

Trade media release

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GF launches SYGEF Ultra for next-generation semiconductor manufacturing

GF is launching SYGEF Ultra, a high-purity PEEK piping system for ultrapure water in next-generation semiconductor manufacturing. Testing indicates that the system can reduce rinsing time by approximately 80% compared with established high-purity PVDF systems, supporting faster commissioning. The system is designed for high purity, long-term reliability and demanding operating conditions. The innovation expands GF's portfolio for the microelectronics industry and strengthens its position as one of the leading providers in this growing market.

Growth in artificial intelligence, high-performance computing, and advanced manufacturing is driving investment in semiconductor production. As chip designs become more complex, contamination-control requirements are rising. Even minute impurities can affect process stability and yield, the percentage of functional chips produced from a wafer, making reliable ultrapure water (UPW) distribution critical. GF addresses these demands with materials, systems, and services engineered for advanced fabrication plants (fabs). SYGEF Ultra enables manufacturers to achieve stringent (H)UPW purity standards, helping maximize yield, ensure reliable operations, and support future technology roadmaps. The use of PEEK High Purity aligns with evolving regulatory expectations. Together, these advantages reinforce GF's differentiation in the highly demanding and technology-driven industry.

"As semiconductor manufacturing advances, customers need partners who understand both the complexity of their processes and the performance required from critical infrastructure. With SYGEF Ultra, we are combining peace-of-mind jointing, long-term reliability with significantly shorter rinsing times, helping customers commission their systems faster and more efficiently," says Thomas Hary, President of the GF Industry and Infrastructure Flow Solutions division.

High purity and faster commissioning

At the heart of SYGEF Ultra is high-purity polyether ether ketone (PEEK), a high-performance polymer combining mechanical strength at elevated temperatures with impact and chemical resistance. Its low leach-out characteristics and smooth internal surface are designed to exceed the requirements of the SEMI F57 standard for high-purity polymer materials and components used in ultrapure water distribution systems. Testing indicates that the system can reach the required water-quality specification within days, reducing rinsing time by approximately 80% compared with established high-purity PVDF systems and enabling more resource-efficient commissioning. Engineered for an expected service life of at least 25 years under its intended operating conditions, SYGEF Ultra is made out of PEEK-HP, a non-PFAS material*.

Performance built for advanced fabrication plants

SYGEF Ultra is a complete system for hot- and ambient-ultrapure water installations. The system is characterized by outstanding leach-out properties, exhibiting excellent performance with respect to total organic carbon (TOC), anionic and cationic leach-out, and rapid rinse-down, offering a future-ready alternative for advanced fabrication plants. The system demonstrates how

GF turns deep material and application expertise into practical innovations that address the customers' most critical manufacturing challenges.

Project support from engineering to pre-fabrication

Supplied primarily through GF's pre-fabrication offering, SYGEF Ultra is supported by engineering services, pipe stress analysis, design assistance and execution support with quality assurance, jointing expertise and dedicated installation and maintenance training. This integrated approach helps customers reduce project complexity, secure timely delivery and build reliable systems for long-term operation.

A broader portfolio for microelectronics

SYGEF Ultra strengthens GF's comprehensive portfolio for microelectronics applications. The offering spans high-performance pipes, fittings, valves and components, advanced jointing technologies, pre-fabrication, engineering and training. Together, these capabilities support the safe and reliable transport of ultrapure water and other critical fluids across the fab. By combining a broad portfolio with global expertise and continuous innovation, GF is well-positioned as a preferred Flow Solutions partner for the next generation of the semiconductor industry.

***Why is PEEK a non-PFAS material?**

PFAS are defined by the Organization for Economic Co-operation and Development (OECD) [1] as "*fluorinated substances that contain at least one fully fluorinated methyl or methylene carbon atom (without any H/Cl/Br/I atom attached to it), i.e. with a few noted exceptions, any chemical with at least a perfluorinated methyl group (-CF₃) or a perfluorinated methylene group (-CF₂-) is a PFAS.*" This OECD definition is also utilized in the current version of the Annex XV restriction proposal [2] submitted under the framework of Regulation (EC) No 1907/2006 (REACH Regulation).

SYGEF Ultra is a piping system manufactured from PolyEtherEtherKetone (PEEK). The PEEK resin used for production does not meet the above OECD definition for PFAS. However, it should be noted that commonly used sealing and gasket materials such as fluoroelastomers (FKM) and polytetrafluoroethylene (PTFE) are fluorinated materials and are therefore not considered PFAS-free. Thus, SYGEF Ultra as a piping system is not considered PFAS-free.

[1] OECD (2021), Reconciling Terminology of the Universe of Per- and Polyfluoroalkyl Substances: Recommendations and Practical Guidance, OECD Series on Risk Management, No. 61, OECD Publishing, Paris. Available at: <https://www.oecd.org/chemicalsafety/portal-perfluorinated-chemicals/terminology-per-and-polyfluoroalkyl-substances.pdf>

[2] European Chemicals Agency (ECHA) (2023), *Per- and Polyfluoroalkyl Substances (PFAS) Restriction Proposal under REACH*, Restrictions under Consideration, European Chemicals Agency, Helsinki. Available at: <https://echa.europa.eu/restrictions-under-consideration/-/substance-rev/72301/term>

For more information about SYGEF Ultra please visit: gfps.com/sygef-ultra

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About GF

With a rich history in industrial innovation since 1802, GF is reshaping the future of Flow Solutions by delivering *Excellence in Flow* through mission-critical products and solutions that enable the safe and sustainable transport of water and other fluids for Buildings, Industry and Infrastructure. Headquartered in Switzerland, GF employs around 13,000 professionals across 46 countries. In 2025, GF's Flow Solutions business generated sales of CHF 3 billion. GF is listed on the SIX Swiss Exchange. For more information, visit www.georgfischer.com.

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	Designed to support future-ready chip manufacturing, GF developed SYGEF Ultra (PEEK-HP), an advanced welded plastic piping system consisting of pipes, fittings, valves for (hot) ultrapure water transport in semiconductor fabs. Source: GF
	Manufactured and packaged under ISO Class 7 (Class 10,000) cleanroom conditions within a dedicated high purity production chain, SYGEF Ultra is engineered to meet the increasingly stringent purity requirements of advanced semiconductor manufacturing. Source: GF