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Public consultation
Comments on Dossier Submitters' Draft EU REACH restriction on PFAS

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Inhalt

1 About Rohde und Schwarz

Rohde & Schwarz develops, manufactures, and distributes a wide range of electronic capital equipment for industry, infrastructure operators and sovereign customers. The independent group is a technology or market leader in all its fields of activity, including mobile communications and radio frequency measurement technology, broadcast and media technology, air traffic control and military radiocommunications, as well as cyber security and network technology. With its industry-leading technology expertise, the independent group is a reliable partner for the future of communication, information, and security.

Our products in the various market segments meet the highest requirements, which is why PFASs for these products play an essential role in achieving the specifications. The proposed substitutions do not work for these applications and cause socio economic damage – not only for Rohde & Schwarz as company – furthermore it has an impact on the products and their performance which then leads to socio economy costs in different sectors e.g., air traffic, transport, telecommunications... .
Therefore, we participate in the ECHA public consultation and analyzed our products.

2 Consultation

Rohde & Schwarz GmbH & Co. KG (hereinafter "R&S") appreciates the opportunity offered by the public consultation process to provide comments on the Proposal for a Restriction of Per- and polyfluoroalkyl substances (PFAS) (hereinafter 'Restriction Proposal'). With this submission, we would like to explain why we believe that a derogation for the semiconductor manufacturing process which is currently marked for reconsideration in the Restriction Proposal – is needed and justified.

The conclusions from our submission are summarized as follows:
- Fluoropolymer based solutions (whether it is cable assemblies, sealants, filters, or vents) are the only option currently on the market that can be used to achieve extreme cleanliness required during semiconductor manufacturing processes.
- Wires and cables incorporating fluoropolymer solutions also provide the only option for high performance signal transmission and power transmission applications while withstanding demanding physical and environmental conditions throughout millions of operating cycles required during semiconductor manufacturing processes.
- Almost all modern technologies, such as computer-based systems, telecommunication, security systems, automotive, defense and aviation, to name just a few, rely on use of semiconductors. With the European Chips Act, chips have been recognized as strategic assets for key industrial value chains. If a short (or no) derogation is granted for applications such as equipment and its components supporting semiconductor manufacturing processes, the EU would be faced with huge economic and strategic threat.

Considering the arguments and evidence presented below, R&S respectfully requests to include the following derogation in Column 2, paragraph 5 of the proposed restriction:

Semiconductor manufacturing process until 13.5 years after EiF

This should be considered the minimum period as there are significant unknowns related to identifying alternatives and many specific uses within the semiconductor manufacturing process which require PFAS currently. The multiple categories of products which use PFAS and uncertainties related to substitution feasibility and timing are highlighted in a report submitted to the public consultation from SEMI Europe which indicates longer potential transition times.

Semiconductor devices (also known as “chips” or “integrated circuits”) are essential components of electronic devices. Semiconductor devices are extremely complex to manufacture, with leading devices requiring more than 2,000 process steps, hundreds of production materials, and approximately 26 weeks to manufacture and test. This requires the utilization of process chemicals, manufacturing equipment, and manufacturing facility infrastructure which use PFAS.

At Rohde & Schwarz products we manufacture from cables to the printed circuit board a wide range of semiconductors for our products and solutions. Therefore, also our production lines need to meet the highest standards where the use of PFAS are necessary.
Our production lines are located in Germany and the Czech Republic.

The given documentation recognizes the industry „electronic, semiconductors and energy“ as a whole. Rohde & Schwarz develops, produces, and markets a wide range of electronic capital goods for industry, infrastructure operators and government customers. Our business fields are wireless communications and RF test and measurement, broadcast and media, air traffic control and military radiocommunications, cybersecurity and network technology.
To meet the customer’s needs and be a technology leader in the European Union, these products are dependent on the use of PFAS for certain appliances. Especially the new technologies like 6G (based on the *mm*-wavelength) and other High-frequency applications (>1GHz) need the versatility of PFAS. The proposed substitutions do not work for these applications and cause socio economic damage – not only for Rohde & Schwarz as company – furthermore it has an impact on the products and their performance which then leads to socio economy costs in different sectors e.g., air traffic, transport, telecommunications... .

Being compelled to use materials of lower performance (as described in Annex I) would have severe consequences in the semiconductor manufacturing sector and may cause manufacturers to reconsider their global manufacturing locations. Hence, if a short (or no) derogation is granted for applications supporting semiconductor processes, the EU would be faced with huge economic and strategic threat due to importance of semiconductors in most areas of modern life (defense, energy, healthcare, transport to name just a few).
The suggested substitutions will not work for these applications and will result in functionality and technology loss due to lower frequencies.
Above all, the production and manufacture of these devices is not/restrictedly possible.
This will lead to a loss of our production locations in Europe.

Our high production depth starts at our own production in printed circuit boards, cables and goes to the development of future technologies (6G). Our development labs and production lines located in Germany (Munich, Memmingen and Teisnach) & Czech Republic (Vimperk) are also dependent on production equipment for these applications (cleaning method of PCB´s, sealing, etc.).
If they´re even partly banned without exceptions for this industry it will cause socio-economy damage (high costs, innovation loss and production site loss).
Our customers in the market segments government and air traffic have strict requirements to the products and demand a high stability.

Our concerns are about the restriction proposal and the opposite statement of the European Chips Act.

Therefore, we answer the following questions as follows:

2.1 Sector & Sub Uses

Electronics and semiconductor

2.2 Emissions in the end-of-life phase

- Production phase
  - Waste due to printed circuit board – trimming waste ~ 5%
  - Cable production: We don't have information on this topic.
  - Wastewater Treatment: We don't have information on this topic.
  - Evaporation losses due to cleaning process: Corporate Confidential. Information in extra Document.
- Use-Phase
  - No emissions under proper handling
- End-Of-Life
  - Electronical waste of R&S-Products
    - Our products are capital goods and have a very long lifetime and a high serviceability. We also have a “second life” market for our products installed. That´s why we can´t raise numbers for waste.
- Used materials over the last three years (in average):
  - PCB-Sheets: Corporate Confidential. Information in extra Document.
  - Semi-finished goods: Corporate Confidential. Information in extra Document.
  - Cleaning procedure: Corporate Confidential. Information in extra Document.

2.3 Emission in the end-of-life phase

Our products are electronical waste. Due the use of mechanical material with no special function only our PCB and cables are affected when the product comes into the waste process.

2.4 Impacts on the recycling industry

We don´t have information on these topics.

2.5 Proposed derogations

Rohde & Schwarz supports the regulation of PFAS-restriction and will optimize its processes for a save environment. For our products and business field Communication (*Semiconductor Manufacturing*) the derogation is needed to be justified. Without a derogation, the manufacturing of semiconductors, which are

essential in many fields of modern life, would not be possible. We propose that a derogation is justified based on the following points:

- The performance requirements for Semiconductor Manufacturing applications.
- The lack of availability of alternatives that would provide the required level of performance.
- The time required for research and development to investigate and evaluate potential alternative materials, and if a feasible alternative is identified, the time required to identify, develop, test, and commercialize new Semiconductor Manufacturing products.
- The large socio-economic cost of restricting the use.
- We support the idea of a *duty to inform* in terms of the REACH-Regulation

2.6 Missing uses – Analysis of alternatives and socio-economic analysis

2.6.1 The annual tonnage and emissions (at sub-sector level) and type of PFAS associated with the relevant use.

Dossier submitters noted that ‘based on the available information for semiconductors no generally applicable alternatives are available’ (Annex E, page 409).
Based on experience and research conducted to-date, R&S agrees with the statement on lack of alternatives. With this submission, we intend to demonstrate that no available substances (including those listed in Appendix E2 of the restriction proposal for sealing applications) can achieve the sufficient performance required to meet demanding needs of semiconductor manufacturing processes, and thereby demonstrate that a derogation is needed and justified.

2.6.2 The key functionalities provided by PFAS for the relevant use.

Table 1 Recommended Additions to Table A.49 of Restriction Proposal. Addition in Green

Use category	Sub-use	Properties
Photolithography	Filters	Chemical resistance Low extractables against solvents
Plasma Etch and Wafer Cleaning	Dry etching agents C4F8 & CF4	Reactants, there are no wet etch dielectrics available for this application.
	Vacuum pump Oil	Chemical resistance against aggressive media. No alternatives available
	Thermal insulation for wet solution	Low thermal conductivity Chemical resistance Thermal durability Less shedding Less gas
	Thermal insulation for gas supply and exhaust in Plasma Etch	Low thermal conductivity Chemical resistance Thermal durability Less shedding Less gas

Semiconductor Manufacturing Equipment & Infrastructure - Enabling Uses of Fluoropolymer Articles	Data, Power & Fluid Interconnects, sealants/piping	Low dielectric constant Low dissipation factor Low outgassing factor Low coefficient of friction Stable electrical performance over high temperature

2.6.3 The number of companies in the sector estimated to be affected by the restriction.

For this question we´ve looked at our suppliers for our production and product needs. We didn´t analyzed the sector.
Our suppliers for the relevant material ca
n be split into two groups.

- Production materials
- Process materials

All suppliers together are twenty different suppliers, for PCB Materials, semi-finished products and process materials like gaskets.

2.6.4 The availability, technical and economic feasibility, hazards and risks of alternatives for the relevant use, including information on the extent (in terms of market shares) to which alternative-based products are already offered on the EU market and whether any shortages in the supply of relevant alternatives are expected.

Alternative material evaluations have indicated that, when available, they frequently fail to match the critical performance characteristics of PFAS substances and lack the range of properties required for electronic and semiconductor applications, such as high chemical and thermal resistance. The proposed restriction will result in increased costs and reduced productivity, both in the performance of the product applications and in their use, creating an additional burden on customers, potentially limiting their choices, and reducing the incentives for technological advancement.
Products produced with alternatives having lower durability and reliability would also result in higher maintenance and replacement frequency and eventually increased waste.
We, as experts, are concerned that regulations aimed at restricting PFAS, regardless of which group it belongs to, would result in "regrettable substitutions," in which a regulated chemical is substituted with an unregulated compound that may be equally or even more harmful (Blum, Balan, Scheringer, & et al., 2015).
We would like to emphasize the significance and necessity of a novel regulatory approach—regulating PFAS compounds as a class. A PFAS restriction proposal that differentiates between the various PFAS groups based on their risk profiles and properties, as well as one that recognizes the safe use of fluoropolymers and their importance for applications, should result in an exemption from any regulatory action under the proposed PFAS restriction (Balan, Mathrani, Guo, & Algazi, 2021).

Our research found that no alternatives are available.
All alternatives will lead into loss of technical functionality and not reaching the technical parameters. This will cause into socio-economic shifts outside of the EU.

2.6.5 For cases in which alternatives are not yet available, information on the status of R&D processes for finding suitable alternatives, including the extent of R&D initiatives in terms of time and/or financial investments, the likelihood of successful completion, the time expected to be required for substitution (including any relevant certification or regulatory approvals) and the major challenges encountered with alternatives which were considered but subsequently disregarded.

According to our evaluation, a derogation period of at least 15 to 25 years is more reasonable as an adequate compliance time frame.

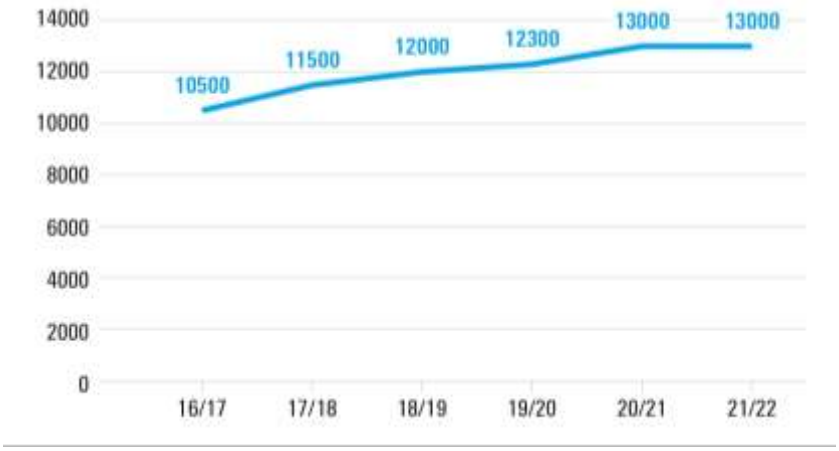
2.6.6 For cases in which substitution is technically and economically feasible but more time is required to substitute:

We don´t have information on that.

2.6.7 For cases in which substitution is not technically or economically feasible, information on what the socio-economic impacts would be for companies, consumers, and other affected actors. If available, please provide the annual value of EU sales and profits of the relevant sector, and employment numbers for the sector.

Employees: Employed Persons / Fiscal Year (as of June 30)

ROHDE&SCHWARZ



Revenue: Millions EUR / Fiscal Year

2.7 Potential derogations marked for reconsideration – Analysis of alternatives and socio-economic analysis.

We don´t have information on these topics.

2.8 Other identified uses – Analysis of alternatives and socio-economic analysis

We don´t have information on these topics.

2.9 Degradation potential of specific PFAS sub-groups

We don´t have information on these topics.