Tube PU polyurethan antistatic

Technical data:

Standard tube color is black.
Temperature range: -30˚C to +80˚C.
The length in the package is 50 m.

Outside diameter ∅ D mm	Inside diameter ∅ D mm	Min. bending radius	Max. pressure at 20˚C [MPa]	Order codes
4	2,5	9	3,4	PUN 4X2,5 ANTISTAT
6	3,9	15	3,3	PUN 6X4 ANTISTAT
8	5,7	28	2,2	PUN 8X6 ANTISTAT
10	7,5	35	2,2	PUN 10X8 ANTISTAT
12	9	50	2,2	PUN 12X9 ANTISTAT

With temperature the pressure changes as follows:

∅ D	20˚C	30˚C	40˚C	50˚C	60˚C	70˚C	80˚C
4	100%	79%	71%	59%	47%	45%	41%
6	100%	82%	73%	61%	48%	42%	36%
8	100%	91%	73%	71%	64%	55%	45%
10	100%	91%	73%	64%	55%	45%	44%
12	100%	73%	68%	54%	55%	41%	40%

Notice

More information such as safety instructions and manufacturer‘s declaration can be found on our website www.sappv.cz/r/10-13a

Electrically conductive special tubes are used where it is necessary to prevent the formation of a static electric charge. They are used mainly in the production of electronic components, in paint shops, in environments with a risk of explosion, in mining. The tubes are made of polyether polyurethane, are highly antistatic, have a surface resistance of $<10^6 \Omega$ and have very good UV resistance. The tube can also be used for vacuum, while the minimum bending radius must be increased by approx. 20%. If the tube is used in environments with a risk of explosion, it is necessary to observe the conductivity of the entire system, i.e. use metal fittings with metal sealing rings.

Safety instructions:

Only qualified personnel who are familiar with assembly, commissioning and operation may install the tubes.

Environmental conditions in the area of use

The given data apply to hoses that are intended for use in an environment with a risk of explosion under atmospheric conditions. This applies to an ambient environment with a pressure from 0.08 MPa to 0.11 MPa, a temperature from -20 °C to +60 °C and for air with a normal oxygen content, usually 21% (v/v). The prerequisite for this is that all parts and connecting parts withstand the mechanical, thermal and chemical stress to which they are exposed during their expected service life. The connecting parts must be designed in such a way that the level of protection against explosion is not reduced by the connection. Hoses made of conductive or dissipative (semi-conductive) material are referred to as Ω-hoses. During the test, the Ω resistance of the hoses between the terminals must not exceed $10^6 \Omega$ along the entire length. The most important protective measure is to connect and ground all conductive parts that could become dangerously charged. However, if non-conductive parts and materials are present, this protective measure is not sufficient. In this case, it is necessary to prevent dangerous discharges from non-conductive solids, liquids and dust.

Liquid flow

When liquid flows through a hose, electrical charges of opposite polarity appear on the inner wall of the hose and in the liquid. The amount of charge created mainly affects the surface resistance of the hose, the conductivity of the liquid and the flow rate. The amount of charge produced by the liquid increases with the size of the existing interfaces, e.g. at walls, and with the velocity of the flow. Furthermore, in immiscible phases, e.g. in dispersions or liquid/liquid mixtures, the charge increases significantly. Since liquids with low conductivity can be charged more strongly than liquids with high conductivity, liquids are classified for the purpose of selecting appropriate measures according to their conductivity K as follows: low conductivity: $K \leq 50$ pS/m; average conductivity: 50 pS/m $< K \leq$ 10 000 pS/m; high conductivity: 10 000 pS/m $< K$. Hazardous charge generation occurs particularly easily in liquids with low conductivity. For liquids with medium conductivity, charge formation is possible during flow through pipes, hoses and filters, as well as during mixing. For liquids with high conductivity, it is necessary to deal with dangerous charges only in processes that generate strong charges, e.g. when spraying or when the liquid is not in contact with the ground. The flow must be designed to prevent any significant splashing of the escaping liquids. The breaking up of a liquid stream into small droplets can create highly charged liquid streams or mist, regardless of the conductivity of the liquid.
Additional measures:
All conductive materials, equipment and objects must be grounded and all must be conductively connected to earth. Individual hose lines made of conductive or dissipative material must be conductively connected to each other and grounded. Conductive pipes can become very highly charged when using a liquid with low conductivity. To limit the formation of an electrostatic charge, the flow rate in the system should be limited to safe values, e.g. by choosing a larger hose diameter. This is especially important when handling flammable liquids and when filling and emptying containers.

Flow of solid particles or liquid droplets

If solid particles or dust are flowing through the hose (pneumatic transport), an electric charge can be expected. The movement of pure gases or gas mixtures creates no electrostatic charge. However, if the gas stream contains solid particles or liquid droplets, these and all affected system parts and objects can become charged. Processes that can lead to significant electrostatic charges include pneumatic conveying, release of compressed gas containing solid or liquid particles, and leakage of liquid carbon dioxide. Such processes can lead to the ignition of spark discharges, to brush discharges and sliding discharges, or to mass cone discharges. The charging of the particles themselves cannot be avoided. In addition to avoiding insulating materials, the following measures are suitable for preventing dangerous charges:
- removal of particles or droplets,
- selection of sufficiently low flow rates,
- selection of suitable nozzle geometry to reduce filling density,
- the use of conductive objects or equipment that must be grounded

The most important protective measure is the grounding of all conductive parts of the equipment, that is, the hose must not be electrostatically isolated by installing non-conductive spacers.

All conductive parts of the device must be assembled in such a way that no dangerous potential differences can arise between them. If there is a possibility that insulated metal parts may become charged and thus act as a source of ignition, earthing must be provided.

A statement is available declaring that these hoses have an antistatic design with a surface resistance of $\leq 10^6 \Omega$ and are designed and suitable for use in potentially explosive atmospheres. Since hoses are not considered equipment, protective systems or components within the meaning of Directive 2014/34/EU, the manufacturer of such equipment or systems must check the conformity of equipment or systems covered by Directive 2014/34/EU. The suitability of the above hoses for use in equipment or systems in potentially explosive atmospheres has been demonstrated by the manufacturer in a technical report from TÜV SÜD Product Service GmbH. The following test specifications were used during the test: DIN EN ISO 80079-36:2016; DIN EN 1127-1:2011; TRGS 727:2016. The statement does not exempt the user and processor of the PU polyurethane antistatic hose PUN ... ANTISTAT from requesting approval of the intended use from the relevant institution.