160 YEARS
FOR GENERATIONS TO COME

SOLVAY

EU REACH PFAS
Restriction Proposal

What are PFAS?

PFAS:

- very broad family of substances
- including thousands of different chemicals
- all with very different profiles and properties.

Solvay believes that a segmentation is needed to differentiate the substances according to their intrinsic properties, toxicological profiles and uses.

ALL PFAS ARE NOT THE SAME, and there is no scientific basis to regulate them as one group.

For example, **fluoropolymers** should not be restricted or banned as they are:

- critical to the functioning of modern society and key to innovation
- chemically inert and recognized as polymers of low concern

FLUOROPOLYMERS are needed in a range of special and essential applications, due to their unique properties and high resistance

SOLVAY

Fluoropolymers are a distinct class of PFAS

- They are polymers with fluorine atoms directly attached to a Carbon backbone.
- Although they are structurally defined as PFAS, they are high molecular weight polymers.
- They have unique physicochemical properties and distinct toxicological/environmental profiles vs. other PFAS.
- They are virtually chemically inert, non-wetting, non-stick, and highly resistant to temperature, fire and weathering.
- Two prominent categories of Fluoropolymers are Fluoroplastics (resins) and Fluoroelastomers (rubbers).
- Perfluoropolyethers (PFPEs) are also a class of polymers, with fluorine atoms directly attached to a Carbon/Oxygen backbone.

Fluoropolymers are safe materials

- Due to the unique properties of the C-F bond, Fluoropolymers are extremely stable and durable, hence they are designated as persistent.
- Assuming that persistency equals to risk is a misconception.
- Fluoropolymers have material properties.
- For hazard assessment purposes, it is not scientifically justified to group inert materials together with other substances having different physical form, chemical-physical properties and hazard profile.
- The properties of some PFAS that can be considered a concern cannot and should not be extrapolated to Fluoropolymers.
- An Industry study has demonstrated that Fluoropolymers meet the OECD criteria for Polymers of Low Concern (PLC).

Fluoropolymers do not pose a risk to human health or the environment as they are non-toxic, non-bioavailable, non-water soluble, non-mobile

Fluoropolymers have unique features

Unmatched properties of Fluoropolymers:

- Non-wetting, non-stick, and high resistance to temperature, fire and weather
- Biocompatibility
- Durability, stability and mechanical strength in harsh conditions
- Chemical inertness, meeting the requirements for low levels of contaminants in key industries
- Stability in air, water, sunlight, chemicals and microbes.

Fluoropolymers ensure safety, reliability and performance in numerous technologies, industrial processes and everyday applications across major markets and are an indispensable driver of the European Green Deal and Digital transition.

Solvay's views on PFAS Universal Restriction

Responsible and safe manufacture

➔ Solvay promotes a responsible and safe manufacture, use and placement of products essential to the European industry and to the decarbonization of the global economy.

Non fluorosurfactant technology

➔ Solvay has phased out fluorosurfactants from a significant part of its manufacturing processes

➔ Phase out roadmap toward 2026.

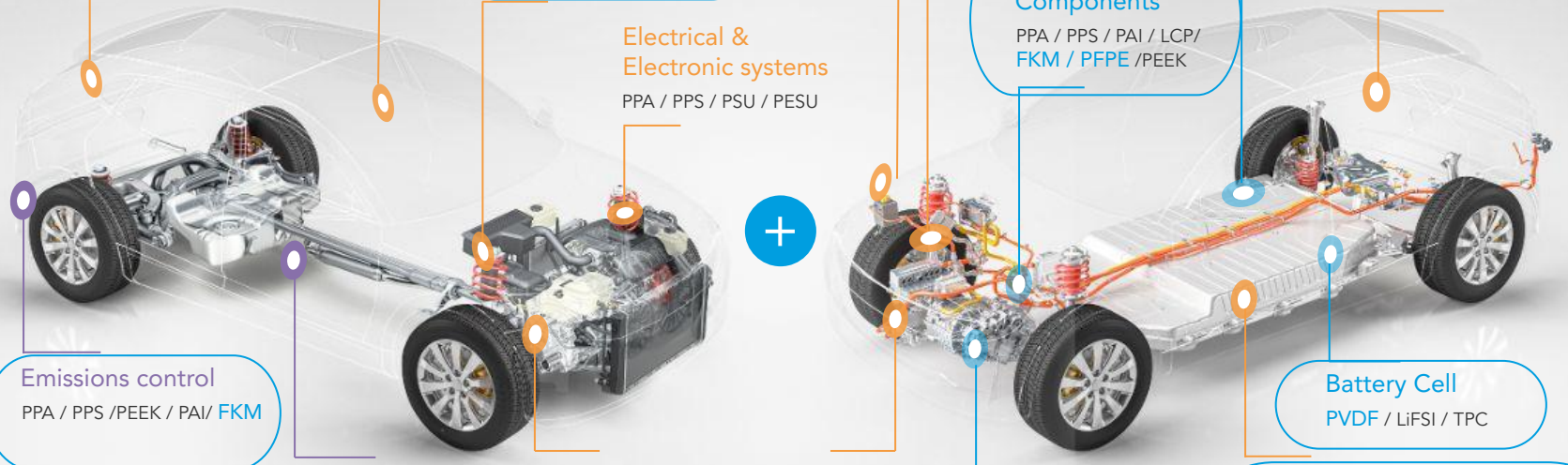
Restriction contradicts EU strategies

➔ A restriction would have a significant impact on many different value chains

➔ Contradicts with the EU Green Deal objectives as well as with the EU's ambition for green mobility and digitalisation

➔ Critical applications merit a full exemption - or an extended derogation upon evaluation how much time would be needed to develop, industrialize and scale safe and efficient alternatives.

Fluoropolymers Supporting Green Mobility



Structural & semi-structural parts
Epoxy prepregs

Seals and Gaskets
FKM

Thermal & air management systems
PPA /FKM / PPS /PEEK / PAI

Electrical & Electronic systems
PPA / PPS / PSU / PESU

Emissions control
PPA / PPS /PEEK / PAI/ FKM

Transmission
PPA / PEEK/PTFE / PAI/PTFE / FKM

Lighting
PPS / PESU / PPA

Electrical & Electronic systems
PPA /FKM / PPS /PEEK / PAI

Battery Pack
MTM®/ VTM®/ LTM® / HTM®

E-motor/eDrive Components
PPA / PPS / PAI / LCP/ FKM / PFPE /PEEK

Structural & semi-structural parts
Epoxy prepregs

Lighting
PPS / PESU / PPA

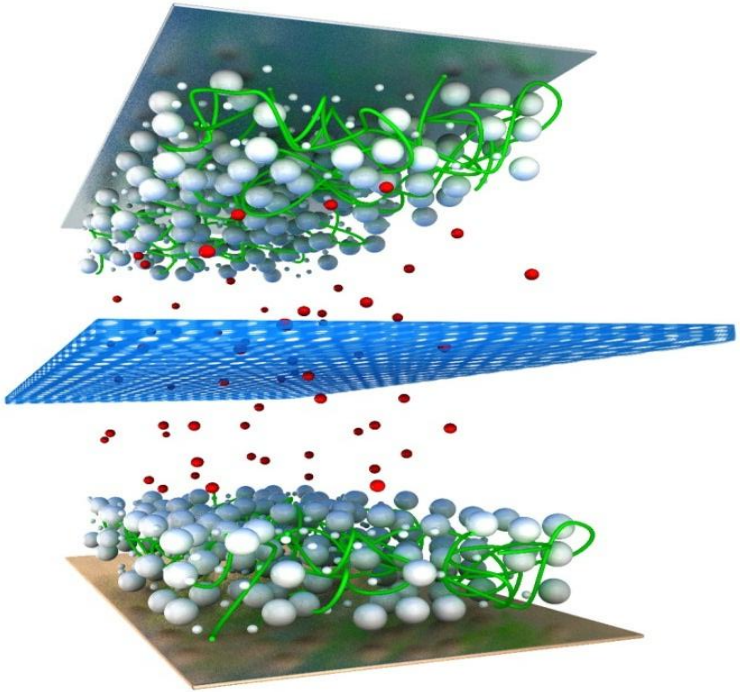
Power Electronics
PPA / PPS / PARA / HPPA

Battery Cell
PVDF / LiFSI / TPC

Thermal management systems
PPA /FKM / PPS /PEEK / PAI

EV applications
ICE and BEV
ICE applications

Li-ion Batteries: Higher Energy Density, Long Lifecycle, Safety



High Performance Cathode Binder

- Good processability
- High Ni cathode compatible (anti-gelation)
- Ultra high adhesion
- Flexible grade available

→ Solef® PVDF

PVDF Separator Coating

- Excellent lamination with electrode
- Outstanding chemical resistance vs. electrolyte
- Faster & complete wettability & processability

→ Solef® PVDF

Cell Gasket

- Good sealing performance
- Chemical resistance to electrolyte

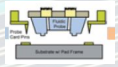
→ Tecnoflon® FKM

Role of fluoropolymers in enabling EU Chips Act

Semiconductor manufacturing requires innovative materials of the highest purity and quality to enable next-generation electronics with leading-edge technology. High performance and high purity polymers for structural and internal parts cover all stages of manufacturing





DEPOSITION CVD, PVD, ALD

- Vacuum Pumps Fomblin® PFPE for lubricants
- Chillers Galden® PFPE for Heat Transfer fluid
- O-rings, Seals Tecnoflon® FFKM
- Structural Parts KetaSpire® PEEK and Torlon® PAI
- Internal Parts Torlon® PAI and KetaSpire® PEEK

CMP

- CMP Structural Parts Halar® ECTFE, Solef® PVDF
- CMP Retainer Rings Ryton® PPS KetaSpire® PEEK, AvaSpire® PAEK Torlon® PAI
- CMP Chemical Delivery System Halar® ECTFE Solef® PVDF

ETCHING, CLEANING

Dry Etching, Dry Cleaning

- Vacuum Pumps Fomblin® PFPE for lubricants
- Chillers Galden® PFPE for Heat Transfer fluid
- O-rings, Seals Tecnoflon® FFKM
- Structural Parts KetaSpire® PEEK and Torlon® PAI
- Internal Parts Torlon® PAI and KetaSpire® PEEK
- Gas Sifren® for Etching Gas

Wet Etching, Wet Cleaning

- Chemical Delivery System Halar® ECTFE Solef® PVDF
- Structural Parts Halar® ECTFE
- O-rings, Seals Tecnoflon® FFKM
- UPW Piping System Solef® PVDF
- Wafer Containers KetaSpire® PEEK

ION IMPLANTATION

- Dopant Gas
- O-rings, Seals Tecnoflon® FFKM
- Internal Parts Torlon® PAI and KetaSpire® PEEK

WLP

- Dielectric Materials

PROBE

- Heat Transfer Fluids Galden® PFPE
- Probe Card Torlon® PAI

PACKAGING

- MRF Halar® ECTFE
- IC Tray Veradel® PESU Udel® PSU
- FC BGA Boat & High T Tray Torlon® PAI Lavanta® HPP

TEST

- Test Socket Veradel® PESU Udel® PSU KetaSpire® PEEK Torlon® PAI
- Test Handler Veradel® PESU Udel® PSU

UPW Piping System
Solef® PVDF, KetaSpire® PEEK

Ducts
Halar® ECTFE

Chemical Delivery System
Solef® PVDF, Halar® ECTFE

Thank you.

Progress beyond