



Case Study

We turn good ideas into great products.

SONY ERICSSON

S500i MOBILE PHONE

The mobile phone market is constantly changing with each manufacturer pushing the envelope to develop products with added functionality and capability. Porticos engineers have been involved with many SEMC mobile phones over the years. The s500i was one of those products that forged new roads in the industry.

"Porticos was selected based on their strong track record and experience in delivering quality mechanical solutions for high-tech products like mobile phones. They have a history of delivering designs that meet our stringent performance requirements without compromising the look, shape, or feel of the phone." **Mark Weadon,**



There were no shortages of engineering challenges to be overcome. The s500i was the first slider phone developed at the SEMC Research Triangle Park design site and featured a quad band GSM architecture, Bluetooth, WAP, EDGE, SMS, MMS, a 4x digital zoom CCD camera module, TFT color display, and push to talk speakerphone all to be housed in a package < 15mm in thickness! Porticos and SEMC engineers worked side by side and developed a product that would eventually become the highest selling device to come out of the RTP design site; reaching production levels of over 500K units per week.



Designing high volume hand held consumer electronic devices requires an extensive knowledge of plastic and metal production technologies and processes as well as cosmetic treatments. PC/ABS was chosen for many of the plastic parts because of its inherent balance of strength and flexibility. One exception was the front frame which doubled as a light guide to provide a "surprise" experience for the user by lighting up on incoming calls. Clear ABS was chosen for that application.

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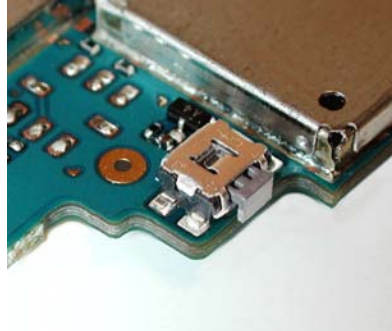
S500i MOBILE PHONE

FEA was conducted in Ansys on critical areas such as the hinge, snap features, screw bosses and lanyard pull. LSDyna was also used to conduct drop and bend simulations allowing the engineers to make design refinements to the Unigraphics CAD models before the parts were released for tooling.

To reduce overall thickness, the hinge sub-assembly was designed to act as the structural chassis of the upper and lower halves of the phone. Stiffening geometries were required to ensure that the 0.5mm base thickness stainless steel hinge would stand up to customer abuse.



A combination of traditional FR4 constructed boards, flex films and flex film / stiffened board combinations were used to allow the most efficient routing of electrical



and electro-mechanical components to ensure maximum performance for the antenna, speaker, display and camera.

Porticos also supported industrialization of the various mechanical components; approving nearly 100 injection molding tools along with multiple stamping and progressive die sets. With the high volumes of the s500i, tolerance analysis was also required to ensure the mixing and matching of parts from different tools and cavities would be seamless. As a point of reference, the front cover alone required 26 two cavity tools to meet demand!

The s500i received the product of the year award at Sony Ericsson and JD Powers and Associate award for “Highest in Customer Satisfaction for Mobile Phone”.