



ELESA SUPER-Technopolymer

The use of technopolymer

Despite the spread of polymers for technical products dating back to a relatively recent era (e.g. polyamide-based polymers in the USA after the Second World War and polypropylene-based ones after Giulio Natta's research in 1954, at Politecnico di Milano, Milan - Italy *n.d.t. a Scientific-technological University*) the so called engineering plastics have now strongly entered our everyday life, replacing materials deemed most "noble" such as metal alloys, glass or wood.

The most technologically advanced industries, such as automotive, aerospace and electronics, has long ago understood the many benefits arising from the use of engineering plastics and has promoted the creation of research centers to develop new high-performance polymers. For example, today 50% of the volume of the materials present in a car are made of plastic materials, with use until very recently unthinkable, such as, for example, air intake manifolds, engine components, lights, doors and hatches.

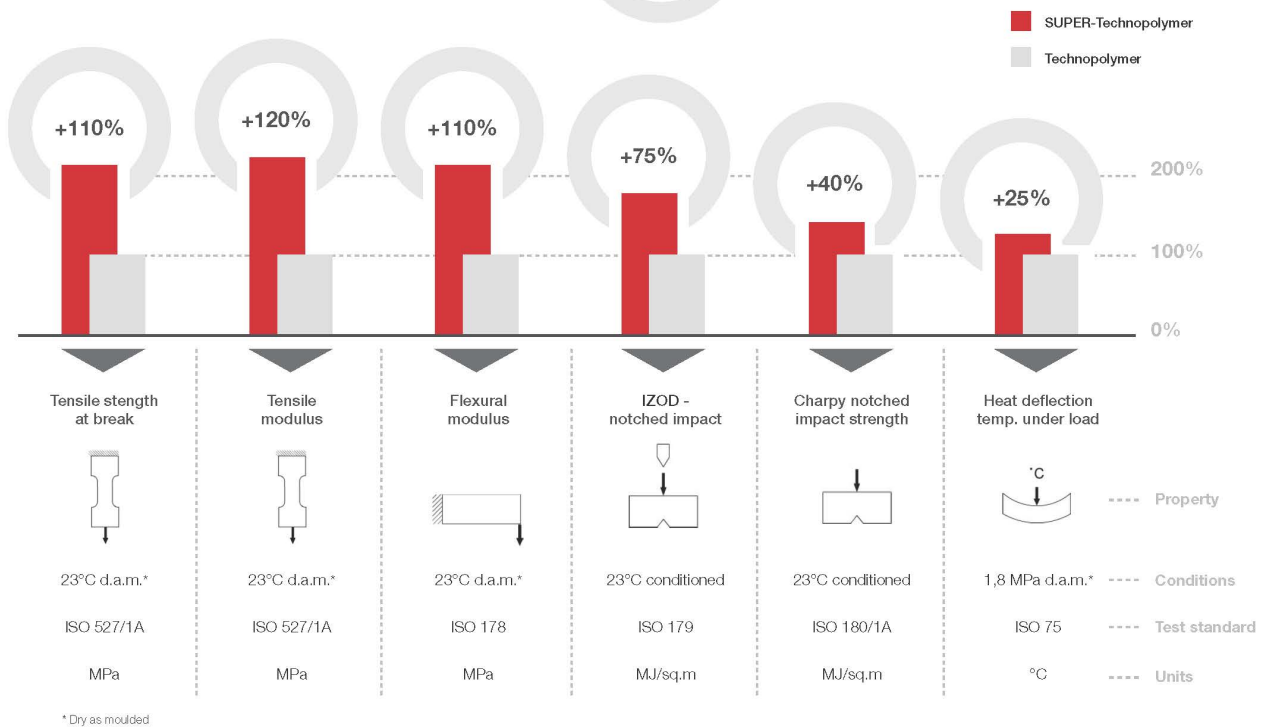
With more than 70-year expertise, Elea is a pioneer in the design and production of standard components for industrial machines and equipment, focusing from the beginning on the use of polymers paying great attention to the development of new technopolymers thanks to an active collaboration with Politecnico di Torino, (Turin), a center of research for the automotive industry and with Proplast of Alessandria, technology center for the engineering of polymeric materials.

SUPER-Technopolymer and Metal replacement

"SUPER-Technopolymers" represent the most recent and advanced development in engineering of polymeric materials. Thanks to the presence of high percentages of glass fibre linked to the base polymer with suitable primers and / or the presence of aramid synthetic fibre, SUPER-Technopolymers are characterized by mechanical and thermal properties far superior to the traditional polymers (see chart SUPER-Technopolymer vs. Technopolymer on page 2).

The so called "metal replacement" is not limited to the use of high-performance engineering plastics. In order to produce technopolymer products for applications which up to now were a prerogative of the metal, it is necessary to deal with expertise, the design phase of the component, so as to ensure the maximum exploitation of all the typical features of polymers, optimizing shapes and thicknesses combined with the benefits of a lower density of material (see chart SUPER-Technopolymer vs. Metal Alloys on page 3).

SUPER-Technopolymer vs. Technopolymer



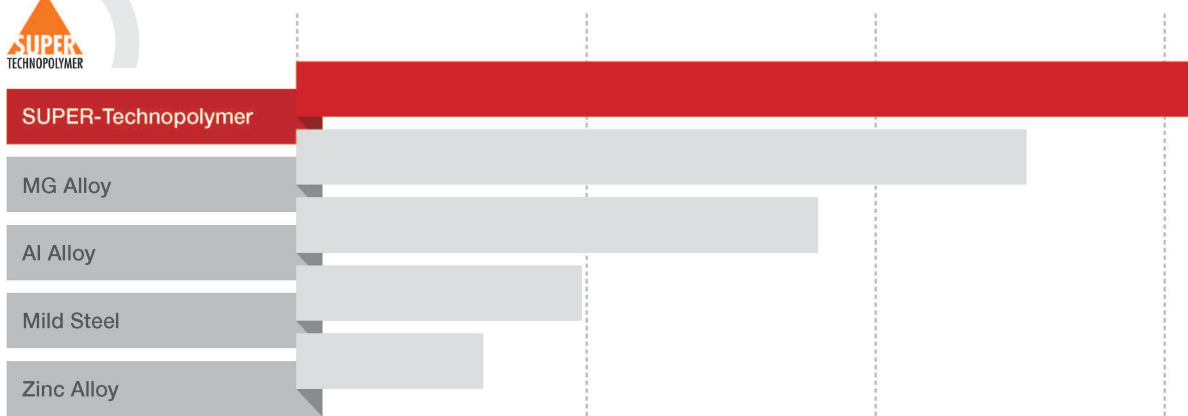
Comparison of Mechanical Properties between SUPER-Technopolymer and Technopolymer

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SUPER-Technopolymer vs. Metal alloys



Specific tensile strength *



* Tensile strength / density

Comparison of Specific tensile strength between SUPER-Technopolymer and Metal Alloys

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The use of SUPER-Technopolymers in combination with the decades-long experience and expertise of ELESA in the design and moulding of plastic materials have made possible the realization of a range of components for machines such as hinges, indexing plungers, cam-levers and column level indicators with protection frames which used to be available on the market only in metal alloys. Mechanical and thermal properties of these products are such as to allow their interchangeability with the corresponding metal products, offering the additional advantages of corrosion resistance and lightness typical of plastic materials. That is why we can say that SUPER-technopolymer components integrate the typical advantages of plastics with some of the strengths of high resistance steel and stainless steel.





Main advantages of SUPER-Technopolymers

- **Corrosion resistance:** therefore suitable for use in wet environments or outdoors or on applications requiring frequent cleaning cycles (food machinery, pharmaceutical, etc.)
- **Lightness:** in addition to cost reduction for transport, storage and handling, the lightness of components made out of SUPER-Technopolymer represents a definite advantage for applications on machines or equipment subject to frequent displacements or intended for goods handling.
- **Absence of maintenance:** the low friction coefficient of polymers avoids periodic lubrication of the component in particular for those made in self-lubricating plastic material.
- **Nonmagnetic:** plastic components are not affected by magnetic fields.
- **Electrical insulation:** preventing the passage of energy through the body of the component. This is a safety factor for all components that can be in contact with the operator's hands.
- **Addition of colour** in the moulded material, offers advantages in terms of quality and duration over painted components (the finish cannot be removed), it also proves economical for reasonable quantities as the cost becomes close to that of standard polymer.



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