Media Release

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Maximized purity and minimized rinsing times: GF unveils PFAS-free piping system for next-generation semiconductor manufacturing

The newly introduced SYGEF Ultra system addresses the needs of the Ångström era by enabling advanced semiconductor manufacturers to stay ahead of developments such as AI, decreasing node sizes and ambitious sustainability goals. GF is presenting the PFAS-free High Purity PEEK piping system for the first time at the UltraFacility Conference in Austin, Texas (US).

The extreme purity requirements associated with chip technology on an atomic level – where even a single particle can have an impact – are pushing traditional piping materials to their limits. As a result, owners and operators require materials that ensure the highest level of ultrapure water and maximize yield.

GF developed SYGEF Ultra for hot and ambient ultrapure water systems serving next-generation semiconductor technologies. The system is made of a specific High Purity Polyether Ether Ketone (PEEK), a high-performance polymer that is well-known for its excellent performance in demanding industrial applications. It combines excellent mechanical strength at elevated temperatures as well as impact and chemical resistance with purity levels that exceed SEMI F57 by far. These properties facilitate significantly shorter rinsing times compared to current materials, speeding up SEMI F63 water quality compliance. SYGEF Ultra is also PFAS-free, which addresses increasingly stringent legislation around the world and the sustainability and environmental stewardship goals of end-user companies.

During UltraFacility 2025, from 3 to 5 December in Austin, visitors will be able to experience SYGEF Ultra at the booth as well as during the conference. Dr.-Ing. Katrin Wallheinke, Head of Materials Technology, GF Industry and Infrastructure Flow Solutions, will introduce the system and discuss its purity performance in relation to industry requirements. In addition, Hanspeter Müller, Senior Application Expert at GF Industry and Infrastructure Flow Solutions, will give a presentation comparing thermoplastic pipe stress modeling and the installation process between PVDF-HP and High Purity PEEK systems.

Wolfgang Dornfeld, President Business Unit APAC, GF Industry and Infrastructure Flow Solutions, emphasizes the importance of SYGEF Ultra: “Semiconductor manufacturers are pushing the boundaries of technology with ever smaller node sizes. With SYGEF Ultra, we can offer an innovative solution for UPW applications that keeps pace with chip development and meets the unique demands of the Ångström era. And thanks to PFAS-free materials, SYGEF Ultra is future-ready.”

SYGEF Ultra is set to be launched in 2026. The high-performance system is bolstered by GF’s complete range of flow solution elements that include pipes, fittings, valves, and welding technology, engineered for ultrapure applications. Refined for the Ångström level, GF’s components for high purity piping systems guarantee the lowest possible particle levels, TOC, anionic and cationic leachout, as well as smooth surface finishes. Extensive jointing technologies that include QA/QC, safe packaging, as well as global engineering and training support, enable reliable installations for more than 25 years of safe operation.

Find more information about SYGEF Ultra here.

GF is participating in the UltraFacility Conference with two presentations:

“Presenting a new PFAS-free HUPW Piping System” by Dr.-Ing. Katrin Wallheinke

“Validating thermoplastic pipe stress modelling (PSA) and installation impact for next generation novel (H)UPW piping systems versus HP PVDF” by Hanspeter Müller

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Corporate Profile

With a rich history in industrial innovation since 1802, GF is actively reshaping itself to become the global leader in Flow Solutions for Buildings, Industry and Infrastructure. GF delivers Excellence in Flow through essential products and solutions that enable the safe and sustainable transport of fluids worldwide. As part of its strategic transformation, GF divested GF Machining Solutions on 30 June 2025 and has signed an agreement to divest its GF Casting Solutions division. Headquartered in Switzerland, GF employs about 15’700 professionals and is present in 46 countries. GF generated sales of CHF 4’776 million in 2024. GF is listed on the SIX Swiss Exchange.
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Image

SYGEF Ultra is a welded plastic piping system made of PEEK that includes pipes, fittings and valves.

Source: GF