PCB PIEZOTRONICS
AN AMPHENOL COMPANY

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PFAS Requested Derogations and Justifications For PCB Piezotronics, Inc. and its Subsidiaries

Derogations needed for PFAS applications necessary for PCB Piezotronics Companies' applications without effective substitutes

Submission Date: 21 September 2023

This submission is in response to the European Chemical Agency's (ECHA) public consultation on the proposal for a restriction of per- and polyfluoroalkyl substances (PFAS) in the Annex XV Restriction Report from 22 March 2023. It is respectfully submitted on behalf of PCB Piezotronics, Inc. ("PCB") and its direct and indirect subsidiaries set forth on Exhibit A attached hereto (collectively, PCB and its subsidiaries are referred to herein as the "PCB Companies"). The PCB Companies are committed to continuously improving the environmental performance and safety of all products they place on the market.

Products of the PCB Companies are considered complex products (articles) and have anywhere from 10 to 500 components in each individual product. Further, the PCB Companies have thousands of active model numbers, each with separate bills of material. This submission is based on a detailed review of our products and supply chain, including internal review by the PCB Companies, review by an independent outside expert, Claigan Environmental Inc. ("Claigan Environmental"), and a review of our supply chain. The complexity of the supply chain, and the intermediate and final products manufactured by PCB Companies does not easily lend itself to gathering credible and accurate information on all essential chemicals and materials embedded in electronics manufacturing processes and products.

As of August 31, 2023, more than 150 comments have been submitted to ECHA by electronics companies or associations. All state similar findings: the utility of PFAS is important and irreplaceable, the supply chain is layered and dynamic, the products manufactured are complex, and their function is governed by laws of physics and chemistry. The ability to efficiently replace these aspects is limited by these complexities. Therefore, it is critical that ECHA consider a modification to the derogations proposed by the Dossier Submitters. A universal restriction of PFAS will impact the PCB Companies' business interactions in Energy, Aerospace & Defense, Test & Measurement, Automotive, PDM & Process Monitoring, and Noise Monitoring applications in the European Union. To effectively minimize impacts to the users of our products in the EU economy, and to the digital and green transition already happening in the EU, it is necessary to have a derogation for intermediate and final electronics products for the 18-month transition period plus a minimum of 12 years.

Furthermore, without proper time to develop, demonstrate performance, and study the environmental and health impacts of alternatives, the resulting impact on the electronics products could create disruption, additional waste and risk to the end user.

The complexity of identifying suppliers and understanding what kinds of PFAS exist in products has proven difficult. Due to the specialized processes and proprietary composition of the electronic components, the design authority of the end product is often unaware of where PFAS are used. Additionally, based on the broad and varying definitions in the classification of chemistries as PFAS, when presented with a chemical name, it is unclear to the design authority whether it qualifies as PFAS and would fall under the proposed restriction. We are working with our supply chain and testing partners to identify additional PFAS in our products and determine if it can be replaced. It is not easy or straightforward. Set forth below are known materials which are currently not replaceable in our products. Accordingly, the PCB Companies respectfully request a derogation with respect thereto.

Requested Derogations for the PCB Companies are set forth below.

1. **PIEZOELECTRIC MATERIALS**
2. **DIELECTRIC USES (INCLUDING SIL PADS AND CIRCUIT BOARD FLAME RETARDANT**
3. **ELECTRICAL INSULATION**
4. **HEAT SHRINK AND THIN FILM MATERIALS**
5. **PTFE AND EPTFE WIRES**
6. **LUBRICANTS/PULLING LUBRICANTS; INCLUDING FOAMS**
7. **THREADS, O-RINGS, PLUNGERS, HAMMER SHAFT (ASSEMBLY AND MAINTENANCE)**
8. **FLUOROELASTOMERS INCLUDING VITON**
9. **PTFE PARTS INCLUDING TAPE**
10. **SURFACTANT IN CIRCUIT BOARD CLEANER**
11. **RELEASE AGENTS (UNDECLARED BUT VERY COMMON)**
12. **OIL USED AS HYDRAULIC FLUID**
13. **ANTI-DRIP IN POLYCARBONATE HOUSINGS**
14. **LABEL RELEASE PAPER**

Time requested 13.5 Years

Aerosol fluoro coating spray; including Fluoropolymer and Perfluoropolyether Release Agents
The use of lubricant spray on wires is very common and listed separately. The actual spray for mold release, wire lubrication, and general part lubrication are usually the same source aerosol (normally fluorosilicone) applied as wire lubricant spray; to internal wiring or their assembly equipment. The spray reduces the friction of PVC or XLPE wires improving cable flexibility and durability. Fluoropolymer and Perfluoropolyether (PFPE) release agents are used in manufacturing processes of plastic and rubber parts including foam. Very common for hookup wires in flexible. Fluoropolymer and PFOE release agents are commonly used in the molds for rubber, plastic, and foams materials. The most common applications of mold release agents are in the manufacturing of o-rings, gaskets, and foam. Roughly 25% of o-rings / gaskets in physical products have residual release agents on the surface above 100 ppm fluorine. Without effective release agents, the rubber, plastic, or foam part would adhere partially to the mold and suffer defects. Substitutes / Alternatives; Silicone mold release agents would be a suitable replacement for PFAS release agents in most applications, however the use of PFAS release agents are so prevalent in manufacturing that the conversion and re-qualification process will take time to identify which have and which do not. **Forever Chemicals Risk None expected**. Due to the low concentration of fluorocoating, no measurable PFAS forever chemicals over 25 ppb is expected.

Time requested 13.5 Years

FEP, PFA, PTFE, and ETFE for electrical insulation; FEP, ETFE, PTFE and ETFE used for electrical insulation purposes except wiring. FEP, PTFE and ETFE have very low dielectric constants which makes both materials excellent electrical insulators. These materials are primarily used in connectors and electronic components including microphones for electrical insulation. The most visually obvious uses are the white ‘ring’ inside a coaxial connector or the white center core of a wireless router antenna. PTFE and ETFE spacers include any application that requires electrical insulation including spacers / separators in batteries or capacitors Substitutes/Alternatives; No other material has equivalent dielectric constant / electrical insulation capability. **Forever Chemical Risk-None expected in initial material nor is material expected to degrade into forever chemicals. The exception is PFA which can have a small amount of perfluorocarboxlates from**

degradation of its C-O-C side chain bond. PFA can be made without perfluorocarboxylate degradation, but it will take time to replace. There is a separate derogation request for phase out of perfluorocarboxylates in PFA. PFA represents <1% of fluoropolymers in dielectrics / insulators.

Time requested 13.5 Years

Fluoro sprays for industrial lubrication PTFE and fluorosilicone sprays for maintaining lubrication in industrial equipment. Metal (and some plastic) parts have very high coefficients of frictions. PTFE and fluorosilicone sprays are capable of dramatically reducing the friction of metal parts with only a thin layer applied. Fluorosprays are used on metal parts in contact with other metal parts such as gears, shafts, and bearings. Without a fluoro spray, the metal parts would have very high friction and wear. Fluid lubrication is not possible in all situations, and a thin layer of PTFE or fluorosilicone is necessary for lubrication. Note - one side effect of the use of fluorolubricants on machinery is that some of the lubricants can be expected (especially fluorosilicone) to migrate to products by contacting machinery during their manufacturing process. Substitutes / Alternatives - No other spray is as effective in low concentrations and thickness in achieving this reduced friction. Silicone spray is less effective than fluoro sprays and often contains D4, D5, and D6 forever chemicals (also regulated in the EU with further restriction expected). Silicone lubricants stay 'wet', apply thicker, do not have good high temperature resistance, and are less effective on moving parts. Fluoroacrylates require specific plastic substances to adhere which normally contain perfluorocarbonxylates (and are not included in the scope of this derogation request). **Forever Chemical Risk None expected**. PTFE dry sprays and fluorosilicone sprays are not expected to have any measurable forever chemicals. PTFE powder in dry spray is not expected to contain perfluorocarboxylates (PFOA) and does not contain the C-O-C bond that degrades into perfluorocarboxylates. Fluorosilicone may contain trace amounts, but the thickness of the layer will normally reduce the concentration of those chemicals in the part below measurement detection. Necessary for the proper functioning of machinery, low risk to human health, wide spread use, and no equivalent alternatives.

Time requested 13.5 Years

Fluoro-coated This listing is for fluorocoating over nitrile (or similar) rubber. Fluorocoatings over nitrile rubber are common in applications where nitrile rubber would come into contact with acids or requires low friction. The fluorocoating provides the nitrile rubber with surface properties of fluoropolymers but not the full advantages and wear resistance of fluoroelastomers. Fluorocoated nitrile is common in the medical and pharmaceutical industry. **Forever Chemical Risk-Never**

Time requested 13.5 Years

Fluoroelastomers This listing is for a wide range fluoroelastomers (FKM) and perfluoroelastomers (FFKM) - and also include fluorosilicone rubber. A very common fluoroelastomer for high temperature or high acidity environments. **Forever chemicals Risk**- Commonly has **6:2 FTS > 1 ppm** Commonly - Normally contains perfluorocarboxylates (PFOA family) or perfluorosulfonates (PFOS family**). Rarely has short chain perfluorocarboxylates (PFHpA and smaller) ~ 100 ppb**

Time requested 13.5 Years

Fluoroelastomers for electrical insulation: Fluorosilicone, amorphous fluoro resins, and fluoroelastomers (including perfluoroelastomers) for electrical insulation purposes except wiring. Fluoroelastomers (and similar materials) have low dielectric constants which makes both materials good electrical insulators. PTFE and ETFE have limited flexibility and fluoroelastomers are required to meet both the electrical insulation and flexibility requirements. It is common products using fluoroelastomers for electrical

insulation. Fluorosilicone, amorphous fluoro resins, fluoroelastomers, and perfluoroelastomers have very similar performance and materials characteristics and are recommended to be covered under the same derogation. **No other material has equivalent dielectric constant / electrical insulation capability with flexibility.** Fluoroelastomer use is more specialized and lower volume than PTFE and ETFE for the same purpose. - Fluoroelastomers and perfluoroelastomers require a sulfonated fluorotelomer surfactant as part of their emulsion polymerization manufacturing process. **Forever Chemical Risk** - All of the fluorosulfonates or fluorocarboxyles present are short chain chemicals and none are classified vPvB or PBT substances. Wide spread use, **no forever chemicals**, and no suitable replacement.

Time requested 13.5 Years

Fluoroether for degreasing applications; Fluoroethers for vapour solvent degreasing of machined parts is widely used. Fluoroethers have high solvency strength, low nonvolatile residue and low surface tension. Fluorinated solvents provide excellent cleaning performance. Fluoroethers are critical for comprehensive cleaning of metal machined parts. Without fluorethers, residue and contamination on machine parts will be common. Substitutes / Alternatives; Chlorinated and brominated solvents can be used to degrease metal parts, they have higher greenhouse gas and environmental emissions; and reduced solvency power - resulting in environmental hazards and would reduce part quality. **Forever Chemicals Risk- None expected.** Fluoroethers are not expected to degrade into perfluorocarboxylates. Fluoroethers themselves have short half lives in the environment and are not bioaccumulants of their own. Necessary for reduced greenhouse gas emissions, reduced contaminants on medical devices, degrade in the environment, and have low risk to human health.

Time requested 13.5 Years

Fluoroethers PFAS Polymers and Non-Polymers for degreasing applications often used as surfactant in circuit board cleaner. This application of fluoroacrylates is at very small concentrations and may not even be detectable by most laboratories test methods after application. The application of fluoroacrylates on capacitors and semiconductors often requires a small amount of perfluoroethers as a solvent. A small concentration of perfluoroethers would be expected in the final coating, however the coating would be so small/thin that the fluoroethers would likely not be detectable with standard test methods. **Forever Chemicals Risk- Not Detectable Fluoroacrylates** normally contain perfluorocarboxylates from the fracturing of the C-O-C connecting the fluoro side chain to the acrylic polymer backbone. However, the overall concentration of the fluoroacrylate coating on the device may be so small/thin, that the perfluorocarboxylates would not be measurable in the final device.

Time requested 13.5 Years

Fluoropolymers in on labels; Fluorocoatings on labels of products (excluding textiles) necessary for environmental resistance. Paper and polyester labels degrade in weather conditions such as rain, sun, or humidity. By fluorocoating the surface of the label, the label can resist water, oil, and other environmental conditions. In many cases, these labels contain information that would create safety issues if subject to aging. Fluorocoated labels are used in a wide range of applications including outdoor products, but can include an electronic product that requires the label to withstand humidity and high temperature. Substitutes / Alternatives- Most polymers do not have the water resistance and oil/stain resistance of fluoropolymers. PVC has nearly equivalent water and oil resistance, but has risks of other regulated substances (such as phthalates) and does not withstand temperature ranges as well as fluoropolymers**. Forever Chemical Risk- None expected.** This does not include fluoroacrylic coatings that would create perfluorocarboxylates (PFOA family) regulated under POP or REACH. No suitable replacements exist, required for safety warnings on products, and does not provide a risk to human health.

Time requested 13.5 Years

Fluoropolymer and perfluoropolyether (PFPE) release agents used in manufacturing processes of plastic and rubber parts including foam The most common applications of mold release agents are in the manufacturing of o-rings, gaskets, and foam. Roughly 25% of o-rings / gaskets in physical products have residual release agents on the surface above 100 ppm fluorine. Without effective release agents, the rubber, plastic, or foam part would adhere partially to the mold and suffer defects. Substitutes / Alternatives available are silicone mold release agents would be a suitable replacement for PFAS release agents in most applications, however the use of PFAS release agents are so prevalent in manufacturing that the conversion and re-qualification process will take years. **Forever Chemicals- None expected.** Due to the low concentration of fluorocoating, no measurable PFAS forever chemicals over 25 ppb is expected.

Time requested 13.5 Years

Heat transfer fluids; Heat transfer fluids for professional and industrial applications. Fluoro heat transfer liquids are used in a range of industrial applications to transport the heat from part of the machinery or equipment to another. Fluoro heat transfer fluids are commonly used in semiconductor manufacturing, data centers, and in the military/aerospace industries. These applications are very specialized with tremendous heat generation / transfer requirements. Substitutes / Alternatives- No other fluids have equivalent heat capacity to transfer heat sufficiently in machinery. Replacement with other fluids would create safety and performance issues in industrial applications such as semiconductor manufacturing, data centers, and military/aerospace. **Forever Chemical Risk None expected**. Fluoro heat transfer fluids are commonly built on chemical structures of F, C, and N without the oxygen bonds that degrade into perfluorocarboxylates. No suitable replacements, specialized industrial applications, low exposure to the public, and no expectation of forever chemicals.

Time requested 13.5 Years

PFA Part This listing is a general listing for PFA used in a solid part (non-coated) in a product (excluding wires). PFA parts are very common in applications requiring low friction or high temperature performance - in particular for situations requiring superior chemical resistance. Commonly has a full range of perfluorocarboxylates (PFOA family) **Forever chemicals Risk PVDF binders would not normally be expected to contact forever chemicals.**

Time requested 13.5 Years

PFA Wire Perfluoroalkoxy alkane (PFA) insulated hookup wire. PFA hook up wire is one of the most common PFAS insulations as it has superior temperature resistance compared to other wire insulations and significant flexibility advantages over PTFE. PFA wire is very common in dense electronics and in invasive or implantable medical devices. **Forever Chemicals Risk- has a full range of perfluorocarboxylates (PFOA family)**.

Time requested 13.5 Years

PFAS Polymers and Non-Polymers; PTFE, PFA, FEP, PVDF, and fluoroelastomer (including perfluoroelastomer) tubing not in contact with drinking water. Fluoroelastomer tubing not in contact with drinking water. Fluoroelastomers have a separate perfluorosulfonate risk from the irradiated PTFE/PVDF or PFA perfluoroalkyl carboxylate risk. PTFE tubing is used in a very wide range of applications either to transport fluid or to provide protection to another material. Fluoropolymer tubing is non-reactive with virtually all fluids and does not affect the quality of the liquid or gas being transported. Fluoropolymer tubing is widely

used in electronics to protect wiring or other components. This tubing is not specifically wire insulation, but it is commonly used in tube or heat shrink form in applications requiring high temperature resistance. For example - the leads of most transformers in electronics are protected by PTFE tubes. No other polymer is as effective as a tubing material in applications in either a) High temperature applications (electronics) or b)Transportation of fluid and gasses (with no reactivity with the transported fluids). Polyurethane and PVC tubing can be used in some applications, but have poor resistance to acids and bases, can release chemicals (isocyanates or phthalates) into the fluid, and have poor temperature stability. **Forever Chemical Risk** -PTFE and PVDF tubing is often irradiated, in particular if used as heat shrink. These perfluorocarboxylates are created during the irradiation process of the powder for the tubing and are **not expected to further degrade into additional perfluorocarboxylates. PFA often (but not always) contains perfluorocarboxylates because of its weak C-O-C side chain bond**. This is related to a necessary processing aid in their emulsion manufacturing process. No suitable replacements, required for fluid transport or temperature performance reasons, substitution would affect the majority of electronics on the EU market, and not in contact with drinking water.

Time requested 13.5 Years

PFAS Polymers PFBS (and its salts) for the purposes of plastic clarity in flame retarded polymers under 1,000 ppm of the plastic used for Piezoelectricity, durability, heat resistance, flexibility, manufacturability. Flame retardant additives to transparent polycarbonate (and similar materials) tends to create a hazy or opaqueness. The addition of trace levels of PFBS (or its salts) maintains the transparency of the plastic. Transparency and flame retardancy are critical criteria for a number of applications including electronic displays or construction materials. Substitutes / Alternatives; There are currently no effective replacements for PFBS as a clarifying additive for flame retardant transparent plastics. **Forever Chemicals- None expected.** Note - PFBS would be present in the product <1,000 ppm. However PFBS is not currently classified as a vPvB or PBT chemical in the EU.

Time requested 13.5 Years

PFAS Polymers; PTFE as a lubricant additive under 1% concentration not in contact with drinking water. PTFE in Low Friction Plastic PTFE powder is added to another polymer (such as nylon) to reduce friction and wear of the plastic part. PTFE added to low friction plastic parts are generally in applications requiring reduced friction or wear such as a valve or other moving part. Forever Chemicals Risk: Never

Time requested 13.5 Years

PFAS in stickers can be present in one (1) of two (2) situations; Fluorocoating on front of the sticker for environmental / water resistance, or PFAS in the adhesive on back side of the sticker. Fluorocoatings on the front of stickers are relatively high concentration fluorocoatings to protect the sticker from water or other environmental conditions. PFAS in the adhesive can be from two (2) different sources. Residual fluorosilicone from the fluorosilicone release paper from which the sticker was peeled, or Low concentration fluoro surfactant used to reduce the surface tension of the adhesive allowing it to penetrate cracks and features better - improving adhesion. Fluorocoatings are more common in exterior stickers but can be on any type of sticker which requires durability including stickers on hard drives. PFAS in the adhesive can be on any type of sticker that uses release paper/liner including silicone thermal pads used for heat dissipation in electronics. **Forever Chemical Risk- Due to the complexity of different sources of PFAS in stickers is unknown, work is still ongoing surrounding the risk of perfluorocarboxylates and perfluorosulfonates in PFAS on stickers.**

Time requested 13.5 Years

PFBS as a Clarity Additive; PFBS (and its salts) for the purposes of plastic clarity in flame retarded polymers under 1,000 ppm of the plastic. Flame retardant additives to transparent polycarbonate (and similar materials) tend to create a hazy or opaqueness. The addition of trace levels of PFBS (or its salts) maintains the transparency of the plastic. Transparency and flame retardancy are critical criteria for a number of applications including electronic displays or construction materials. There are currently no effective replacements for PFBS as a clarifying additive for flame retardant transparent plastics. **Forever Chemical Risk- None expected.** Wide spread use, low concentration use, and no suitable replacement.

Time requested 13.5 Years

PTFE Additive in Grease; PTFE as a lubricant additive under 1% concentration not in contact with drinking water as a lubricant additive under 1% concentration for professional applications. PTFE in mineral oil or silicone oil grease has superior lubrication properties compared to mineral or silicone oil alone. PTFE added grease is used in a very wide range of applications, primarily for machinery or other moving parts when lubrication for an extended time period is required. PTFE added grease has both consumer and professional applications. Substitutes / Alternatives-No other material has the same impact as a low friction additive to mineral or silicone oil than PTFE. **Forever Chemical Risk- None expected** Unirradiated PTFE does not normally contain perfluorocarboxylates and is not expected to degrade into perfluorocarboxlates. Irradiated PTFE would not normally be used as an additive in grease, and would be regulated by current POP and REACH restrictions for long chain perfluorocarboxylates. No suitable replacements and very low risk to human health (no forever chemicals).

Time requested 13.5 Years

PTFE, ETFE, PFA, PVDF, and FEP as a wire insulator. Fluoropolymers are commonly used as wire insulation. These materials have excellent electrical insulation and temperature resistance properties. These materials are very important wire insulators in high density/temperature environments such as complex electronics. With the move to chlorine free wiring, and the reduction of PVC wiring (and associated phthalate risks), PTFE (and other fluoropolymer wiring) has been the common choice. Most PTFE (and similar) wiring is internal wiring with very limited exposure to humans or drinking water. Substitutes / Alternatives ; Silicone has similar temperature resistance to PTFE (and similar) wire insulators, but requires greater thickness, and is not suitable for dense applications, contains, on average, over than 100X more forever chemicals than even PFA wire insulation, is likely to be subject to REACH Restriction due to its constituent monomers, and does not hold its shape to the same manner as PTFE (and similar) insulation. **Forever Chemical Risk -None expected for PTFE, FEP, PVDF, and ETFE wire insulation. PFA wire insulation will commonly contain ~100 ppb for each perfluorocarboxylate (PFOA family)** due to degradation of the C-O-C bond in the fluoro side chain. No suitable replacements, very limited human exposure, and wide usage.

Time requested 13.5 Years

PTFE in Low Friction Plastic; PTFE powder is added to another polymer (such as nylon) to reduce friction and wear of the plastic part. PTFE added to low friction plastic parts are generally in applications requiring reduced friction or wear such as a valve or other moving part. The addition of PTFE powder to standard plastics such as nylon reduces the coefficient of friction of the plastic by up to 60%. Used in a wide range of plastic components that turn against the surface of another plastic or metal. PTFE added plastics are commonly used in fluid, gas, machinery, and electronics applications. Fluid and gas uses are generally (but not exclusively) valves and similar components with potential for wear, plastic gears in machinery (including

consumer products), and connectors (with a turn lock type function) in electronics. Substitutes / Alternatives; No other additives are as effective to safely reduce the coefficient of friction of plastics. Restriction of PTFE additives in plastics for friction reduction would reduce the lifetime of many products, resulting in products going to waste or landfall sooner and more often. **Forever Chemical Risk- None expected.** Unirradiated PTFE powder has no forever chemicals. Irradiated PTFE powder is not needed and would be restricted by current PFOA and long chain perfluorocarboxylate restrictions (POP and REACH) in the EU.

Time requested 13.5 Years

PTFE Tape PTFE tape is used primarily to join fluid or gas transporting components. However, PTFE has many uses including wrapping of internal wires in a cable for environmental resistance or sealing joints. PTFE tape is not uniformly one material as it can be manufactured through a skiving process (blade peeling process) or extrusion (extruded into a PTFE rope and then calendered (rolled) into a flat tape). These two processes produce very different materials with very different risks of forever chemicals. **Forever chemicals Risk**-Extruded PTFE tape commonly **contains the entire range of perfluorocarboxylate (PFOA) family lengths** (from at ~ 100 ppb. This is likely from irradiation of the original PTFE powder to improve 'rubberiness' to aid in extrusion and calendering. PTFE tape can be both extruded or skived without forever chemicals, but the majority of extruded PTFE tape currently contains perfluorocarboxylates**.**

Time requested 13.5 Years

PTFE used as an additive drip agent in plastics to meet flammability safety requirements Polytetrafluoroethylene (PTFE) PTFE is the most common fluoropolymer with a wide range of applications. There is a flame retardant additive to prevent 'dripping' of hot plastic during burning. Many plastics, such as ABS and PC, often drip during burning. To meet high flame retardancy ratings, such as UV94 V-O, plastics must not drip when exposed to a flame. PTFE (added up to ~1% concentration) when it burns, forms a 'webbing' preventing the main plastic from burning. More common in plastic housings of electronics requiring high flame retardancy. There are currently no effective replacements for PTFE as an anti-drip additive. Virtually all electronics use PTFE anti-drip agents in one or more parts. Restriction of PTFE anti-drip agents would create a significant safety risk for electronics and require the redesign and re-qualification of safety of virtually every electronic product. **Forever Chemicals Risk Does the use contain measurable perfluorocarboxylates (PFOA family) or perfluorosulfonates (PFOS family) in the finished article. None expected.** Unirradiated and unexpanded PTFE does not contain any PFOA or PFOS family of chemicals. PTFE does not degrade into forever chemicals such as PFOA or PFOS. PTFE does not have the ether bond (C-O-C) that leads to degradation into PFOA related chemicals that can occur in other fluoropolymers (such as fluoroacrylate coatings or PFA polymers). Wide spread use, no suitable replacement, no forever chemicals, and substitution creates a significant safety risk.

Time requested 13.5 Years

PTFE Wire; This listing is for the specific use of PTFE for wiring insulation. Common in low friction applications, or in high temperature applications unsuitable for other materials. Transformer wires are very common uses of PTFE wire. PTFE and fluorosilicone lubricants for internal wires, Fluoro lubricants for internal wires. Hookwires inside cables are commonly lubricated with either a fluorosilicone or PTFE lubricant. Lubrication of the internal wires reduces friction and wear of the cable, improving the flexibility and lifetime of the cable. PCB and it's entities have found the need for lubricants in high temperature environments and they are not replaceable lubricants. **Forever Chemical Risk-None expected.** The trace amount of fluoro lubricant on a wire ~ 100 ppm and no forever chemicals would be measurably present in the wire.

Time requested 13.5 Years

Fluoroelastomers for Seals; Fluoroelastomers (including perfluoroelastomers), fluorosilicone, and amorphous fluoro resins as a sealing material in situations requiring chemical resistance, oil resistance, oxidation resistance, decompression resistance, or high temperature (over 150C). Fluoroelastomers (including perfluoroelastomers), fluorosilicone, and amorphous fluoro resin used as a sealing material. Fluoroelastomers (and similar materials) are important for chemical resistant sealing materials in environments requiring acid resistance, alkali resistance, water resistance, oil resistance, and/or high temperature performance. Without sealing materials that can function in these harsh environments, there is a strong risk for equipment or product failure. Fluoroelastomer seals are used in a very wide range of applications including oil, gas, electronics, medical devices, laboratory equipment, and any other application that requires a rubber seal with strong temperature resistance. Substitutes / Alternatives- No other rubbers have equivalent hydrophobic and oleophobic properties, and chemical safety over a range of temperatures as fluoroelastomers. PTFE has similar environmental properties, but is a plastic and is not suitable for applications requiring the conformity of a 'rubber' seal. Fluoroelastomers also have a higher coefficient of friction than PTFE and create a superior 'seal' in most applications. **Forever Chemical Risk** - Any approval of fluoroelastomers or perfluoroelastomers will need approval of **6:2 FTS fluorotelomer sulfonates (and substances that degrade into 6:2 FTS),** and approval of a **low concentration of short chain perfluorocarboxylates that degrade from 6:2 FTS** . Additionally, approval will be required for low concentrations of residual bisphenol AF crosslinking additives. No suitable replacements, specialized uses, and replacement creates a safety risk.

Claigan Environmental, an independent third party expert with respect to environmental regulatory matters and chemicals, when considering the PCB Companies' products and their composition, and the fact that most of our products are encapsulated, concluded that the risk of creating PFAS in drinking water for humans is **very low**.

Claigan Environmental's report (submitted as a separate comment by Claigan Environmental to this public consultation) lists the following general risks associated with PFAS:

Very High risk

Fluoroalkyl phosphates

Examples - cosmetics

High risk

Fluoroalkyl acrylates (external)

Examples - fluoroacrylates in clothing

Low risk

Fluoroalkyl acrylates (internal)

Examples - fluoroacrylates internal to electronics

PFA, fluoroelastomers, perfluoroelastomers, irradiated PTFE, ePTFE,

Examples - electronics wiring, professional seals, water membranes, and other applications of the materials above.

No risk

PTFE (standard - unirradiated)

Examples - cookware, PTFE seals

PVDF, ETFE, FEP

Examples - fluid transport components

PFAS are used in PCB Companies' products because of their unique properties. Examples of these unique properties that make PFAS particularly useful in PCB Companies' products include the following:

-Chemical stability: PFAS are resistant to chemical reactions and degradations which allow them to have increased stability over time

-Thermal Stability: PFAS-containing products can withstand high temperatures without degrading

-Low Surface Tension: PFAS are repellant to liquids and help create nonstick surfaces

-High Thermal and Electrical Insulation: PFAS are useful in electrical components and thermal insulation applications

-Dielectric strength: PFAS offer higher dielectric strength and better insulation properties for high voltage and high-speed applications

The PCB Companies are committed to continuously improving the environmental performance and safety of all products placed on the market. We are committed to replacing PFAS in products and processes where feasible and in a responsible manner. Due to the widespread and varied nature of PFAS used in electronics in performance materials, broad generalizations on alternatives are not reasonable or valuable to eliminating these substances in products. Replacement of these substances must be undertaken on a case-by-case basis as they are selected for their specific properties that ensure product reliability, safety, and efficiency. For most uses of PFAS in PCB Companies products, there are no drop-in solutions which provide the same properties as PFAS-containing materials. Because of this, more research must be conducted on alternatives based on use case and industry must have more time to investigate alternatives. The use of PFAS in electronics materials is currently necessary for the key functionalities and properties it provides.

The PCB Companies respectfully request a derogation for the above PFAS products. We have identified many uses of PFAS in multiple electronic materials, intermediate products, our assemblies, and our final products that need a 12-year derogation (in addition to the 18-month transition period). Differentiating specific uses and exploring non-PFAS options is our ongoing plan. As noted above, many individual parts go into our thousands of products, and PFAS currently is an unavoidable substance to making our products function properly. We request a workable transition time to mitigate unintended consequences and continue to aim for the EU's sustainable goals.

Exhibit A

This derogation request is submitted on behalf of PCB Piezotronics, Inc., Depew, NY, a New York (USA) corporation together with its direct and indirect subsidiaries, including the following entities:

PCB Piezotronics of North Carolina, Inc., Halifax, NC, a Delaware (USA) corporation

Accumetrics, Inc., Schenectady, NY, a New York (USA) corporation

The Modal Shop, Inc., Cincinnati, OH, an Ohio (USA) corporation

PCB Piezotronics GmbH, Huckelhoven, Germany, a German company with limited liability

PCB Piezotronics Srl, Treviolo/BG, Italy, an Italian limited liability company

PCB Piezotronics Sensor Technology (Beijing) Co., Ltd, Beijing and Shanghai, China, a limited liability company formed under the laws of the Peoples Republic of China

PCB Piezotronics S.A., Saint Aubin, France, a limited company formed under the laws of France

PCB Piezotronics Limited, Hertfordshire, UK, a UK limited liability company

PCB Piezotronics B.V., Zaventem, Belgium, a Belgian private limited company

Dalimar Instruments ULC, Quebec, Canada, a Canadian unlimited liability company