HIGH PERFORMANCE POLYMERS

Empower water management with our solutions

Water
management

RADICI GROUP

Sustainability, safety and innovation

Water management solutions for a better future

Today, **potable water applications** have become all-important, and there is an increasing demand for **safe and efficient systems** from the **building industry**. Polymers designed for water management offer a **cost-effective solution** without compromising **long-term performance**, maintaining water quality even under harsh conditions. RadiciGroup provides a comprehensive range of engineering polymers that meet **potable water approvals** and offer viable alternatives to traditional brass and metal alloys for numerous applications.

Why choose RadiciGroup solutions?

RadiciGroup materials are certified and approved in accordance with the latest and strictest standards and are designed to deliver **performance, resistance and safety over a long period of time**. The product range also includes **specialty polyamides** – from long-chain to bio-based and recycled solutions – specifically developed to guarantee **superior technical characteristics**, in particular chemical resistance to extremely aggressive conditions and galvanic corrosion, together with superior environmental performance.

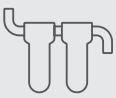
Product name	Product description
radilon® S PA6	Grades combining very good mechanical performance properties, excellent processability and colourability for parts not in contact with potable water.
radilon® A PA66	Grades combining high mechanical performance properties with good hydrolytic resistance at elevated temperatures (90°C).
radilon® DT PA612	Grades combining high mechanical performance properties with excellent chemical and hydrolytic resistance at elevated temperatures. They offer superior dimensional stability, low moisture absorption and superior resistance to oxidation degradation.
radilon® D PA610	Grades combining high mechanical performance properties with excellent chemical and hydrolytic resistance at elevated temperatures. Partially made from renewable sources, this range offers superior dimensional stability, low moisture absorption and superior resistance to oxidation degradation.
radistrong® Aroma Special PA	Grades combining superior mechanical performance properties with high welding line resistance and excellent surface finish, as well as excellent processability.
radilon® Aestus T1 PPA	Grades combining high mechanical performance properties, including excellent creep resistance in hot water and steam, with outstanding chemical and resistance to oxidative degradation at elevated temperatures (120°C).
raditeck® P PPS	Grades combining good mechanical performance properties with outstanding hydrolytic and chemical resistance at elevated temperatures (120°C), as well as outstanding dimensional stability and creep resistance.
RENYCLE®	New sustainability-oriented engineering polymers made from post-industrial and post-consumer sources. This range is targeted at meeting the growing market need for products with a low and measurable environmental impact that do not compromise on quality, reliability, traceability and safety.

Ideal applications for our products

Water distribution

Sanitary systems

Heating systems



Filtration systems

Water distribution

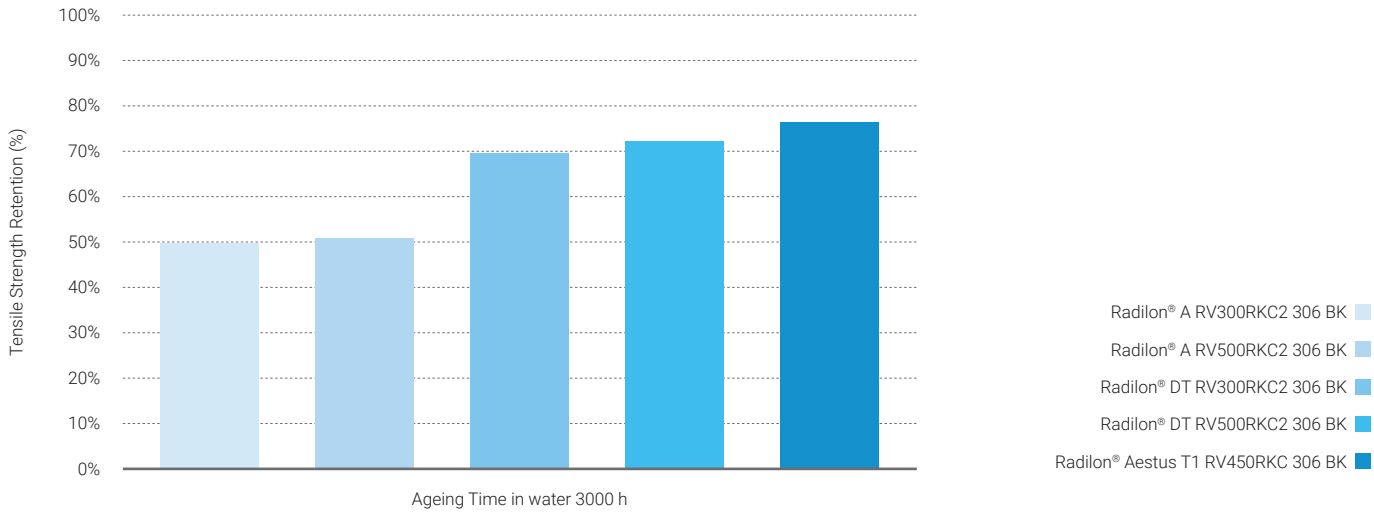
Water distribution covers all the systems that bring water to a building and measure the flow, including **water filtering** and **metering systems**, as well as **submersible pumps** or **shut-off valves**. In these systems, **long-term dimensional stability**, **high mechanical properties and high resistance to disinfectants at ambient temperature are required**. The type of disinfectants and concentration levels can significantly influence the long-term resistance of engineering polymers to oxidative degradation.

Water meter and water pipe system

Manifold realized with engineering polymers

High-temperature and chemical resistance

Ageing for 3000 hours at 60°C in contact with a water solution of 5 ppm of monochloramine (NH2Cl) results in a medium-high retention of tensile strength for the products tested. The graph shows the standard performance of Radilon® A grades (PA66) and the promising results of Radilon® DT (PA612), which performed very well with a retention value similar to Radilon® Aestus T1 (PPA), our best solution.



KEY POINT

The replacement of metal by engineering polymers in metering systems is driven by the global restrictions on lead levels in water, in addition to production cost saving.

Sanitary systems

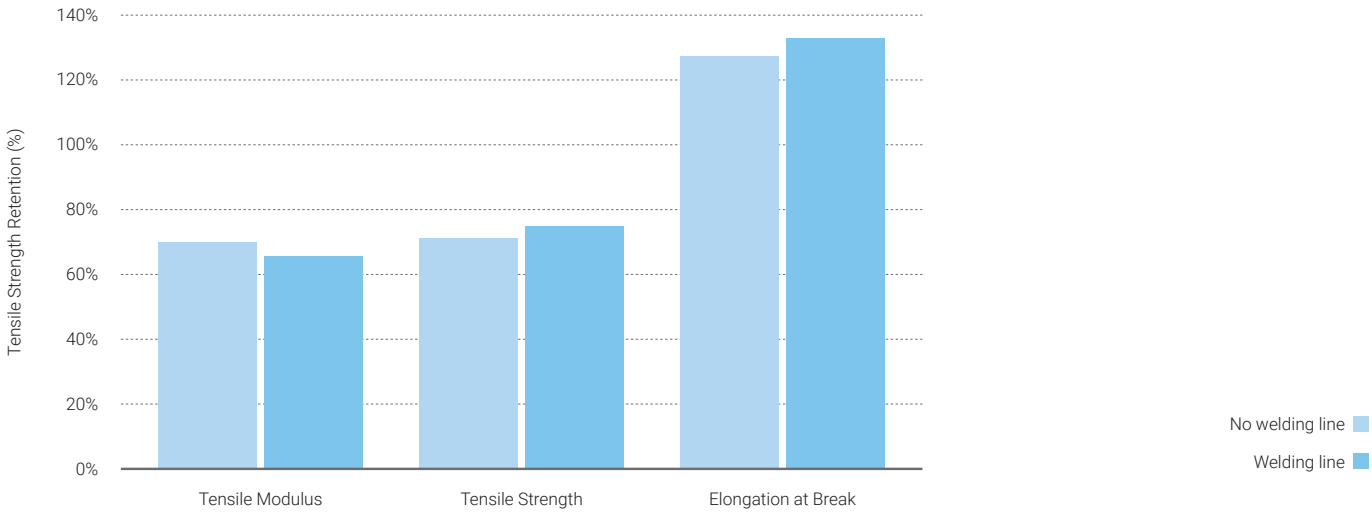
Sanitary systems cover all systems or accessories that are in contact with water in kitchens or bathrooms, both in domestic and commercial buildings. Typical applications are **faucets**, **valves** and **shower head components**. In these systems, **long-term dimensional stability**, **high mechanical properties and high resistance to disinfectants at elevated temperatures are required**.

Thermal solar panels for water heating

Flowmeter for sanitary water heating

Full functionality in any setting

This graph compares the mechanical properties of components with and without welding lines, measured on Radilon® DT RV300RKC2 (PA612) after ageing for 3000 hours at 60°C in contact with deionized water. The results show that our solutions prevent leakage and guarantee the functionality of the parts typically used for sanitary system components.



KEY POINT

RadiciGroup High Performance Polymers solutions prevent scale build-up and corrosion of parts, all the while achieving international approvals for contact with potable water at 60° or 85°C.

Heating systems

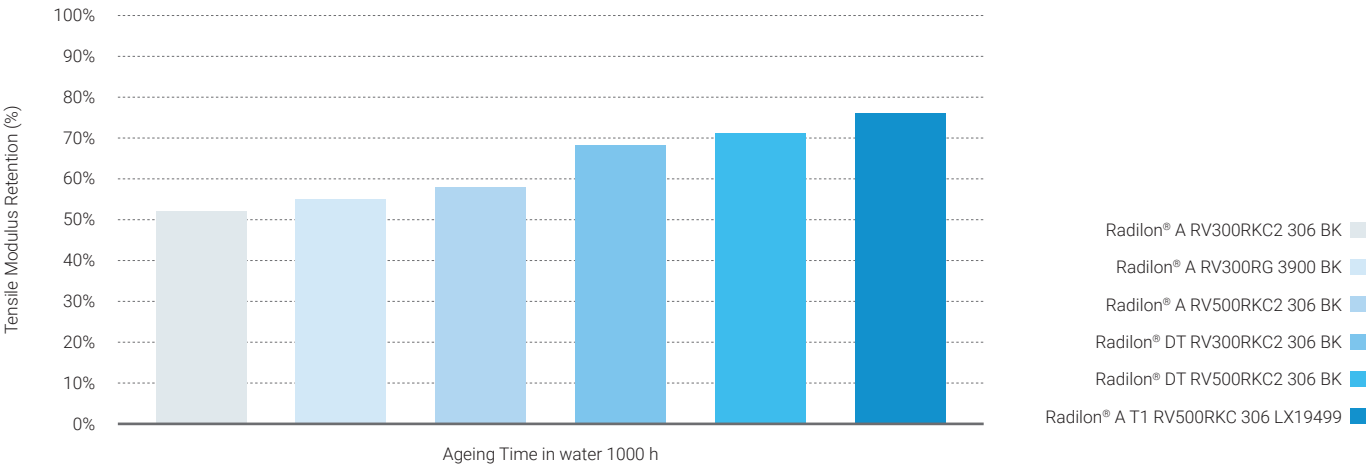
Heating systems are all the systems that **provide heat to a building**.
These include **heat pumps**, **furnaces** and **boilers**. Hot water systems are often called **hydronic systems** and can be integrated with solar-thermal or geothermal systems.
Nowadays, many domestic hot water systems circulate water through manifolds and plastic tubing under the floor, a system called **hydronic radiant floor heating** that can use chemicals and additives for higher performance.

Domestic heating system room

Magnetic sludge separator for heating system

High resistance to antifreeze additives

Additives are commonly used in heating systems. We tested the properties of our materials after contact with a solution of 50% ethylene glycol and 50% water at 120°C and 1.5 bar of pressure. In the graph, the retention tensile modulus values show the good performance of standard Radilon® A (PA66) product grades and the improved behaviour of Radilon® DT (PA612), due to its long-chain chemical structure, compared to the highest performance of our best-in-class engineering polymer, Radilon® Aestus T1 (PPA).



KEY POINT

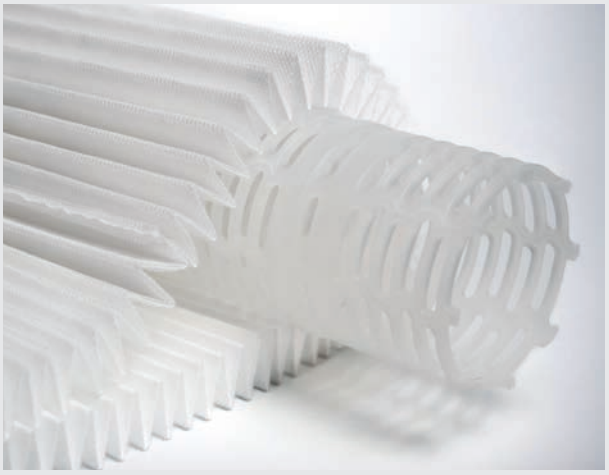
RadiciGroup High Performance Polymers solutions provide significant system cost saving by decreasing the number of brass parts, yet always retain high hydrolysis and glycol resistance.

Filtering solutions

The continuous demand for clean and safe water has led to an increasing number of engineering polymer applications for filtering and purification. Indeed, the demand for high-quality water from public services to meet the constant need for this important resource by households and industries is contributing to the **steady growth of the water management market and the increasing performance of the polymers used**.
RadiciGroup's engineering polymer solutions allow for manufacturing **high performance**, **safe and reliable parts** and are especially ideal for replacing metals in industrial and domestic filter housings. Filters are key components to treat and remove odours, limestone particles and bad tastes.

Multistage filters for potable water treatment

Integrated solutions for water filtration: not only cutting-edge engineering polymers but also nonwoven fabrics dedicated to water quality



Filter cartridge for water depuration.

RadiciGroup stands out as a **comprehensive supplier**, offering both high performance engineering polymers and nonwoven fabrics specifically designed to meet the most complex needs in **water purification**.
Radimelt® filtration media is designed to fulfil the most critical requirements of water management applications in industries, such as food and beverage, industrial processing and water filtration.
Our media can meet the most complex **liquid filtration** challenges with different solutions using PP, PBT and PA polymers to satisfy any working conditions: **single layer or composite** filters with flat calendering can generate an extremely **wide range of pore sizes**.

Choosing RadiciGroup means investing in **a partner dedicated to improving water quality**. With our wide range of products and our **integrated vision**, we are ready to overcome current and future challenges in delivering **cutting-edge filtration solutions**, thus contributing to ensuring access to **quality water for all**.

KEY POINT

RadiciGroup High Performance Polymers solutions allow for setting up systems with high resistance to disinfectants, high mechanical properties and high burst pressure resistance. Our materials are suitable for metal replacement projects.

Engineering Service drives improvements in sustainability

RadiciGroup engineering polymers are important for **achieving sustainability** in water management systems because of their durability, corrosion resistance, flexibility, versatility, reduced energy consumption and potentially lower environmental impact.

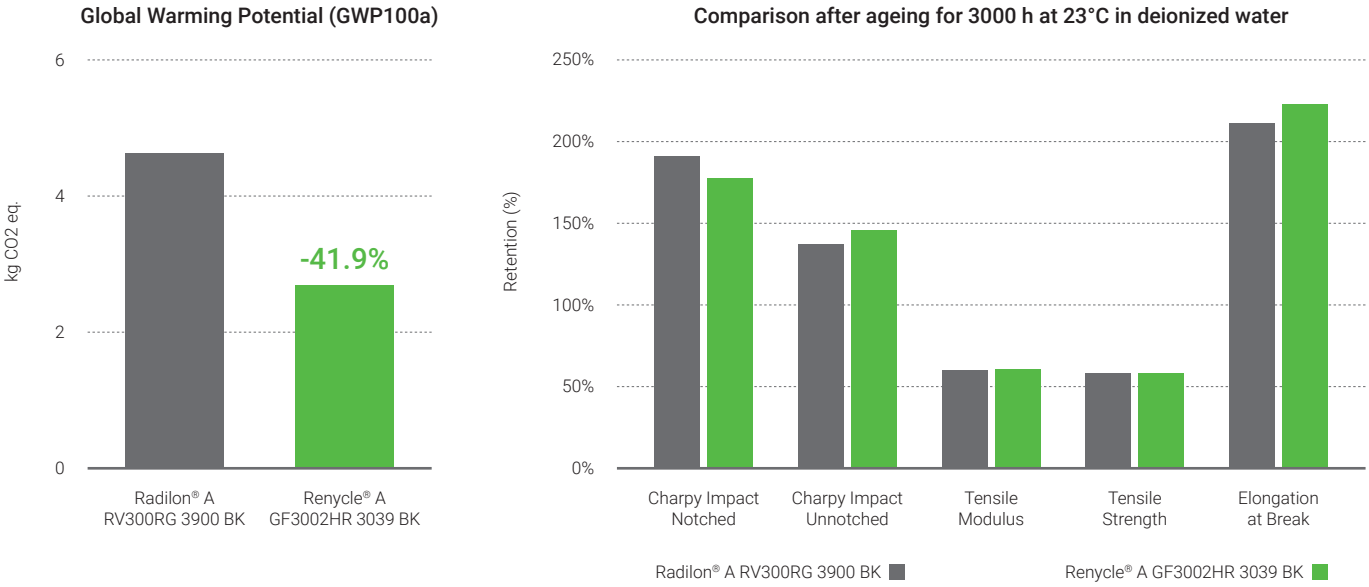
These characteristics contribute to more efficient and cost-effective water management practices, especially with the aid of the **RadiciGroup Engineering Service**. This team aims to predict **the behaviour of products** right from the very early stages of their development, in order **to optimize the design**, also with a view to ecodesign and environmental performance. **RadiciGroup Engineering Service** can count on the most **advanced computer numerical simulation systems** and the **skills and experience of RadiciGroup specialists**. The goal is to help customers strengthen their development processes and simultaneously achieve higher levels of lightweighting, safety, performance and sustainability.

Four pillars of sustainability for water management
Our revolutionary engineering polymers:

- Have a **smaller carbon footprint**, as measured by LCA methodology.
- Are manufactured using **green energy**.
- Are **solution-dyed**, thus significantly reducing water and energy consumption.
- Can be **bio-based** or manufactured with **recycled materials**.

With these pillars of sustainability, our products not only revolutionize water management but also foster an active commitment to a greener and more responsible future.

Trade-off example: Environmental vs mechanical performance



Drinking water certifications

KTW-BWGL

ACS

WRAS APPROVED PRODUCT

NSF Certified to NSF/ANSI 61

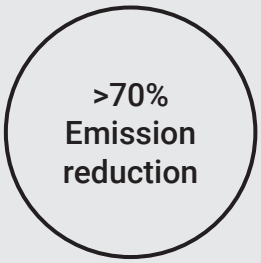
RadiciGroup.
Inside your world.

RadiciGroup is one of the world's leading producers of a wide range of chemical intermediates, polyamide polymers, high performance engineering polymers and advanced textile solutions, including nylon yarn, polyester yarn, yarn made from recovered and bio-source materials, nonwovens and personal protective equipment for the industrial and healthcare fields. These products are the result of the Group's outstanding chemical expertise and vertically integrated polyamide production chain and have been developed for use in a variety of industrial sectors, such as: automotive, electrical and electronics, household appliances, consumer and industrial goods, apparel, furnishing, construction, sports. The basis of the Group's strategy is a strong focus on innovation, quality, customer satisfaction and social and environmental sustainability.

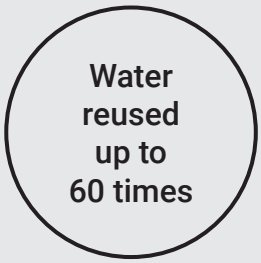
Sustainability

Every day at RadiciGroup, we work to make circularity our business model. We optimize the use of materials while fine-tuning our processes, eliminating waste and promoting recyclability from the earliest product design phases. We are always looking for low-impact solutions in terms of natural resources and energy. We rely on certified management systems for Quality, Health and Safety, Environment and Energy to keep our companies in line with the highest sustainability standards.

GRI, third-party certified **Sustainability Report** covering all RadiciGroup companies worldwide.



Since 2011, in RadiciGroup plants.



Water reused in RadiciGroup production plants.

Data Source: RadiciGroup Sustainability Reports

RADICI NOVACIPS SpA (Headquarters)
Via Bedeschi, 20 - IT - 24040 Chignolo d'Isola (BG)
Tel. +39 035 4991311 - Fax +39 035 4994386
www.radicigroup.com
info.plastics@radicigroup.com