Applied Research Activities

Processing flexible glass – the influence of functionalization on the edge strength and durability of ultrathin glass

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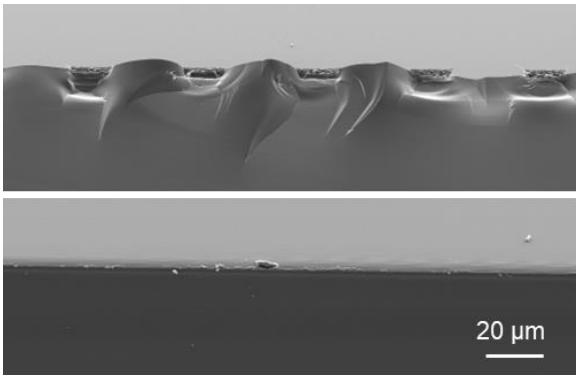
Ultrathin flexible glass with thicknesses of 100 µm or below shows excellent surface and barrier properties while still being bendable. For these reasons, it is well suited for vacuum coating of thin films and has a high potential for electronical applications, e. g. in displays or OLEDs. The current use in foldable displays of mobile devices gives an idea of the wide range of possible applications.

Glass with a thickness below 100 µm is flexible

However, its higher brittleness compared to polymer webs must be considered. The sensitivity of flexible glass primarily originates in its particularly sensitive edge characteristics. In addition, its mechanical characteristics are strongly influenced by thin film coatings. Currently, only little data is available on the mechanical behavior of coated thin glass. Nevertheless, it is necessary as process chains must be adapted to allow pilot scale and industrial scale vacuum coating of flexible glass.



Cutting edge of wheel cutting (top) and thermal stress cutting (bottom) process

In this research project, the most crucial process and handling steps in flexible glass coating processing have been identified by correlating different process para-meters e.g. cutting techniques with the resulting fracture strength and glass fatigue behavior. The presented results will allow the definition of para-meter fields for reliable processing, for example suit-able role diameters for winding. This can enable wider spread applications beyond foldable displays.