Life Changing Glass Innovations

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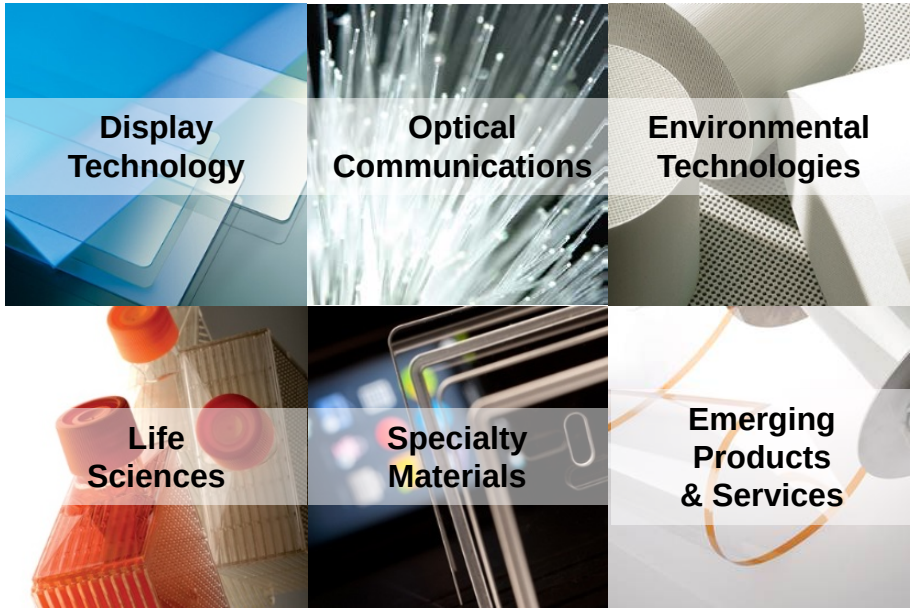
The Connected World of Glass

- Impact of silicate oxides in the context of our lives
  - Historical examples
  - Innovation is a key ingredient
  - Glass will drive pervasive personal connectivity
- Examples of extremely versatile glass
  - Flat, light weight and damage resistant glass for displays
  - Anti-microbial glass
  - Video is the killer app driving petabit glass fiber optics and personal communications
  - Thin glass on carriers
- Summary
  - Glass speaker demo

Life-Changing Innovation

How We Succeed:

- Tough technology problem
- Close customer collaboration
- Deep materials & process expertise



160 Years of Using Glass In New Ways

CorningWare®

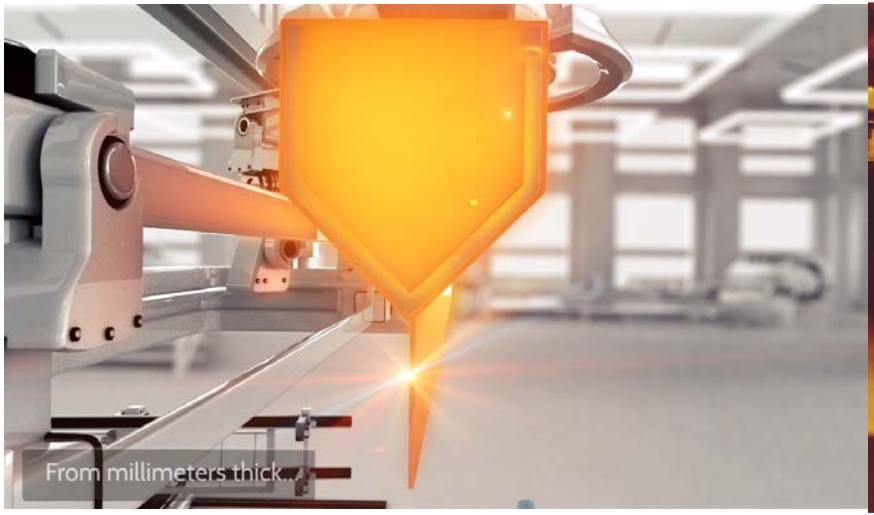
Environmental Technology

1952

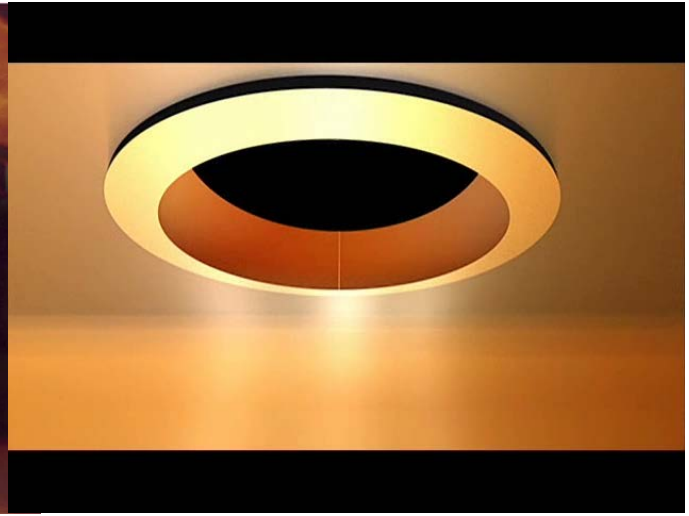
1972

Glass Processing

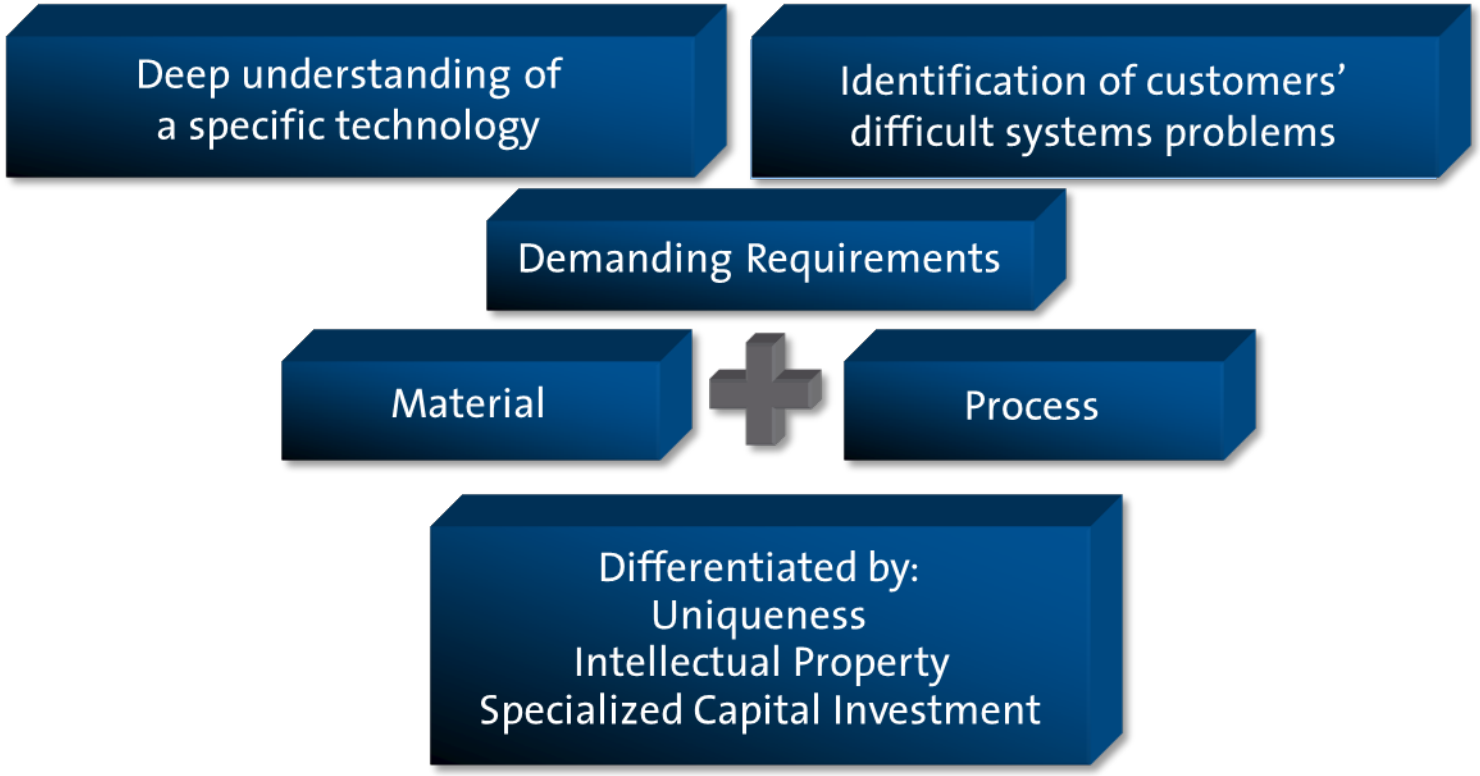
Thin sheet, fusion process



Optical fiber being drawn



Innovation Recipe Drives Strategic Actions



Pervasive Personal Information Connectivity:
Anywhere, Anytime, and Anyplace

Internet & Cables

Corning Optical Fiber, Cable, Components & Wireless Solutions

Information Rendition

Substrate Glass for High-Performance LCD and OLED

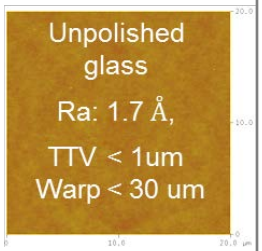
User Interface

Thin, Light weight, High-Performance

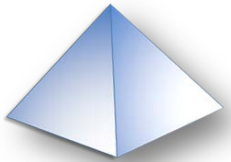
Precision Glass Display Surfaces

Fusion Process

AFM Results



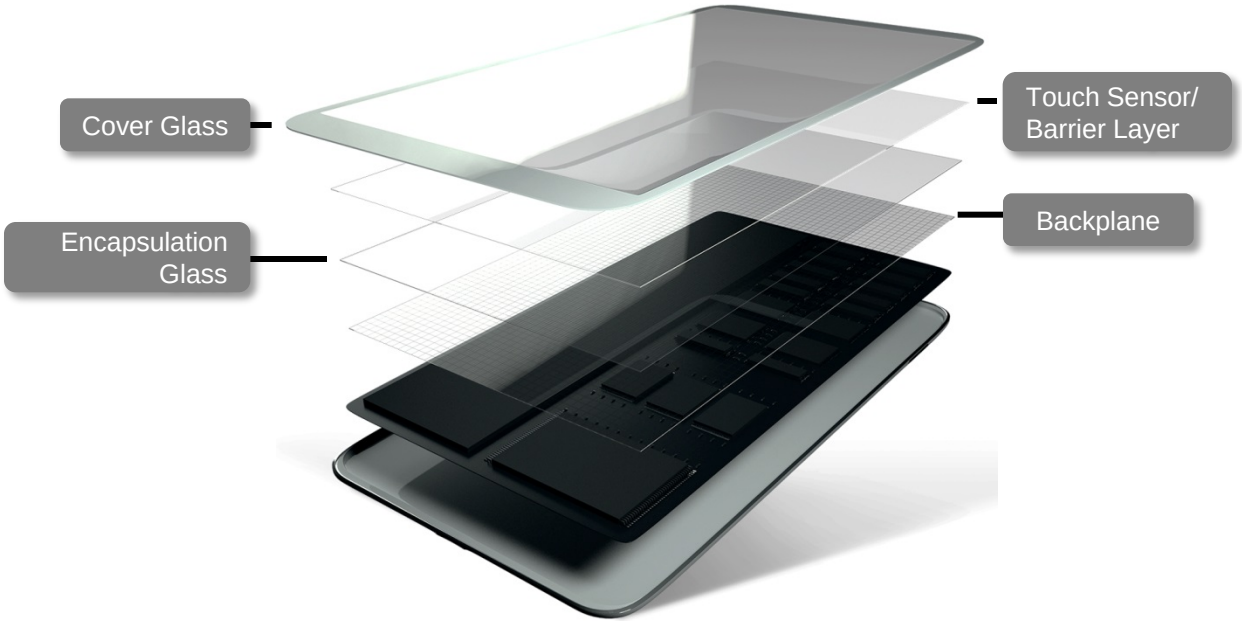
Pristine Surface



Stable

Flat

Thin & Strong



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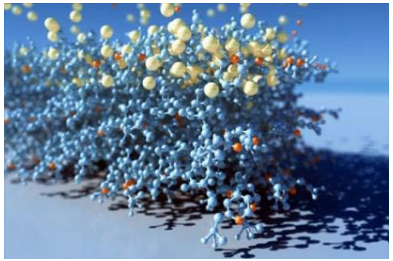
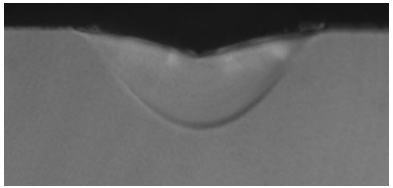
Beyond Displays: Corning® Gorilla® Glass



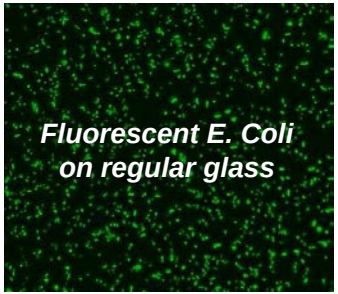
Potassium replaces smaller sodium



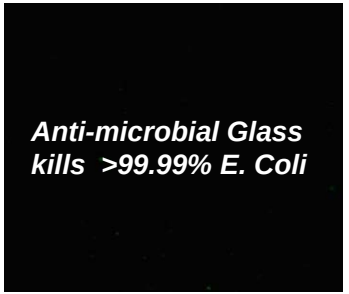
Force absorbed with densification ... no starter flaws, low residual stress

illustration: Fortune

Architectural, automotive, and state-of-the-art home appliance applications



Fluorescent E. Coli on regular glass



Anti-microbial Glass kills >99.99% E. Coli

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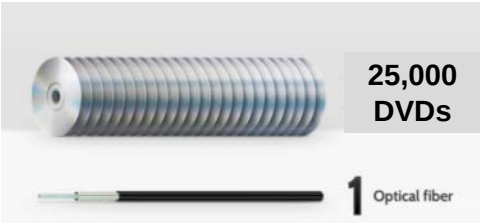
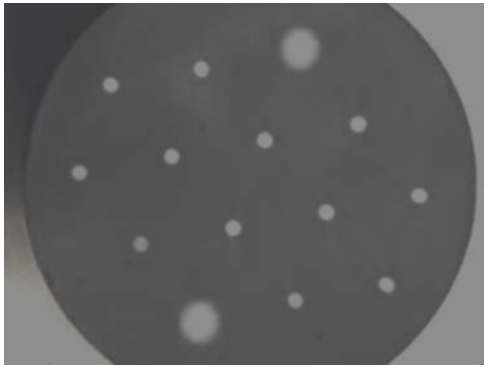
Video is the killer app driving the next expansion of the Internet
In telecommunication or the personal space

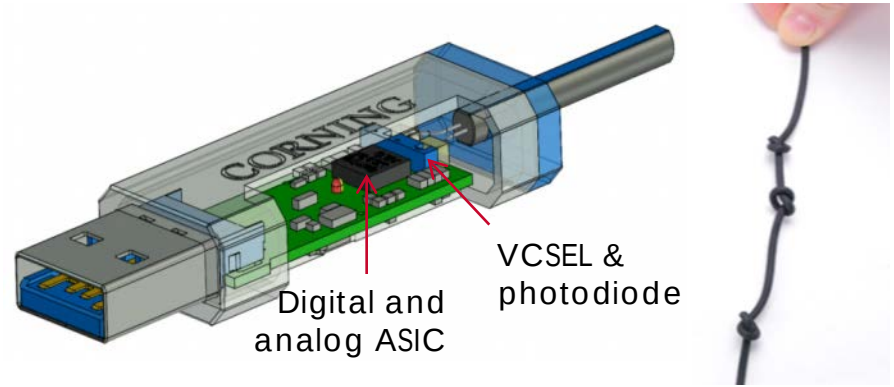


A single modem optical fiber can carry **1.05 Pb/S** (Petabit/s) over a kilometer – i.e. enough information to fill **25,000 DVDs** every second.

Thunderbolt™ and USB 3.0/2.0 active optical cables launched at CES

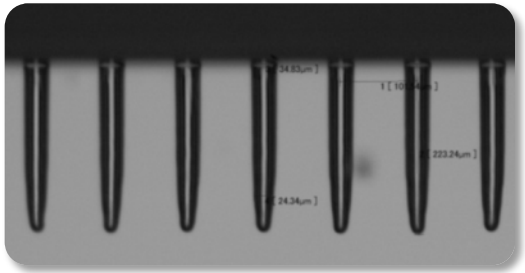


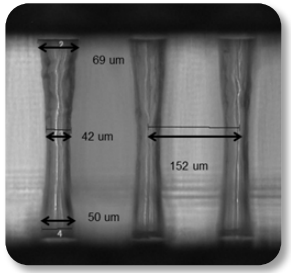
Frontiers in Optics/Laser Science XXVIII paper FW6C.3
http://dx.doi.org/10.1364/FIO.2012.FW6C.3

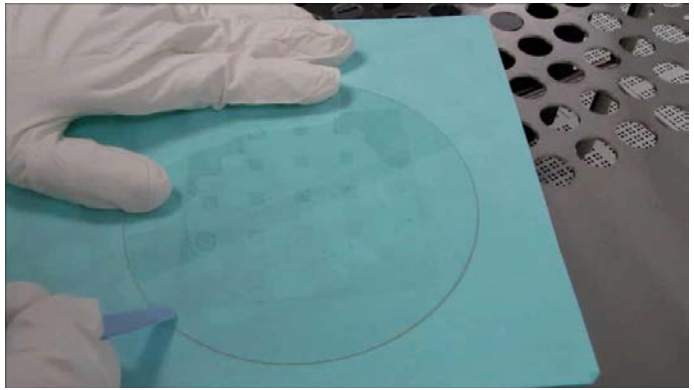


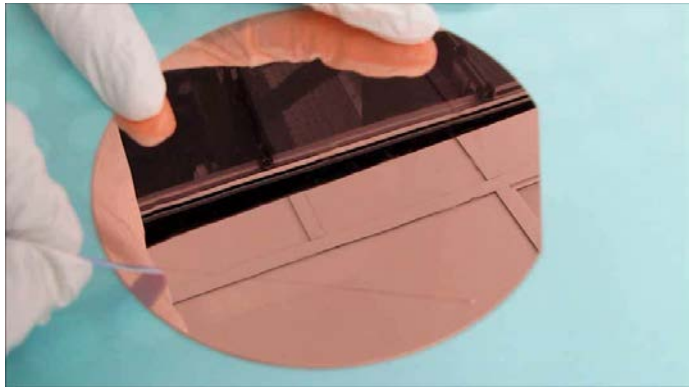
Interposer Temporary Bonding Technology –
Corning® Willow™ Glass (thin glass) on Carrier

- Temperatures to > 450° C
- Zero outgassing and no residual residue
- Survives chemical durability testing with common processing chemistries (SC-1, SC-2, Piranha etc.)
- Successfully demonstrated seed layer sputtering. Blind holes or through holes
- Debonding is mechanical release from side









Summary

- Glass (silicate oxides) has a long history of inventing products with silicate oxides.
- Display glass is pristine, stable, flat, strong, and inhibits the growth of microbes.
- Enables clean air technologies.
- Delivers as much video data as a pickup load of DVDs.
- Changing the world in which we live!

Sounds From Glass Speakers

CORNING