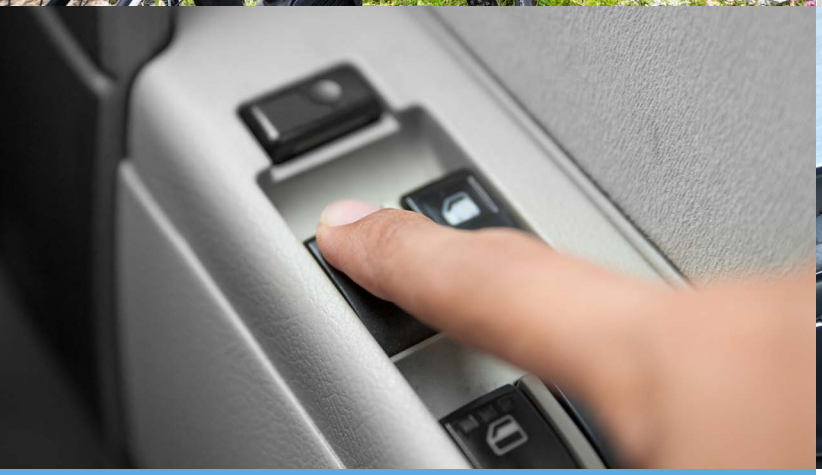
Delrin® 51HSE – A New Standard for Plastic Gears in Automotive and E-bike Applications

Newly developed Delrin® 51HSE draws on the Delrin® 100 series' long history of setting the industry standard for plastic gears. The Delrin® 100 series is well known for its class-leading mechanical properties for gears; it offers light weight, high strength, durability, excellent creep performance and low noise. Now Delrin® 51HSE demonstrates improvements that build on the core strength of Delrin® 100 and is ideally suited for plastic gears in automotive and e-bike applications.









Delrin® 100CPE is a high-viscosity, low-emission, high-productivity resin that is proven in high-performance gears.

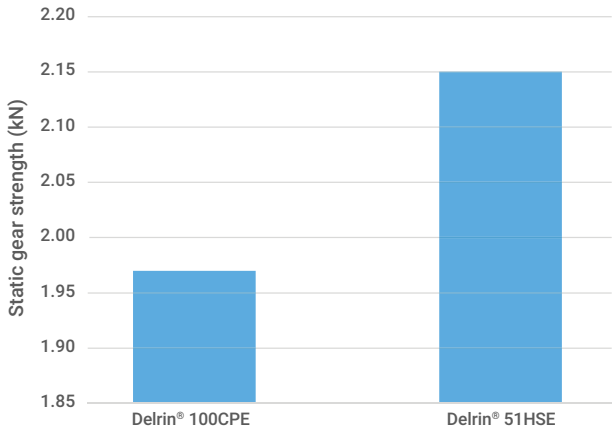
Delrin® 51HSE is a high molecular weight (low flow) nucleated resin, specially formulated for use in applications requiring creep resistance and fatigue durability.

The improvement in static gear strength is about 10%, but the real benefit comes from durability.



Static Gear Strength Test

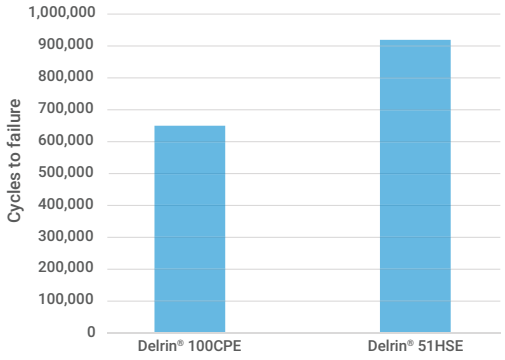
The chart below shows that Delrin® 51HSE has higher static gear strength than Delrin® 100CPE. The improvement in static gear strength is about 10%, but the real benefit comes from durability.



Source: DuPont

Gear Fatigue Test

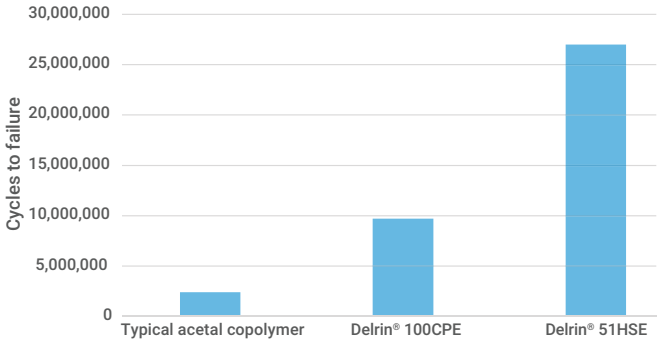
This was validated by gear testing at 80°C, 150 rpm. In this case, the results show the number of cycles to failure at a tooth root stress of 60 MPa. Here, Delrin® 51HSE showed a 41% improvement.



Source: DuPont

Fatigue Test

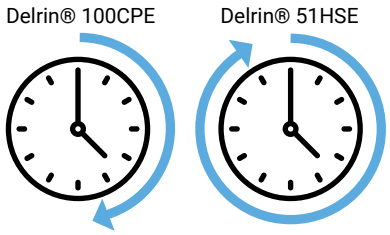
In a lab fatigue test, Delrin® 51HSE was tested against Delrin® 100CPE and a high-viscosity acetal copolymer at 80°C, 30 Hz and 21.6 MPa load. Delrin® 51HSE clearly shows a significant improvement over the comparison products.



Source: DuPont

Creep Rupture Test

Delrin® 51HSE shows superior creep rupture performance versus Delrin® 100CPE. Unlike standard creep tests, creep rupture tests measure the time to fracture for a given temperature and strain level. In this case, the load was 22.5 MPa at a temperature of 90°C. Delrin® 51HSE outperformed Delrin® 100CPE up to a 2X multiple.



Creep rupture time up to 2X

Source: DuPont

In e-bike durability testing, the motor is repeatedly stopped and started. Delrin® 51HSE endures 2.5 times more load cycles than Delrin® 100 grades such as the 111 series normally used in this type of application.

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

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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