

Public comment for PFAS restriction about the automotive wire

Several thin, parallel white lines are drawn diagonally across the right side of the slide, starting from the top right and extending towards the bottom left.

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.

Automotive wire receive heat and vibration from the motor or engine. So bending characteristics, heat resistance, chemical liquid resistance and elongation is required for fluorine insulation wire of automotive.

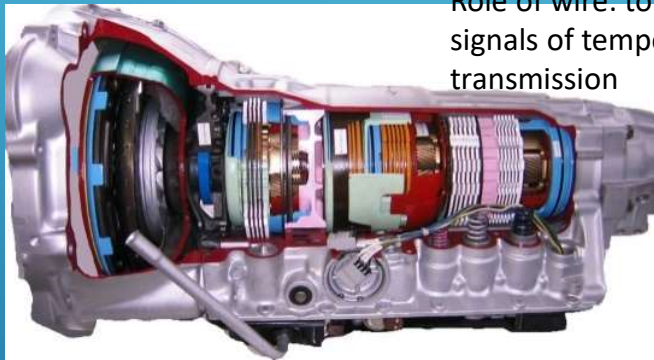
There is no alternative material to meet these all characteristics.

Automotive wire is used for to transmit signals and electricity. If these wire doesn't perform, there is life-threatening risk. To avoid these risks, we need to continue to use Fluorine insulation wire for automotive.

Fluorine insulation wire (FKM, PVdF, TFE-P, ETFE, and so on)

Example:

Transmission (AT/CVT) temperature sensor



Role of wire: to transmit the signals of temperature in transmission

Transmission is located between the shaft of engine and the shaft of wheel. Transmission is consisted of combination of different size gears and shift power of the engine to appropriate torque and rotational speed.

AC generator



Role of wire: to transmit the power to the rectifier to change AC to DC

Wire length
100~1000mm per circuit

Power of engine is utilized for producing AC and AC is converted to DC to deriver the battery. AC generator is located near the engine.

Requirement specification for wire

To reduce abrasion and temperature, these wire is used near the engine with engine oil, ATF or etc. immersed or attached.

➡High temperature resistance and liquid resistance is necessary. In the environment of high temperature and liquid chemicals the insulation shall not be fractured.

➡Wire is routed with wire bended and the vibration of the engine affects the wire.

Elongation of insulation and vibration characteristics is necessary to avoid to break the conductor.

Impact

transmission : Vehicle drives slower because the rotation of engine doesn't transmit the wheels. If traffic accident happens, it is possible to lose someone's life.

AC generator : The AC generator doesn't apply power for the battery and the vehicle is slow down. If traffic accident happens, it is possible to lose someone's life. Especially the vehicle will shift EV, the importance will become stronger.

Requirement characteristics and candidates

Characteristics	requirement	candidates
Heat resistance	To assure the elongation in high temperature atmosphere. Lower heat resistance has risk that insulation fracture occur	No candidate
Elongation	To assure the initial elongation. Lower elongation has risk that insulation fracture occur in routing and bending wire.	Silicone elastomer
Vibration characteristics	To require no conductor break in the environment in engine room. It has risk break of conductor because of the vibration.	No candidate
Liquid chemical resistance	To assure the insulation characteristics with wire immersed or attached.	PEEK

Typical material characteristics

	TFE-P	ETFE	PEEK	silicone	Poly-ethylene	Poly-vinyl chloride
Heat resistance	200°C OK	200°C OK	260°C NG(※1)	180°C NG	120°C NG	100°C NG
Elongation	300% OK	300% OK	50% NG	100~500% OK	100~3000% OK	100~3000% OK
Liquid chemical resistance	OK	OK	OK	NG	NG	NG
Judge	OK	OK	NG	NG	NG	NG

(※1) Peek has less elongation to use insulation of wire.

There is no candidate to meet all requirement specifications.

Exhaust in the life cycle of wire

To remove conductor and crush to pieces

Quantity of Fluorine material

Considering our fluorine wire production volume and market share in Europe, the emission is 1 tons.

Economical impact

The price of PEEK wire will increase to 4 times as that of Fluorine wire.

The impact will be 5,00 million yen per month for our customer.