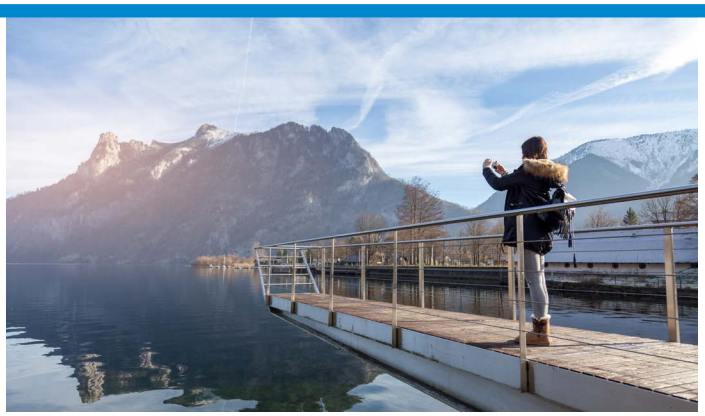
Low-friction, Low-noise Delrin® Unleashes the Power in OPPO's Smartphone With Pivot-rising Camera



Project

In 2018, through partnership with the OPPO Research and Development team, Delrin learned that this global smartphone maker was designing an innovative pivot-rising camera that would slide up from a hidden position on the top of a smartphone, the series we now call Reno.

The pivot-rising camera is the hallmark of OPPO's new Reno flagship model, a truly bezel-less phone that offers an immersive full-screen display. The mechanism to raise and lower the camera had to work in under one second without noise. Plus, it needed to be durable enough to withstand over 200,000 uses.

OPPO had tested other materials for the pivot hinge, but they all failed on repeated, rigorous reliability tests.

After the Delrin technology team stepped in and studied the performance requirement, they recommended two Delrin products to the OPPO team for the pivot-rising components that move the camera into position for taking pictures and stow it away inside the phone when not in use.

Challenges

OPPO's pivot-rising camera needed to be integrated seamlessly with their smartphone design. OPPO designers wanted to wow consumers with sophisticated camera movement and excellent photo-taking performance without losing screen area for the embedded camera. This unique new shark fin-like pop-up module brings greater camera zoom capability than previous OPPO models.

Reliability with repeated use

Smartphone cameras must be reliable in a world where over 100 million photos and videos are uploaded to Instagram each day. OPPO required that the camera slider work flawlessly for the five-year life of the phone; that meant at least 200,000 cycles of use.

Smooth, quiet operation

The movement of the camera had to be fast and quiet. Friction had to be minimized, if not eliminated.

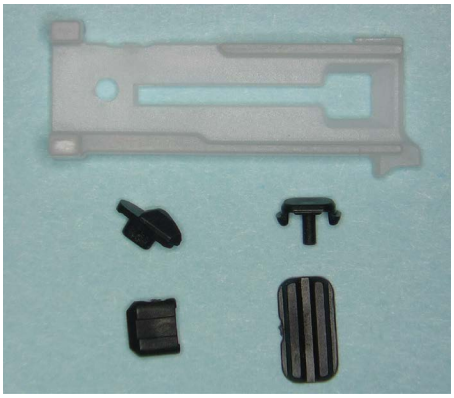
Compact size

The slider mechanism had to fit within the confines of a smartphone. The OPPO Reno measures just 7.43cm wide and 9mm thick. Designers needed a material to enable a hinge design that was thin, lightweight and with a low coefficient of friction.

Solution

Two grades of Delrin acetal homopolymers succeeded in delivering the performance OPPO required for the compact, sliding component that pivots the camera up from the top edge of the Reno smartphone.

In-lab testing that simulated smartphone use proved that where other products like copolymers had cracked and failed, Delrin materials remained strong and operated smoothly.



Delrin reliability for wear resistance and low friction allows the OPPO pivot-rising smartphone camera to operate 200,000 times without fail or noise.

Delrin® 100AL was the solution for the sliders. Delrin® 500AL was employed for the brackets that hold the slider. Both grades have an advanced self-lubricating characteristic in addition to the superior properties of low wear, low friction and low noise against metals and plastics. The performance of Delrin materials allowed the pivot mechanism to deliver reliable operation for at least 200,000 cycles. When the OPPO Reno camera goes into action, it rises from the smartphone in just 0.8 seconds. The pivot movement is intricate, first moving fast then slow.

With Delrin® 100AL's extremely low coefficient of friction, the camera components move without a sound. If the phone is dropped while the camera is up, it automatically recedes.



Delrin is the key to reliable and smooth operation of OPPO's unique shark fin pivot-rising camera.

The phone has been well received by critics who praise the camera's design and performance. The pivot-hinge component of the Reno includes a selfie camera on the front. On the back, it has powerful zoom features and a flash. These attributes complement the standard camera built into the back of the smartphone.

OPPO has developed an innovative contender that has grabbed the attention of consumers in Asia, the Middle East and Europe, making OPPO the fifth largest – and growing – smartphone provider globally. Delrin is proud of the role it played in optimizing the pivot-rising camera.

Why Delrin is the industry standard

For over 60 years, Delrin acetal homopolymers have been the industry standard for plastic gears because they provide superior properties such as:

- Increased design flexibility
- Thinner wall sections at same physical part performance
- Lighter parts and less material usage
- Improved mold filling
- Shorter molding cycle times

Delrin® 100 resins are distinguished by their high viscosity versus other acetal grades. This, along with their natural high crystallinity, yields materials that have:

- Toughness, ensuring high impact strength and high resistance to repeated impact
- High elongation to allow higher deformation
- High mechanical strength and rigidity for high-loading applications
- Outstanding creep resistance and long-term fatigue endurance helps enable lifetime performance

Delrin® 100AL and Delrin® 500AL both contain an advanced system of lubrication designed for low wear, low friction and low noise against metals and plastics. Delrin® 100AL has very high mechanical properties to ensure lifetime performance and Delrin® 500AL's better flow helps improve productivity and facilitates design freedom.

To learn more, contact your Delrin representative or visit Delrin.com.

Delrin®

Delrin® is an industry-leading premium industrial polymer business. Grounded in strong innovation, Delrin is a category creator with a longstanding reputation for quality, reliability, supply and product performance. The iconic Delrin brand, coupled with proprietary technology and deep application expertise make us a leader in the high-end engineering polymer market. Delrin has exciting growth prospects from exposure to automation, actuation, healthcare, mobility and consumer applications.

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