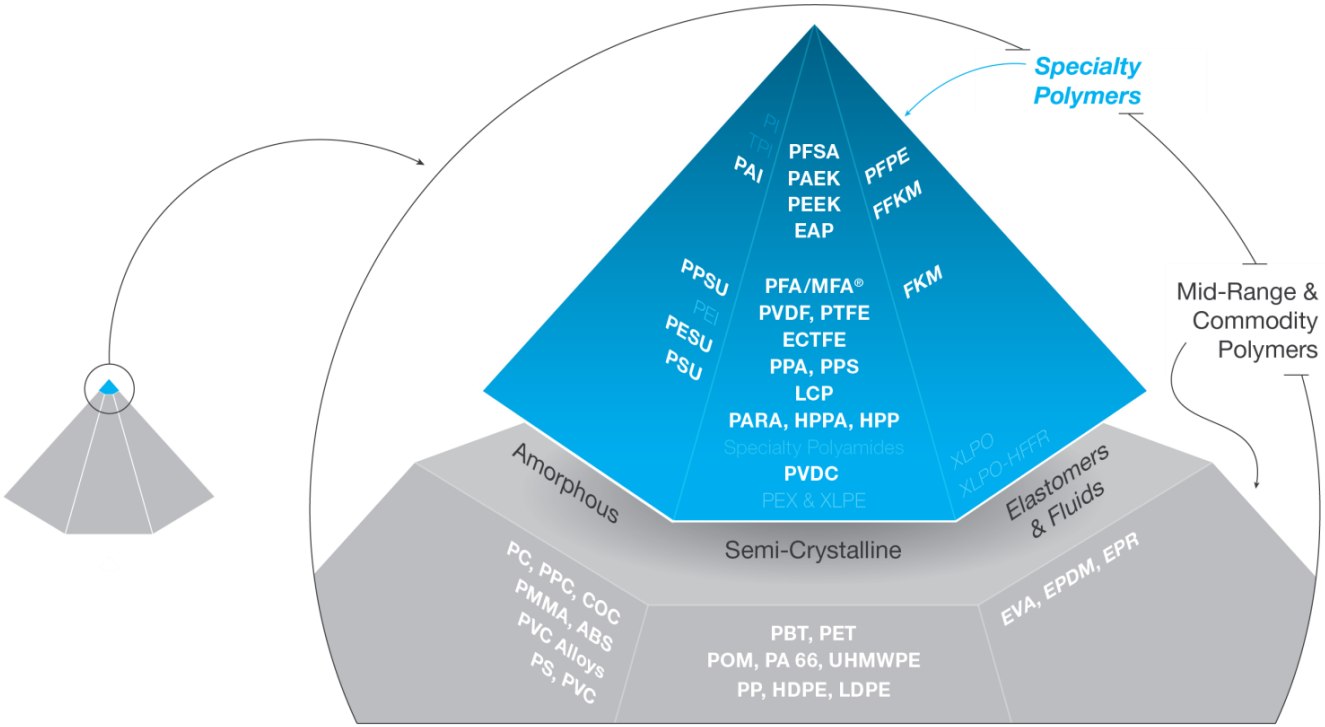
Plumbing / Water Management

The new generation of water meters: all the advantages of choosing Specialty Polymers (over metal and low performance plastics)

Specialty Polymers Comprehensive Portfolio

Aromatics, Fluoropolymers, Barrier Polymers



Key Performance Factors

- Lightweighting
- Fire resistance
- Mechanical performance
- Resistance to harsh elements
- Broad range of temperatures
- Surface properties

Metal Replacement with Specialty Polymers

Advanced solutions minimize corrosion, weight, scale deposits, cost and risk of contamination.

Global trends in water management are increasing the use of advanced water meters to manage water delivery as well as their electrification to radically improve precision and connectivity. This makes metal replacement a key engineering challenge for water meter manufacturers in order to design cost effective, reliable and electronically enabled devices.

Solvay offers three families of Specialty Polymers for potable water handling which give design engineers the right combination of properties for the new generation of water meters ,Plumbing Heating and Sanitary Systems

Switching from metal to plastic

High-performance plastics are a definite improvement on metal.

The advantages range from lighter weight, stronger resistance to oxidative aging, greater strength at elevated temperatures, better chemical and chlorine resistance as well as higher heat resistance.

Their injection-molding processing also means easier forming, fewer finishing phases and a faster production cycle.

Lightweighting

Mechanical performance

Resistance to harsh elements

Solvay High Performance Polymers Solutions: Value and Key Benefits

Plumbing

In meeting the safety regulations, durability and competitive cost demands of the market, Solvay offers lead-free, high performing plastics (up to 95 °C) that are also internationally-approved for drinking water (NSF61, KTW, WRAS, ACS). In addition to cost reduction owing to easy assembling, all these combine low water pick-up, high hydrolysis resistance and anti-weatherability as required.

Sanitary Systems

Meeting demand by faucet manufacturers and other component producers of stop valves, cartridges and fixtures, Solvay has developed a large portfolio of high-performing, lead-free plastics (up to 95 °C) offering high stiffness, good dimensional stability, excellent chemical resistance, attractive surface finish and international approvals for drinking water (NSF61, KTW, WRAS, ACS).

Heating Systems

For boilers and other heating systems, Original Equipment Manufacturers (OEMs) and their direct suppliers seek integrated functionability as well as cost and weight reduction. Both expect Solvay's advanced performance plastics to prevent corrosion and to guarantee efficient long-term metal replacement. Such solutions must exhibit creep resistance, improved moldability as well as welding line reinforcement. Outstanding resistance to both hot and cold chlorinated water is also a prerequisite.

Performance You Can Trust
The Broadest Selection of High-Performance Polymers for Water-Handling Systems

Sulfone Polymers
Radel® PPSU
Veradel® PESU
Acudel® modified PPSU
Udel® PSU

Fluoropolymers
Solef® PVDF
Halar ® ECTFE

Polyphenylene Sulfide
Ryton® PPS

Aromatic Polyamides
Amodel® PPA
Ixef® PARA
Omnix® HPPA

The best fitting solutions for water meters

Ryton® PPS (Polyphenylene Sulfide)

Ryton® PPS compound for injection-molding or extrusion provides excellent chemical resistance along with exceptional dimensional stability in water, thanks to its low water pick-up. Its very low viscosity allows Ryton® PPS to be injected into thin-walled parts. Ryton® PPS compound can bear temperatures above 95 °C which in extreme cases can reach up to 220 °C.

Amodel® PPA (Polyphtalamide)

High-performance polyamide suitable for applications with intermittent exposure to hot chlorinated water.
It delivers a number of performance advantages over conventional polyamides, including higher operating temperatures, lower moisture absorption, better dimensional stability and superior resistance to creep and fatigue.

Omnix® HPPA (High-Performance Polyamide)

High-performance polyamide that bridges the cost/ performance gap between lower performing PA66 and higher performing polyphthalamides such as Amodel® PPA. It exhibits lower moisture absorption than PA66 for higher strength and stiffness, better dimensional stability and lower warpage as well as good chemical resistance and efficient, cost-effective manufacturing

Main benefits:

- ✓ High dimensional stability
- ✓ High hydrolysis resistance
- ✓ No depolymerization
- ✓ Resistance to chlorinated water
- ✓ Perfectly-adapted to fit with polymeric fittings
- ✓ Easy moldability
- ✓ Welding line reinforcement

Cold water	
23-40 °C	HPPA
Warm to hot water	
40-75 °C	PPA
>75 °C	PPS

Further critical advantages include:

Ease of Assembly

Assembly of metal installations usually requires hot gas welding at high temperatures. The advantage of systems based on multilayer pipes and polymeric fittings, is that professionals have a wide variety of fixation systems available, as well as do-it-yourself installers. No welding is required.

Low Noise

Polymeric piping systems transmit less noise from the motion of water – important for waste water pipes. For pressure piping systems however, this is only a factor in areas where there are connections to older installations with different diameters.

No Contamination by Heavy Metals

Unlike metal plumbing systems, polymeric installations do not create heavy metal contamination in tap water.

Thermal Insulation

In plumbing, thermal conductivity is a factor that is 100 to 1,000 times lower for polymers than for metals. The "intrinsic" insulation properties of polymers thus make them the material of choice, especially for hot water distribution and heating systems.

Reduced Environmental Footprint

High-performance polymers are produced through injection-molding, which replaces earlier machining for metals. This requires less elaborate manufacturing, considerably limiting the environmental footprint of processes.

Total Cost of Ownership

The cost of corrosion-resistant metal parts for plumbing applications – brass in particular – is significally higher than it is for polymer parts. That difference is partly due to volatile metal prices, while those of polymeric raw material have remained at approximately the same level. Manufacturing costs are another important factor. Whereas metal fittings need several manufacturing steps, polymeric fittings can often be produced in one injection-molding step.