



Shaping the Physical AI Future

Humanoid Robotics Portfolio

Covestro Humanoid Robot Solutions



Lightweight & Impact-Resistant, Built for Strength

- Enhances robot agility and battery life
- Protects critical components
- High flow for thin wall claddings

Covestro Material Solutions

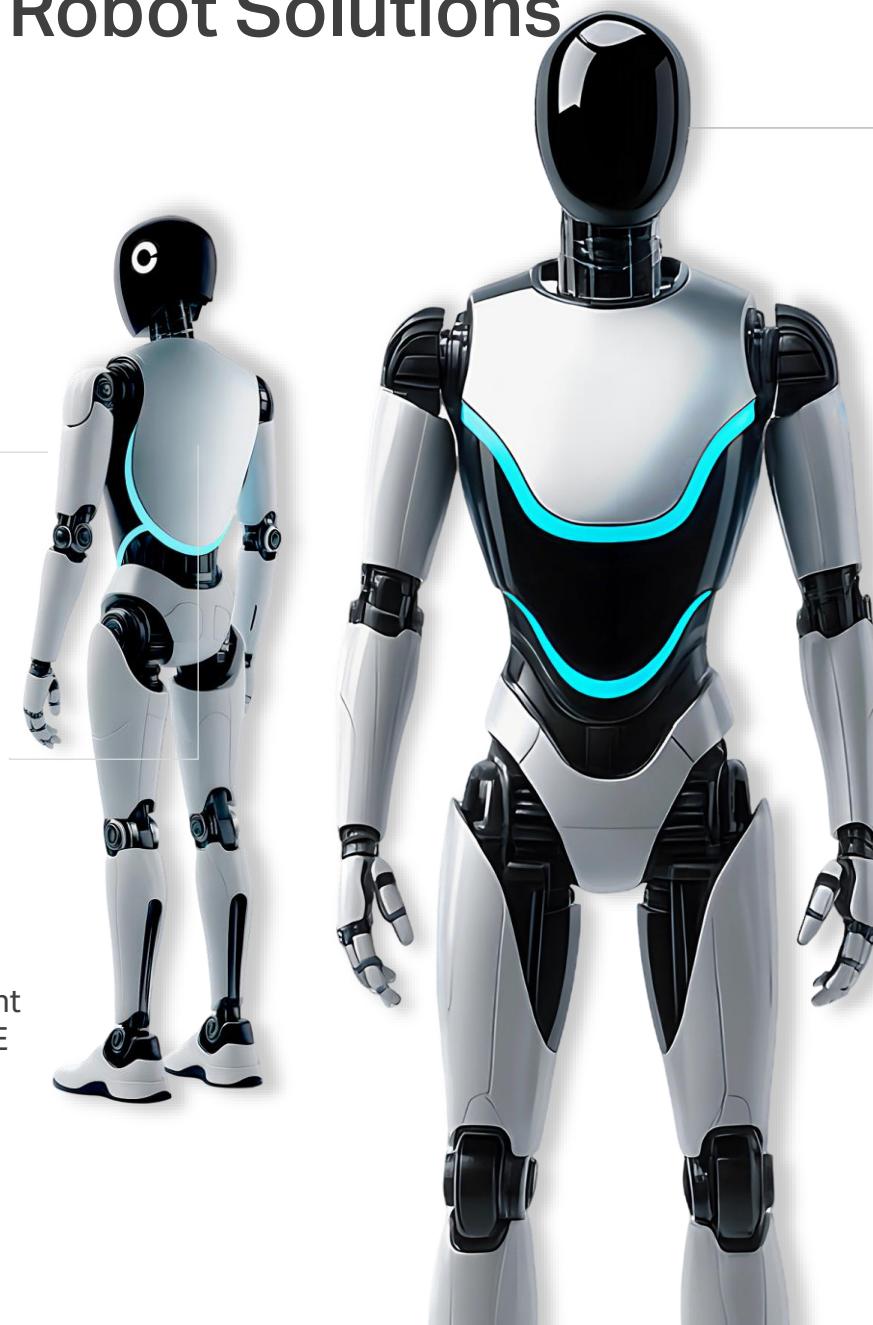
- APEC XT
- Bayblend® FR
- Makrolon® FR

Efficient Thermal Management, Safeguarding Battery and Brains

- **Battery system:** Excellent FR and high RTI ensure long-term stable operation in high-temperature environments
- **Chip/electronic control system:** High thermal conductivity, low dielectric constant (Dk) to ensure signal integrity, and low CLTE

Covestro Material Solution

- Makrolon® TC
- CTI grades



Sensor Transparency and Optical Quality for Vision & Planning

- **Optical transparency:** Provides a clear view for visible light cameras with high impact
- **High near-IR transmittance:** Ensures undistorted signal transmission for infrared and other sensors
- **Flame retardancy:** Meets overall device electrical safety standards

Covestro Material Solution

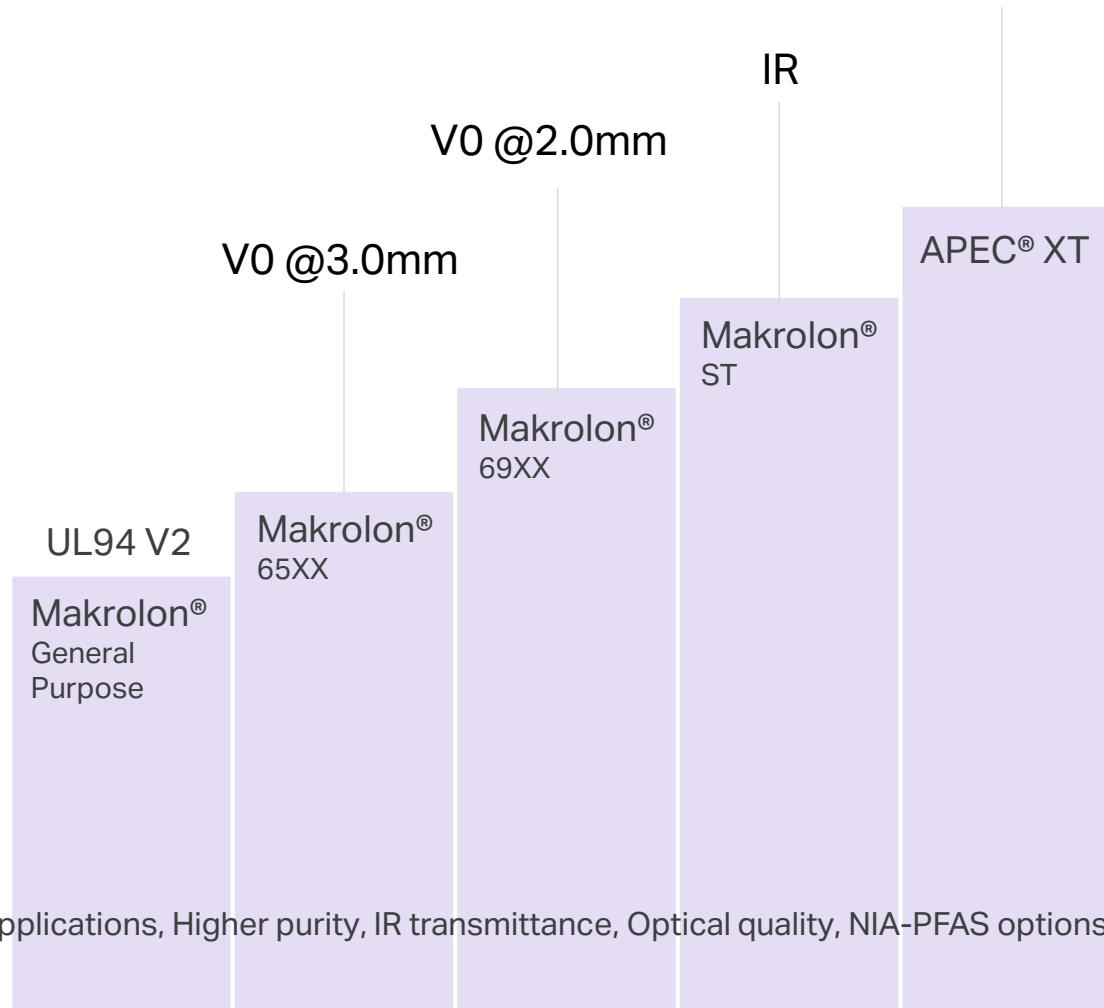
- Makrolon® ST
- Apec® ST
- Makrolon® transparent





Diverse Portfolio for Robot Head

HB-V0 Flame-Retardant, High Gloss Black,
Transparent & IR-Transmitting, Standard PC &
Copolymers



Full Range of Materials for Robot and Charging Station Enclosures



LiDAR Covers

Covestro Material Solutions

Makrolon® Ai

Color: Piano black

Advantages:

- Block visible light
- Infrared light transparency (89% IR transmittance at 2 mm / 905 nm)



Battery Pack Enclosures

Covestro Material Solutions

Bayblend® FR

Color: Black

Advantage:

- Ultra-high flow for thin-wall designs
- Excellent flame-retardancy
- V0 @ 0.75mm

Robot Housings & Claddings

Covestro Material Solutions

Bayblend® FR

Color: Customized per requirements

Advantage:

- Ultra-high flowability and excellent flame-retardancy
- Impact-resistance and drop-resistance
- Excellent structural rigidity and dimensional stability, easy to assemble

Bayblend® FR35XX

Enhanced low-temperature impact-resistance

Bayblend® FR32XX

Enhanced flowability

Bayblend® FR30XX

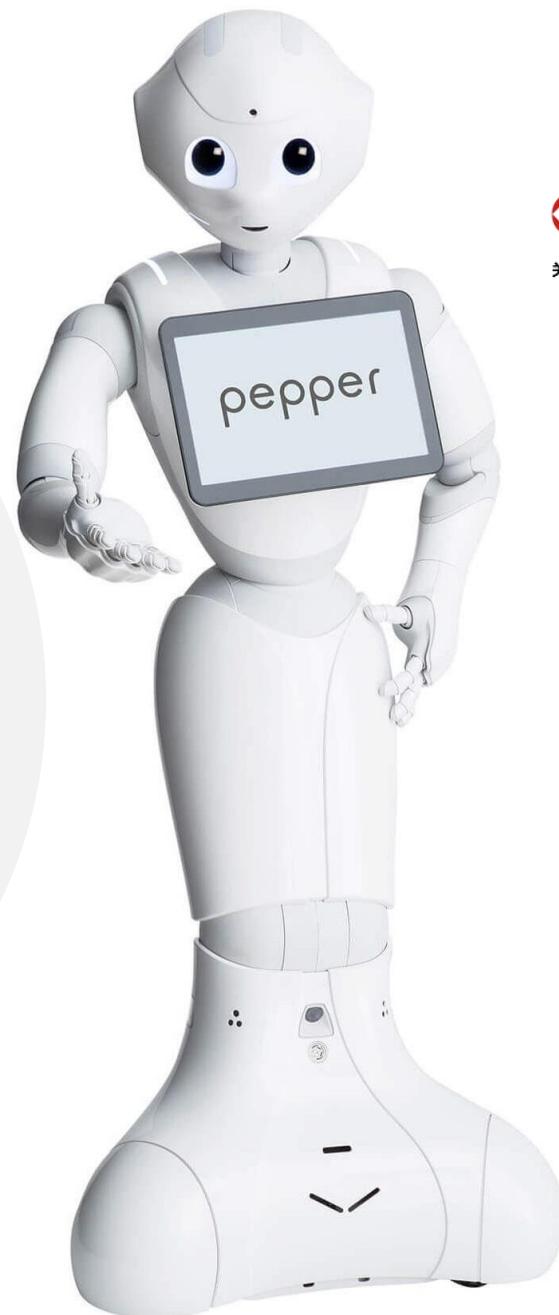
Enhanced hydrolysis resistance

Makrolon® Transparent flame-retardant solution

Pepper & Pudu

FR PC/ABS Offering Outstanding Performance

- ✓ V0 @ 1.1-1.5mm flame retardancy
- ✓ Low-temperature impact resistance at -10 °C
- ✓ Balanced impact & chemical resistance
- ✓ Superior colorability & elegant high-gloss white



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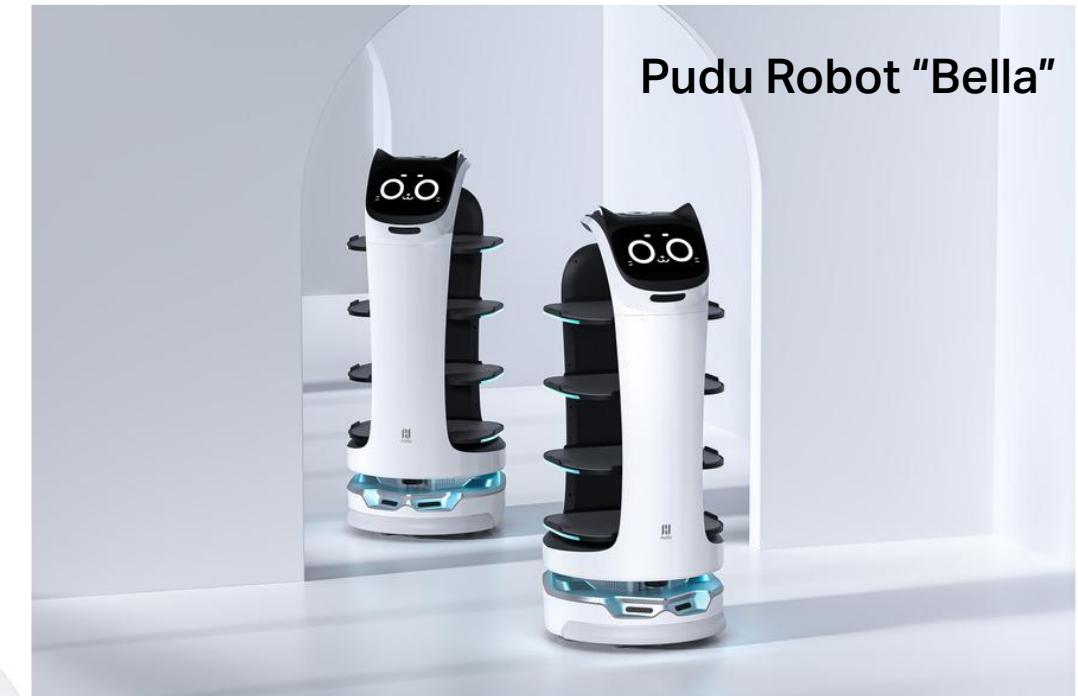
2022

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