

ABB contribution to the ECHA consultation on PFAS

ABB Electrification Distribution Solutions (ELDS)

ABB ELDS is a part of the ABB group covering the segment of electrical distribution systems in medium voltage (MV) up to 52 kV. ABB ELDS is market leader in power distribution solutions. ABB ELDS serves the EU, as well as the global market, with products produced in both within and outside of the EU. For a wide range of products, the lead development centres and the lead factories are located in Europe. ABB ELDS factories in the EU are located in Germany, Finland, Poland, Czech Republic and Italy with a total of several thousand employees. In addition to direct jobs, we are connected to a wide supplier base in the EU, serving ABB with components and material.

The product portfolio of ABB ELDS covers a wide range of products required for the distribution of electricity. These products are important for the EU electrification by upgrading and extending the electrical networks. Due to the growing distributed energy generation in the medium voltage level by wind and solar power, we expect a significant growth of the segment in the coming years.

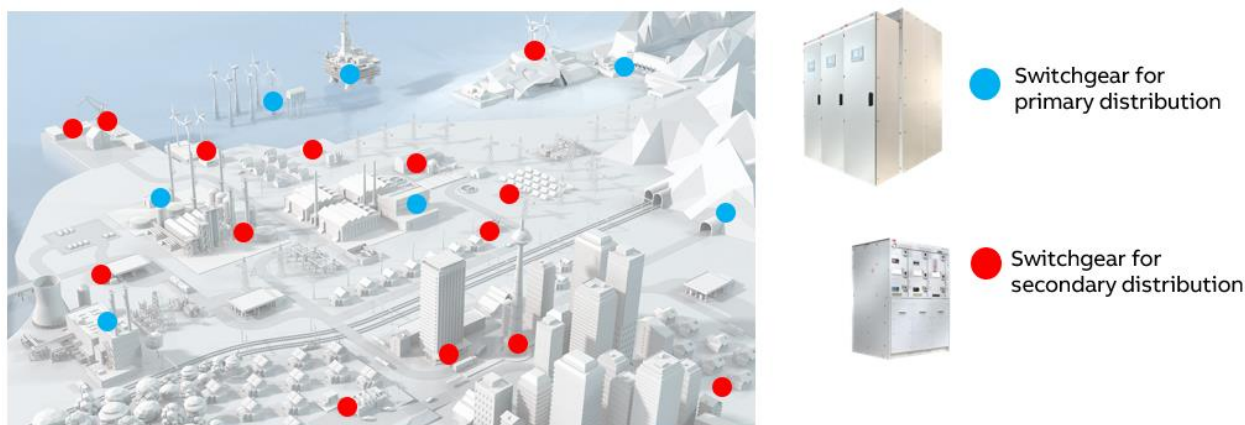


Figure 1: Location of products of ELDS in a typical electrical MV network

Medium voltage switchgear are the top product level in the distribution network. They are either air insulated (AIS) or gas insulated (GIS). Many of the components are designed and manufactured by ABB, such as circuit breakers, cable bushings, instrument transformers and control- and protection relays. These components are used to build ABB switchgear, but are also manufactured for other companies to be used and sold in their own products. In some markets, outdoor circuit breaker are used in the network without a switchgear. Special applications as railway use e.g. a circuit breaker on the train.

The main requirement for the complete product range is the high quality and reliability level, as the lifetime expectation from the market is extremely high (>40 years) and the maintenance effort for the customer has to be kept low. Failure rates of the products are expected to be extremely low. This requires the use of top quality materials with outstanding performance, reliability for a wide temperature range. All these requirements are supported by PFAS materials or PFAS additives in materials. A part of the complex ABB ELDS product portfolio and how they are linked together is shown in figure 2. The red arrows are pointing to the next level product of ABB, but these components are also sold to 3rd parties for their own products.

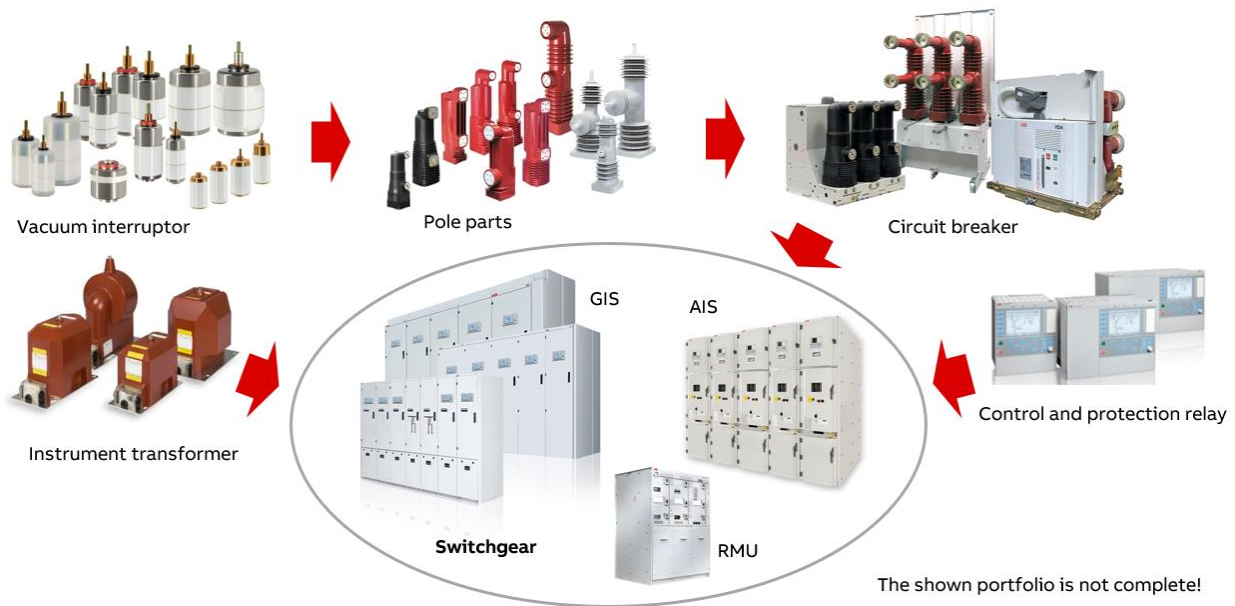


Figure 2: ELDS products and their use in ABB and non-ABB products

ABB Electrification Smart Power (ELSP)

ABB ELSP is a part of the ABB group covering the segment of electrical distribution in low voltage (LV) up to 1 kV in AC applications and up to 1,5 kV in DC applications. ABB ELSP is market leader in power distribution solutions. Thanks to a wide network of feeder factories located all around the world, ABB ELSP serves EU countries as well as the global market. Production is performed by several thousand employees and in addition to the direct jobs at ABB we are connected to a worldwide supplier network serving ABB with components and materials.

Most relevant products included inside ABB ELSP portfolio are:

- Circuit breakers
- Switches
- Fuse gear
- Contactors
- Manual motor starters
- Overload relays
- Arc guards
- Pilot devices
- Safety and control devices
- Enclosures
- Switchgears



Circuit breakers



Contactors



Switches



Manual motor starters

Why is ABB contributing to the ECHA consultation on PFAS?

As PFAS are widely used in electrical equipment, ABB, together with other manufacturers, will be strongly affected by the proposed restrictions, including the very broad ban at very low concentration levels.

ABB is committed to finding an alternative to replace PFAS in a realistic time frame, where it is technically possible, where it is advantageous for the environment and the society. For this we have prepared and uploaded specific contributions on the issue. We ask the ECHA technical experts to review these contributions carefully and consider them in the preparation of the final restriction, taking into account requested exemptions.

In case of additional questions, required background information or direct request for discussion, please feel free to contact us, using the contact details at the end of this document.

Contribution 1:

Topic: Electrical equipment

Target: Exemption from the restriction for additional 8 years

Electrical equipment for transmission and distribution are very complex products with extreme durability and a long lifetime of 40 years or more. To allow this, in combination with long maintenance periods or even maintenance free design, high grade materials are used. For some of the technical functions PFAS materials are used intentionally or might be used as components of 3rd-party materials. The materials used in electrical equipment are divided in the following groups:

- 1) Articles or components containing PFAS, which have been selected intentionally by design as material or as ingredient of a material mixture for a specifically defined function
- 2) Material, that has been selected based on technical parameters. PFAS has not been specified by the equipment manufacturer, but might be contained as ingredient of a material mixture based on the definition of the manufacturer of the material
- 3) Components or assemblies, which are supplied from 3rd party suppliers, which have designed them on their own. PFAS has not been specified by the equipment manufacturer, but might be contained as ingredient of a material mixture or as material based on the definition of the component manufacturer or of the material manufacturer for materials used in the component
- 4) PFAS is a contaminant from the production process, e.g. as release agent used in a cast moulding process to allow easy demoulding. Also surface treatment using PFAS or PFAS containing substances can result in such an effect. Contamination because of PFAS components in the production machine or due to manufacturing of PFAS containing products close to the production line of intended PFAS free products can lead to contaminations. Due to the extremely low threshold level of 25 ppb, contamination is hard to control, especially if the manufacturing of parts or components are outside the EU, where no restrictions on PFAS exist

For 1) the manufacturer of the electrical equipment (e.g. we as ABB) is called to identify and search for alternatives. This process has already started. For 2) it is already more complex, as materials are used in

many applications and changes of a material recipe might have impact on the technical parameters. A change might result in that the material can no longer be used. Then another material has to be qualified. Alternatively, the supplier might decide to stop the production of the material. Then a new supplier for a similar, PFAS free material needs to be identified. At 3) it becomes even more complex and time consuming, as the process is not under control and can barely be influenced by the electrical equipment manufacturer (e.g. ABB). The responsibility is on the supplier. An example for this group could be electronic equipment as control and protection relays requested from our customer to be used from 3rd party. They contain semiconductors or other electronics, where it has been announced from the industry that it is almost impossible to offer PFAS free solution in short to mid term. For 4.) it is actually unclear how a declaration of PFAS-free could be achieved.

The identification processes 2) to 4) have one problem in common: The vast majority of the about 10,000 individual substances covered by the restriction proposal are currently not classified as hazardous in accordance with the CLP Regulation (EC) No. 1272/2008 nor identified as substances of very high concern (SVHCs) under REACH Regulation (EC) No 1907/2006. Thus, information on PFAS contained in mixtures and articles is usually not communicated along the supply chain. In addition, the extremely low threshold level of 25 ppb is not only limiting the identification process to intended ingredients, but extends it to contaminants during the production process, which can result in that concentration. Analytical processes to proof if an article is PFAS-free will be extremely challenging taking the huge number of related articles into account, especially for polymers. Without a preceding, sufficiently long mandatory information phase based on legal requirements, during which information on PFAS in articles and mixtures had to be communicated in the supply chain, e. g. via safety data sheets or according to REACH Art. 33, it is not possible to determine all PFAS uses.

ABB has the target to replace PFAS in products wherever possible by PFAS-free materials. There might be some applications where this is not possible, which will be addressed separately. In all other cases, where a replacement is possible, the complex way of identification, finding a replacement, implementing them in products and finally repeating type testing of related products will by far exceed the given transition time of 18 months, taking into account that only the time required for full type testing of products can be one year or more. As this would not only affect ABB but all manufacturer of electrical equipment, due to the limited number of accredited test laboratories, this will create a bottleneck in type testing, which could cause shortage of electrical equipment with huge financial impact and a delay of the EU green energy transition. Type tests are mandatory for most markets, including EU and any material change with impact on the test result, requires type tests to be repeated. As these tests are very time consuming and some specific tests are extremely expensive, the tests have to be done after all PFAS replacements in the specific product to be tested have been completed, to avoid repeated testing of the same product for each identified PFAS again and again.

For this ABB asks for an extended transition time of additional 8 years to complete the transition to PFAS-free solutions. As the investigation along the whole ABB supply chain is still ongoing, we still see the risk that this might be challenging, especially if the low threshold level is kept and the identification is not limited to intentionally added PFAS. For this the possibility of a further exemption after 8 years should be offered, if it is proven that the replacement projects are not completed due to missing alternative solutions.

Dr. Maik Hyrenbach

Corporate Executive Engineer

ABB AG

Oberhausener Str. 33

40472 Ratingen

Mobile: [REDACTED]

Phone: [REDACTED]

E-mail: [REDACTED]@de.abb.com