

## Let the future evolve in your hands

Smartphones have become our constant companions. In our increasingly dynamic daily lives, we allow them to set the pace to get things done. At the same time, we expect them to flexibly conform to our needs. And that's not meant to be some image we are painting: the day is soon to come when smart phones will transform into a wearable around the wrist – made possible by ultra-thin glass.

### Challenge

## Ultra-thin, ultra-sensitive, ultra-unique

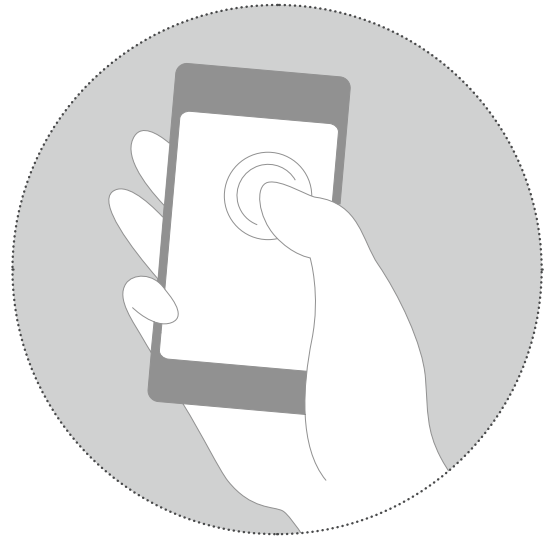
How can you wrap a smartphone around your wrist? How can you do it without compromising the display, camera, chip or battery?



The answer to this technological innovation is ultra-thin glass from SCHOTT. It is as thin as a strand of human hair yet extremely stable and very stylish. It is indeed the ideal solution for covering bendable displays. It is also suitable as a carrier or separation material for a smartphone's electronic components. After all, ultra-thin glass not only has to be reliably bendable, but it also has to be much thinner than it currently is...and of course more efficient! And ultra-thin glass can do so much more.

# With your security in mind

Your smartphone knows you inside out. You trust this technology so much that you store within the most vital data about yourself. To ensure your information is protected, manufacturers have begun implementing fingerprint sensors as part of an ID check. Ultra-thin glass helps make your unique print easier to recognize.



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People

“Smartphones will not only continue to get thinner; at the same time, they will also become more robust.”

— Dr. Rüdiger Sprengard (Director New Business Ultra-Thin Glass)

## Material for true innovations

How ultra-thin glass enables new applications



## Supreme, razor-thin glass

This thin sheet of glass can be further processed for a variety of uses. It is thinner than sapphire or silicone.

50

micrometers

## Flexible and dependable

Unbreakable even with the smallest of radii

Flexibility that's been proven over and over again

Tough, ultra-thin glass is scratch-resistant and bendable with a radius of just a few millimeters, showing no signs of fatigue. In addition, it has excellent barrier properties and provides protection from environmental elements.

# The future in motion

How ultra-thin glass is made



As experts in specialty glass, SCHOTT has developed a unique process for the manufacturing of ultra-thin glass: "Down-Draw" technology. SCHOTT currently offers four types of glass with different properties and has a fifth one in the works.

# More flexibility for innovative device options



## Micro-batteries

As a substrate material, ultra-thin glass is relevant for their performance and allows for the capacity to be raised



## Camera module

Ultra-thin glass is used as cover of the camera module, as substrate for innovative autofocus systems; as Infra-Red filter and it is used for wafer level packaging of the camera image sensor.



## Antenna

Ultra-thin glass with high frequency properties is needed for fast mobile communication antennas.



## Bio-sensors

Micro-sensors can be used for microfluidics analysis, such as blood diagnostics. Here, laser-structured ultra-thin glass comes into play.



## IC packaging

Ultra-thin glass is a key element for the semiconductor industry. It enables thinner and faster microchips with highest data transfer rates.



## Finger print sensor

Thanks to ultra-thin glass, the sensor can recognize your finger print very reliably. This means that personal data is protected much better.



## Bendable / Foldable cover

Ultra-thin glass is particularly bendable and enables new form factor smartphones and wearables. Even flexible and foldable covers could be imagined.




## OLED display

Ultra-thin glass protects oxygen and moisture sensitive display materials from harmful environmental influences.



## MEMS

Part of positioning sensors (GPS) and environmental sensors, i.e. for measuring temperature and air quality



# For the microelectronics of tomorrow

We have not even begun to exhaust the potential uses of ultra-thin glass in innovative applications, just like the Internet of Things. Glass-based batteries ensure that the tiniest of devices and sensors can be connected to one another without needing a central power supply. In fact, SCHOTT is already partnering with industry experts and researchers on making this energy storage system a reality. We want to help you realize technological developments that are extraordinary.

Let's shape the future together.

## What's your next milestone?


Contact

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 [This glass can bend tens of thousands of times without breaking \(CNET\)](#)

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 [Flexible Glass Could Bring Back the Flip Phone \(Technology Review\)](#)

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