



WE MAKE TOMORROW



HYALINE

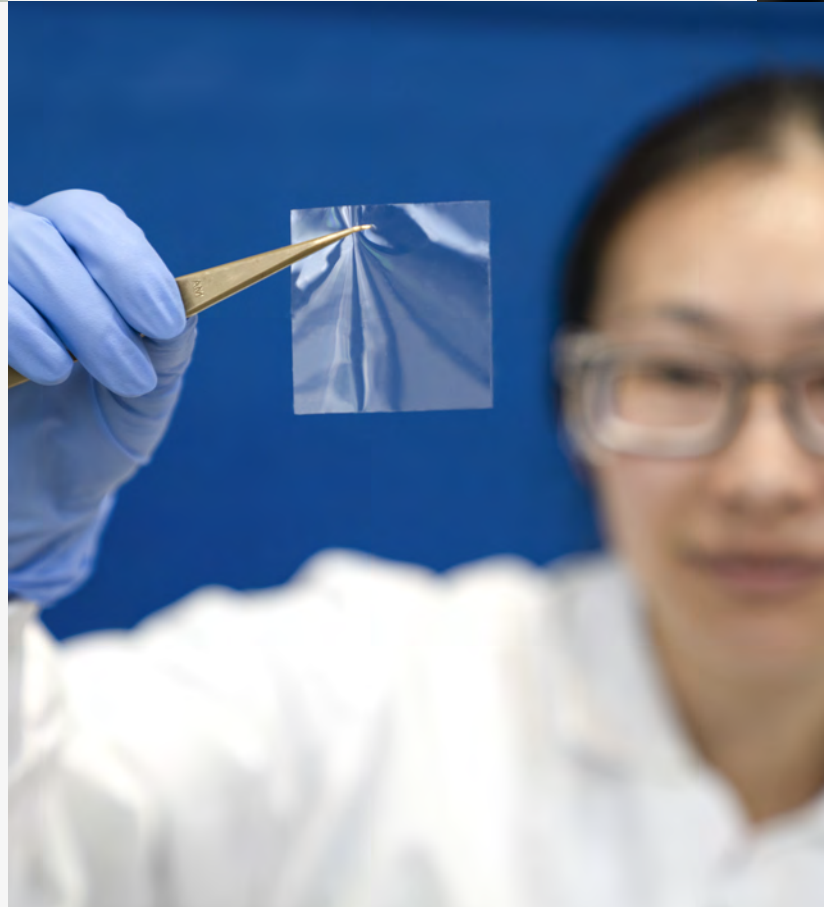
A breakthrough family of films for a wide range of electronics applications

Hyaline is a family of dynamic transparent polyimide films enabling the next generation of innovation in Electronics. These films offer dramatically better optical, thermal, mechanical and weight-saving characteristics.

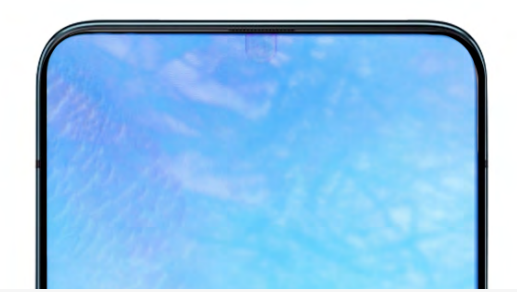
Hyaline Z2 is our first commercial material designed for Electronics, delivering never-before-seen characteristics. This product is a high performance, transparent polyimide flexible film that brings a unique balance of properties. Competing with standard industry materials, this film is ideal for optical applications that require high transparency, temperature resistance and mechanical robustness.

MOST DYNAMIC FILM ON THE MARKET

- Best-in-class optical properties (T%, YI, haze, birefringence) in a high-fold-endurance polyimide
- Balanced thermal/mechanical (Thinner, more flexible than other low-Rth films)
- Optical grade MFG process
- Available up to 1.3m wide (15, 25, 50 μm - thicker films on request)



HYALINE Z2 APPLICATIONS



DISPLAY TOUCH SENSORS

- Superior transparency, haze and yellow index enable brighter displays and longer battery life
- Mechanical and electrical properties support thin substrate designs
- High folding endurance at small radius enables foldable devices with long lifetime

BACKPLATE FOR UNDER-PANEL CAMERA DESIGN

- Best-in-class optical properties (transmittance, yellow index, haze, birefringence) in a high-fold-endurance polyimide
- Correct modulus to support neutral plane adjustment

TRANSPARENT EMI SHIELDING

- High optical transmittance supports brighter displays and longer battery life
- Low birefringence/mura improves image quality
- Thermo-mechanical properties support thicker and more conductive shield layers than other materials

| Property | | Hyaline Z2 | Colorless Polyimide | COP | PET |
|-------------------|-------------------------------------|------------|---------------------|-------|---------|
| Optical | TT (%) | ≥92 | 90 | 91.5 | 90 |
| | Haze (%) | <0.1 | 0.3 | 0.1 | 0.4 |
| | YI | <1 | 1.5 | <1 | <1 |
| | Rth (nm) | 35 | 300 | 10 | 2500 |
| Mechanical | Modulus (GPa) | 3.1 | 6.5 | 2.5 | 2.0 |
| | Tensile Strength (MPa) | 113 | 180 | 70 | 65 |
| | Fold Endurance (Cycles - R=1mm) | >200k | >200k | <50k | <50k |
| Thermal | Tg (°C) | 185 | 330 | 140 | 75 |
| | CTE (ppm/°C) | 63 | 11 | 70 | 60 |
| | Flammability (UL94) | VTM-0 | V-0 | HB | - |
| Electrical | Dielectric Constant (f = 1 GHz) | 2.8-2.9 | 2.8-2.9 | 2.5-3 | 3.4-3.7 |
| | Dielectric Loss Tangent (f = 1 GHz) | 0.009 | 0.002 | 0.005 | 0.02 |
| | Breakdown Voltage (MV/m) | 172 | 190 | 250 | 180 |