**Segment: Semiconductor**
**Public Version for Question 1**
**Submitting on behalf of Corporation**
**Country, Germany**

**1**:**Sectors and (sub-)uses**: Please specify the sectors and (sub-)uses to which your comment applies according to the sectors and (sub-)uses identified in the Annex XV restriction report (Table 9). If your comment applies to several sectors and (sub-)uses, please make sure to specify all of them.

The responses in this Annex XV submittal refer to the Main Applications of Electronics and Semiconductor (Annex E.2.11.) with **additional** sub-uses as per Table 9 as shown with asterisk*. Although this table is not inclusive of all sub-uses which more accurately reflect essential sub-uses across various Industry Sectors.

Summary: Semiconductors are used throughout every aspect of our daily lives. Our products support the production of semiconductor devices by providing reliability in wafer level packaging, as dielectrics and as stress buffers. These products have been safely used for decades without direct human exposure by our customers and downstream customers. Semiconductor usage of PFAS-containing materials is controlled at the Business to Business (B to B) level throughout the supply chain. Every Customer is screened and approved prior to sale of product. No Resale of our products is permitted. Our products are not made for nor sold to consumers. Semiconductor manufacturers must adhere to stringent regulations in Industrial Use Only and all handling is in Clean Room environments. Air filtration, PPE, semiconductor grade purity restrictions and engineering controls protect both the worker and the quality of the product. The table below illustrates the broad range of Applications and Sub-Uses that rely on our products and devices made with our products; acronyms used in Annex E.2.11 Table 9are defined in the text below the table.

Annex E.2.11 Table 9 including additional sub-uses related to this submission of evidence

| Main Applications | Sub-Uses | Sub-Uses | Sub-Uses | Sub-Uses | Sub-Uses | Sub-Uses | Sub-Uses |
|---|---|---|---|---|---|---|---|
| **Electronics and Semiconductors** | **Wires and Cables** ***IC-LSI** **Discrete - Power Passives** | **Coating, Solvents and Cleaning** ***Developer** ***Thinner** | ***Wafers,** ***Substrates,** ***Flexible Hybrid Electronics** ***Wire** ***Fiber Optics** | **Electronic Components, *MEMS,** ***Sensors** | **Advanced Semiconductor Packaging – *IoT(WiFi-4G,5G),** ***Logic/ASIC** ***Analog devices** ***Passivation/ Insulation -** ***Power Devices,** ***Memory** ***AI** | **Photolithography** ***Dispense** | ***Temporary Bonding** ***Permanent Bonding** |
| **Transportation and Safety** | **Combustion Engine Systems** | **Electrical Engineering and Information Technology, *LIDAR** ***ADAS** | **Safety equipment (incl. fire prevention and protection)** ***Airbags,** ***Lane Change Sensors** | **HVACR systems** | ***EVs** ***Lithium-ion Batteries** ***Wired/Wireless Charger** ***Charging Stations** | ***Avionics** | ***Defense** ***Vehicles,** ***Wearables,** ***Communication** ***UAVs,** ***Lightweighting** ***Sensors** ***LIDAR** |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Medical Devices | Implantable Medical Devices | Diagnostic laboratory Testing *Equipment | ***MEMS, *Sensors *Humidity Sensors *Transmitter** | | | | |
| Energy Sector | Photovoltaic Cells | Wind Energy | Coal Based Power Plant | ***Generator *Converter *Inverter *Conditioner** | Nuclear Power Plant | Electrolysis Technologies | Lithium-ion Batteries |

**Semiconductor Infrastructure Sub-uses**: Wires and Cables, Integrated Circuits, LSI (Large-Scale Integration), Discrete Power Passives, Coatings, Solvents and Cleaning, Developer, Thinner, Wafers, Substrates, (FHE) Flexible Hybrid Electronics, Wire Bonding, Electronic Components, (MEMS) Micro Electronic Mechanical Systems, Sensors, Advanced Semiconductor Packaging, (IoT) Internet of Things, WiFi, 4G, 5G, Logic/(ASIC) Application Specific Integrated Circuit, Analog Devices, Passivation, Insulation, Dispense, Temporary Bonding, Permanent Bonding, Telecommunications, Fiber Optics, Smartphones, Data Storage, Central Computing, Aerospace, Displays, Home Electronics (e.g. Security Systems, Appliances), Wireless Smart Communications

**Transportation and Safety Sub-uses**: Combustion Engine Systems, Electrical Engineering and Information Technology, (LIDAR) Light Detection and Ranging, (ADAS) Autonomous Driving and Sensor Systems, Safety Equipment, Fire Detection and Suppression Systems, Airbags, Lane Change Sensors, (HVAC) Heat, Ventilation and Air Conditioning Systems, (EVs) Electronic Vehicles, Lithium-Ion Batteries, Wired and Wireless Chargers and Charging Stations, Avionics, Defense Industry, Vehicles, Wearables for Warfighters, Communications (UAVs) Unmanned Aerial Vehicles, Drones, Lightweighting, Sensors

**Medical Devices Sub-uses**: Implantable Medical Devices (Pacemakers, Defibrillators), Testing Equipment, Temporary Medical Devices

**Energy Sector Sub-uses**: Power Production, Energy Transmission and Storage, Renewable Energy Technology (Photovoltaics), Metering and Monitoring

We are aware that many trade associations representing the aerospace, automotive, transportation, electronics and semiconductor industries intend to advocate for removal of fluoropolymers from the scope of the restriction proposal. We would endorse that proposal because it aligns with our understanding of the following: 1) the socioeconomic benefits of the use of polymeric PFAS in essential applications far outweighs the risks, 2) polymeric PFAS can be fully mineralized by incineration, and 3) polymeric PFAS are not toxic and do not bioaccumulate. Our submission below is not intended to detract from such arguments, it serves to support and provide additional information.

PFAS-containing products have been used in devices in permanent application spaces that cannot be re-engineered easily without a discovery, significant time and without unintended consequences. The finished designs were completed years ago, many of which are now used for replacement parts for automotive electronic components, telecommunications infrastructure, and power grid electronic components. The original designs, test equipment, laboratories and engineering personnel that created these devices no longer exist. Only the replacement components are available. This would mean a complete reinvention of legacy electronic systems and devices (e.g. automotive powertrain systems, computer storage drives, fiber optic cables, smartphone microprocessors) would be required. It is challenging to recreate the past in this way. It would lead to unnecessary supply shortages of critical replacement chips or electronic components thus discarding entire systems, which is unsustainable.

Referenced are reports from ACEA (European Automobile Manufacturers' Association) regarding potential consequences of a PFAS Restriction Proposal and SIA Impact of Potential PFAS Restriction on the Semiconductor Sector.

Public References:
Impact of a Potential PFAS Restriction on the Semiconductor Sector, Report No. 2022-0737 REV.9, April 13, 2023; ACEA (European Automobile Manufacturers' Association) Submission, ACEA Comments on the Annex XV Dossier of the Universal PFAS Restriction Proposal, May 2023