



Delrin[®] Acetal Homopolymer from Distrupol

Delrin[®] acetal homopolymer bridges the gap between metal and plastics with a unique combination of mechanical properties. It is a highly-crystalline engineering thermoplastic which is often specified for high load mechanical applications because of its stiffness, toughness and strength, without the need for reinforcement.

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*Distrupol, your supply partner for Delrin[®] materials.
Contact us today to find out more!*

Delrin[®]

Distrupol is a world class supplier of Delrin® polymers, offering a wide range of innovative solutions across multiple industries.

Distrupol and key supply partner Delrin® have been providing revolutionary polymer solutions to designers, moulders and OEMs across Europe for over 60 years. With the scientific innovation and expertise of Delrin®, and the technical knowledge and commercial experience of Distrupol, we provide a fully integrated approach to our customers' polymer projects.

Technical Support:

With over 60 years of experience and knowledge, we understand the many requirements, considerations and specifications that a project can have. We can help select a 'fit for purpose' solution for your application, recommending the most suitable material(s) and enabling you to get it right first time. Our development engineers can support you with conceptual design, mould flow and tooling, material sampling and process optimisation.

Quality, Certification, Traceability and Confidence:

Material authenticity and traceability is critical when it comes to the manufacture of your components. We can supply certificates of conformity and analysis, and full traceability with every delivery, giving you, and your moulders, confidence that you're using a certified and in-specification material.



An introduction to Delrin® Acetal Homopolymer

Delrin® bridges the gap between metal and plastics with a unique combination of mechanical properties. It is a highly-crystalline engineering thermoplastic which is often specified for high load mechanical applications because of its stiffness, toughness and strength, without the need for reinforcement.

Chemistry

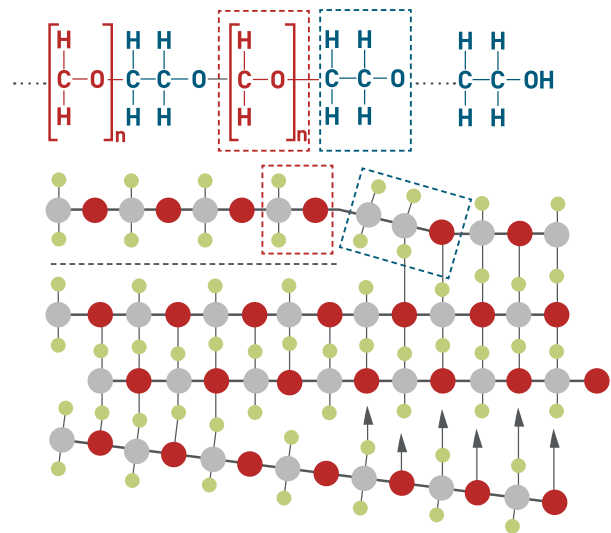
Acetal is the common name for a family of thermoplastics otherwise known as Polyoxymethylene (POM). Available in both copolymer and homopolymer (Delrin®) varieties, acetal is a relatively simple molecule which is made of repeating units of formaldehyde (CH₂O).

Acetal copolymer consists of 92-99% linear polymer chains with a randomly inserted comonomer and 1-8% low molecular weight cyclic oligomers. The comonomer disrupts the alignment and reduces the natural tendency of the polymer to crystallise, while the oligomers are absent from crystallisation completely. This results in a typical crystallinity of 45-50% for acetal copolymer.

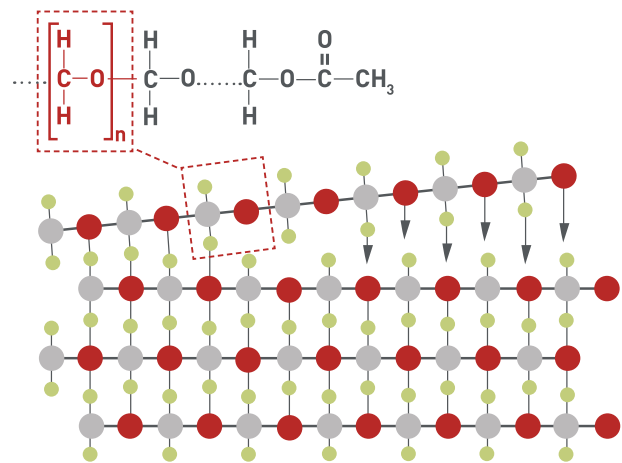
Delrin® acetal homopolymer consists of only formaldehyde to form the polymer chain, with a second molecule forming the endcaps, stabilising the chain and controlling the molecular weight. The uniformity of the structure allows for the tight-packing of polymer chains and increased interconnections between blocks. This results in a typical crystallinity of 55-60% which gives Delrin® acetal homopolymer the mechanical property advantage over standard acetal copolymer.

When compared to acetal copolymer, Delrin® acetal homopolymer offers higher tensile strength, stiffness and creep resistance and significantly higher impact resistance. The lower molecular weight also results in a significant improvement in melt flow rate (MFR) and mouldability, allowing for thinner and lighter part design, shorter moulding cycles and the potential for cost reductions.

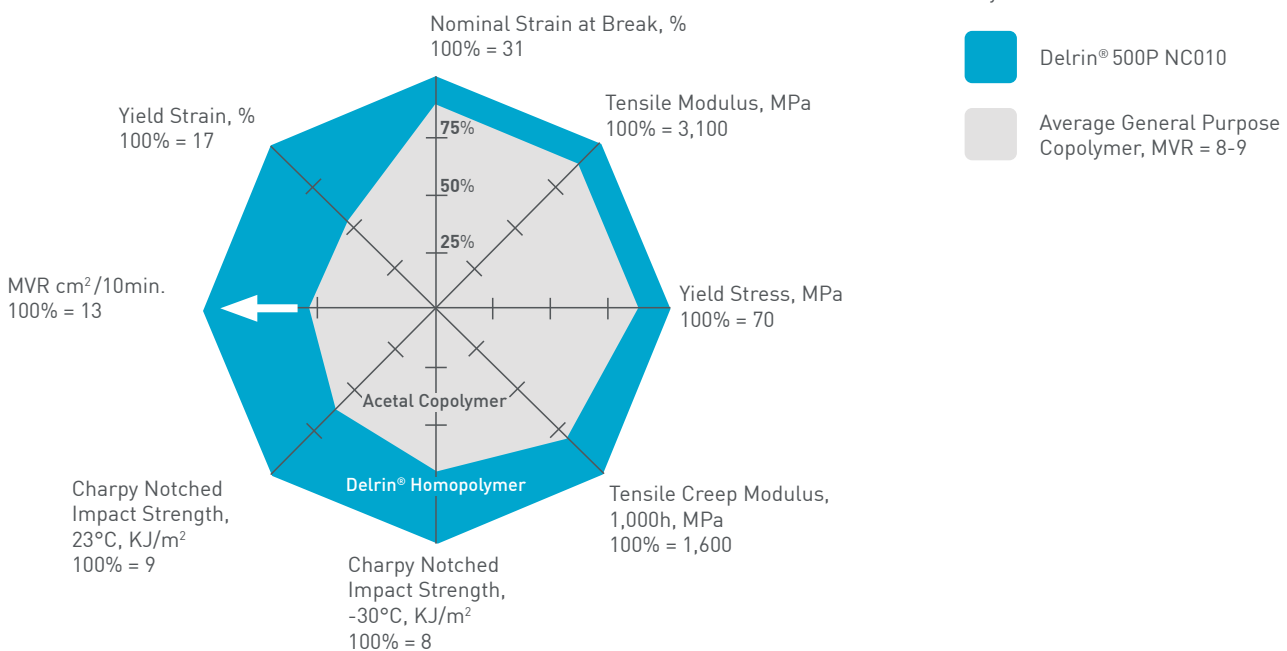
Acetal Copolymer



Delrin® Homopolymer



Mechanical properties of acetal copolymer vs. Delrin® homopolymer



Product Properties

Mechanical Performance

Delrin® is very resistant to creep, offers high mechanical strength and stiffness and offers exceptional impact resistance due to its very high crystallinity of up to 60%. This makes Delrin® a great material choice for gears and snap fits.

Low Friction

The low friction properties combined with low wear and low noise properties make Delrin® a great material choice for sliding applications.

Temperature Resistance

Delrin® retains its outstanding toughness, fatigue and impact resistant from temperatures below -50°C up to 90°C (intermittent to 120°C). This makes Delrin® an excellent material choice for automotive interior applications.

Low Emission

Many Delrin® grades meet the requirements for healthcare, food and cosmetics industries for emissions and the high indoor air quality standards of automotive cabins. Modified grades are also available for the strictest air quality standards.

Dimensional Stability

Low moisture pickup and very good dimensional stability make Delrin® a great material choice for precision parts.

Applications

Invented in 1960, Delrin® is widely used in many applications around the world today, including in the automotive, industrial, electronic, consumer goods and medical industries. The advantageous properties of Delrin® – including very high strength, stiffness and creep and temperature resistance – make it ideal for applications such as gears, clips, fasteners, bearings, conveyor belts, switches, handles, screws, springs, valves and much more, across an extensive variety of industries.

Examples



Delrin® is suitable for a variety of automotive applications including seatbelt pillar loops. The low friction and low wear, fatigue and impact resistance properties of Delrin® make it ideal in this instance.



The Delrin® range includes medically certified grades which are used for many applications including multiple components of auto-injector pens. Beneficial properties for this include low friction, durability, dimensional stability and strength against force.



Delrin® is used in buckles, clips and fasteners across a wide range of applications and industries. The high stiffness and strength of Delrin®, as well as the low wear and low friction properties, make it a reliable material for this group of applications.

Range Overview

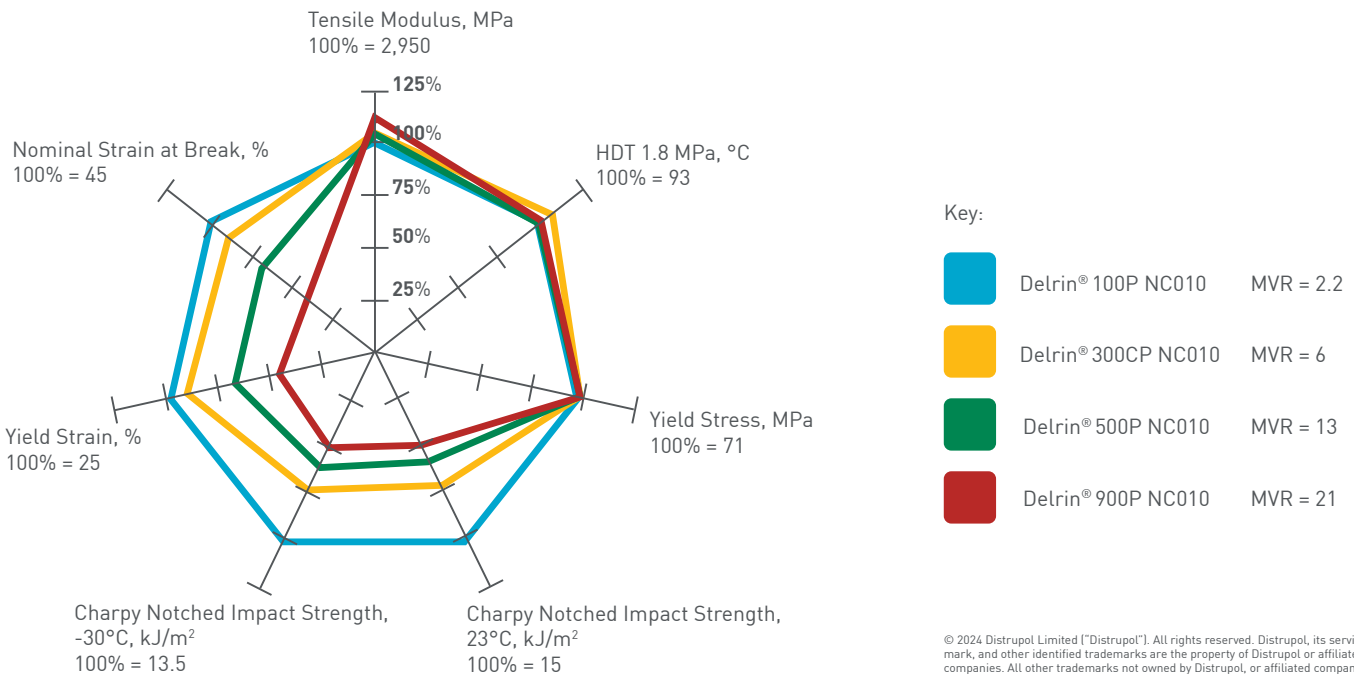
FLOW SERIES	DESCRIPTION	MODIFIED GRADES AVAILABLE
100 Series	High viscosity acetal homopolymer for use in easy-to-fill moulds (thick walls). Best combination of strength, toughness and creep resistance without modification.	20% Teflon Advanced Fiber, Advanced Lubrication, Unnucleated, Nucleated, Kevlar Modified, Low Emission, Toughened, Super Toughened, Teflon Lubricated, UV-Stabilised, Food Grade Certified
300 Series	Medium-high viscosity acetal homopolymer with an outstanding balance of ease of processing and mechanical performance.	Antistatic and Stiffness, Antistatic, Toughened and Black, Unnucleated, Nucleated, Low Emission, Toughened, Food Grade Certified
500 Series	General purpose medium viscosity acetal homopolymer with an optimum combination of flow and mechanical performance.	20% Teflon Advanced Fiber, Advanced Lubrication, Chemical Lubrication, 20% Teflon Micro-Powder, Unnucleated, Nucleated, Low Emission, Silicone Concentrate, Toughened, 1.5% Teflon Lubricated, Glass Reinforced, UV-Stabilised, Food Grade Certified
900 Series	Low viscosity acetal homopolymer for multi-cavity and thin wall moulding.	Unnucleated, Nucleated, Advanced Lubrication, Food Grade Certified
PC6 / SC6 Series	Acetal homopolymer certified for healthcare applications.	Premium Control, Special Control

Preferred by Designers

FLOW SERIES	MELT-MASS FLOW RATE	MELT-VOLUME FLOW RATE
100	2.4	2
300	7	6
500	15	13
900	25	21

Preferred by Moulders

Mechanical properties of Delrin® series



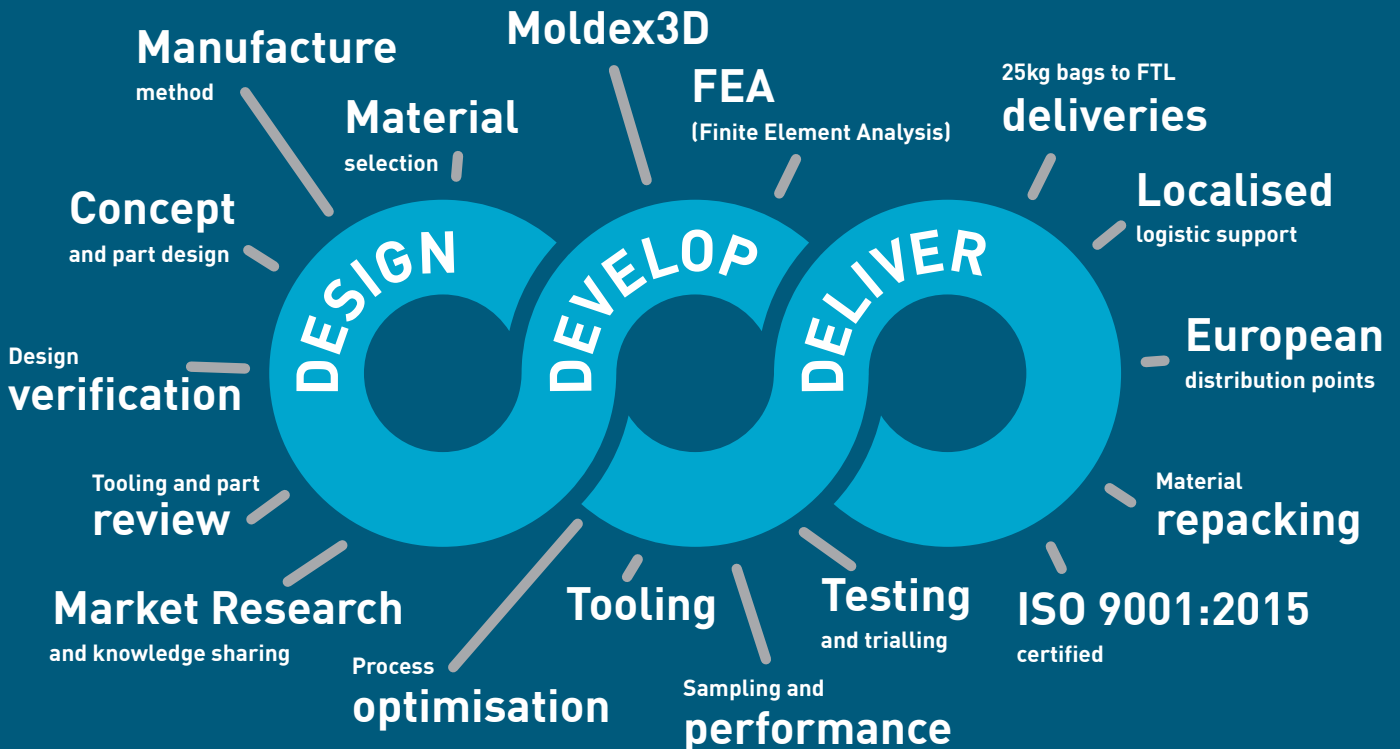
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Availability

Delrin® acetal homopolymer is available in four general series based on molecular weight/flow rate.

An Integrated Process

From concept to manufacture



Distrupol is a European leader with over 60 years of excellence, innovation and expertise in the sales and application development of thermoplastic polymers and elastomers.

Our team of highly experienced sales people is able to meet your requirements and exceed your expectations, whilst adding value to your business.

The team is supported in every market by our development engineers, who have an unrivalled knowledge of every aspect of polymer technology including design of parts and moulds, polymer selection to achieve best performance, troubleshooting and optimising the production of parts.

Our long-term partnerships with world class suppliers strengthen our knowledge and give us an extensive range of high quality products to provide a material solution for every application.

All of our suppliers are REACH compliant and all of the Distrupol businesses are fully accredited to ISO 9001:2008.

The Distrupol portfolio contains products and solutions that fulfil the requirements of leading and emerging industries.

The range is accompanied by certifications and approvals for the automotive, medical, food and electrical industry. Warehouses in the United Kingdom, Ireland, Sweden, Finland and the Netherlands support us to offer next day delivery across Europe. Materials are available from 25kg bags to full truckloads, octabins, big bags and bulk delivery. Whenever required, we can repack material in our warehouse into the desired packaging.

Discover the real value that Distrupol can add to your business.

Design, Develop and Deliver with Distrupol.