewable and printed on the glass.

When significant variances in temperature and/or humidity occur, the air that is trapped between glass and polymer can become unstable causing the top polymer layer to expand and contract or **pillow**. Not only is this pillowing aesthetically unacceptable, it can cause both false and missed touches.



**Tail Delamination.** One of the weakest mechanical areas of a touch screen is where the cable is connected to the body of the touch screen. Either stresses in handling and/or assembly can cause some touch panels to delaminate at this junction point leaving the touch panel on-functional. A more problematic scenario is when this electrical junction is weakened during installation but only fails after it is the field. Extreme temperatures and vibration are the two main contributors to this failure mode after a given touch screen is in the field.



## The Solution

The good news is that a few touch panel manufacturers have developed the means to prevent these problematic failures. One that has proven particularly adept at addressing these issues is the Taiwan-based company named Higgstec. Higgstec has been designing and manufacturing some of the most robust touch screens in the industry for nearly 15 years. More poignantly, Higgstec has developed proprietary processes that specifically address the pillowing and tail delamination issue.

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Higgstec has able to discern that the pillowing issue could largely be avoided by controlling a few of the critical variables during the lamination of the thin polyester layer to the glass layer. Combining the right combination of pressure and laminating processes the are able to produce touch panels that remain flat at very high temperatures.

Another contributor to the robustness of their touch screens is the implementation of their proprietary **high temperature bonding process**. Not only does this process stabilize the glass by subjecting it to extremely high temperatures, it plays an instrumental role in eliminating the concerns over tail delamination. By curing the silver and ITO layers on the glass at very elevated temperatures, they in effect cause the inks to sinter into the glass layer creating an extremely durable composite.

Operating and Storage Temperatures	
<b>Standard Touch Panel</b>	<b>Higgstec Touch Panel</b>
Storage: -40°C - 71° C Operating: -10°C - 50° C	Storage: -40°C - 80° C Operating: -10°C - 70° C

The bottom line is that though many touch screens may look very similar, there is a wide range in how these products are manufactured and thus how well they will perform in the field. In general, the more rigorous the environmental conditions, the more important it is to use companies that have the know how to manufacture product that can withstand these difficult environments.

## To Learn More

SSI Electronics, Inc. has strengthened its offerings of user interface devices by recently becoming an authorized distributor of Higgstec. To learn more about touch screens or for help in integrating any user interface into your products, contact [SSI Electronics, Inc.](#) Today.



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