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**A DIGITAL view on the
PFAS restriction**

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- data analytics
- software & hardware
- cybersecurity
- telecoms
- semiconductors
- cloud technology



- Healthcare
- Manufacturing
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- Buildings
- Mobility

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NATIONAL ASSOCIATIONS

100

COMPANIES

60+ Categories of uses identified in electronics*

Application area

Coatings

Printed circuit boards

High voltage/power applications

Cables and connectors

Components

Mechanical applications

Displays

Batteries

Fire prevention

Heat transfer

Chemical equipment

Chemicals

Others

*Excluding semiconductors, energy, medical, automotive, aerospace

Details

Capacitors, dielectric films

Electret films in microphones, sensors

Gaskets, sealing

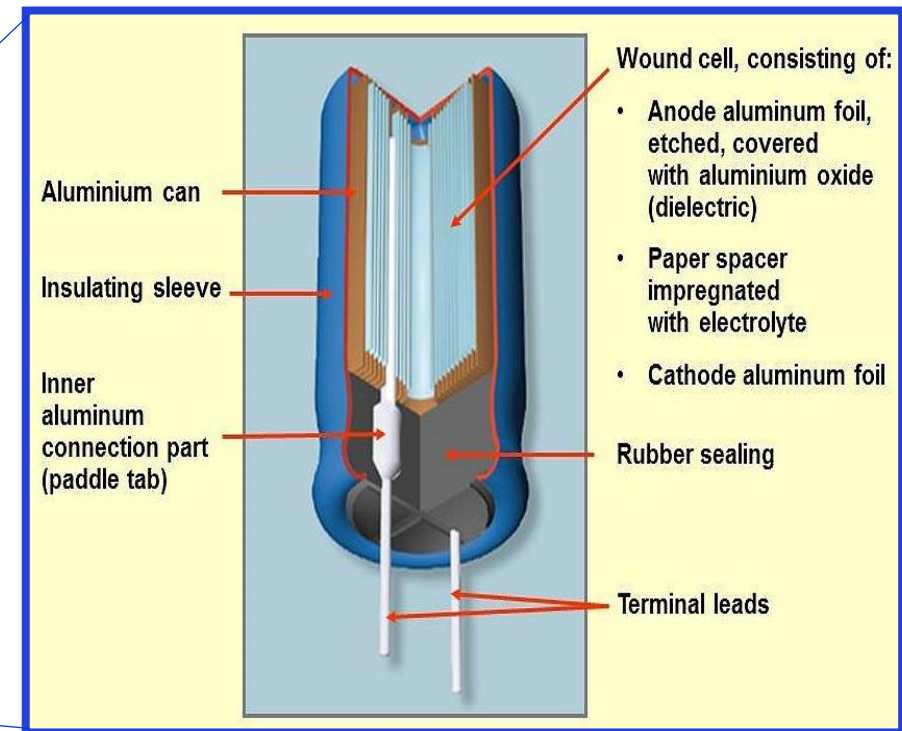
Microphone/speaker vent membrane

Piezo in acoustical equipment

Rubber parts in image forming process in printers

Complexity of electronics supply chain

- ▶▶ Even a simple circuit board contains dozens of different components
- ▶▶ A component consists of many articles
- ▶▶ A product contains thousands of articles
- ▶▶ Each article to be investigated for the use of PFAS



Towards PFAS-free electronics

- ▶▶ **No drop-in alternatives** for most applications
- ▶▶ In many cases, there is no alternative for PFAS yet (e.g., Li ion batteries)
- ▶▶ **At least 48 months transition time**
 - Once alternative is available, product re-design normally takes minimum 24 months (selection, qualification, certification, etc.)
 - Redesign of a complete portfolio takes longer
 - EU RoHS phthalate restriction transition time was 4 years
 - EU Battery Regulation final draft requirements impacting design gives 42 months
- ▶▶ Applications which have no alternatives will require **timebound derogations** like EU RoHS exemptions

Annex XV report about electronics

Elements contradicting circularity for electronics and twin transition objectives

- 1** Apart from proposed 12-year derogation for the semiconductor manufacturing process, **no derogations for the electronics sector**
 - No computing / communications products will meet 18 months transition period
 - Huge economic impact, business closures
- 2** **No exemption for spare parts** of existing products
 - No spare parts can be made available despite the requirement to do so under the EU Ecodesign directive/regulation
 - As is, restriction will lead to premature obsolescence of products on the market
- 3** **No exemption for refurbished or second-hand products** / articles already on the market

Use and emissions from electronics are less than 1% of the total PFAS use and emission

All stakeholder input to be taken into account

Broad statements that alternatives are not available. The Dossier Submitters cannot derive generalizable information from generic formulations (Dossier Submitters marked examples in bold)

- **Innovative alternatives** must be found to restrictions in the choice of materials, which are associated with **high development costs**.
- Fluorinated materials, which are quite expensive are **only used for the cases, where no technical/safe alternatives** (cheaper or same price level) are available. For the majority of uses, EPDMs (or NBRs/HNBRs) are used already.
- Most of our applications require oleophob coating due to customer requirements and application conditions. **In several cases** chemical stability in combination with higher temperature stability is requested, especially for battery and fuel cell venting and in automotive field.
- No other class of polymers do offer **such a balance of properties**; that is to say replacement of fluoropolymer will degrade cable functionality and portfolio use.

Statements on specific uses. That often are too specific to derive a generalizable need for a derogation.

- the dielectric constant of the PTFE (low density PTFE) used for data cable cannot be reached by the listed alternatives or any other cable insulation: None of the listed alternative can provide all the cumulative benefits of PTFE for most demanding applications, when space cluttering is limited.
- Up to now, no alternative material for membranes is known. Likely it will never be found, as the requirements under the highly corrosive conditions and functionality are quite special. If PFAs cannot be used in our process anymore, this would mean for all clients a downgrading of their technology to old diaphragm or amalgam technology (with much higher energy consumption)
- We have not yet identified a cable insulation material capable of the 200 °C operating required "Solid state batteries" have been discussed as a panacea for several years, but, for most applications, they are a speculative technology with no advanced construction

- ▶▶ Sufficient time required for authorities to evaluate stakeholder input
- ▶▶ Electronics industry will provide much more details in public consultation

Conclusions & Way forward



- ▶▶ Current proposal will force most electronic products to be withdrawn from the market due to short transition period and no exemptions
- ▶▶ Elements are contradicting the Green Deal, Circular Electronics, and particularly Ecodesign objectives
 - Digital/Green Transition objectives impossible
 - No refurbishment, no repair; premature obsolescence



Transition towards PFAS-free electronics will take time

- At least 48 Months needed for transition where alternatives are available
- Time-bound exemptions for uses with no alternatives
- Exemption for spare parts and articles already on the market

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Thank you for your attention!

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