

水性平台2013“电子产品先进设计概念 与环保涂料论坛”

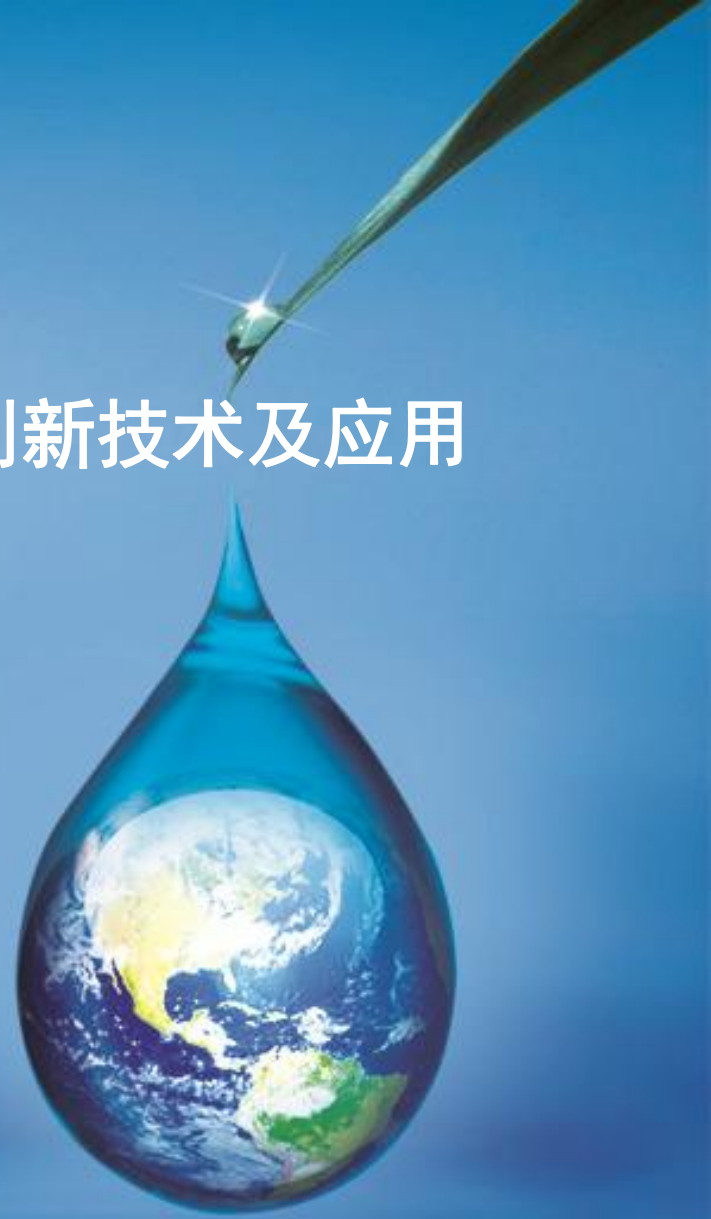
2013年11月14日，深圳



话题：高性能塑料在3C领域内的创新技术及应用

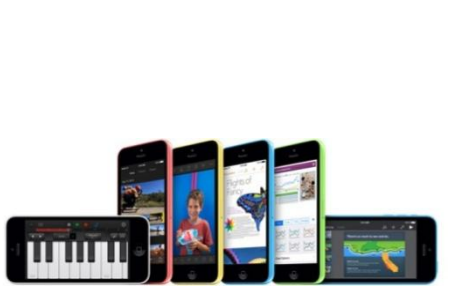
讲课代表：游 蓉 Ronna You

水性平台会员单位代表



3C Products - All Round You!

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轻薄·二合一
VAIO® Tap11 平板式个人电脑



Market Trends – translate to substrate



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Getting more complex/smaller 轻巧超薄

- Better Heat, Impact, Modules, Fatigue, FR, Flow...

Extreme environment usage 极端环境

- Extreme Low Temperature Impact(-60C), Weather ability, UV, Chemical resistance

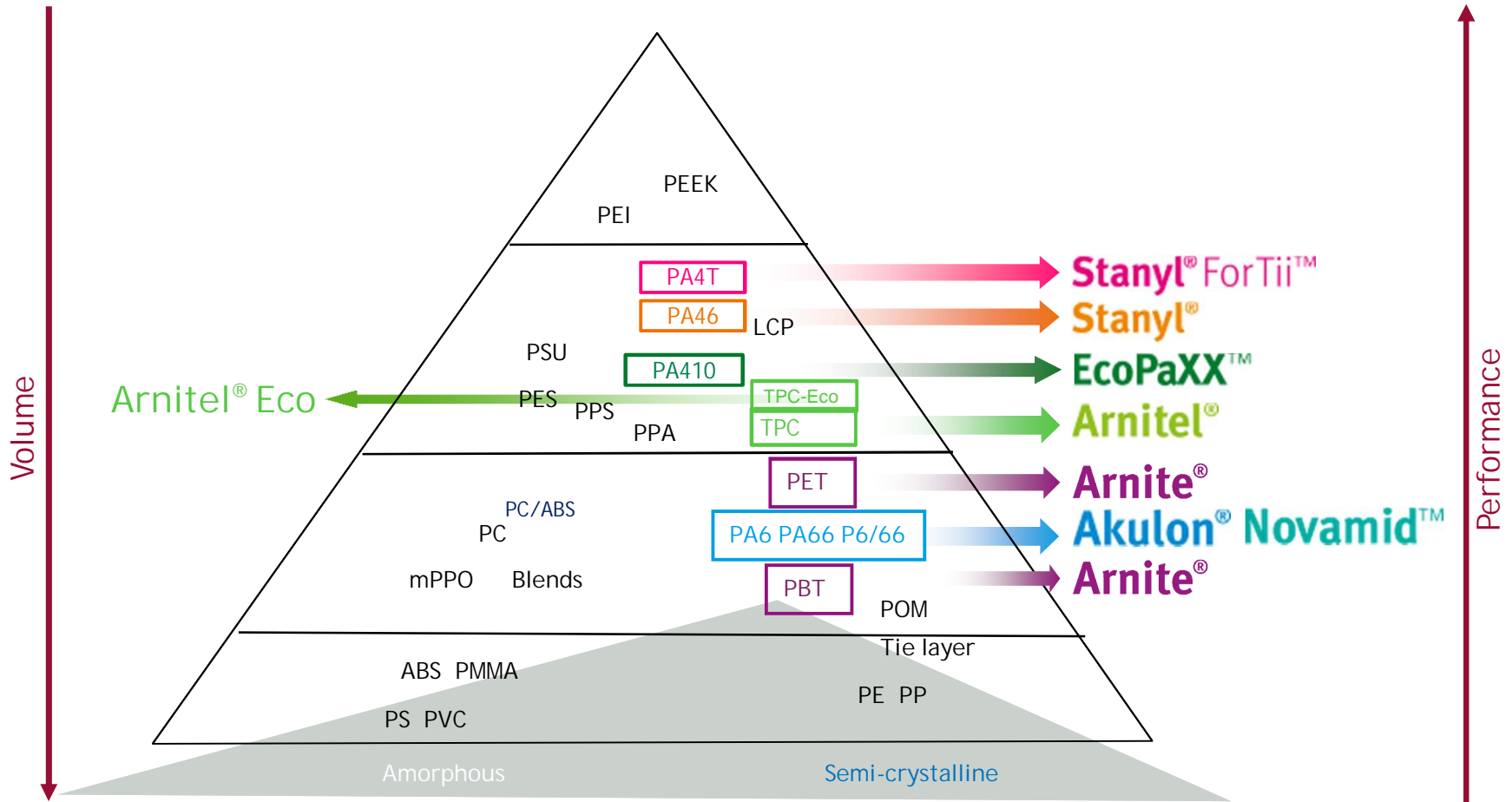
System cost 减低系统成本

- Cycle time reduction – Better Flow and mold Release
- Simplify processing – Hard coating elimination, paint replacement
- Weight reduction – Metal, glass replacement
- Lower Maintenance cost – Longer product life time

Environmental friendly 环境保护

- ECO flame retardant material, ROHS, WEEE
- Waterborne green platform
- Paint, hard coating replacement
- Recycle

Thermoplastics: Engineering and Commodity



Substrate Improving Methods

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➤ Modification 优化



➤ Co-Polymer Technology 共聚合

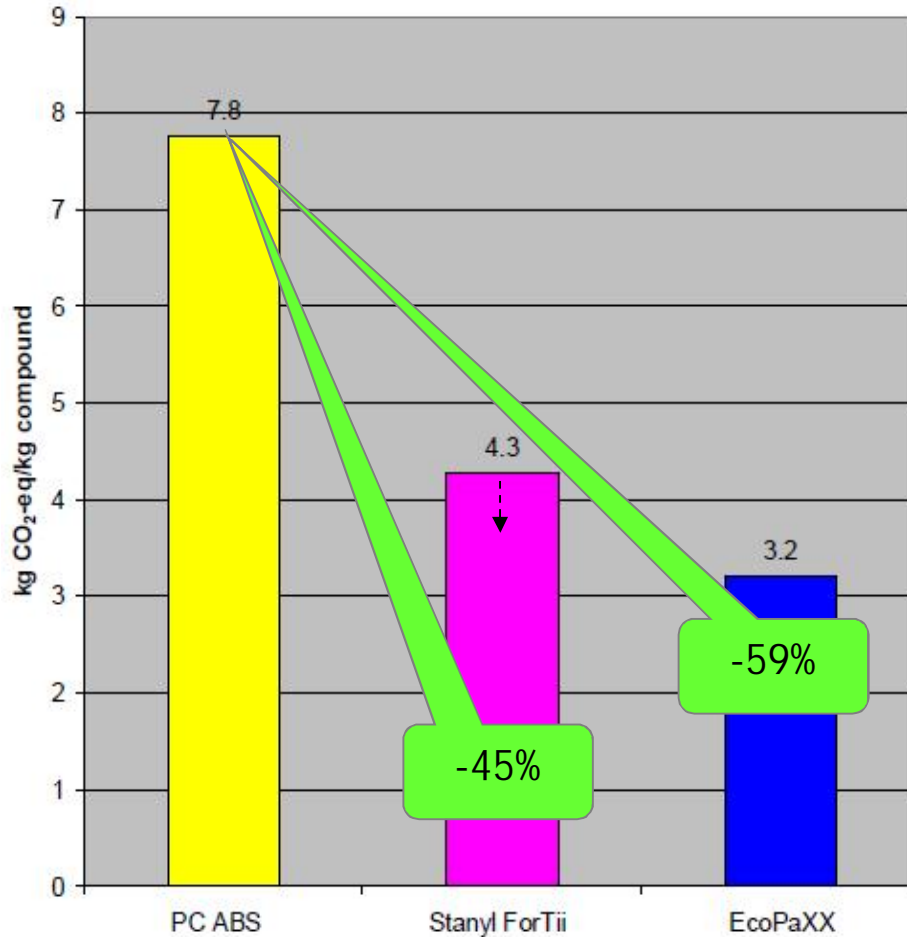


➤ Innovation 创新



Carbon Footprints: example

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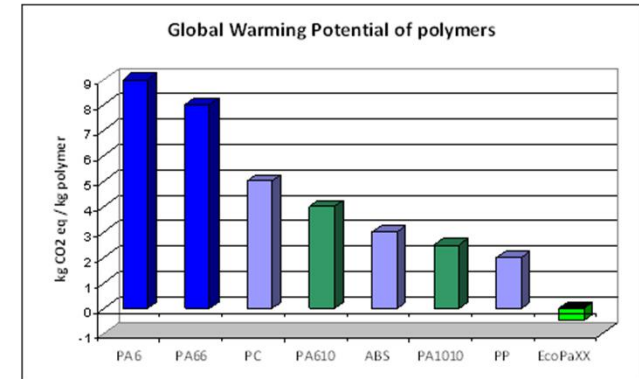


- ✓ Initial calculations show a significant reduction of carbon footprint for ForTii and EcoPaXX versus PC/ABS
- ✓ Latest ForTii grade currently in development will lead to a further reduction of the carbon footprint by ~10%
- ✓ The carbon footprint is calculated using the IPCC 2007 GWP 100a assessment method
- ✓ the result is expressed as kg CO₂ equivalents

Bio-based Material: example

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- ✓ EcoPaXX[®], polyamide 4.10, a unique bio-based, carbon neutral material
- ✓ A perfect fit with DSM's sustainability ambitions...
- ✓ Biogenic content has been established by ¹⁴C method by Beta Analytical Inc., USA. Result: Mean Bio-based Content is: 72 % (+/- 1%)

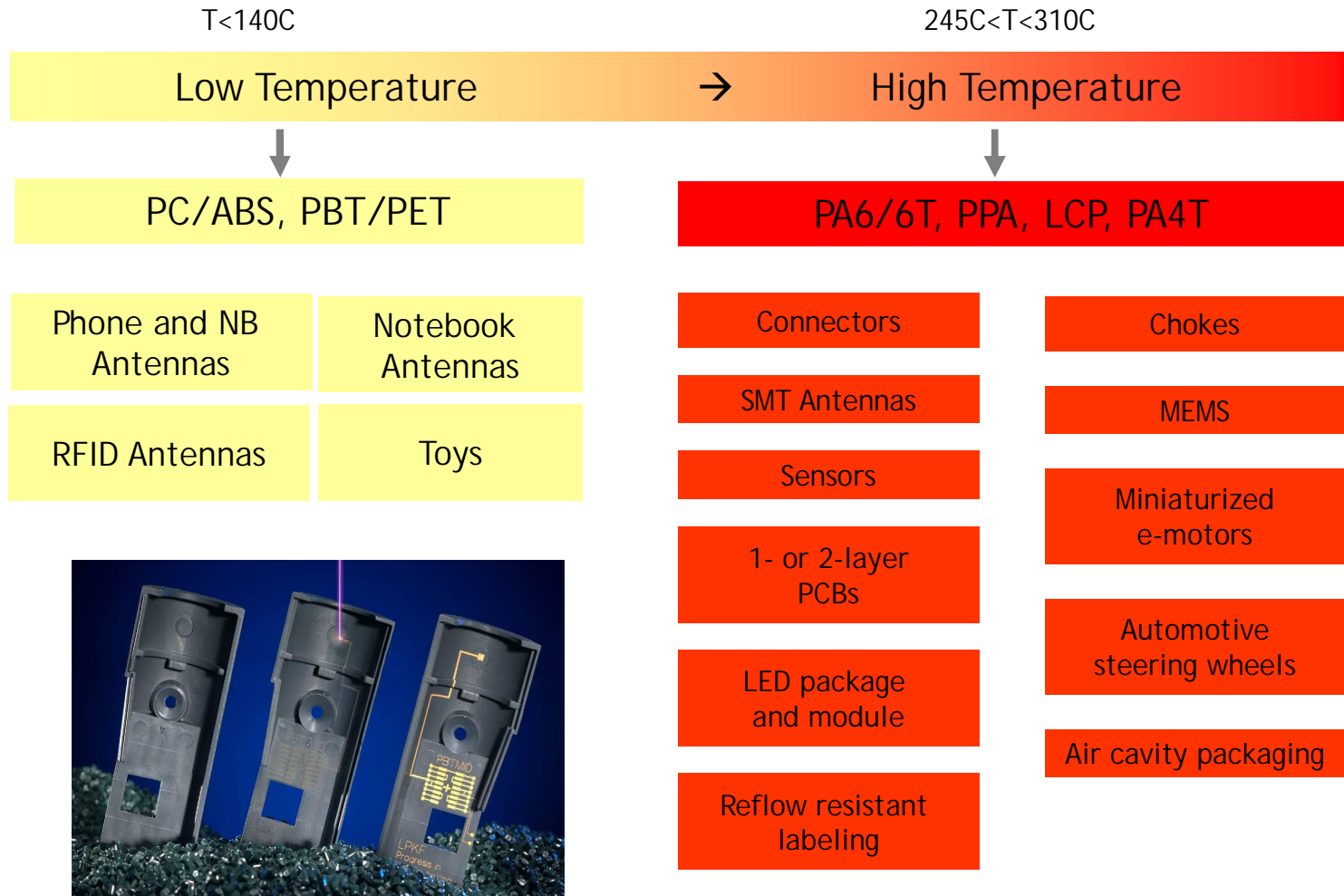


Environment : Chemical, Thermal, Electrical, Stress characteristics

- Specification - Safety regulations, such as flammability, food contact, medical criteria etc. Industrial specification such as automotive, electrical, etc.
- Service environment - Chemicals / solvents, water / humidity, operating temperatures (high, low, duration)
- Structural properties - Strength, toughness, stiffness, creep, fatigue
- Design considerations - Electrical properties, dimensions, aesthetics, wear and friction, assembly
- Economics - From list of possible materials to a reduced final short-list
- Processing - Processing, assembling, secondary operation

Functions: Laser Direct Structure

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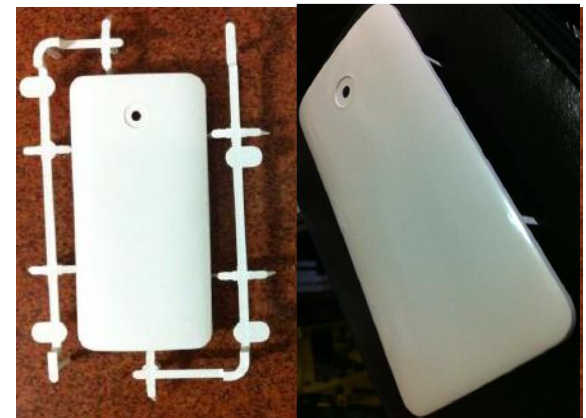


➤ Next generation antenna installed using reflow soldering

Functions: Thermal Conductive + LDS

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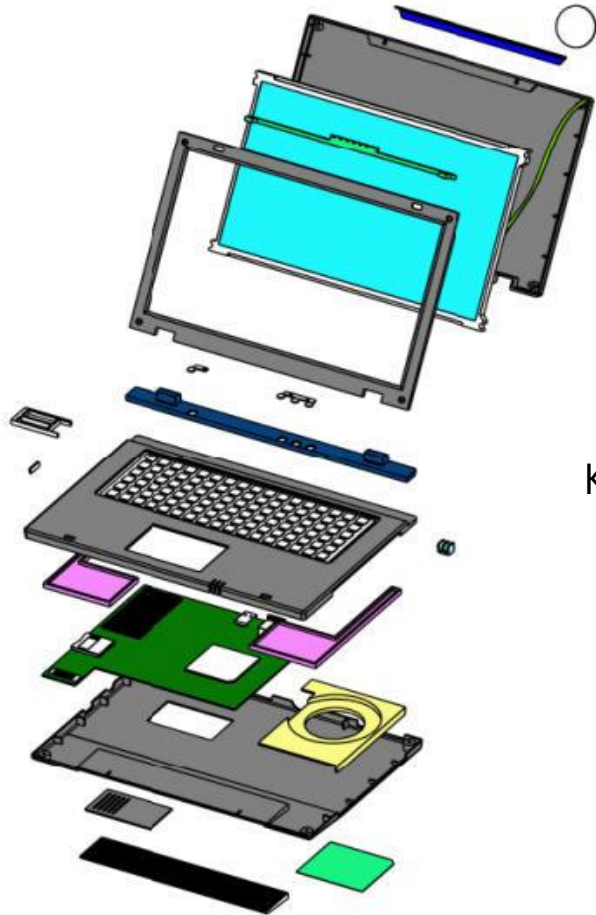
- Latest Innovation: TC + LDS in one material allowing heat management as well as electrical trace and antenna integration
- Providing good surface for next process



Stanyl TC

Functions: High Modulus Ductility

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- ✓ Thickness: Total/21mm; Cover/ 2.0mm → 1.0mm
- ✓ Substrate: PC, PC/ABS → Metal; PA + 50% GF; PA + 20% CF; Carbon Sheet

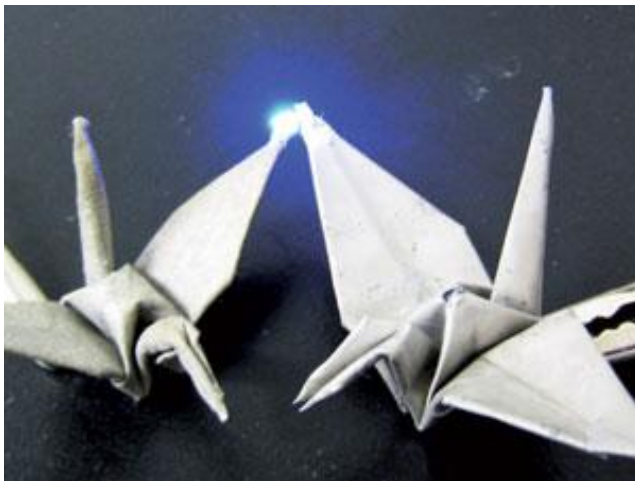
Key issue on decoration: Improved by high flow and high mould temp

- Surface
- Water Absorption
- Welding line
- Outgassing

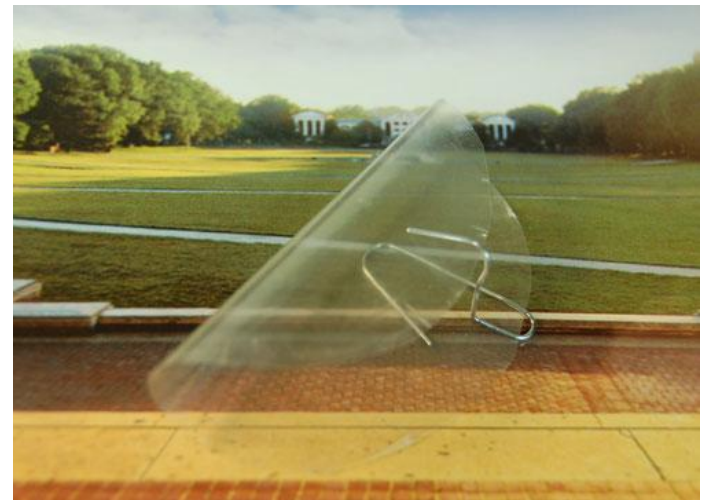
New Substrate: Nanopaper

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- ✓ Mobile device: Slim design, Wearable, Zero Edge design, Roll able, Foldable
- ✓ Nanopaper is a cutting edge variety of paper with a strength of 214 megapascals (MPa), greater than 130 MPa of cast iron and approaching that of structural steel (250 MPa). Typical paper has a strength of 1 MPa.
- Foldable nanopaper antennas for origami electronics.
- Nanopaper transistors for the coming age of flexible and transparent electronics



Lighting of an LED via folded paper printed with silver nanowire inks



A picture of a fabricated transparent and flexible Nanopaper transistor. (Image: Bing Research Group, University of Maryland)

Waterborne China Platform

水性平台（中国）

