

Request for Exemption from PFAS Restrictions for PTFE Thread Sealing Tapes

PTFE thread sealing tape

PTFE thread sealing tape, with its unique properties, has made it highly sought after in a variety of industries. Derived from polytetrafluoroethylene (PTFE), PTFE thread sealing tape is water resistant and highly resistant to high temperatures. The heat resistance of PTFE thread sealing tape allows it to withstand extreme temperatures, making it well suited for applications involving heat sealing equipment, piping, automotive and electrical systems. In fact, PTFE temperature-resistant thread sealing tape not only has excellent temperature resistance, it also has the following properties chemical resistance, non-reactivity, pressure resistance, low friction and inertness. As a result, PTFE thread sealing tapes are resistant to a wide range of chemicals, acids, alkalis and solvents, preventing corrosion and chemical interactions within a pipeline or fluid transfer. In addition, their resistance to high pressure makes them ideal for demanding applications such as fuel injection systems. The low coefficient of friction of the tape facilitates easy assembly and disassembly of threaded connections, thereby reducing the risk of thread damage or connection damage. Because PTFE thread sealing tapes are inert, they are also safe for food and beverage applications (Hillsirrigation, 2020).

PTFE thread sealing tapes are made from PTFE, which is classified as a PFAS in terms of molecular structure, but PTFE is a polymer characterized by high molecular weight and narrow molecular weight distribution. Unlike other PFAS non-polymers, PTFE does not degrade into hazardous substances, nor does it cause the environmental persistence and bioaccumulation associated with similar PFAS non-polymers (Barbara J Henry, 2018). Therefore, PTFE should not be regulated uniformly by the PFAS restriction and should be exempted from the PFAS restriction.

Possible Alternatives:

Thread sealants and pastes (Pipe Dope) are used to ensure effective sealing of threaded pipe connections.

Compared to PTFE thread sealing tape, thread sealants and pastes have the following disadvantages.

1. Thread sealants and pastes are more complicated to apply, requiring a brush or other tool to apply them evenly to the threads, which requires some experience and skill.
2. Thread sealants and pastes are messy to apply, can drip and require additional cleanup.
3. Thread sealants and pastes require time to cure and set.
4. Thread sealants and pastes can react chemically with the pipe, which can lead to corrosion or cracking (Hunter, n.d.).
5. Thread sealants and pastes applied singly may leak due to uneven application by the workforce.
6. Thread sealants and pastes are not reusable and require cleaning of sealant residue from the original threads during the second application.
7. Thread sealants and pastes are hazardous to human health and the environment:

They may pose an immediate and long-term hazard to human health and the environment due to the potential release of their chemical components during use and disposal. The

following are some of the significant hazards associated with thread sealants and pastes:

Hazards to humans:

Many thread sealants and pastes contain volatile solvents and chemical compounds, such as (acrylic polymers) that can irritate the skin and eyes on contact. (Argco, n.d.) Inhalation of vapors or aerosols from these products can also cause respiratory irritation, coughing and difficulty breathing (Shuai, 2018).

In addition, thread sealants and pastes are formulated with volatile organic compounds (VOCs) that can contribute to indoor air pollution and cause adverse health effects, including headaches, dizziness, and nausea (Xiangmei (May) Wu, 2015). Some thread sealants and pastes may also contain carcinogens including toluene and p-phenylenediamine that can increase cancer risk with repeated exposure over time. (Hercules, n.d.)

Since chemicals inevitably seep into pipes when using thread sealants and pastes, the seepage of chemical compounds into drinking water can be directly responsible for serious harm to humans if used on a referenced water line.

Environmental Hazards:

If thread sealants and pastes are not used or managed properly, they can enter and contaminate groundwater and soil. This can result in toxic substances that can harm aquatic organisms, disrupt ecosystems and reduce biodiversity.

Volatile Organic Compounds (VOCs) released into the air can cause smog formation and reduce air quality (EPA, 2023).

Conclusion

In conclusion, there is no equivalent alternative to PTFE thread sealing tape, which is a cleaner, safer and more efficient option, especially as a non-permanent seal, with far greater convenience. The unique properties of its PTFE high molecular weight polymer stand out, and the risk of degradation to hazardous substances is minimal. Unlike other PFAS non-polymers, PTFE does not contribute to environmental persistence or bioaccumulation; potential environmental and health risks associated with alternatives are also minimized. In summary, we request an exemption from the PFAS restriction for PTFE thread sealing tapes due to their unique properties. This allows industries to continue to take advantage of the benefits of PTFE thread sealing tapes while also maintaining environmental integrity and public health.

References

- Argco. (n.d.). Retrieved from MATERIAL SAFETY DATA SHEET: http://www.argco.com/pdf/MSDS/SuperDope_MSDS.pdf
- Barbara J Henry, J. P. (2018, 2 09). *A critical review of the application of polymer of low concern and regulatory criteria to fluoropolymers*. Retrieved from <https://setac.onlinelibrary.wiley.com/doi/10.1002/ieam.4035>
- EPA. (2023). *Volatile Organic Compounds' Impact on Indoor Air Quality*. Retrieved from <https://www.epa.gov/indoor-air-quality-iaq/volatile-organic-compounds-impact-indoor-air-quality>
- Hercules. (n.d.). *Hercules Megaloc*. Retrieved from file:///C:/Users/admin/Downloads/raw_02_Hercules_Megaloc_SDS_00396203%20(1).pdf
- Hillsirrigation. (2020). Retrieved from www.hillsirrigation.com.au: <https://www.hillsirrigation.com.au/when-not-to-use-teflon-tape-4-times-to-think-before-you-wrap/#:~:text=PTFE%20is%20short%20for%20polytetrafluoroethylene,jobs%2C%20such%20as%20irrigation%20contractors>.
- Hunter. (n.d.). *WHAT ARE THE EFFECTS OF PIPE DOPE ON ABS PLASTIC?* Retrieved from <https://www.hunterindustries.com/en-metric/support/what-are-effects-pipe-dope-abs-plastic>
- Shuai, J. K. (2018). *Health risk assessment of volatile organic compounds exposure near Daegu dyeing industrial complex in South Korea*. *BMC Public Health* 18, 528 (2018). Retrieved from BMC Public Health: <https://bmcpublihealth.biomedcentral.com/articles/10.1186/s12889-018-5454-1#citeas>
- Xiangmei (May) Wu, a. Z.-S. (2015, 2 9). *Exposures to volatile organic compounds (VOCs) and associated health risks of socio-economically disadvantaged population in a “hot spot” in Camden, New Jersey*. Retrieved from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4321696/>