



Thermoplastics

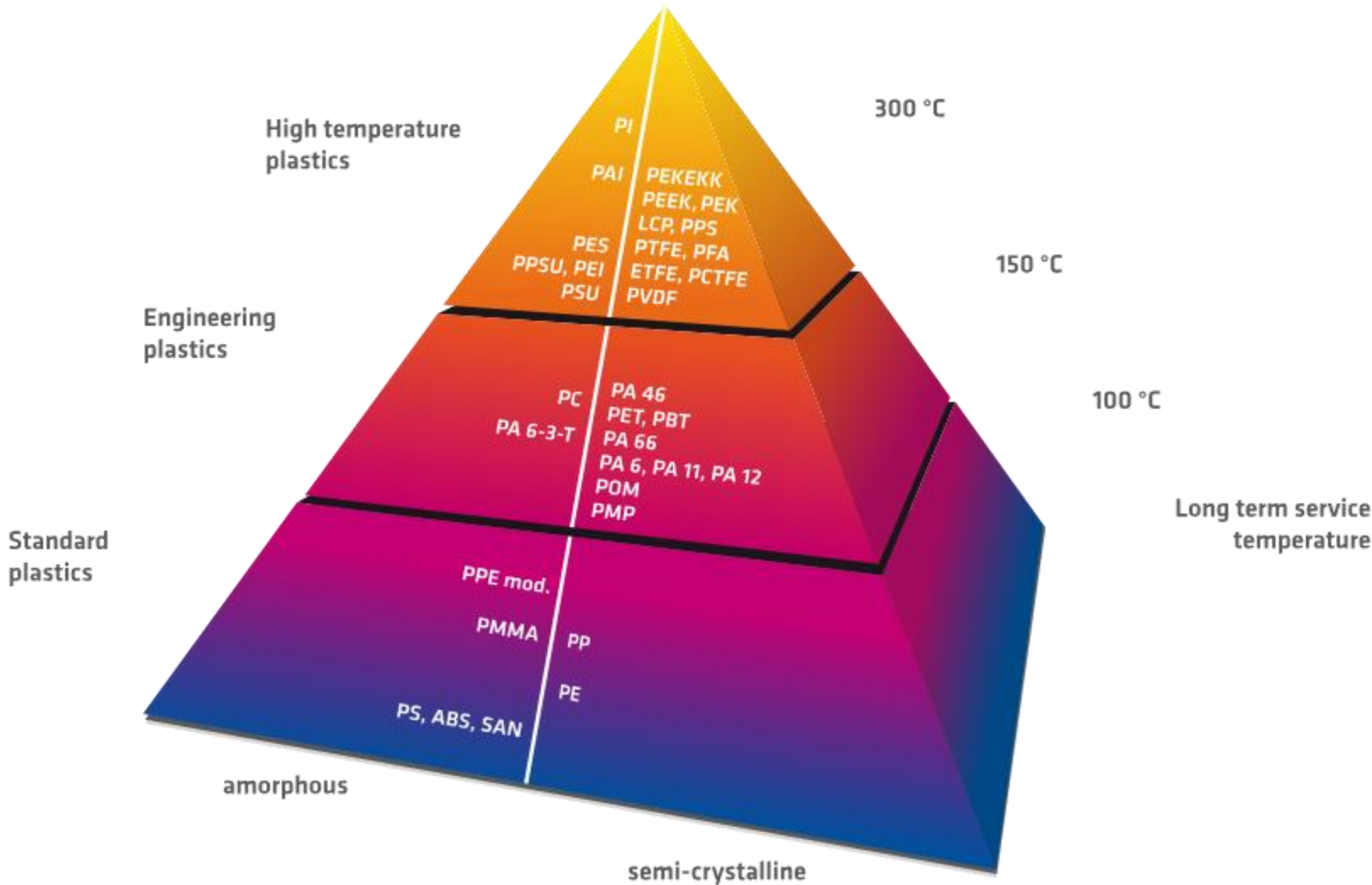
Manufacturer and supplier of thermoplastic polymers

In modern industry "performance" is a must. It can cover many aspects concerning quality, efficiency, durability, speed, throughput or resistance to external factors. The aim is to have applications that run smoothly, with minimum maintenance, at the best cost to performance ratio. Within our material portfolio, you will certainly find the plastics you need for your individual applications.

Ensinger has specialised in the processing and distribution of thermoplastics for over 50 years. Our expertise covers the entire value chain in the world of plastic. Starting with the selection of the right material with regard to your specific requirements through to the manufacture of thermoplastic components using a suitable further processing method.

As a thermoplastics manufacturer, our focus is mainly on the so-called high performance plastics and engineering plastics, which are characterised by various outstanding properties, for example in terms of heat resistance. However, our material range also includes the well-known standard plastics.

Classification of plastics



High performance plastics

High performance thermoplastics typically have a permanent operating temperature of more than 150 °C. It is this material class that brings the superior properties of polymers - such as sliding friction characteristics, weight saving and chemical resistance - to bear, especially, a high permanent operating temperatures. Using special reinforcing materials such as glass fibre, glass beads or carbon fibre, heat distortion resistance and rigidity can be increased even further. Additives such as PTFE, graphite and aramid fibres considerably improve the sliding friction characteristics, and the addition of metal fibres and carbon black provide improved electrical conductivity.

The following high performance plastics are manufactured by Ensinger:

PEEK	PEKK	POLYIMIDE
PAI	LCP	PPS
PPSU	PSU	PEI
PTFE	PVDF	PPA

High performance polymers in applications

Some of the most important areas of application for high temperature plastics are:

- Applications that require abrasion resistance, wear or a low friction coefficient, these engineering plastics offer superior performance when compounded with lubricants such as PTFE and graphite
- Heat and shock resistant applications in the glass and aerospace industries
- Heat resistant, emission proof, highly insulating or defined conducting materials for the semiconductor and electrical engineering industry
- Sterilisation and hydrolysis proof parts for medical devices
- Emission proof and radiation resistant components for vacuum technology and applications in the areas of X-ray technology and nuclear energy
- Components for the chemical industry

Engineering plastics

Engineering plastics (technical plastics) and high performance plastics are our main business. Engineering plastics have a whole array of benefits to offer, and in many cases can effectively replace metals or ceramics. Moreover, engineered plastic components often provide the only alternative when it comes to the implementation of unusual technical applications - which makes them a true pacemaker for innovation in every key of industry.

Ensinger processes a wide variety of engineering plastic and thermoplastic polymers, which possess better mechanical and/or thermal properties than the more widely used standard plastics such as polystyrene, PVC and Polyethylene.

In comparison to widely used commodity plastics for packaging as PE, PP, PVC, engineering plastics are chosen in case of higher requirements in mechanical strength or thermal resistance, but are not as sophisticated and expensive as high temperature plastics. Material blends and modifications permit product characteristics to be optimised across a broad range to suit different applications. Engineering plastics consequently cover a wide spectrum of different properties.

Engineering plastics can be used permanently at temperatures between 100 °C and 150 °C. In general, this product group is also referred to as technical thermoplastics.

The following engineering thermoplastics are manufactured by Ensinger:

ACETAL / POM	EXTRUDED NYLON	CAST NYLON
POLYESTER	PCT-G	PBT
POLYCARBONAT	POLYKETONE	

Engineering plastics for applications

Ensinger's engineering plastics are available in a broad stock programme and thus offer dimensions that suit your final size requirements. Due to their high quality, Ensinger's engineering plastics are of interest for a multitude of industries and applications. Engineering plastics are mainly used for applications where a good ratio between costs and properties are needed at moderate temperatures. Our machinable plastic types are frequently used to produce industrial plastics for applications in the automotive, manufacturing, engineering, electronic, food and transport industries.

Industrial plastics

Ensinger's general industrial plastics category consists of materials that represent an array of enhanced physical characteristics. While these materials do not have the higher temperature resistance profiles typically seen in the high performance or engineering categories, general industrial plastics still offer a number of significant advantages that other design materials do not. Whether you are looking for chemical resistance, clarity, lighter weight or some other attribute, you are likely to find exactly what you are looking for among these lower cost, general purpose industrial materials.

The engineer considering a thermoplastic candidate from the general industrial category should first be aware of the upper temperature resistance limit, for these materials should not exceed 85 °C.

The following industrial plastics are manufactured by Ensinger:

PPE

PP

PE

ABS

PMP

SAN

Thermoplastic properties

The properties within a plastic group are often similar. The following table provides an overview of the distinguishing properties of each group:

	High performance plastics	Engineering plastics	Industrial plastics
Polymers	PEEK, PEKK, PK, PI, PTFE, PVDF, PPSU, PPS, PSU, PEI, PES	PA (Nylon), Cast Nylon, POM, PBT, PC, PET, PPA, LCP, SAN	PPE, PP, PE, ABS, PMP
Properties	<ul style="list-style-type: none"> - High temperature resistance - Outstanding sliding friction properties - Excellent chemical resistance 	<ul style="list-style-type: none"> - Good mechanical properties - Excellent machinability - Excellent dimensionally stability - Good chemical resistance - Good wear resistance 	<ul style="list-style-type: none"> - Very good chemical resistance - Excellent impact strength - Low weight and often easily weldable (PP, PE) - Usually not affected by moisture