

Keeping the World in Motion

Polymer Solutions for the Modern Pump Industry

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Pumps and pump systems play a vital role in keeping our modern world in motion. Whether we are talking about coolant pumps in cars, pumps that deliver drinking water hygienically in the quantity and temperature required by the user or even heavy-duty industrial pumps which move chemicals on a large scale – the requirements are the same: accuracy, reliability and efficiency.

Pump systems and their design have developed widely during the last 20 years and are as diverse as the number of end applications in the market. As a result, the requirements for today's pumps and materials used in their manufacture have become dependent on meeting ever more demanding requirements and specifications, such as abrasion, temperature and chemical resistance. Pump manufacturers also face the challenge of meeting the increasing demand for energy-efficient solutions, which not only positively impact the cost-performance equation but perhaps most importantly contribute to CO₂ reduction and tackling climate change.

All this offers enormous opportunities for the pump industry – especially for component manufacturers. Improving reliability and efficiency of pump systems, whether for installing a new system or replacing old ones is key. In addition to optimized production methods in the highly fragmented pump market, high performance and engineering polymers are increasingly needed to achieve the best possible solutions in this innovative industry.

Material Selection

Selecting the best material for pump components and assemblies follows three key principles:

Determination of Component Requirements

When selecting the material for specific pump parts, it is essential to understand the requirement profile precisely and to be familiar with the relevant pump type. Therefore, the first selection criteria is the type of media that needs to be handled. This includes an understanding of the exposure to mechanical and thermal stresses as well as stresses caused by erosion or corrosion which may result from contact with the media being pumped. In essence, it's about having an in-depth understanding of what technical properties a material needs to fulfil in order to achieve the best performance.

Determination of Special Regulatory Requirements

Pumps are used in diverse industries and for different end applications. In many cases the end-use application is governed by certain industry specifications or regulations which can have a significant influence on the material selection process. Some examples are:

- Electrical conductivity for ATEX (explosion protection) applications
- Drinking water approval
- Long term UV resistance
- Medical grade plastics addressing EU healthcare regulations for pump applications in the field of medical, pharmaceutical or bio-pharma use

Material Identification

In addition to the product design and the exposure profile, financial aspects naturally also play an important role in the selection of materials. Aspects of processability and availability also are important factors, which can also affect the commercial bottom line. The ALBIS portfolio for applications that meet the requirements of the pump industry contains a comprehensive selection of materials from our market-leading partners BASF, Envalior, Syensqo, MOCOM and GFL amongst many others.

The most important factors for selecting the best material for individual pump applications are summarized in the following table.

Note: This list is not exhaustive – please contact your ALBIS representative to discuss your specific application requirements.



ALBIS Pump Industry Solutions

Advantages at a glance:

- Competent technical advice to support the optimum choice of materials
- Fast and cost-efficient product development cycle through compliant raw materials
- Comprehensive portfolio of high performance polymers, offering extensive benefits when replacing metals
- Excellent chemical and corrosion resistance
- Lower density for lightweight design

Polymer Type	Application Use	Partner	Product Name	Service Temperature (short-term)	Hydrolysis Resistance	Chemical Resistance	Drinking Water Approvals	Special Properties
HPPA	Pump Housing	Syensqo	Omnix®	up to 150 °C	++	++	x	high strength, low water absorption, improved thermal stability
PA	Pump Housing	BASF	Ultramid®	up to 220 °C	-	++	x	cost-performance ratio, high impact strength, UV resistance
		Envalior	Durethan®					
		MOCOM	Alcom® WP					improved abrasion resistance, reduced friction
			Altech®					cost-performance ratio, high impact strength, UV resistance
			Altech® ECO					recycled content
PEEK	Bushing Line Shaft Bearings Case Wearing Ring Impeller Wearing Ring	EVONIK	VESTAKEEP®	up to 250 °C	++++	++++	x	best in class chemical and thermal stability, carbon fiber reinforced grades for wear applications
PARA	Pump Housing Separating Cans	Syensqo	IXEF®	up to 150 °C	++	+	x	high strength, low water absorption, high-quality surface
PESU	Water Pump Impeller	BASF	Ultrason®	up to 180 °C	+++	+++	x	e-conductive (ATEX) grades available
PPA	Pump Housing Separating Can Impellers/Propeller	BASF	Ultramid® Advanced N	up to 240 °C	++	++		superior dimensional and chemical stability
			Ultramid® Advanced T	up to 240 °C	++	++		
			Amodel®	up to 240 °C	++	++	x	e-conductive (ATEX) grades available
		Syensqo	Amodel® Bios	up to 240 °C	++	++		bio-based feedstock, superior chemical stability
			Amodel® ECHO	up to 240 °C	++	++		extremely high glass transition temperature
PPS	Pump Housing Impeller	MOCOM	Tedur® L	up to 240 °C	++	+++	x	e-conductive (ATEX) grades available
		HDC POLYALL	Ecotran®	up to 240 °C	++	+++	x	cost-performance ratio, chlorine free PPS
PVDF	Pump Housing Separating Can	GFL	INOFLAR™	up to 150 °C	++	+++	x	superior chemical stability
PP	Pump Housing	MOCOM	Altech® NXT PP	up to 150 °C	++	++		improved heat aging performance
			Altech® PP	up to 150 °C	++	++		cost-performance ratio, easily coloured
			Altech® PP ECO	up to 140 °C	++	++		post consumer recycled content
PPE+PA	Impellers	Romira	Luranyl®	up to 210 °C	+	+		dimensional stability
PPE+PS	Impeller	Romira	Luranyl®	up to 140 °C	+	+	x	dimensional stability
ASA+PC	Housing	INEOS Styrolution	Luran® SC	up to 120 °C	+++	++		UV resistance, impact resistance, dimensional stability
ABS+PA	Housing	INEOS Styrolution	Terblend®	up to 160 °C	++	++		UV resistance, chemical resistance, haptics, aesthetics
TPE	2K lips, gaskets, seals, grommets, cable bushings, vibration dampers, O-rings, fittings, connectors, handles, grips	Alphagary	Evoprene®	up to 120 °C	++	-	x	food contact grades
		Covestro	Desmopan®	up to 120 °C	++(Ether) --(Ester)	++	x	food contact grades, abrasion resistance
		MOCOM	Alfater XL®	up to 130 °C	++	++		bonding to PA, food contact, low compression set, e-conductive grades (ATEX)
		Sipol	Sipolprene®	up to 150 °C	-	++	x	food contact grades
		Uteksol	Solplast®	up to 120 °C	++	-	x	flame retardant grades, food contact grades

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INEOS
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