

Socio-economic report: Proposed REACH restriction of PFAS and its implications for the semiconductor value chain

This socio-economic report aims to assess the potential negative impact on VAT Vakuumventile AG and its subsidiaries, operating within the semiconductor value chain, resulting from the proposed REACH (Registration, Evaluation, Authorization, and Restriction of Chemicals) restriction of per- and polyfluoroalkyl substances (PFAS). While recognizing the importance of environmental protection and public health, it is essential to evaluate the potential socio-economic consequences of such regulatory measures.

Overview of VAT Vakuumventile AG and the semiconductor value chain

VAT Vakuumventile AG is the leading global manufacturer of high-quality vacuum valves and components. Our innovative product portfolio includes a wide range of valves, gate valves, angle valves, and other vacuum components, designed to meet the demanding requirements of industries such as semiconductor manufacturing, research laboratories, and advanced manufacturing processes. 75% of the valves sold by VAT Vakuumventile AG go to the semiconductor industry and 25% to other high-tech industries.

VAT Vakuumventile AG operates with a well-established structure to support its global operations and is represented worldwide with production facilities in Switzerland, Romania, and Malaysia as well as other sales and service locations. In 2022, the company employed 2,991 people and generated net sales of CHF 1,145.5 million, with an annual turnover of more than CHF 60-100 million in the European Economic Area (EEA) alone.

VAT Vakuumventile AG is mainly affected by REACH regulation as a downstream user of sealing devices. To ensure the vacuum function for the high-performance area, certain physical properties are needed for the sealing devices.

A good seal material is crucial for our vacuum valves and components due to several reasons. Firstly, sealings are a critical part in ensuring that the desired vacuum level is maintained in the system, enabling efficient and precise vacuum treatment, and preventing leaks. Secondly, a high-quality seal prevents the ingress of foreign particles or contaminants that could compromise the performance and lifespan of the vacuum application. This is particularly important in industries where our products are used in atmospheres with corrosive and aggressive gases, such as the semiconductor industry. Here the heat and chemical resistance of the PFAS material is of the utmost importance. Additionally, an effective seal helps reduce leaks, leading to improved energy efficiency and cost savings. Overall, a good seal is essential for preserving optimal vacuum results and ensuring the reliability and quality of products in the vacuum industry. Only materials from the PFAS group exhibit these properties, therefore our sealings contain substances directly linked to the PFAS substance group.

Currently, we process about 3-4 million sealings for the manufacturing of our vacuum solutions and service activities, whereby approximately 20% of all our products sold end up in the European market or at least, in the context of possible intermediate processing steps, pass through the EEA and would thus be very strongly affected by the REACH regulation.

Understanding PFAS and the proposed REACH restriction

PFAS are a diverse group of chemical substances used in various industrial applications, including our business, due to their unique properties, as mentioned above. And while concerns regarding the persistence, bioaccumulation, and potential adverse health effects of PFAS have led to proposed restrictions under REACH and harmful properties of some PFAS substances are beyond question, there are also harmless substances in the PFAS group. Argumentation on the PFAS substances which we use.

Potential negative impact on VAT Vakuumventile AG

- **Product performance:** PFAS-based materials play a critical role in ensuring high-performance, reliable, and long-lasting vacuum valves. If PFAS were to be banned from being used in sealings, the previously mentioned side-effects will most certainly occur: faster ingress of foreign particles or contaminants reducing the lifespan of vacuum application, causing a rise in costs and due to the overall importance of vacuum for the semiconductor industry a possible disruption in the semiconductor supply.
- **Product availability;** The restriction of PFAS may limit the availability of suitable alternatives, potentially compromising the performance and functionality of not only semiconductor components, but also other areas where due to the corrosive and aggressive atmosphere vacuum valves are used.
- **Cost implications:** The development and adoption of alternative materials or technologies that meet the proposed restrictions may require significant research and development investments. These costs could be substantial for VAT and may affect its competitiveness in the market, potentially leading to increased semiconductor costs for end-users.
- **Supply chain disruption:** A sudden restriction on PFAS without adequate alternatives readily available could disrupt the semiconductor value chain. It may lead to supply shortages, production delays, and increased lead times, impacting VAT's ability to meet customer demands and fulfill contractual obligations.
- **International competitiveness:** If the proposed REACH restriction of PFAS is more stringent compared to regulations in other regions, VAT and the semiconductor industry in Europe may face a competitive disadvantage. This could result in market share loss to companies operating in regions with less stringent regulations. While we are currently expecting a growing of our business of up to 25% in the next 2 years in the EEA, the restriction of PFAS and all the associated implications related to the semiconductor industry might shift away from an increase in Europe to pre-dominantly focus on Asia.

Mitigation strategies and opportunities

VAT Vakuumventile AG acknowledges the importance of addressing environmental concerns and strives to adopt sustainable practices. To mitigate the potential negative impact of the proposed REACH restriction of PFAS, the following strategies could be explored:

- **Collaboration and research:** We are engaging in collaborative efforts with industry stakeholders, our suppliers and research institutions to develop and promote the use of safer alternatives to PFAS material in sealings wherever possible. However, based on current knowledge the alternatives are limited (see our report on possible alternatives).
- **Regulatory dialogue:** We are actively participating in regulatory consultations, providing company insights, data and expertise to ensure a balanced approach that considers both environmental protection and the socio-economic implications for the semiconductor industry.
- **Supply chain resilience:** We are strengthening relationships with suppliers, assessing alternative supply sources, and diversifying the supply chain to mitigate potential disruptions caused by the restriction. In case of a full ban with limited material alternatives a further shift to the Asian market needs to be considered, leading us to strengthen our Asian supply chains.

The proposed REACH restriction of PFAS presents socio-economic challenges for VAT Vakuumventile AG and the semiconductor industry as a whole. Balancing environmental concerns with the socio-economic impact is crucial. VAT Vakuumventile AG remains committed to sustainability, innovation, and responsible practices, striving to minimize the potential negative consequences while actively contributing to the development of a sustainable semiconductor industry.