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PTFE PRODUCTS
HEALTH AND SAFETY DATA

Our product codes: M700, M720, M725, M770, M780, M790

DESCRIPTION

Polytetrafluoroethylene (PTFE) is formed mainly from Thermoplastic Flurocarbons, PTFE Threadseal and cord are pure virgin PTFE resin. In some cases it will be sodium etched to receive a hot melt rubber based adhesive.

Primary routes of potential exposures:

INHALATION

The health risk from PTFE relates to possible inhalation of decomposition products. At temperatures in excess of 260°C the polymer will progressively decompose and give rise to a number of gases including tetrafluoroethylene (from 430°C), hexafluoropropylene (440°C) and perfluoroisobutylene (from 475°C). In some manufacturing operations involving extended exposure at 400°C, carbonyl fluoride is known to be the main decomposition product which, in the presence of moist air is rapidly converted to the highly corrosive hydrogen fluoride. A complex particulate substance is also known to be formed from the decomposition of PTFE at temperatures above 350°C which is thought to be the cause, inhaled of development of a characteristic syndrome with influenza-type features (fume fever). The latter usually manifests itself within a few hours of exposure but the characteristics usually subside within 48 hours with no after-affects. Some of the products from higher temperature decompositions of PTFE (e.g. perfluoroisobutylene) are highly toxic *(reference 1)*.

SKIN CONTACT

No skin problems should arise from the handling of PTFE-containing products referred to above but good occupational hygiene practices should be observed when such materials are being handled. The possible contamination of tobacco with PTFE should be avoided as smoking is then a possible cause of the fume fever referred above.

We recommend a no smoking storage area for large quantities of PTFE. In any event, when handling PTFE glass cloth (adhesive or non-adhesive) face masks and gloves should be worn as glass fibre is a skin irritant.

CARCINOGENICITY

PTFE has not been classified by the International Agency for Research on Cancer and does not appear in the list of substances cited in the US Fourth Annual Report on Carcinogens (summary 1985) under the headings “Substances that may reasonably be anticipated to be carcinogenic”.

OCCUPATIONAL EXPOSURE LIMITS

In the ACGIH booklet *(reference 2),* reference is made in Appendix B to PTFE decomposition products. Although it is recognised that such products decompose in part by hydrolysis in alkaline solution and can therefore be quantitatively determined in air as a fluoride to provide an index of exposure, no TLV is recommended pending the determination of the actual toxicity of the products. However, it is stated that the air concentration should be minimal.

With regard to PTFE glass cloth, dust emissions are only likely to arise from being subjected to harsh mechanical treatment (e.g. high speed cutting, stamping operations or the use of abrasive tools).

Where it is considered possible that the work being carried out might give rise to dust levels above exposure limits, airborne dust tests should be undertaken.

FIRE & EXPLOSIVE

PTFE is basically non-flammable (it has a Limiting hazards Oxygen Index of 95). If a flame is applied to the surface of PTFE it will ignite because of the formation of gaseous decomposition products but combustion ceases when the flame source is removed.

In a sustained fire involving PTFE products, fire-fighters must wear approved forms of breathing apparatus.

DISPOSAL

Because PTFE decomposes at high temperatures to give toxic products, any scrap or waste material must always be disposed of by an approved method of dumping, rather than incineration. To ensure this, it is good practice to keep PTFE waste in separate containers and not to mix it with other rubbish. As far as is known, PTFE is biologically inert and so may be safely disposed of by burying.

References

1. Technical service note F10 published by ICI “Health and safety aspects of “Flour” polytetrafluoroethylene”
2. ACGIH booklet. “Threshold Limit Values and Biological Exposure Indices for 1987/88”