

News Release

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Clean and safe water

- **High-purity Ultrason® E for ultra-filtration water treatment membranes**
- **Polyethersulfone enables high flux membranes with excellent virus and bacteria removal**
- **Broad range of usage in water treatment systems: from water purification systems to point-of-use filters**

In order to ensure the production of clean and safe water throughout the whole water treatment system, the water treatment company Pentair, London, United Kingdom uses Ultrason® E 6020 P. With this high-performance polyethersulfone (PESU) by BASF, ultrafiltration (UF) membranes can be produced which are used for the purification and decontamination of drinking water. Pentair employs the high-purity PESU for a wide range of X-Flow water treatment applications covering the whole water distribution line from upstream to downstream, especially for at-the-source membranes in water distribution systems of public buildings as well as in point-of-use filters for infection control in hospitals. In contrast to other materials commonly used for UF membranes like polyvinylidene difluoride (PVDF), Ultrason® E shows the unique combination of a high flux of water and a narrow pore size distribution. This enables UF membranes which can reliably remove parasites, bacteria and even viruses to meet drinking water standards without the need to additionally super-chlorinate the drinking water after filtration.

At-the source solution: UF membranes for water distribution lines

Pentair uses Ultrason® E to produce X-Flow membranes for filtration systems of public buildings like hospitals, health centers and hotels. The systems help to avoid possible contamination of pathogenic waterborne bacteria such as legionella and pseudomonas in the water pipes, which can lead to serious health issues for the occupants. With Ultrason® E as base material, a narrow pore size distribution in UF membranes can be achieved. The membranes enable the high throughput production of clean and safe potable water, free of bacteria and fungi, at low pressure in a very efficient way. Other water treatment systems such as reverse osmosis (RO) systems as well as boilers, ice machines and water coolers benefit from a better water quality.

Point-of-use solution: UF filters for infection control

The BASF PESU can also be employed in point-of-use filtration for easy and reliable protection against waterborne bacteria at the last possible moment before human contact. The unique filters for shower heads, taps and faucets are especially designed for hospitality and medical facilities, also for high-risk areas like critical wards, intensive care units or operating rooms. They consist of hollow-fiber UF membranes with microscopic pores made of Ultrason® E. The pores form a very fine filter that reliably retains bacteria or fungi and thus offer protection from waterborne infection. Despite this high filtration efficiency Ultrason® E allows for membranes with very high productivity, i.e. high water flux.

Ultrason® E is a high-purity material with a low content of gels and oligomers ensuring stable membrane manufacturing processes. It shows low fouling tendency and can be easily cleaned as it has an outstanding chemical resistance to e.g. acids, sodium hypochlorite and caustic soda. Repeated sterilization with superheated steam (at 134°C), ethylene oxide and gamma-radiation is possible without harm to the delicate pore structures. The BASF material is usable on a wide pH-range (0-13) without degradation. It complies with FDA and European standards for food contact at repeated use so that not only drinking water contact but also food processing is possible. For a broad application range, several product types are offered to the market, e.g. Ultrason® E 2020P, E 6020P and E 7020P.

Ultrason® is BASF's brand name for polyarylenesulfones. It encompasses the different product lines Ultrason® S (polysulfone - PSU), Ultrason® E (polyethersulfone - PESU), and Ultrason® P (polyphenylenesulfone - PPSU). Ultrason® is suitable for the production of membranes in a wide range of applications from ultrafiltration (UF) to nanofiltration/reverse osmosis (NF/RO) including gas separation and pervaporation membranes.

More information at www.xflow.pentair.com and www.ultrason.basf.com.

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About Pentair

X-Flow BV, a Pentair company, has broad know-how and a proud history in the development and application of innovative membrane filtration technologies. At X-Flow we believe membrane technology is essential in purification and filtration processes, now and in the future. Looking at worldwide health and environmental concerns, and at dwindling natural resources, we see the development of membrane technology as an absolute necessity. Throughout the years Pentair X-Flow has especially gained expertise and experience in water purification, ranging from producing potable water to treating wastewater and the pre-treatment of seawater, but also in the food, beverage and pharmaceutical industries. Worldwide, Pentair X-Flow has an extensive network of professional sales offices, service centers, agents and distributors that work together to make Pentair X-Flow leading in purification. Together with the extensive application know-how for projects of all sizes, this guarantees the best available water purification solutions. Proof can be found worldwide: operational solutions among the largest in capacity of their kind, realized by leading principals in many different areas in the industry.

About BASF's Performance Materials division

BASF's Performance Materials division encompasses the entire materials' know-how of BASF regarding innovative, customized plastics under one roof. Globally active in four major industry sectors – transportation, construction, industrial applications and consumer goods – the division has a strong portfolio of products and services combined with a deep understanding of application-oriented system solutions. Key drivers of profitability and growth are our close collaboration with customers and a clear focus on solutions. Strong capabilities in R&D provide the basis to develop innovative products and applications. In 2018, the Performance Materials division achieved global sales of €7.65 bn. More information online: www.plastics.basf.com.

About BASF

At BASF, we create chemistry for a sustainable future. We combine economic success with environmental protection and social responsibility. The approximately 122,000 employees in the BASF Group work on contributing to the success of our customers in nearly all sectors and almost every country in the world. Our portfolio is organized into six segments: Chemicals, Materials, Industrial Solutions, Surface Technologies, Nutrition & Care and Agricultural Solutions. BASF generated sales of around €63 billion in 2018. BASF shares are traded on the stock exchange in Frankfurt (BAS) and as American Depositary Receipts (BASFY) in the U.S. Further information at www.basf.com.