Highlight 2 Zeon Products Making Contributions to Society

Cyclo Olefin Polymers, specialty materials creating the future

Zeon's original COP developed ahead of the world

Zeon's Cyclo Olefin Polymers (COP) have excellent optical and chemical properties. Under the product names ZEONEX® and ZEONOR®, they are widely used in optical films and lenses, medical and biotechnology applications while earning highly favorable reviews. The FY 2019 business scale of the Specialty Plastics Business came to 56.8 billion yen in net sales.

Currently, the optical film business for LCD and OLED panels for TVs and smartphones takes a large share of the COP business. COP's characteristics are not only applicable to optical films; they also have potential for application in a wide range of usage settings including the medical applications outlined in our 2019 Corporate Report.
Here we introduce the use of COP in electronic devices.

2019 Corporate Report ▶ http://www.zeon.co.jp/csr_e/report.html

●Characteristics of Zeon's COP that improve the performance of electronic devices

Low water absorbency (high-intensity)	COP is hydrolysis-resistant and able to maintain strength long term.
Low outgassing	COP undergoes very little degassing of volatile components from resin.
High chemical inertness	COP demonstrates excellent resistance to acid, alkali and alcohol.
Low dielectric loss	COP experiences little transmission loss in high-frequency ranges.
Excellent electric insulation	COP offers high dielectric breakdown strength, effective at miniaturization and improving the durability of electronic components.
High processability/ precision moldability	COP is easily processable into films and molded goods, and processing technology is also available. COP offers good dimensional stability, and is also suitable for precision molding.
Strong environmental performance	COP does not produce hazardous substances even when incinerated (only CO_2 and water).

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Zeon's COP making contributions to self-driving cars and 5G communication

Many new electronic devices will be developed to perform sensing, communication, and information processing in the self-driving car and 5G communication fields, whose markets are forecast to expand in the near future.

Our COP is able to meet needs for the advanced functions required in these new fields.

As a film antenna substrate

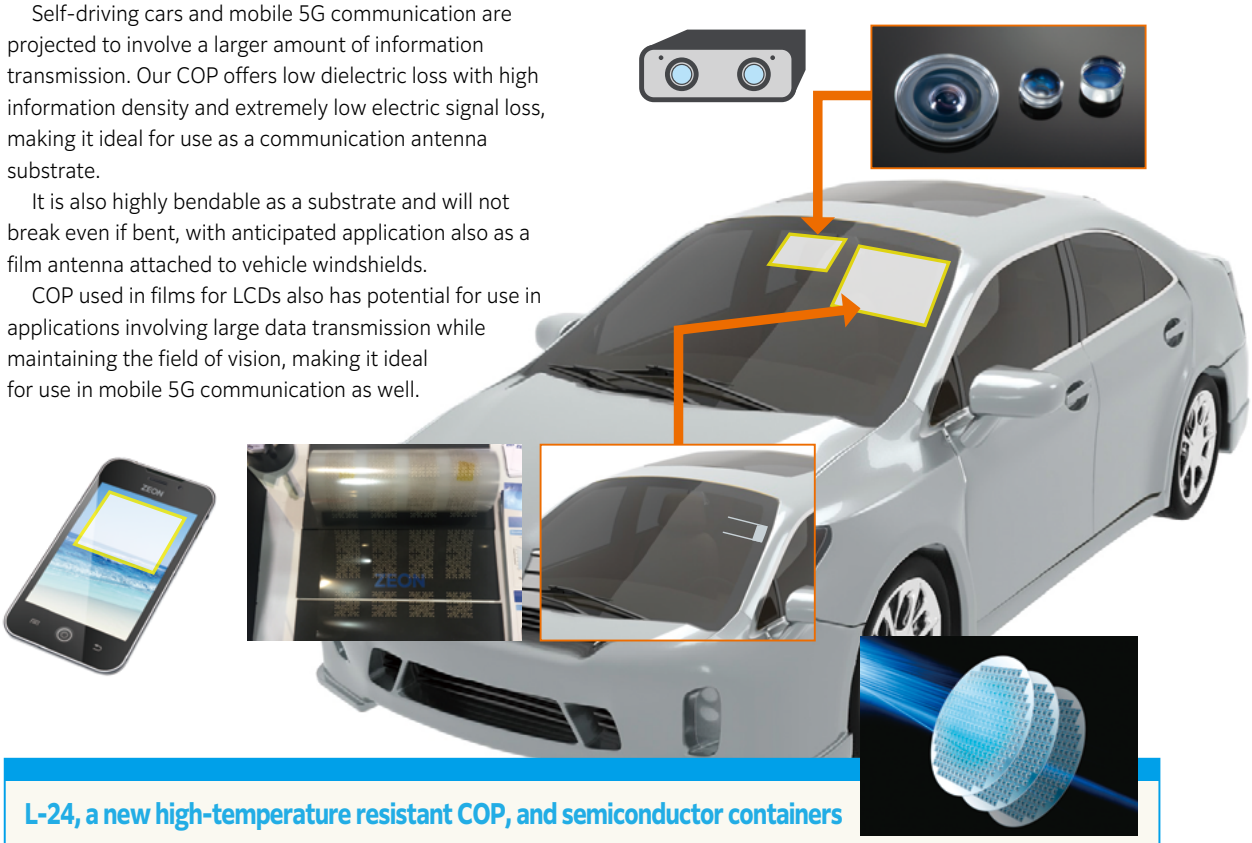
Self-driving cars and mobile 5G communication are projected to involve a larger amount of information transmission. Our COP offers low dielectric loss with high information density and extremely low electric signal loss, making it ideal for use as a communication antenna substrate.

It is also highly bendable as a substrate and will not break even if bent, with anticipated application also as a film antenna attached to vehicle windshields.

COP used in films for LCDs also has potential for use in applications involving large data transmission while maintaining the field of vision, making it ideal for use in mobile 5G communication as well.

As a sensing camera lens

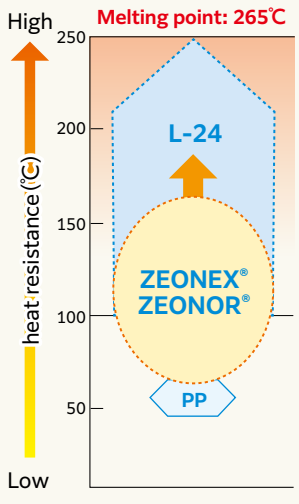
The lenses of sensing cameras, which serve as the "eyes" in collision avoidance systems and drive recorders, need to be transparent and offer excellent precision molding properties. Our COP products have been adopted in many lenses for smartphone cameras to date. In self-driving cars, which are forecast to see market expansion, even more camera lenses are predicted to be used to monitor the vehicle surroundings.



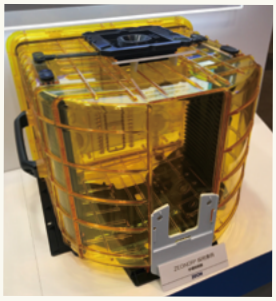
L-24, a new high-temperature resistant COP, and semiconductor containers

COP materials in the past have offered heat resistance to approximately 160℃. However, the new L-24 (development code) material we developed achieves greatly improved heat resistance with a **melting point of 265℃** thanks to added crystallinity.

To obtain the heat resistance and bendable properties required for communication applications, we improved the molecular design of the resin using our original technology, resulting in the creation of a brand-new crystalline COP material.



A lot of fluorine resins are used in conventional semiconductor manufacturing. Fluorine resins exhibit high heat resistance and chemical inertness, but the materials are heavy and expensive, greenhouse gases are produced during manufacturing, and toxic gas is emitted during incineration, which has given rise to needs for alternative materials.



Semiconductor container using COP (stores and mechanically transports tens of 300mm–450mm disc-shaped wafers)

Our COP is increasingly being used in semiconductor containers that store disc-shaped wafers in semiconductor processes, due to its high degree of chemical inertness, low water absorbency, low outgassing, and low environmental impact during incineration.

In addition, L-24 offers improved heat resistance, leading to gains in semiconductor productivity, and therefore is a promising new material.