AGC Glass Technology Solutions
for High Performance and Functional Display Requirements

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Asahi Glass Co., Ltd.

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- ✓ Overview of AGC Technology and Core Display Products
- ✓ Introduction of New / Upcoming Products

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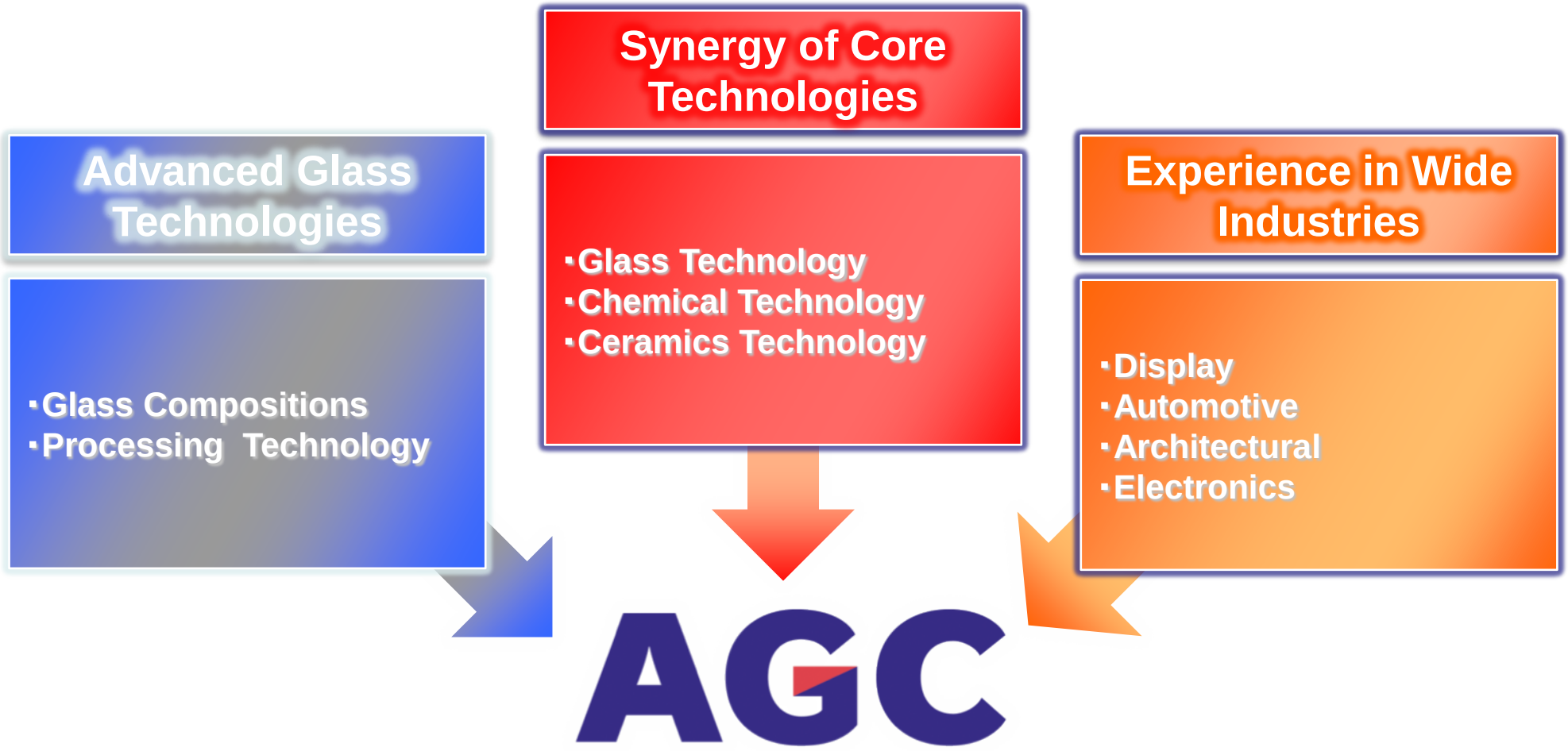
AGC Strengths



Utilize our strengths for the future display industry.

AGC Glass Development

AGC offers solutions for newly emerging needs in display market

Glass compositions

- Alkali free glass
- High strain point glass
- Aluminosilicate glass
- Soda lime glass

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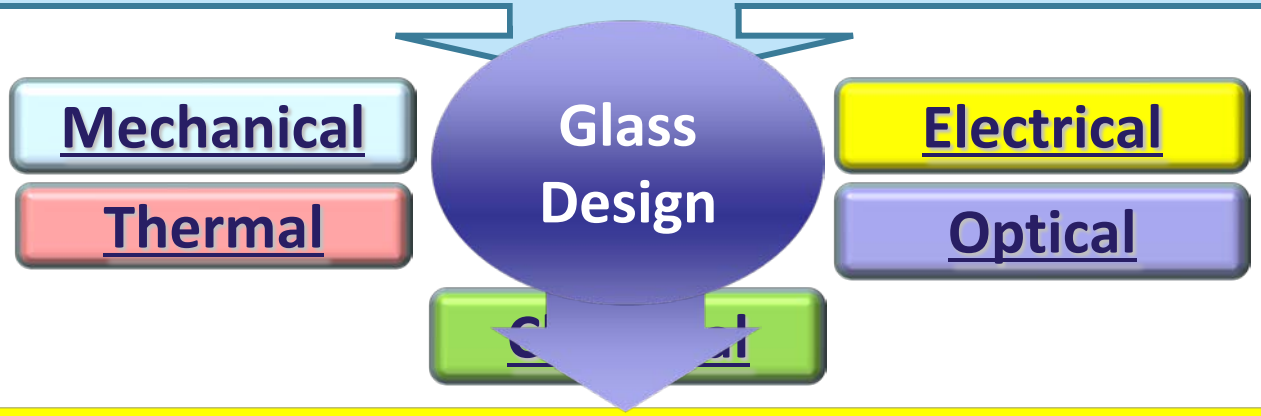
Processing technology

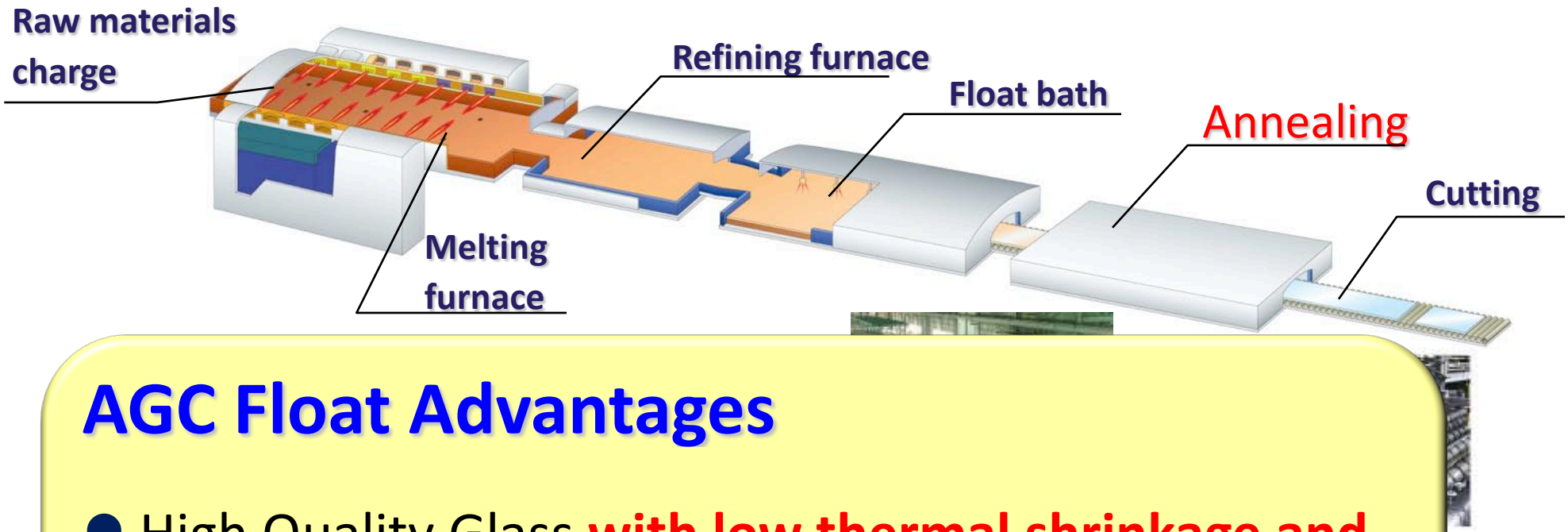
- Larger size
- Thin/Ultra-thin
- Robust
- 2.5D/3D glass forming
- Surface coating
- Polishing
- Multiple function



AGC glass products for display application

- Glass substrate for TFT-LCD, OLED <**AN100**>, PDP <**PD200**>
- Cover glass <**Dragontrail ™**>
- Touch screen glass <**AS Thin Glass**>
- Chassis glass, 3D filters, Glass for photo-mask…

AGC Float Glass Manufacturing Process



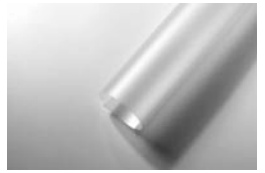
AGC Float Advantages

- High Quality Glass **with low thermal shrinkage and residual stress**
- Suitable for **efficient production** of **large size glass**
- Wide range of thickness available
  0.1 mm ～more than 5mm

Smartphone

AS Thin glass

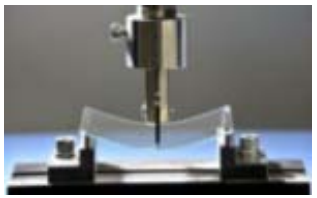
CARBOGLASS®



Anti Fingerprint Coating

Touch Screen

Dragontrail

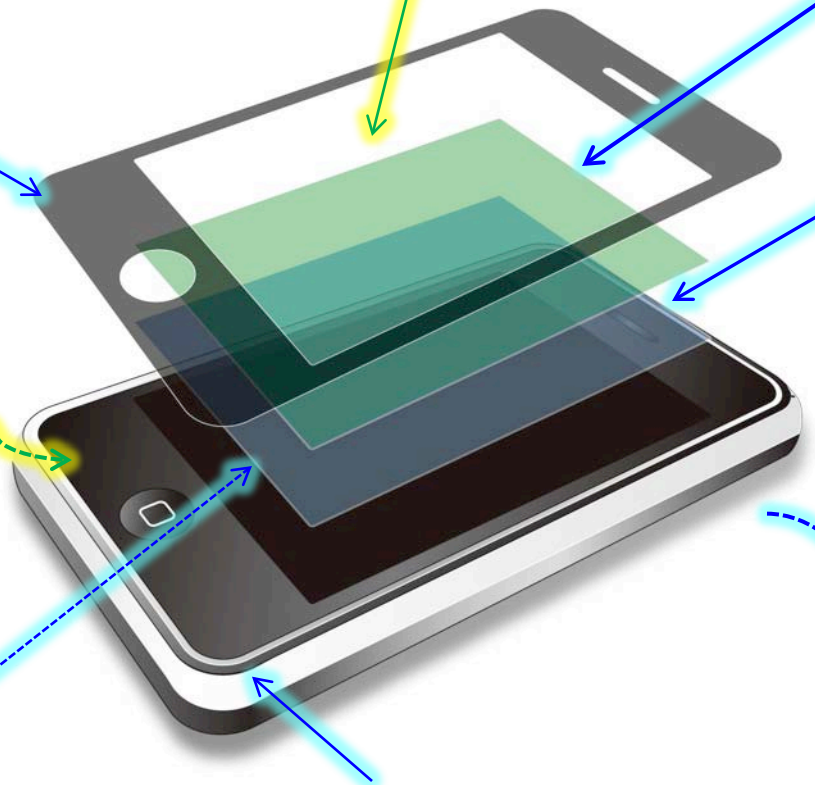


Cover Glass

Ultra Thin Glass

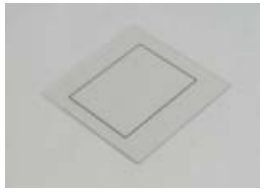
AN100

TFT-LCD /OLED Glass Substrate



- EPRIMA®AL-X6
  Gate Insulation
- EPRIMA® Cu Paste
  Conductive paste
- Glass for Photomask

Electro Printable Materials etc



Glass Frit Laser Seal for OLED

Dragontrail ®

2.5D/3D-Glass Chassis

Camera Unit

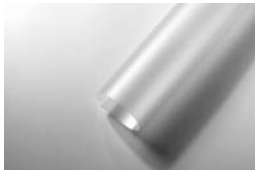
NF-50 series

Visibility Compensation Filter for Camera module

AGC

TV

CARBOGLASS®
Polycarbonate film



Light Diffuser, BEF

AN100 **Ultra Thin Glass** **PD200**

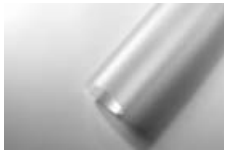
TFT-LCD /PDP/OLED Glass Substrate

- EPRIMA®AL-X6
  Gate Insulation
- EPRIMA® Cu Paste
  Conductive paste
- Glass for Photomask

Electro Printable Materials etc

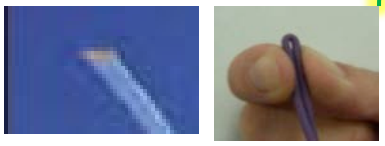
Dragontrail®

CARBOGLASS®

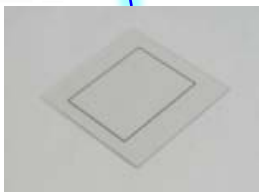


Designed Front Panel

FONTEX®



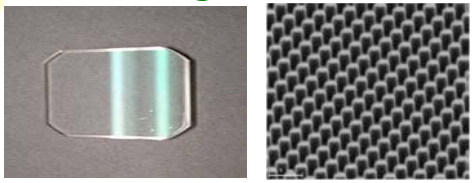
Plastic Optical Fiber



Glass Frit Laser Seal for OLED

Fluoropolymer
for Moth-eye

AR coating



Anti Reflection Film/Coating

-Contents-

Display Technologies Evolving to the Future

Advanced Communication Interface

ADVANCED NETWORK TECHNOLOGY
"BEING CONNECTED"

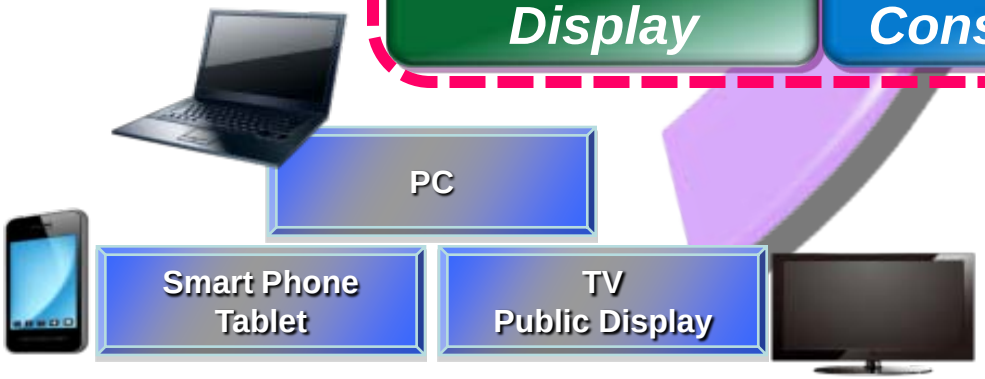
Next Generation Display

- *Super High Definition*
- *Thinner Display*
- *Low Power Consumption*

High Function Display

Glass

- Mechanically tough
- Thermally Stable
- Thinner



Key Application Segments for FPD

➢AN Wizus ™

***Advanced Glass Substrate** for higher resolution panels*

➢Carrier Glass Technology

***Noble Processing Technology** for thinner display panels*

➢Self-Adhesive Glass

***Advanced Direct Bonding Technology** for display screens*

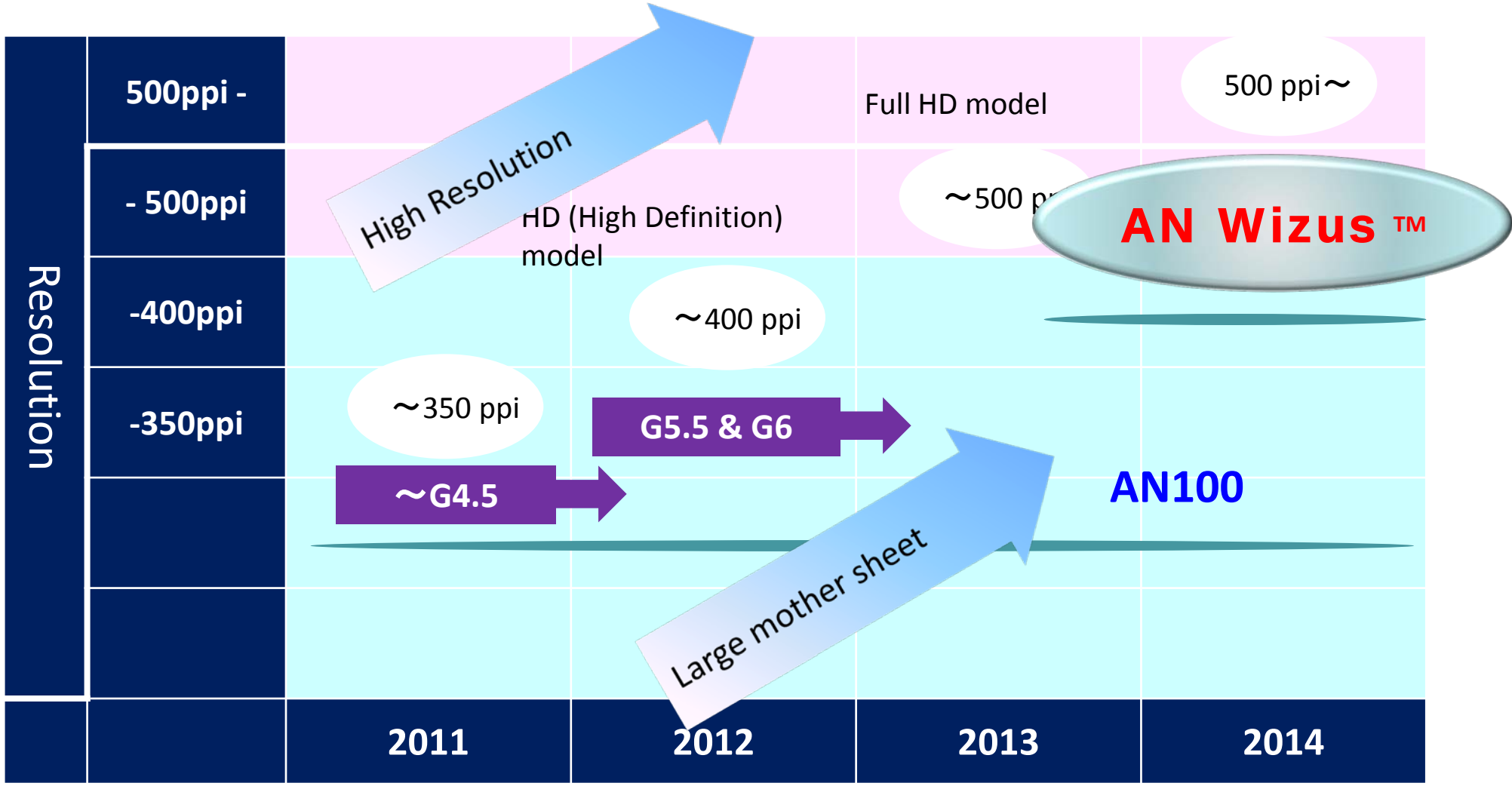
Advanced Glass Substrate for higher resolution display

ANWizus™

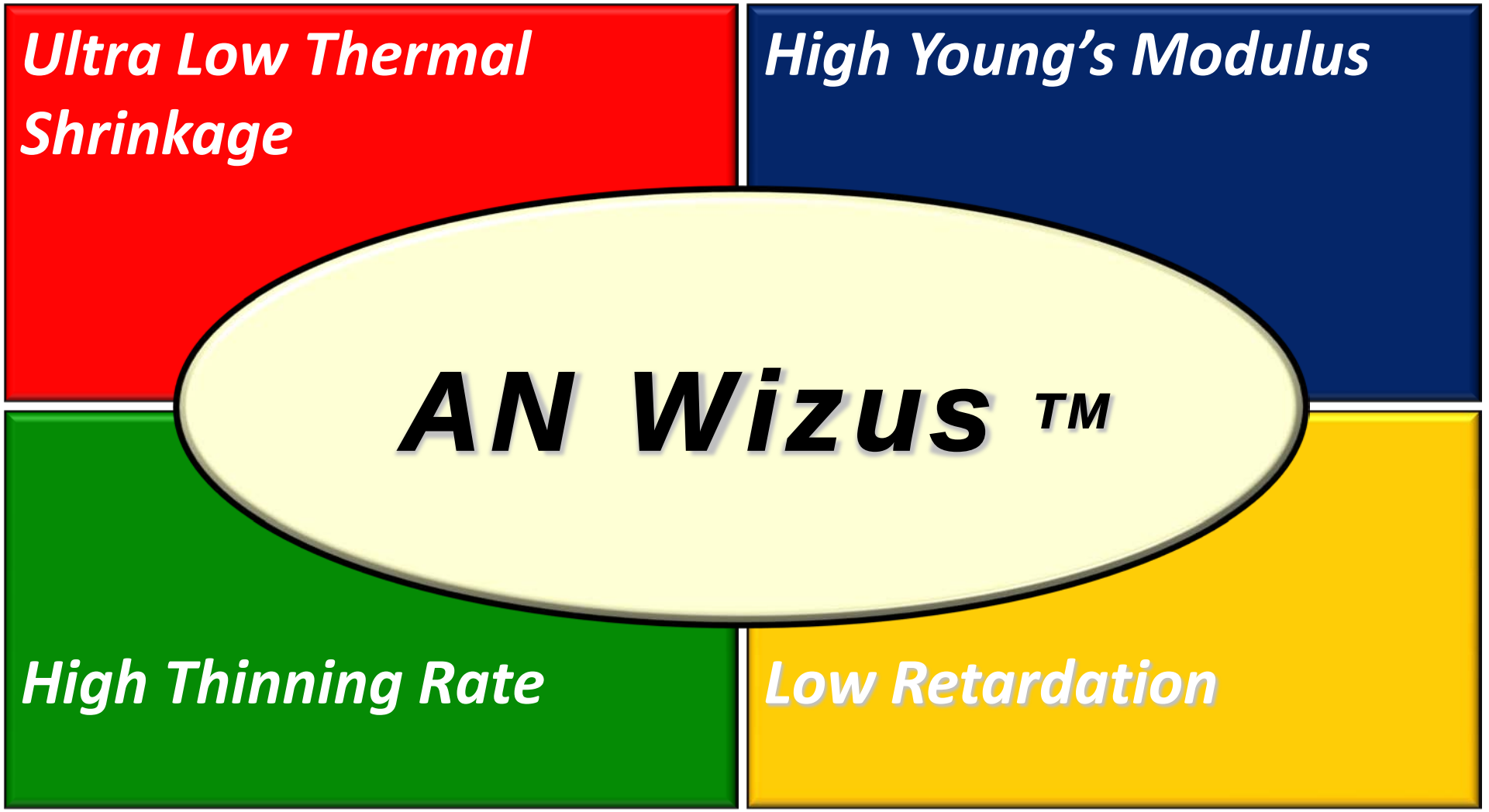
AN100

AGC

Trends of High Resolution in Smart Phones



Ultra High Resolution Mobile Display



Ultra Low Thermal Shrinkage

Key Point

AN Wizus shows dramatically quite low thermal shrinkage.

	AN100	AN Wizus ™
Shrinkage（ppm）	33	7

(Heated at 600 deg.C for 10 min.)

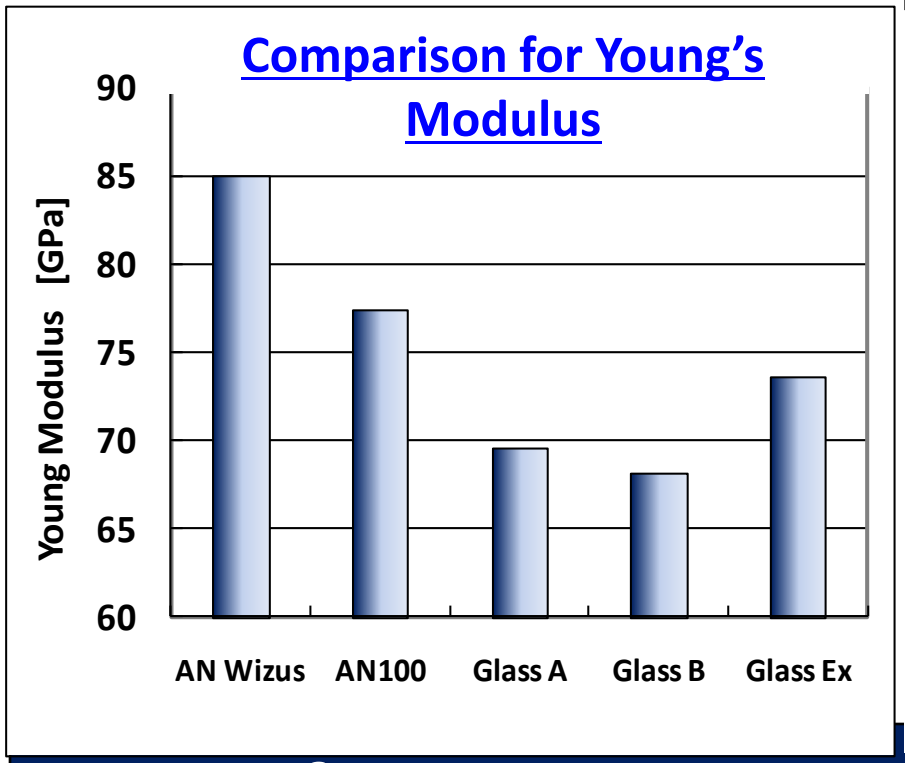
Benefit

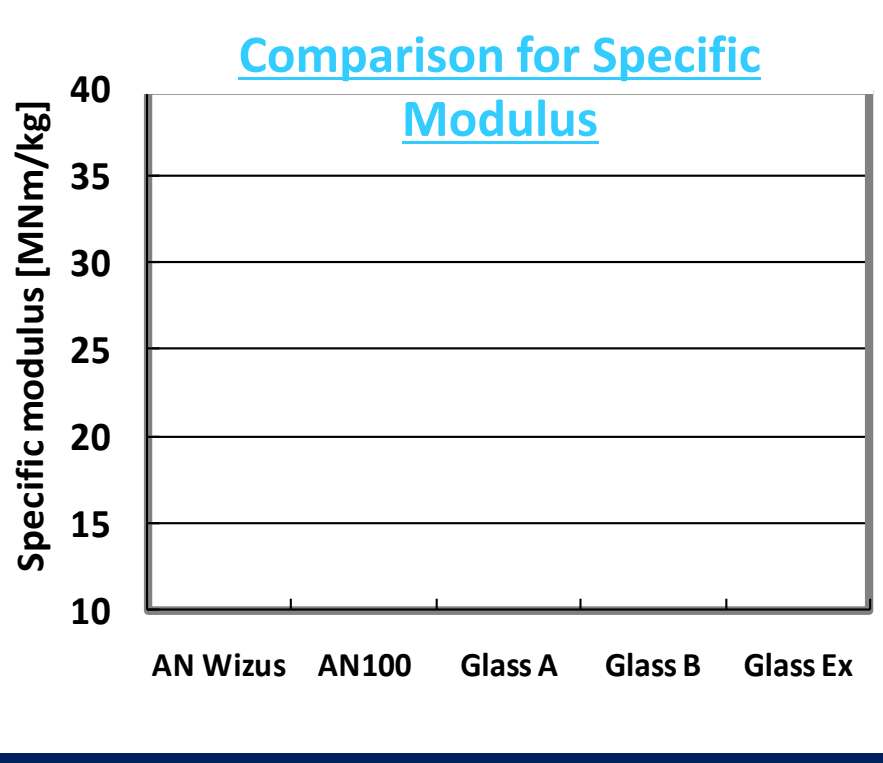
AN Wizus contributes to achieve high aperture ratio and earn design margin of panel

High Young's Modulus

Key Point

AN Wizus shows higher Young's Modulus and Specific Modulus





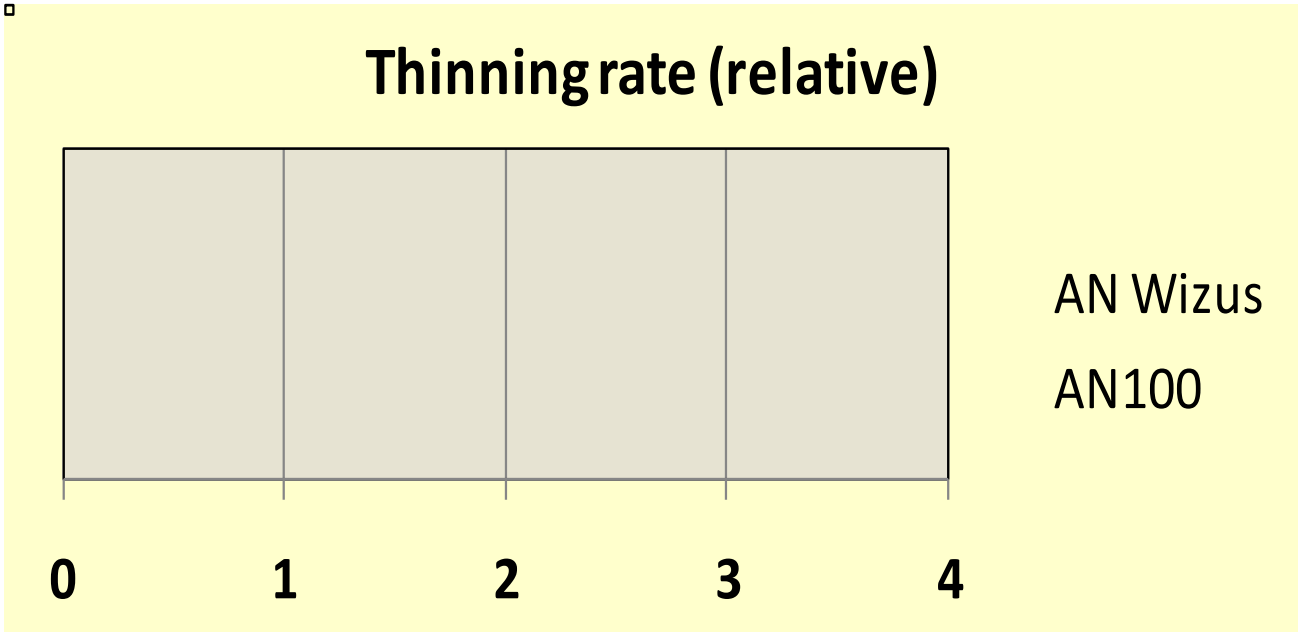
Benefit

AN Wizus reduces Sag and warp in thinner panel processing

High Thinning Rate

Key point

AN Wizus shows higher thinning rate with HF based solution



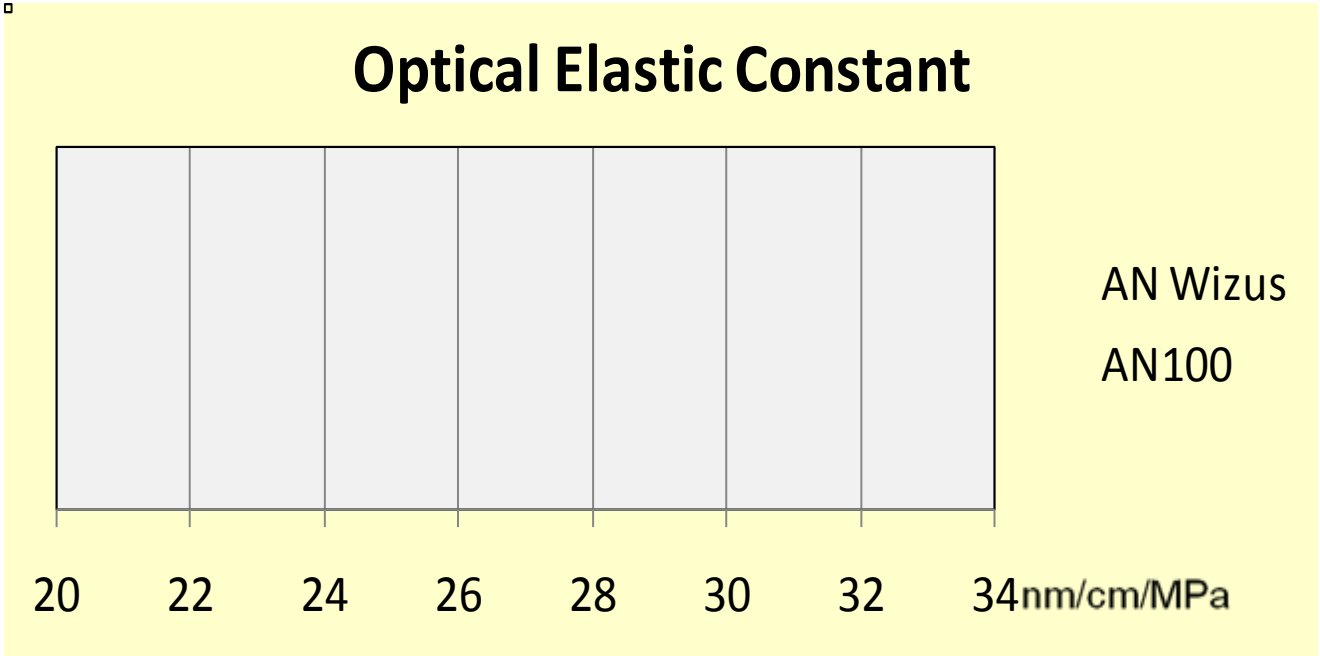
Benefit

AN Wizus contributes to increase productivity of thinning process.

Low Optical Elastic Constant

Key Point

AN Wizus has smaller retardation when stress is applied



Benefit

AN Wizus helps to improve display quality , such as light leakage.

AN Wizus ™

Key Points

Ultra Low Thermal Shrinkage

High Young's Modulus

High Thinning Rate

Low Retardation

Benefit

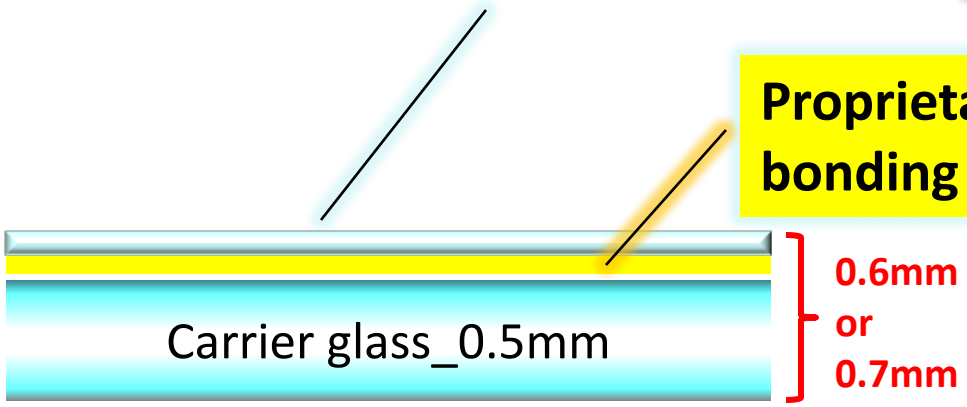
- ✓ Less Power Consumption
- ✓ Higher yield
- ✓ Higher Efficiency
- ✓ Higher Productivity
- ✓ Higher Display Quality

Best Candidate of Glass Substrate for higher resolution panel of LTPS TFT LCD and OLED

AGC

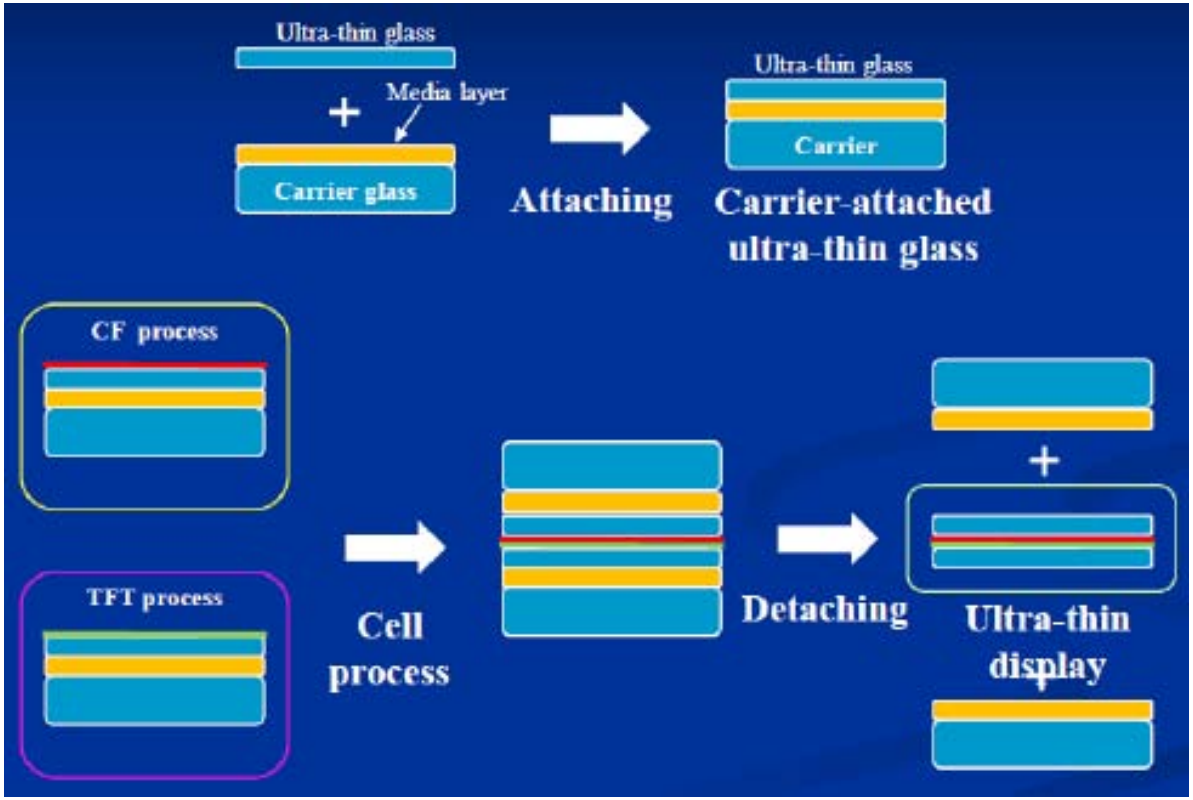
Carrier Glass Technology (Production Starts Soon)

Ultra thin glass(UTG)_0.2mm（0.1mm） **Spool ™**



-High thermal durability
（High Temp.）
-High chemical durability
-Proper adhesion property

Panel Processing of UTG attached Carrier Glass



Laminating 0.1(0.2)mm ultra-thin glass for easy handling

- ✓without changing the current panel process
- ✓unnecessary of thinning by HF based aqueous solution

Carrier Glass Technology

Ready for production.

Benefit

- ✓ **No additional investment** for current panel fabrication
- ✓ **Solution** of the current thinning issues (thickness, dimple, wastes, etc)
- ✓ **Potential** of larger mother glass

Industry Best Solution handling method for thinner display

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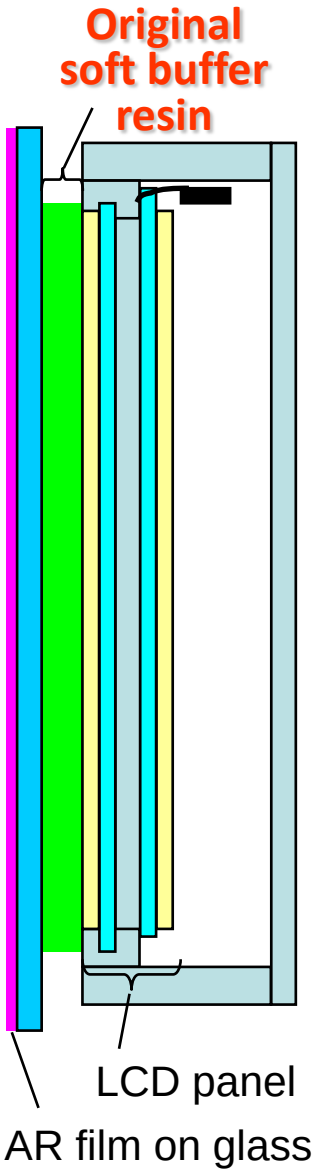
Advanced Direct Bonding Technology

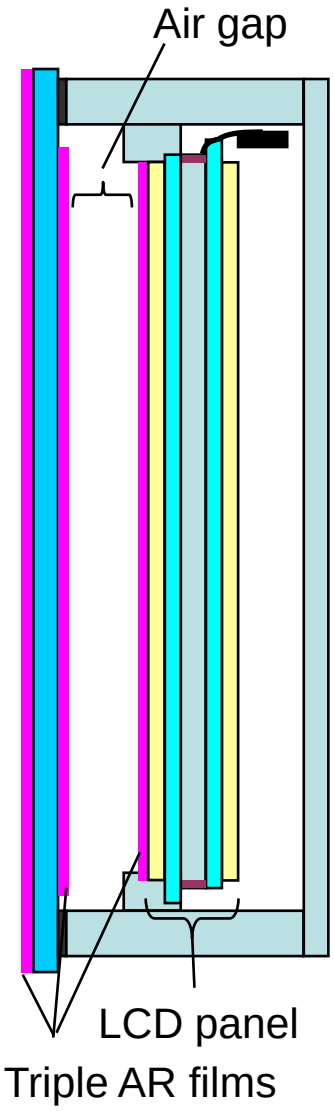


Picture quality

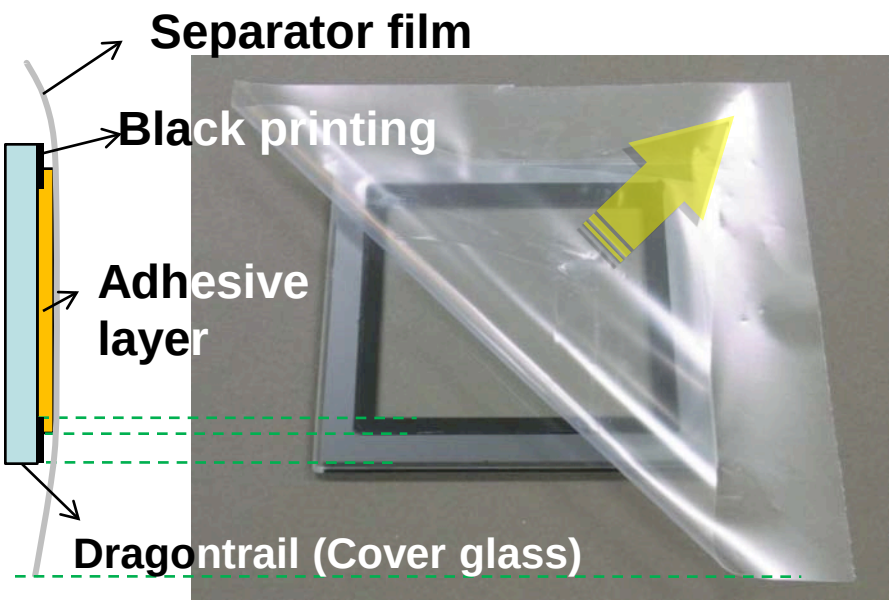
- Higher contrast
- Higher brightness
- No parallax

Other Effect

- Reduction of AR film
- Simple fabrication



Self-Adhesive Glass by Dragontrail ™



Bonding process of Self-Adhesive Glass

Step 1 : Remove the separator film

Step 2 : Dry the adhesive layer in low pressure (optional)

Step 3 : Laminate SAG to LCD in vacuum

UV irradiation and Autoclave treatment are not required.

Benefit

- ✓ **No MURA** after bonding even for IPS panel
- ✓ **No Bubbles -** disappear in the special adhesive layer
- ✓ **No Restriction** of printing thickness in black or white
- ✓ **No Problem** in direct bonding to LCD in metal frame

Process Benefits of Self-Adhesive Glass

Features	OCA	UV resin	Self-Adhesive Glass
Total steps for lamination	7	6	4
Direct bonding process after lamination			
Autoclave treatment	**Required**	Free	Free
UV irradiation	Free	**Required**	Free
Total steps for bonding	**8**	**7**	4
Investment cost	Medium	Large	Small
Adaptability to printing on cover glass			

Best candidate of direct bonding for high quality larger display

AGC

Smart Display x AGC = ∞

AGC connects glass technology and the future display market

Let's work Together
We can grow Together!

Please visit Booth #329

To learn more about

how we can grow together.