

A Novel approach to the Analysis of Glass Components used in Portable Electronic Devices by Micro-XRF

Jamie Vargeson*, Kristen Eckart, Anna Nached, Corning Incorporated, USA,
VargesonJJ@Corning.com

The market for touchscreen devices, such as mobile phones and tablets, is large and continuing to expand. On almost all of these devices is a high-strength, thin sheet of glass that is used as a protective cover which has high durability and scratch resistance, but also has good optical clarity and touch sensitivity. Corning Incorporated is one of the major manufacturers of cover glass for mobile devices with Gorilla® Glass having already been designed into more than five billion devices globally. However, there are many other manufacturers in this market place as well.

Virtually all of the cover glasses on the market gain their surface strength through the ion-exchange process, where the glass is dipped in a molten potassium salt bath that exchanges smaller sodium ions from the glass with the larger potassium ions from the salt. The larger potassium ions take up more volume and create a residual compressive stress on the surface of the glass.

When tracking the use of various glass families in the global market, a technique is needed that can quickly and accurately differentiate each glass type by composition. The ion-exchanged surface of the glass, as well as the application of various coatings and adhesives to the glass, adds complexity to the measurement by traditional techniques, such as wet chemistry, ICP-OES, and WD-XRF. However, Micro-XRF is a very convenient tool for the analysis of ion exchanged and otherwise coated glasses. With Micro-XRF, samples can be prepared and analyzed on the cross-section, which allows for analysis near the center of the cross-section while avoiding the ion-exchanged and coated area of the glass near the surface.

In this presentation, the best practices of the analysis of ion-exchanged and coated cover glasses by Micro-XRF will be summarized, including: sample preparation, analysis location, benefits over other analytical techniques, calibration, and data analysis.