

Public comment for PFAS restriction about the high-speed interface cable

- 1. USB**
- 2. Thunderbolt**
- 3. Virtual Reality**

Comments

Our company have been actively working to comply with chemical regulations in various countries. Furthermore, we support the ambitious efforts of the European Union (EU) to reduce risks posed by hazardous substances and have earnestly taken measures to meet the requirements of EU chemical regulations such as REACH. In addition we would like to emphasize that from an environmental and health perspective, we are fully committed to replacing PFAS in our products.

However, there are no alternatives available for some applications that are essential to society. Therefore, we suggest an exemption for some essential uses.

High-speed I/F cables mainly used for connecting PCs and their peripheral devices (displays, storage), etc., and for connecting VR devices such as head-mounted displays (HMD). These cables require low dielectric property, thin extrudability and flame retardance and there is no alternative material to meet these all characteristics.

If these cables do not work properly, they affect to the risk that are slow down data transfer speeds, blur images, and potentially catch fire.

To avoid these risks, we need to continue to use Fluorine insulation wire for high-speed I/F cable.

High-speed I/F cable(USB/TBT/VR)

■ Usage

High-speed I/F cables mainly used for connecting PCs and their peripheral devices (displays, storage), etc., and for connecting VR devices such as head-mounted displays (HMD). The cable consists of a multi-core cable and uses FEP/PFA for the insulation of each coaxial line/insulated line inside.



Cable Diameter: 2.0~5.0mm
Number of cores : 10C~30C

■ Disposal method

High-speed I/F cables are discarded as general household waste.
Estimated world PFAS use : about 216t/year
Estimated EU PFAS use: about 55t/year

High-speed I/F cable(USB/TBT/VR)

Required material properties	Reason
• Low dielectric • Low loss tangent	For achieving GHz-level high-speed transmission., and it is essential to use materials with low dielectric constant and low dielectric loss tangent. If the material properties deteriorate, the transmission performance may deteriorate and accurate image transmission may not be possible.
• Thin extrusion (small diameter)	High-speed I/F cables are important for ease of handling, and for this reason, cable diameter reduction is required. In order to reduce the diameter, it is necessary to make each signal line thinner, and thin insulation extrusion of FEP and PFA is essential.
• High flame retardance	Flame retardancy is a very important safety parameter, especially for high-speed transmission lines wired in equipment. It is very important to use PFA and FEP as insulating materials, which are the dominant factors that determine the flame resistance of wires.

High-speed I/F cable(USB/TBT/VR)

-	PFAS		PFAS Alternatives in the Proposed Restrictions						
Materials	FEP	PFA	EPDM	Silicone	PEEK	Mica	Polyvinyl chloride	Polyethylene	Ceramic Based
Dielectric constant (ϵ)	2.1	2.1	>2.5	>3.5	3.4	>4.5	>2.8	2.3	>4.0
Loss tangent ($\tan\delta$)	<0.0002	<0.0002	-	0.001~0.02	0.0035	0.01~0.02	0.01~0.1	<0.0005	0.0005~0.003
Thin extrusion	Good	Good	Poor	Poor	Poor	Poor	Poor	Poor	Poor
Flame retardance (OI)	>95	>95	30	26~32	38	-	28~38	18~19	-

Fluorine is the only material that satisfies all the required properties