

Resitape S.r.l.'s comment on ECHA public consultation regarding potential restrictions on per- and polyfluoroalkyl substances (PFAS)

Confidentiality

All the documentation, information and knowledge in this document is obtained from public sources and/or internal knowledge and know-how made available to the public.

Scope

The scope of this publication is to advocate the need to differentiate the current restriction proposal on Per- and polyfluoroalkyl substances (PFAS) by ECHA as per Annex XV report. The aim is to demonstrate that since at least part of the substances subject to the restriction proposal do not exhibit the chemical properties associated with “dangerous” PFAS compounds, there is an absolute necessity to properly discriminate them from the restriction proposal.

Would it make sense to ban ethanol in foods because it belongs to alcohols -which comprises toxic methanol? - Would it make sense to ban Vanillin because it belongs to the same family of chemicals of Formadehyde (aldehydes)?

Proportionality and transparency are key principles at the heart of ECHA decisions, so the aim of this publication is to rely on those principles to advocate for a differentiation in the scope of the restriction, setting fluoropolymers apart.

In particular, we will bring valuable insights about some of the critical functions and roles of fluoropolymer in the modern society. Resitape is involved in the transformation of PTFE (polytetrafluoroethylene) -fine powders in particular-, for products related to the cable industry, medical applications and thread sealing business. Resitape was founded in 1962, is headquartered in northern Italy and accounts around 60 employees.

Executive Summary

This executive summary provides an overview of the safety and significance of fluoropolymers (which are considered a subgroup of PFAS according to the current proposal of restriction) in various applications, highlighting their importance and countering the proposed ban on all existing PFAS substances. Fluoropolymers have demonstrated their safety and reliability over time, making them essential in industries such as cables, thread sealing, filtration, and medical applications.

Fluoropolymers possess numerous inherent safety features that make them suitable for a wide range of applications. Their exceptional biocompatibility allows for their use in medical prostheses without adverse effects. Additionally, fluoropolymers are non-bioaccumulative, minimizing their impact on the environment compared to other PFAS. These characteristics position fluoropolymers as polymers of low concern (PLC) under OECD definition, highlighting the low risks associated with their usage.

The physical properties of fluoropolymers play a critical role in their suitability for various applications. Their resistance to acids ensures their compatibility with corrosive substances, making them indispensable in industries that handle such materials. Moreover, fluoropolymers, particularly polytetrafluoroethylene (PTFE), are well-suited for contact with pure water, further expanding their utility in sectors requiring high-purity conditions.

Alternative materials often fall short in replicating the unique features of fluoropolymers. Substitutes often lack the same combination of physical properties, rendering them inadequate or less efficient replacements. These shortcomings reinforce the necessity of fluoropolymers in industries where their unparalleled characteristics are vital for safety and performance.

The ban on fluoropolymers would have far-reaching consequences, particularly for the European Union (EU) industry. The EU's technological leadership and the progress towards environmental goals, such as the green deal, could be severely compromised. The integrated value chain of fluoropolymers in high-technology industries would face

substantial downsizing or complete elimination, resulting in significant job losses and unemployment in various EU regions. Furthermore, the EU risks losing skilled workers and the associated expertise, impacting its competitive edge in innovation.

Promoting technological progress and fostering innovation should be paramount. A blanket ban on fluoropolymers without sufficiently assessing alternatives could hinder the development of advanced solutions. It is important to consider the level of concern associated with different PFAS substances and implement a step-by-step approach to banning them as viable alternatives become available. Striking a balance between control measures, environmental regulations, and proportionate actions would ensure progress without unduly impeding technological advancements.

A global perspective is crucial when addressing the issue of PFAS substances. A coordinated effort among countries is necessary to prevent the displacement of pollution from one region to another. Rather than a complete ban, efforts should be focused on refining control and environmental regulations, ensuring responsible use of fluoropolymers while minimizing their potential impacts.

In conclusion, fluoropolymers have established themselves as safe materials through their biocompatibility, non-bio-accumulative nature, and low environmental dispersion. They possess critical physical properties required in a wide range of applications, for which suitable alternatives are currently unavailable. The proposed ban on fluoropolymers would have severe repercussions, endangering the EU's technological leadership, causing significant job losses, and impeding technological progress. Instead, a balanced approach, considering the specific concerns associated with PFAS substances, should be adopted to safeguard safety while fostering innovation and sustainability.

1 Introduction: restriction implications and legal grounds

Under the legal framework of the EU's REACH Regulation, the European Chemicals Agency (ECHA) assesses restriction proposals for substances based on specific criteria outlined in Article 69. The conditions that must be evaluated include whether the

substance poses an unacceptable risk to human health or the environment, whether the risks are not adequately controlled, and whether restriction is the most appropriate measure to address the identified risks. ECHA ensures that the proposed restrictions adhere to the principles of proportionality and transparency, considering scientific evidence and conducting consultations with stakeholders.

However, the restriction proposal based on ECHA's current definition of Per- and polyfluoroalkyl substances (PFAS) encompasses an estimate of over 10.000 compounds, making it one of the most comprehensive bans on chemicals ever. No other Country or State in the world have proposed similar bans in terms of extent for the time being. It is highly doubtful that a generalized ban of over 10.000 compounds with extreme sub-differences within the different members of the PFAS family of chemicals is proportionate to the benefits and key roles these compounds bring to the modern Society.

2 Human safety as a key driver to set Fluoropolymers apart from other PFAS compounds

ECHA Annex XV reference: §1.1.4

The safeness of fluoropolymers has been widely documented in the years (Henry, Carlin et al. 2018, Korzeniowski, Buck et al. 2023). These are only some of the numerous publications regarding the safeness of Fluoropolymers. Among others, it is useful to remind that existing literature on fluoropolymers highlights important properties such as inertness, insolubility, thermal stability, chemical and biological stability, non-mobility, non-bioavailability and absence of bioavailability. In fact, fluoropolymers are often key components of medical devices and implants used by millions of people worldwide.

In reference to Annex XV's §1.1.4 it appears that often, such as in figure 4, there is an extreme generalization of PFAS properties. As mentioned, there is extensive research that underlines the safeness of fluoropolymer in contact with human body or even in case of ingestion. In fact, not only PTFE is used in critical implants which are exposed 100% of the time to human contact, but has also been proposed as an additive to increase the volume of meals to treat obesity, based on its inertness and intrinsic properties (AbuRahma, Robinson et al. 2000, Naftalovich, Naftalovich et al. 2016).

Of course, health safety comes among a more comprehensive set of concerns regarding PFAS substances, however given the intrinsic safety of at least a consistent subset of PFAS compounds, it is widely arguable that a global restriction would outbalance the dramatic impact this would have on the European Society.

Direct examples of safety on PTFE products are also corroborated by toxicity tests that PTFE products are required or eligible to pass. In particular, direct examples of certificates and standards that certify Resitape products for contact with potable include:

- EN751-3:2022
- DIN 30660
- UBA KTW
- AS/NZS 4020:2018
- KIWA ATA/Watermark
- WRAS
- BS7786:2006

Given the amount of available information regarding the safeness of fluoropolymers in relation to human health, we think it is pointless to repeat ourselves when public studies are abundant and confirmed by reputable organizations which classifies substances such as PTFE in “Group 3 – [...] *is not classifiable as to its carcinogenicity to humans*” (International Agency for Research on Cancer, WHO)

Having assessed the safety of at least part of the PFAS group proposed as per current ECHA’s definition, we then believe that it would be overproportionate to propose a indiscriminate restriction towards the entire category, also in view of the consideration that will be set forth in the following chapters of this commentary.

3 The importance of Fluoropolymers in the cable industry

ECHA Annex E reference § E.2.11.

ECHA Annex XV reference § Table 8 R01

3.1 Considerations on fluoropolymer properties

Fluoropolymers play a vital role in the cable industry due to their exceptional electrical, thermal, and chemical properties. Their unique characteristics make them highly desirable for a wide range of applications where reliable performance and durability are critical. In this explanation, I will provide a detailed overview of the fundamental need for fluoropolymers in the cable industry, supported by scientific evidence.

Electrical Insulation:

Fluoropolymers, such as polytetrafluoroethylene (PTFE), have excellent dielectric properties, making them ideal for electrical insulation in cables. Their high dielectric strength allows for efficient power transmission without electrical leakage or breakdown.

Thermal Stability:

Fluoropolymers exhibit outstanding thermal stability, enabling them to withstand high temperatures without degradation. This property is crucial in cables that operate in extreme conditions, such as aerospace and automotive applications.

Chemical Resistance:

Fluoropolymers have exceptional chemical resistance, which is a critical requirement in cables exposed to harsh environments or corrosive substances. They can withstand exposure to acids, bases, solvents, and other chemicals without deteriorating or losing their mechanical properties.

Low Friction and Lubricity:

The low-friction properties of fluoropolymers, particularly PTFE, make them advantageous for cable jacketing materials. These polymers reduce the coefficient of friction, facilitating smooth cable installation and minimizing wear and tear during cable routing.

Environmental Stability:

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Fluoropolymers possess remarkable resistance to environmental factors, including UV radiation, moisture, and weathering. This attribute ensures the long-term stability and reliability of cables in outdoor and exposed conditions.

Fire Resistance:

Fire safety is a critical consideration in the cable industry. Fluoropolymers offer inherent flame resistance and low smoke emission properties. They have a high Limiting Oxygen Index (LOI), meaning they require a high concentration of oxygen to support combustion. Other advantages include flame retardancy and low smoke generation, which are extremely desired features in extreme conditions such as in the aerospace applications.

Scientific evidence and industrial use of fluoropolymer despite the extremely higher economic cost compared to cheaper solutions such as PVC provide substantial evidence for the fundamental need of fluoropolymers in the cable industry. Their unique combination of electrical insulation, thermal stability, chemical resistance, low friction, environmental stability, and fire resistance make them indispensable for achieving high-performance cables that meet the stringent requirements of modern applications.

Furthermore, it is worth to point out at a key feature of fluoropolymers: their synergistic Effect of Properties: while other materials may demonstrate some of these properties individually, fluoropolymers offer a synergistic effect, where the combination of these properties enhances overall cable performance.

Compatibility and Integration: Fluoropolymers can be easily integrated into cable designs and systems due to their compatibility with other materials. They can be used as insulation, jacketing, or protective layers, working in conjunction with conductive materials and other components in cables. This compatibility and integration contribute to the overall performance and reliability of the cable system.

Comprehensive Solution: Fluoropolymers provide a comprehensive solution to meet the diverse requirements of cable applications. The combination of properties offered by fluoropolymers, such as wide temperature range, excellent dielectric performance,

chemical resistance, low friction, environmental stability, and fire resistance, ensures that cables can withstand demanding operating conditions and provide reliable performance over extended periods.

In conclusion, fluoropolymers stand out in the cable industry due to their unique combination of properties, the synergistic effect of those properties, compatibility with other materials, and the comprehensive solution they offer. There is wide literature confirming the crucial role of fluoropolymers in ensuring the highest level of safety in cable manufacturing even when it comes to comparing them with halogen-free compounds (James J. Henry, Dave Seiler et al.).

3.2 Potential alternatives

Regarding potential substitutions, it is useful to analyze one-by-one drawbacks of the alternatives. The Annex XV reports suggest a full ban based on the absence of data. We aim to provide useful insights on this topic. First of all, it is relevant noting that although an alternative material may prove to be satisfactory under one specific physical parameter, it is extremely difficult to find an alternative that features the aforementioned synergistic effect (i.e. exhibiting all the features simultaneously).

PEEK, PC and EPDM are cited in Annex XV as potential substitutes. But this may prove to be only partly true.

Material	Chemical Resistance	Melting Point	Max. Operating Temperature	Flexibility	Abrasion Resistance
PTFE*	Excellent	327 °C	260 °C	Excellent	Excellent
ETFE*	Very good	260 °C	200 °C	Very good	Very good
PEEK	Good	343 °C	250 °C	Fair	Good
PC	Good	260 °C	150 °C	Good	Fair
EPDM	Good	140 °C	120 °C	Good	Fair
PVC	Fair	220 °C	70 °C	Fair	Fair
*= Fluoropolymer-based					

Table 1 - some physical parameters and qualitative evaluation on alternatives to fluoropolymers. Source: elaboration of the author.

Fluoropolymers, such as ETFE (ethylene tetrafluoroethylene), PTFE (polytetrafluoroethylene), and PVDF (polyvinylidene fluoride), offer several advantages over alternative materials in cable making. We will now provide a insight on why the materials provided in Annex XV and other already existing alternatives to fluoropolymers in the cable industry are not suitable for highly demanding applications where safety and reliability are paramount, such in aerospace cables.

When compared to mica, fluoropolymers provide better electrical insulation due to their high dielectric strength and low dielectric constant. Additionally, fluoropolymers offer superior resistance to moisture, chemicals, and heat, ensuring long-term reliability in harsh environments. Mica, on the other hand, is prone to moisture absorption and may deteriorate under prolonged exposure to high temperatures.

When compared to Kapton (polyimide), fluoropolymers offer better resistance to moisture and solvents, making them more suitable for applications where cable insulation needs to withstand harsh conditions. Kapton, known for its high-temperature resistance and electrical properties, is often used in aerospace and electronics industries together with fluoropolymers but may not provide the same level of resistance to chemicals and moisture as fluoropolymers when used alone.

When compared to PVC (polyvinyl chloride), fluoropolymers exhibit far superior thermal stability and resistance to flames. PVC is widely used as an insulation material due to its low cost and ease of processing, but it may release heavy smoke when exposed to fire, compromising safety. Fluoropolymers, with their excellent flame-retardant properties and low smoke generation, are preferred in applications where fire safety is critical.

When compared to PEEK (Polyether Ether Ketone, which is a high-performance thermoplastic polymer that is sometimes considered as an alternative to PTFE in various applications due to its exceptional properties there are still several reasons why PEEK may not replace PTFE or other fluoropolymers in cable manufacturing where the material is usually directly applied to the cable or wrapped in a tape form:

1. **Dielectric Properties:** While PEEK has good electrical properties and is considered a high-performance thermoplastic, it may not match the superior dielectric properties of PTFE, especially at higher frequencies. PTFE's extremely low dielectric constant and low loss tangent make it ideal for high-frequency applications, such as in coaxial cables used in telecommunications and high-speed data transmission.
2. **Temperature Resistance:** PTFE has a higher temperature resistance compared to PEEK. PTFE can withstand temperatures up to around 260°C (500°F) continuously, while PEEK's continuous use temperature is typically around 240°C (464°F). In extremely high-temperature environments, PTFE may still be the more suitable choice.
3. **Chemical Resistance:** PTFE is renowned for its exceptional chemical resistance, outperforming PEEK in this aspect. PTFE's ability to resist a wide range of aggressive chemicals is crucial in certain applications.
4. **Low Friction Coefficient:** PTFE has an ultra-low coefficient of friction, making it highly desirable in applications where reducing friction is essential.
5. **Established Use:** PTFE has been used in cable manufacturing for many years, and its performance and reliability are well-known and trusted in various industries. Revising specifications (e.g. aeronautical cable specifications) may cause widespread disruptions and enormous cost to re-certify entire processes or products (e.g. aircrafts).

Regarding the comparison of Fluoropolymers (PTFE in particular) with PC (polycarbonate), also cited in Annex XV as an alternative, looks extremely unlikely for a number of reasons:

1. **Electrical Properties:** PTFE is an excellent electrical insulator and has a low dielectric constant, making it suitable for high-frequency applications. It exhibits low signal loss and is often used in coaxial cables and high-frequency connectors. Polycarbonate has moderate electrical insulation properties, but it is not as widely used in high-frequency applications as PTFE due to its higher dielectric constant.

2. **Temperature Resistance:** PTFE has exceptional thermal stability and can withstand a wide temperature range from extremely low to high temperatures without losing its mechanical and electrical properties. It is commonly used in applications requiring resistance to extreme heat and harsh environments. PC has good temperature resistance (around 150 °C continuous operation) but it is not as suitable for extreme temperature conditions as PTFE.
3. **Mechanical Properties:** PTFE has a low coefficient of friction, which imparts excellent non-stick properties. It is also highly flexible and exhibits high tensile strength, making it suitable for applications requiring flexibility and durability. Polycarbonate offers good impact resistance and toughness, although less than PTFE or other fluoropolymers. PTFE also has far greater resistance to UV light and degradation over time.

Very similar considerations regarding temperature ranges, abrasion resistance, UV-resistance, smoke production when burnt apply also to EPDM.

In conclusion, although some alternatives may be viable for non-critical applications, fluoropolymers stand out in cable making by providing a unique combination of excellent electrical insulation, chemical resistance, high-temperature stability, and flame retardancy, making them unmatched for demanding applications in various industries.

3.3 Main concerns for the cable industry regarding a potential ban which includes Fluoropolymers

The first concern is on the available alternatives. As set out in the previous chapter 3.2, there is a great concern regarding the existence of alternatives to fluoropolymers in cable manufacturing, especially for high demanding applications. There are a number of reasons, including economic motivations, that already make PTFE as a last resort in cable manufacturing. Wherever possible, manufacturers already prefer lower performing materials such as PVC given that their price is already far lower than fluoropolymers (in

some cases . Therefore, a ban on limited application such as proposed RO2, would only produce a very small reduction in fluoropolymer usage in cable manufacturing, as there would be many applications that would be included in exemption lists as there are no alternatives to fluoropolymer-based cables.

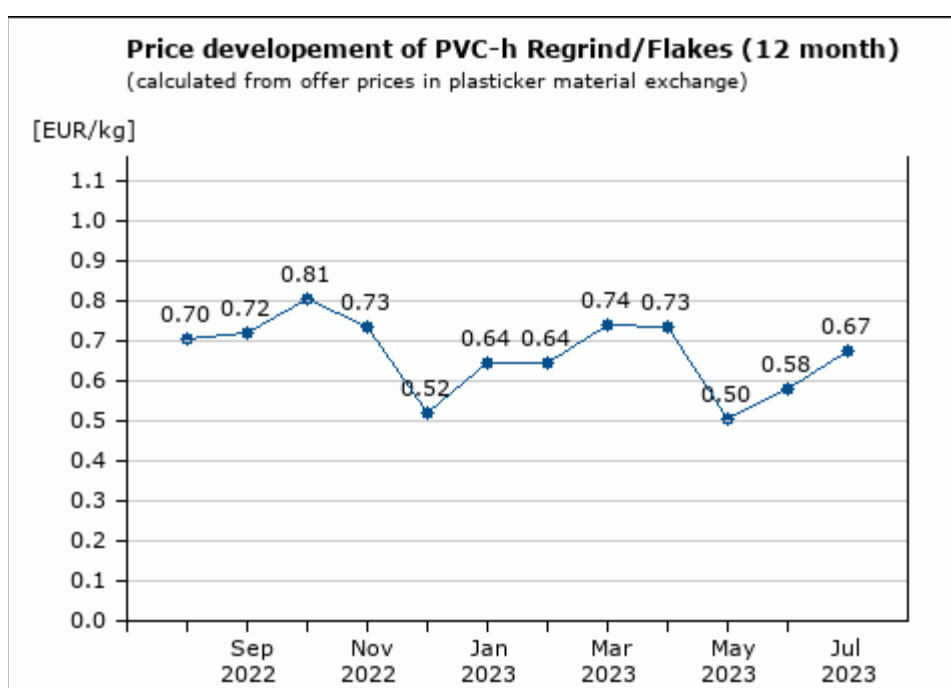


Figure 1 – Average price per kg of PVC flakes (EUR/kg) Source: plasticker.de

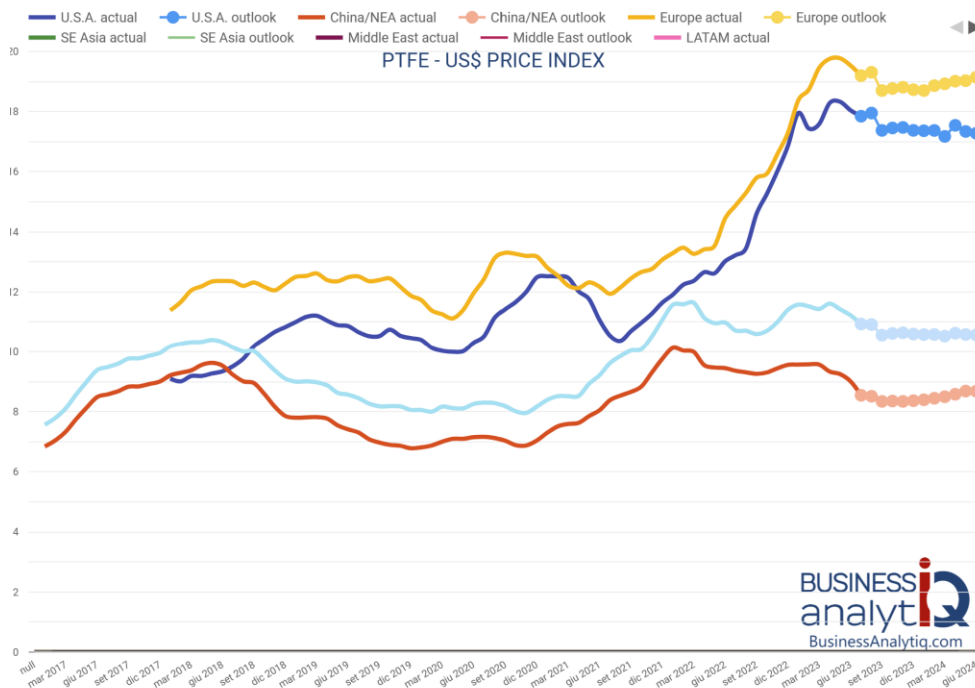


Figure 2 – Average price of PTFE per kg in several world regions (USD/kg). Source: businessanalytiq.com

As clearly visible in figures 1 and 2, there is a remarkable difference between PVC and PTFE (one of the highest performing fluoropolymers used in cable manufacturing). It is easily understandable that such a difference (almost 28,4 times in January 2023 in Europe) would itself convince any cable manufacturer to use PVC as an alternative compared to PTFE wherever that replacement is possible.

Also, there are wide concerns regarding safety of alternative materials and how to deal with existing standards which heavily rely on fluoropolymers as a safe and effective solution for wirings and cables. In fact, particularly in the form of specialized cables, fluoropolymers play a fundamental role in enhancing safety within the cable industry, particularly in aviation. This is of utmost importance as safety remains the highest priority in the aviation sector, and numerous accident and incident reports have underscored the significance of addressing electrical arcing and damage to aircraft

wiring. Two notable aviation accidents serve as poignant examples of the critical role of cable safety. Firstly, the tragic incident involving TWA flight 800 Boeing 747 on 17th July 1996, which exploded in mid-air and crashed into the Atlantic Ocean, resulting in the loss of all 230 lives onboard. Investigations revealed that the probable cause of this accident was the explosion of flammable fuel vapors in the center fuel tank. Compounding the issue, problems with the aircraft's wiring were identified, with evidence of arcing, which might have triggered the fatal explosion.

Secondly, the unfortunate crash of Swissair flight SR 111 McDonnell Douglas MD-11 on 2nd September 1998, falling into the Atlantic Ocean off the coast of Halifax, Nova Scotia, claimed the lives of all 229 passengers and crew onboard. The investigation revealed that the accident stemmed from faulty wiring, which led to the ignition of flammable insulation above the cockpit, resulting in an uncontrollable fire and complete electrical power failure, ultimately causing a loss of control. Notably, evidence of arc-tracking in wiring within the in-flight entertainment network was identified as a contributing factor to the tragedy.

To mitigate the risks associated with arc-tracking and ensure the safety of aircraft electrical wiring, several industry standards have been established. These standards prescribe the use of specialized cables incorporating fluoropolymers. Some of these industry standards include:

- Boeing Material Specification BMS 13-60B, which recommends the use of wire electric with arc-resistant properties, employing a tape-wrapped construction comprising layers of PTFE tape in combination with polyimide tape, often referred to as TKT (Teflon/Kapton/Teflon).

- Aerospace Standard AS22759/91, which specifies the use of electrical wire insulated with Polytetrafluoroethylene/Polyimide (FP/POLYIMIDE/FP Tape), known for its high arc resistance.

- EN 3475-604 Aerospace series, which focuses on cables designed for aircraft use and includes a test method to assess their resistance to dry arc propagation.

-EN 2267-010A, which addresses arc tracking-resistant general-purpose aircraft wiring, ensuring improved safety performance.

In conclusion, the incorporation of fluoropolymer-based cables, in adherence to established industry standards, represents a pivotal measure in reducing and eliminating arc-tracking issues in electrical aircraft wiring. As demonstrated by the unfortunate accidents involving TWA flight 800 and Swissair flight SR 111, prioritizing cable safety through the utilization of advanced materials is indispensable for the overall safety and reliability of the aviation industry.

Having say that, it is quite likely that some applications may still require the use of fluoropolymers. A temporary ban would likely require adequate traceability measures to monitor the end-uses for the involved fluoropolymers. However, there would be an extremely high difficulty in properly implementing such system, for a number of reasons: firstly, because the number of actors involved between the preparation of the fluoropolymer and the final user is quite significant, secondly because it would heavily rely on declarations which are difficult to prove, and lastly because it would require a verification body that can sanction improper uses. Such enormous costs related to re-certification of products and components, analyzing which derogations would be worthy and constant verification, monitoring and sanctioning system could be extremely harmful to EU economy and overall very arguable - considering that, at least for fluoropolymers, the regulation would be directed to limit a family of chemicals considered “polymers of low concern” under the OECD definition, that are already far more expensive than other alternatives which are always preferred when there is not a contingent need for such performance.

Finally, concerning the environment, the incredible resistance of PTFE and other fluoropolymer may actually be beneficial in regard to the reduction of waste. PTFE, for example, does not degrade under UV light leading to very high stability over time and long lifespan. This feature can indeed be advantageous for the environment. Due to their inherent resistance to harsh chemicals and extreme temperatures, fluoropolymers exhibit exceptional durability and longevity. This extended lifespan means that less material will

be required over time, as they degrade at a slower rate compared to other conventional materials. Consequently, this reduces the frequency of replacement and disposal of fluoropolymer-based products, leading to reduced waste generation and lower overall environmental impact. Additionally, their chemical resistance makes them suitable for applications in aggressive environments, thereby preventing leakage and contamination of hazardous substances, further safeguarding the environment and human health. Overall, fluoropolymers' ability to resist degradation and their long-lasting properties contribute positively to sustainability and environmental conservation efforts.

In addition to their extended lifespan and resistance to degradation, fluoropolymers' inability to degrade in hazardous compounds even when improperly disposed in the environment further reduces their impact. Fluoropolymers are known for their inertness, non-reactivity, and non bio-accumulability making them highly stable even when exposed to harsh chemicals and pollutants. This characteristic prevents them from releasing harmful substances or breaking down into toxic byproducts, which could otherwise contribute to environmental pollution. This unique combination of chemical resistance and inertness underscores the fact that fluoropolymers pose no specific additional concern in regard to their lifecycle and may also reduce the amount of waste when compared to alternatives which features a shorter lifespan.

4 The importance of Fluoropolymers in thread sealing applications

ECHA Annex E reference §E.2.13.

ECHA Annex XV reference § Table 8 R01

4.1 Consideration of fluoropolymer properties

As already mentioned in chapter 3.1, fluoropolymer have unique properties that make them particularly suitable for critical applications, also with regard to thread sealing.

Fluoropolymers, with polytetrafluoroethylene (PTFE) as their flagship representative, exhibit a remarkable array of physical and chemical properties that make

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them highly desirable for thread sealing applications. One of the most outstanding features is their exceptional thermal resistance. PTFE can withstand a wide range of temperatures, from cryogenic lows to high heat extremes, without losing its sealing effectiveness. This extraordinary attribute finds practical applications in various industries, such as the aerospace sector, where extreme temperature fluctuations are common during flight. PTFE thread seal tape ensures leak-free connections in fuel lines, hydraulic systems, and other critical components, enhancing safety and reliability in demanding environments.

In addition to thermal resistance, the unparalleled chemical resistance of fluoropolymers is another key advantage for thread sealing applications. PTFE remains unscathed when exposed to a vast array of aggressive substances, including acids, bases, solvents, and reactive chemicals. For instance, in chemical processing plants, where exposure to harsh chemicals is frequent, PTFE thread sealants provide reliable and long-lasting seals, preventing hazardous leaks and minimizing costly downtime. Moreover, in industries like oil and gas, where pipelines traverse corrosive environments, PTFE-based thread sealants protect against corrosion and maintain the integrity of connections, ensuring smooth and efficient operations.

Beyond thermal and chemical resistance, the low friction properties of fluoropolymers further contribute to their desirability for thread sealing applications. PTFE, in particular, exhibits a very low coefficient of friction, making it easier to tighten and loosen threaded connections. This reduces the risk of galling and ensures that threaded parts can be assembled and disassembled without damage, even after prolonged use. Consequently, industries that rely on frequent equipment maintenance and reassembly, such as automotive and machinery, benefit from the durability and ease of handling offered by PTFE-based thread sealants.

Furthermore, the exceptional dielectric strength of PTFE makes it an ideal material for electrical applications. In the electronics industry, PTFE thread sealants provide effective insulation and sealing for sensitive connections, preventing electrical leakage and safeguarding the integrity of delicate components. This versatility expands the scope

of thread sealing applications to encompass electronic devices, ensuring their optimal performance and longevity.

Summarizing, the outstanding combination of extreme thermal resistance, chemical resistance, low friction, and excellent dielectric properties makes fluoropolymers, particularly PTFE, highly desirable for thread sealing applications in various real-life scenarios. From aerospace to chemical processing, from oil and gas to electronics, PTFE-based thread sealants have proven their worth by enhancing safety, reliability, and efficiency across diverse industries.

4.2 Potential alternatives

Alternatives to fluoropolymers (PTFE in particular), have been in use for a long time, however their application is limited by the features they can offer. The most common alternatives are: nylon-coated multifilaments (such as Loctite® 55), hemp&paste and liquid thread sealants. Below, a table comparing the main features, based on Attachment A (Technical Datasheets of some selected thread sealing products retrieved online).

Property	PTFE	Loctite 55	Hemp & Paste
Temperature Range	-200°C to +260°C	-55°C to +150°C	Up to 140°C
Acid and Base Resistance	Excellent	Fair	Poor
Fuel and Oil Resistance	Excellent	Poor (unrecommended)	Poor
Solvent and Chemical Resistance	Excellent	Poor (unrecommended)	Poor
High Pressure and Temperature Vapor Resistance	Very Good	Moderate	Poor

Table 2: Quantitative and qualitative features of different thread sealing means. Source: elaboration of the author.

Typical features of the different sealing solutions:

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PTFE, commonly known as Teflon® tape, is a thin, flexible tape made from polytetrafluoroethylene. It stands out for its chemical inertness and exceptional resistance to temperature variations and aggressive chemicals. The tape is easy to apply and provides a reliable seal for various materials, including metals and plastics. It can withstand extreme temperatures, making it suitable for both high-temperature and cryogenic applications. Additionally, PTFE is compatible with a wide range of acids, bases, solvents, and chemicals, including oxygen (for example in healthcare) making it a versatile choice for different industries and applications.

Loctite 55 is synthetic coated polyamide multifilament specifically designed for thread sealing applications, provided in the form of a cord or string. It offers the advantage of being easy to use and requiring no curing time. The adhesive exhibits fair resistance to most common fluids and gases, providing reliable sealing for a wide range of applications. It can handle moderate temperature variations and is suitable for sealing metal and plastic threads. However, it may not be compatible with fuel and oil and aggressive chemicals, which limits its use in certain applications. Additionally, while it can handle moderate pressure and temperature, it might not be suitable for demanding conditions or high-pressure systems. According to the manufacturer, this product is not compatible with oxygen-rich environments, for example in healthcare applications.

Hemp & Paste is a traditional thread sealing method involving the use of hemp fibers coated with a paste or sealing compound. The method is cost-effective and can provide a reliable seal for low-pressure applications. It is generally compatible with a range of standard fluids making it suitable for various settings. However, Hemp & Paste may not be suitable for high-pressure systems or applications with aggressive chemicals. It requires more time and effort for application compared to other options like PTFE tape and Loctite 55. Moreover, the performance of Hemp & Paste might be limited under high-temperature conditions, making it less suitable for certain applications with elevated temperatures or extreme environmental demands.

There is in fact also an additional category of thread sealing products that can compete with PTFE for some applications in terms of resistance: liquid anaerobic sealants. However, it appears quite clear that such an alternative is in fact by far riskier

for the user. Attachment B shows 4 different Safety Data Sheets belonging to PTFE, Loctite55®, Paste to be used with hemp and a type of liquid anaerobic thread sealant. It is evident that potential risks in handling liquid thread sealants are by far greater than those related to PTFE, in fact misuse can higher the risk of developing cancer, damage to organs, irritation among handling risks connected to the flammability of the product itself. Most of anaerobic thread sealants are based on methyl methacrylate compounds which is itself considered toxic and irritant. By contrast, for example, ingesting PTFE by accident has no consequences at all, as previously mentioned (Naftalovich, Naftalovich et al. 2016). Also, liquid thread sealants are not immediately effective: there is a specific timing (known as cure period) where the liquid sealant undergo polymerization to guarantee the sealing effect. In some applications (let's consider an oxygen line in a hospital) curing period may be a significant obstacle. In comparison, PTFE is immediately effective after installation.

4.3 Main concerns for thread sealing applications regarding a potential ban which includes Fluoropolymers

The first main problem would be the difficulty to find alternatives which offer similar performance. Although for some standard applications there may be alternatives at the present day, it is however very arguable that these substitute products can be effectively used in more demanding applications such as oxygen-rich environments, contact with acids, bases and other aggressive chemicals. The first concern is safety: for example, connection in aircrafts, chemical plants (e.g. nuclear power plant) or other critical systems may need proper testing and certification/approval to use suitable alternative. It is difficult to gather analytic data because each company may adopt its own policy, however there are some standards in the industry which recommend the use of PTFE:

- ANSI/ASME B1.20.1-2019, "Pipe Threads, General Purpose (Inch)", recommends the use of PTFE tape for sealing threaded connections in water, gas, and other fluid systems.

- AWWA C606-14, "Standard for Packing and Thread Sealing Compounds for Waterworks Service", also recommends the use of PTFE tape for sealing threaded connections in water systems.
- ISO 228-1:2013, "Pipe Threads - Part 1: Dimensional and Tolerancing Requirements for Pipe Threads with External and Internal Cylindrical Taper", allows for the use of PTFE tape for sealing threaded connections in fluid systems.

With these premises, a second set of problems could emerge if a temporary derogation is adopted: how could manufacturers properly trace the end-uses of their products? Often, distributors or even clients themselves don't know the end-use for the PTFE sealants they buy. This is also due to the fact that a same product unit can be used on many systems: let's consider a plumber that is installing a water faucet in the morning and a fuel pump in the afternoon. The same PTFE sealant can be used, but what should he declare when buying the material? This of course would create a huge amount of paperwork whose efficacy would be doubtful.

Another significant issue would be the environmental impact of alternatives: the most common alternative in case of high performance (e.g. high temperatures, high pressures) are based on methyl methacrylate which poses significant threats to users when improperly used (Attachment B). Also, it would be interesting to evaluate a long-time contamination and potability test for these liquid sealants (most of them hold certificates of water compatibility once installed, however no data is available for installations where the liquid sealant has been in place for long time).

5 Environmental impacts

5.1 Manufacturing

The manufacturing of PTFE (polytetrafluoroethylene) has, by its nature, some environmental impacts. These impacts can be categorized into three main phases:

resource extraction, manufacturing process, and installation/assembly on the final product (in our case, cables)

- a. Resource extraction
- b. Manufacturing process
- c. Installation/assembly

We will propose a differential approach compared with potential substitutes. Regarding the first two points a) and b) it is worth looking at the emissions in the manufacturing process: the website <https://www.cableizer.com/documentation/EEC/> provides a comprehensive view of environmental impact of different components of cables including fluoropolymers. Although it is known that fluoropolymers require a significant amount of energy, the CO₂ emissions for 1 kg of PTFE are comparable with those of 1 kg of PA. It is also worth highlighting that products such as PA, PE, PVC cannot be used as substitutes of PTFE in many applications due to their technical features (as previously shown), so it is extremely difficult to assess the incremental emissions compared with alternatives, also given the fact that the cable industry currently has no alternatives to fluoropolymers. Also (as many other goods) emissions are highly related to the amount of energy required to transform the product (for example PTFE requires very high temperatures and pressures) so by addressing the energy source first (such as installing solar systems or heat recovery systems) the amount of emissions can be significantly controlled. In our experience as a transformer of PTFE, we developed a process which features a chiller and a regenerative thermal oxidiser (RTO) to recover processing solvent, respect environmental emissions requirements and recover heat from the RTO itself.

Regarding the installation phase, we will compare the direct extrusion on the cable compared for example to PTFE tape wrapping. In direct extrusion the material is directly applied to the wires and then cooled, whereas usually PTFE wrapping is applied through a rotating machine and then sintered. High temperatures (and pressures in the case of extrusion) are required in both cases so there is no evidence of an increased energy need in one or another.

As far as we know as a PTFE transforming company,

Regarding other hazards, such as pollution or release of chemicals in the environment it very important to understand that there are many fluoropolymers that can now be manufactured without dangerous fluoro-surfactants (FS) such as PFOA or GENx. The first implication is that actions can be taken to restrict dangerous PFAS such PFOA (at least in relation to fluoropolymer manufacturing) and related chemicals that are no longer required as polymerisation aids. The second positive aspect is that since the use of FS is no longer necessary Fluoropolymers got rid of what was the main concern related with their manufacturing and use (namely, the use of PFAS-derived polymerisation aids).

In conclusion, to mitigate these environmental impacts, efforts can be made in several ways:

1. Efficient resource use: Ensuring the efficient use of raw materials, such as minimizing waste and optimizing manufacturing processes, can help reduce the environmental footprint of PTFE tape production.
2. Renewable energy sources: Transitioning to renewable energy sources, such as solar or wind power, for the energy-intensive manufacturing processes can significantly reduce GHG.
3. Chemical management: Implementing proper chemical management practices, such as using safer alternatives to FS, reducing chemical usage, and implementing appropriate wastewater treatment, can mitigate the potential negative effects on the environment.
4. Recycling and end-of-life management: Promoting the recycling of PTFE tape or finding alternative uses for waste materials generated during the manufacturing process can minimize the environmental impact associated with disposal.

5.2 Emissions when in use

Fluoropolymers are extremely stable during their lifecycle which could be virtually unlimited under certain conditions. On everyday applications, even if very demanding

such as aircrafts, spacecrafts and satellites, many PTFE cables survive the entire lifecycle of the device (e.g. 30 years or more for a plane).

5.3 Disposal

One of the main concerns regarding fluoropolymer is their end of life under normal conditions (i.e. when not improperly disposed). During the processing of PTFE products, for example, cuttings can be recycled into other PTFE-based products (for example, after irradiation). According to a study conducted by Conversio in 2020, fluoropolymers account for less than 0,01% of the waste collection in Europe. Approximately 97% of fluoropolymers are disposed either in landfill (around 13%) or incinerated (around 84%). The remaining part is recycled. The main concern about recycling of fluoropolymers is to build a sufficiently robust supply chain to make it feasible. The fact that fluoropolymers are often a component of complex systems (let's think of cables in an electronic circuit board or interconnection systems of appliances) may play a role in making the recycling process more difficult. Either way, there is evidence to believe that disposal of fluoropolymers through landfill or incineration is not more concerning than general urban waste.

Regarding landfill, also as set out in the following chapter 5.4, fluoropolymers are believed to be extremely stable over time, are not mobile, insoluble, non-volatile, non-hygroscopic and non-bioaccumulative. This suggests that fluoropolymer will remain extremely stable even for a long period of time and will not disperse in water or soil.

About incineration, several studies are still ongoing, but some evidence is already available, as set out in a preliminary pilot-scale study for thermal treatment of Fluoropolymers by Hans-Joachim Gehrman et al. In particular the study has found that fluoropolymers do not release any measurable levels of per- and polyfluoroalkyl substances (PFAS) when incinerated under representative European municipal incinerator conditions.

A large majority of samples indicated that long chain PFAS were below levels of 1 ng/m³ (99% of samples associated with 860 °C condition and 98% of samples associated with 1.100 °C condition). There were no short chain PFAS detected post incineration. TFA was non-detectable in all samples with a reporting limit of 14 µg/m³.

The results of the study confirm that fluoropolymers are completely mineralized during incineration, meaning that they are converted into harmless substances such as hydrogen fluoride and carbon dioxide.

The main reason for including fluoropolymers in the EU PFAS restriction proposal was their persistence in the environment. However, the absence of organic fluorides and PFAS in tests representative of municipal waste incineration confirms that fluoropolymers are completely mineralized during incineration.

In conclusion, the study found that fluoropolymers do not pose a risk to human health or the environment when incinerated.

5.4 Risk of improper disposal

Fluoropolymers are not water soluble and will not likely result in widespread groundwater impacts or exposures from drinking water. If released to the environment, fluoropolymers are likely to remain in the environmental matrix they contact following release, such as terrestrial soil or aquatic sediment. Because fluoropolymers are chemically inert, they cannot partition and are not chemically mobile between water and soil/sediment. Any potential movement of fluoropolymers in the environment will occur via mechanical transport processes, such as overland flow from precipitation events (e.g., rainfall flows carrying fluoropolymers from soil to sediment via runoff). Indeed, Feng et al. (2022) recently demonstrated that PTFE in modelled tidal sediments showed enhanced retention and low likelihood of resuspension into the water column. Given their chemical inertness, non-volatility, and lack of water solubility, fluoropolymers are not highly mobile in the environment.

6 Conclusions and recommendations

Given the availability of sufficient data regarding the non-toxicity and classification of “Polymers of low concern” (PLC) by the OECD of at least a group of PFAS, namely Fluoropolymers (i.e. fluorocarbon-based polymers with multiple carbon-fluorine bonds), considering the non-replaceability of fluoropolymers in many applications, where alternatives do not guarantee the same level of performance, are significantly anti-economic, or pose significant higher threats to end-users in terms of toxicity;

Considering that from an emission standpoint Fluoropolymers exhibit far longer service lifetimes than alternatives (where alternatives can be found) and the collection and disposal can be improved to further reduce the impact;

Considering that improperly dispersed fluoropolymers in the environment exhibit an extreme stability over time, and there is no evidence to conclude fluoropolymers are bio-accumulative or toxic;

Considering that the manufacturing and disposal of fluoropolymers have no significant incremental emissions when compared to other alternatives;

Considering that a temporary derogation framework under RO2 proposal would require an extremely extensive analysis of situations where Fluoropolymers are irreplaceable, the result of which (given the extremely high cost of fluoropolymers compared to other alternatives) would likely be a wide series of derogations requiring documentation and dedicated processes and inspections and verifications to enforce the RO2 restrictions (with an extremely high risk of forgery in documentation or irregularities in the end-use declarations);

Considering also the proportionality criteria to be adopted by ECHA in regard to restricting chemicals, and remembering that the current proposal would indiscriminately ban tens of thousands of chemicals, some of them by far less concerning in terms of toxicity and pollution than other everyday chemicals such as PMMA;

Resitape would recommend to:

- exclude Fluoropolymers (and all chemicals in the PFAS group which do not exhibit demonstrated health concerns) from the scope of the proposed restrictions RO1 and RO2.
- work on a sensibilization concerning best practices connected to Fluoropolymer lifecycle to increase the recycling rate, proper disposal and awareness on the correct use of fluoropolymers.

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ATTACHMENT A

EXAMPLES OF TECHNICAL DATA SHEETS FROM DIFFERENT THREAD SEALING PRODUCTS RETRIEVED ONLINE

Unipak



PRODUCT DESCRIPTION:

UNIPAK jointing compound is a grey, high-viscosity, paste jointing compound consisting of a saponified fatty acid, natural minerals, high grade paraffin oils and water. All the substances of the contents are permitted as additives to foodstuffs and the like.

APPLICATION:

UNIPAK jointing compound is applied together with flax/hemp, for the sealing of threaded pipe joints on potable water systems, heating systems and low pressure steam systems. (max. 140°C and 8 bar).

TECHNICAL PROPERTIES:

UNIPAK jointing compound applied together with flax/hemp provides 100% tight threaded pipe joints as well as UNIPAK facilitates connection and future disconnection of the joints. Application of UNIPAK jointing compound - contrary to e.g. thread seal tape - also provides a large adjusting flexibility as the pipe joints remain tight when loosened.

DIRECTIONS:

Flax/hemp should be applied evenly and tightly to the thread in the direction of inclination of the thread. Then the entire packed thread should be applied an adequate quantity of UNIPAK jointing compound in an even layer, after which assembling can be carried out straight away and installations be put into service. Wipe away odd jointing compound with a cloth or the like.

TESTS:

UNIPAK jointing compound's technical suitability has been repeatedly subjected to tests by the Danish Technological Institute. By this process it was proved that threaded joints properly sealed with flax/hemp and UNIPAK can remain tight up to 140°C and 8 bar. Tests also proved that UNIPAK jointing compound does not have an influence on water quality.

The data contained herein are furnished for information only and are believed to be reliable. We cannot assume responsibility for the results obtained by others over whose methods we have no control. It is the user's responsibility to determine suitability for the user's purpose of any production methods mentioned herein.

PACKAGING:		Item no.:	VVS-nr.	RSK-nr.	NRF-nr.	LVI-nr
65 g plastic tube	(24 pcs./box)	5000006	271351003	4051317	9507804	3265105
65 g plastic tube	(200 pcs./box)	5000007	271351003	4051317	9507804	3265105
250 g plastic tube	(48 pcs./box)	5000025	271351025	4051315	9507805	3265107
360 g plastic tube	(48 pcs./box)	5000036	271351036	4051318	9507803	3265112
4 kg tube		5000400	271351040	4051319	9507802	3265118
1 pcs. D-I-Y-set	(48 pcs./box)	5008800	271351103	-	9507807	-
1 stk. D-I-Y-set sv/fi textt	(48 stk./krt.)	5030800	-	4051175	-	3265088

Please see **SAFETY DATA SHEET**

As we constantly develop our products and we reserve the right to make changes without prior notice.

LOCTITE® 55 Pipe Cord™

Agosto 2016

DESCRIZIONE DEL PRODOTTO

LOCTITE® 55 Pipe Cord™ ha le seguenti caratteristiche:

Tecnologia	Filato multifilo ricoperto
Natura chimica	Filato in poliammide con pasta inerte
Aspetto	Colore bianco, filo rivestito ^{LMS}
Reticolazione	Non applicabile
Applicazione	Sigillaraccordi

LOCTITE® 55 Pipe Cord™ per uso generico, sigillante per raccordi filettati da utilizzare direttamente dal flacone sulle filettature. Il filo è fornito in contenitori che conservano il prodotto e al contempo fungono da dispensatori. Raccomandato per sigillare raccorderie metalliche e non fino a 4" NPT (National Pipe Thread) per un utilizzo in applicazioni dove vi è presenza di acqua e fluidi. Particolarmente indicato per la sigillatura di raccordi che richiedono sigillatura immediata e riaggiustamenti durante il posizionamento prima di mettere in esercizio l'impianto. Il prodotto è usato per applicazioni fino a 149 °C.

NSF International

Certified to ANSI/NSF Standard 61 per un utilizzo in impianti civili e commerciali di acqua potabile a temperature non superiori a 82° C. **NOTA:** Contattare il vostro servizio tecnico locale per maggiori informazioni e chiarimenti.

EN 751-2

Sigillatura di raccorderie metalliche a contatto con gas della 1°, 2°, e 3° famiglia e acqua calda; Parte 2: Composti non indurenti LOCTITE® 55 Pipe Cord™ è stato testato in conformità alla EN 751-2 per la classe ARp composti e a seguito della DVGW approval.

WRC e BGA KTW approval

Indicazione per prodotti non metallici per un utilizzo a contatto con acqua potabile intesa per un consumo umano in relazione ai loro effetti per la qualità dell'acqua. LOCTITE® 55 Pipe Cord™ è stato testato ed ha ottenuto l'approvazione BS 6920, inoltre aderisce alle specifiche **WRC** e **BGA KTW** per acqua potabile calda e fredda

Approvato da Australian Gas Association Certificate numero 6007 Classe III pressione di lavoro 2000 KPa, temperatura di lavoro -10 a 150°C.

PROPRIETA' TIPICHE

Peso Specifico @ 25 °C	1,25
Punto di infiammabilità - Vedere MSDS	
Peso rivestimento, g/m	0,54 a 0,74 ^{LMS}
Peso rocchetto, g:	
12 misura rocchetto	7,0 a 10,4 ^{LMS}
50 misura rocchetto	27,3 a 39,6 ^{LMS}
100 misura rocchetto	54,0 a 80,7 ^{LMS}
160 misura rocchetto	86,4 a 125,1
Lunghezza rocchetto, m:	
12 misura rocchetto	12,5 a 14,0 ^{LMS}
50 misura rocchetto	50,5 a 53,5 ^{LMS}
100 misura rocchetto	101,0 a 109,0 ^{LMS}
160 misura rocchetto	161,0 a 169,0
Effetto lubrificante, ASTM D5648, fattore K:	
3/8 x 16 con LOCTITE® 55 Pipe Cord™	0,15
3/8 x 16 (sgrassato)	0,2
3/8 x 16 vite e dado fosfatati	0,16

(Per applicazioni critiche è necessario calcolare il fattore K corretto. Loctite non garantisce performance specifiche su serraggi particolari):

PROPRIETA' TIPICHE DEL PRODOTTO APPLICATO

Approval tests in accordi alla o EN 751-2 per composti in classe ARp

Test di resistenza, sezione 7.2.1.2	Nessuna perdita
Test di resistenza dopo un aggiustamento di 45° , sezione 7.2.1.3	Nessuna perdita
Resistenza a condensa di gas, sezione 7.2.1.4	Nessuna perdita
Test per resistenza acqua calda, sezione 7.2.1.5	Nessuna perdita
Test a cicli in temperatura , sezione 7.2.1.6	Nessuna perdita
Test a vibrazione , sezione 7.2.1.7	Nessuna perdita
Compatibilità con schiuma rileva perdite, sezione 7.2.2	Passato
Test di indurimento e smaltimento, sezione 7.2.3	Passato

Resistenza in pressione

LOCTITE® 55 Pipe Cord™ testato per resistere alla pressione e sigillatura a 69 MPa. su raccordi a T da 3/8 NPT quindi assemblati e pretensionati a 27 N·m prima del test a 69 MP con pressione idraulica @ 23 °C in accordi alla ASTM D 1599.

RESISTENZA TIPICA AI FATTORI AMBIENTALI

LOCTITE® 55 Pipe Cord™ resiste ai più comuni gas e fluidi

Compatibilità al vapore

LOCTITE® 55 Pipe Cord™ testato per resistere al vapore a 0,17 MPa. 1,5 " NPT assemblati e testati a 0,17 MPa con pressione @ 130 °C per 1 000 ore.



INFORMAZIONI GENERALI

Questo prodotto non è consigliato per l'uso con ossigeno puro e/o su sistemi ricchi di ossigeno e non deve essere utilizzato come sigillante per cloro o altri materiali fortemente ossidanti.

Per le informazioni relative all'impiego in sicurezza di questo prodotto consultate la Scheda Informativa in Materia di Sicurezza (MSDS).

Istruzioni per l'uso

1. Irruvidire le parti con una spazzola prima di applicare il prodotto.
2. Tenere il raccordo e applicare il filo sui primi tre filetti.
3. Avvolgere il filo sui filetti nella stessa direzione degli stessi partendo dalla fine del raccordo.
NOTE: Non è necessario avvolgere tutte le filettature.
4. **AVVERTENZA:** Non applicare una quantità maggiore a quella consigliata. Il prodotto in eccesso tende ad essere espulso quando il raccordo è assemblato, inoltre è più difficile completare l'assemblaggio.
5. Tagliare il filo con il taglierino di cui il contenitore è munito e lisciare il filo avvolto nei filetti.
6. LOCTITE® 55 Pipe Cord™ può essere riposizionato fino a 45° dopo il serraggio.

Istruzioni per l'uso

Nella tabella sottostante le quantità ideali in funzione del diametro del raccordo LOCTITE® 55 Pipe Cord™

Diametro raccordo	del	Numero di giri	
		Metallo	Plastica
1/2 "		6 a 8	12 a 15
3/4 "		7 a 9	15 a 25
1 "		8 a 12	20 a 30
1 1/2 "		10 a 15	25 a 35
2 "		15 a 25	-----
2 1/2 "		20 a 30	-----
3 "		25 a 35	-----
3 1/2 "		30 a 40	-----
4 "		35 a 45	-----

LOCTITE® 55 Pipe Cord™ sigilla acqua fredda e aria compressa su raccordi plastici quando applicata nelle quantità e modalità corrette.

Loctite Material Specification^{LMS}

LMS in data Gennaio 26, 2005. Per le proprietà ivi riportate sono disponibili test report per ciascun lotto. I test report secondo LMS includono parametri di Controllo Qualità considerati appropriati alle specifiche per l'utilizzo da parte dei clienti. Controlli addizionali e completi sono effettuati per assicurare la qualità e la ripetitività del prodotto. Richieste specifiche del Cliente possono essere coordinate tramite l'apposito Ente "Henkel Loctite Quality".

Immagazzinamento

Conservare il prodotto nel contenitore chiuso in luogo asciutto. Le informazioni sullo stoccaggio potrebbero essere riportate anche sull'etichettatura del prodotto.

Stoccaggio ottimale: da 8 °C a 21 °C. Lo stoccaggio a temperature inferiori a 8 °C o superiori a 28 °C, può inficiare le performances del prodotto.

I materiali una volta prelevati dai loro contenitori possono essere contaminati durante l'utilizzo. Non re-immettere il prodotto nel contenitore originale. Loctite non si assume alcuna responsabilità per prodotti che siano stati contaminati o stoccati in condizioni diverse da quelle qui sopra specificate. Per ulteriori informazioni contattate il Servizio Tecnico locale.

Conversioni

(°C x 1.8) + 32 = °F

kV/mm x 25.4 = V/millesimo di pollice (mill)

mm x 0.039 = pollici

µm x 0.039 = millesimo (mill)

N x 0.225 = libbre

N/mm x 5.71 = lb/in

N/mm² x 145 = libbre su pollice quadrato (psi)

MPa x 145 = libbre su pollice quadrato (psi)

N·m x 8.851 = lb·in

N·mm x 0.142 = oz·in

mPa·s = cP

Nota:

Le informazioni fornite in questa Scheda Tecnica riportante raccomandazioni per l'uso e l'applicazione del prodotto, sono basate sulla nostra conoscenza e sulle prove effettuate sul prodotto alla data del presente documento.

Il prodotto può avere diverse applicazioni e l'applicazione e le condizioni di funzionamento possono variare a seconda delle vostre condizioni ambientali di cui non siamo a conoscenza.

Henkel pertanto non può essere responsabile dell'idoneità del prodotto per i Vostri processi e condizioni di produzione nell'ambito dei quali viene usato il prodotto, così come le applicazioni e i risultati previsti. Vi raccomandiamo vivamente di effettuare vostre prove per confermare l'idoneità del prodotto.

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Referenze 1.9





Toll Free: 87 PERMATEX

6875 Parkland Boulevard, Solon
Ohio 44139

Technical Data Sheet

High Temperature Thread Sealant

INDUSTRIAL

PRODUCT DESCRIPTION

Permatex® High Temperature Thread Sealant is a medium strength anaerobic sealant with PTFE for tapered pipe threads. This sealing compound is of a white, creamy paste consistency. The high lubricating properties of this compound prevents galling on pipe threads and fittings. It will provide immediate low pressure sealing and allow for the readjustment of fittings shortly after assembly. After 72 hours the joint is sealed to pipe burst pressure. This product has a medium solvent resistance and will withstand temperatures to 400°F (204°C). **This product is not recommended for use on plastic piping.**

PRODUCT BENEFITS

- Resists leakage, vibration loosening, moisture, hydraulic fluids, diesel fuels.
- Lubricates threads for easy assembly and disassembly.
- Will not shred or wear like tapes.
- Parts may be repositioned for up to 24 hours after application.

TYPICAL APPLICATIONS

- Head bolts into through holes
- Oil PSI sending units/sensors
- Oil and coolant lines
- Fuel fittings
- Rear axle fill plug
- Brake and power steering fittings

DIRECTIONS FOR USE

1. For best performance, surfaces should be clean and free of grease.
2. Product should be applied to the thread engagement area in sufficient quantity to fill all engaged threads.
3. Use accepted trade practices to assemble and wrench-tighten fittings until proper alignment is obtained.
4. Very large thread sizes may create large gaps, which will affect cure speed and strength.
5. For maximum pressure and solvent resistance, allow at least 24 hours for the product to fully cure before filling and pressurizing system.
6. Fittings assembled with Permatex® High Temperature Thread Sealant may be disassembled with normal hand tools.
7. For large pipe diameters (over 1"), heat may be required to disassemble fittings.
8. Fittings may be reused by removing loose sealant residue with a wire brush and reapplying sealant.

FOR CLEANUP

1. Wipe off any material outside the joint with a dry cloth.
2. Clean hands with Permatex® Fast Orange® hand cleaner or soap and water.
3. Cured material must be removed with Permatex® Gasket Remover.

PHYSICAL PROPERTIES OF UNCURED MATERIAL

	Typical Value
Chemical Type	Dimethacrylate ester
Appearance	White opaque paste
Odor	Acrid
Specific Gravity	1.21
Viscosity (cP)	350,000
Flash Point (T.C.C.) °F	>200
Chemical resistance	Gasoline, oil, water, glycol, hydraulic fluid, freon, transmission fluid, brake fluid

TYPICAL CURING PERFORMANCE

Cure speed vs. temperature

The rate of cure will depend on the ambient temperature. **Full cure** is attainable in 24 hours at room temperature, 72°F (22°C), or 1 hour at 200°F (93°C).

Cure speed vs. substrate

The rate of cure will depend on the material used. Permatex® High Temperature Thread Sealant will react faster and stronger with **Active Metals**. However, **Inactive Metals** will require the use of an activator (Surface Prep) to obtain maximum strength and cure speed at room temperature.

Active Metals	Inactive Metals
Soft Steel Iron	Stainless Steel
Copper	Anodized Surfaces
Brass	Titanium
Manganese	Zinc
Bronze	Pure Aluminum
Nickel	Bright Platings
Aluminum Alloy	Cadmium

Cure speed vs. activator

Where cure speed is unacceptably long, or large gaps are present, applying an activator (Surface Prep) to the surface will improve cure speed. Assemblies will fully cure in 24 hours with activator.

NOT FOR PRODUCT SPECIFICATIONS.

THE TECHNICAL DATA CONTAINED HEREIN ARE INTENDED AS REFERENCE ONLY.

PLEASE CONTACT PERMATEX, INC., TECHNICAL SERVICE DEPARTMENT FOR ASSISTANCE AND RECOMMENDATIONS FOR YOUR SPECIFIC APPLICATION.
PERMATEX, INC., PARKLAND BOULEVARD SOLON, OHIO 44139 PHONE - (1-877)PERMATEX REVISED 01/19

CURED INFORMATION

(Cured 72 hours @ 75°F)

Pressure Resistance (psi) 10,000
 Temperature Range °F -65 to +400
 Breakaway torque (in.-lb.) 40
 Maximum recommended pipe size* 2" NPT

* May be used on threads larger than 2" but all threads must be activated with Surface Prep Activator and time for full cure extended to 48 hours (Pipe burst pressure after 96 hours). Heat may be required for removal.

Chemical / Solvent Resistance

Aged under conditions and tested at 72°F (22°C)

% Initial Strength retained after time

	Temp	500hr	700hr	1000hr
Heat aged	150°C		80%	
Motor oil(SL)	125°C		90%	
Antifreeze	87°C		40%	
Gasoline	23°C		40%	

GENERAL INFORMATION

This product is not recommended for use in pure oxygen and/or oxygen rich systems and should not be selected as a sealant for chlorine or other strong oxidizing materials.

For safe handling information on this product, consult the Material Safety Data Sheet, (MSDS).

ORDERING INFORMATION

Part Number	Container Size
59214	6 mL tube, carded
59235	50 mL tube, carded

STORAGE

Products shall be ideally stored in a cool, dry location in unopened containers at a temperature between 46°F and 82°F (8°C and 28°C) unless otherwise labeled. Optimal storage is at the lower half of this temperature range. To prevent contamination of unused product, do not return any material to its original container.

NOTE

The data contained herein are furnished for information only and are believed to be reliable. We cannot assume responsibility for the results obtained by others over whose methods we have no control. **Permatex, Inc. specifically disclaims all warranties expressed or implied, including warranties of merchantability or fitness for a particular purpose, arising from sale or use of Permatex, Inc. products and disclaims any liability for consequential or incidental damages of any kind, including lost profits.** This product may be covered by one or more United States or foreign patents or patent applications.

REVOLUTIONARY, PATENTED PIPE THREAD SEALANT MONOFILAMENT MADE OF 100% POLYTETRAFLUOROETHYLENE (P.T.F.E.) FOR SEALING METAL & PLASTIC THREADED PIPE JOINTS

Features

- ❖ Twineflon® is a dynamic sealant which adjusts its state during installation
- ❖ Creates a perfect seal by calandering the P.T.F.E. into a film in the exact thickness required between the two pipe ends
- ❖ Absolutely chemically resistant to the most aggressive chemicals, solvents, fuels and acids
- ❖ Remains functionally stable in a temperature range from -200 °C to +240 °C
- ❖ It is not flammable and does not burn



Product Advantages

- ❖ Non hazardous material with no limitation on shelf-life
- ❖ P.T.F.E. is completely resistant to surface fouling, oxidation, embrittlement, fungal or bacterial growth, enzymatic or microbiological attack
- ❖ Absolutely inert while remaining soft and pliable throughout its life
- ❖ No effect whatsoever on the process fluids in the pipes
- ❖ The P.T.F.E. is the seal and does not require the presence of additives to function as a seal



Application Advantages

- ❖ Replaces all other sealants and tapes on all threads
- ❖ Easier and quicker to install than other sealants
- ❖ Low cost per seal for maximum performance
- ❖ Simply wrap around the threads in an overlapping haphazard fashion
- ❖ Install directly from the hand held dispenser with its unique 360° proprietary cutter
- ❖ Unused product remains safely protected from dirt & dust for future use



Product Approvals

- ❖ DIN-DVGW for gas and water installations according to DIN EN751-3 (FRp and GRp), DIN30660 and UBA KTW (NV-5143BP0261)
- ❖ DIN-DVGW tested & approved for pipe adjustments up to 45°
- ❖ DVGW tested & approved up to 100 bar pressure in accordance with EN751-3 test protocol (tested at 23 °C)
- ❖ TZW tested & approved for hot & cold water in accordance with German Health Ministry recommendations
- ❖ BAM tested & approved for use with gaseous oxygen at 30 bar & 100 °C (for use with the installation aid, II-2742/2004E)
- ❖ BAM tested & approved for use with liquid oxygen at 30 bar & 100 °C (use without installation aid, II-2742/2004E)
- ❖ WRAS listed product for U.K. Water Regulations Advisory Scheme for use with hot and cold water (Ref. 2208540)
- ❖ ASTM F423 Steam & Cold Water Cycle Test – passed
- ❖ UL Tested: passes UL outline 1321 for use with gasoline, petroleum, propane, butane, gas (< 300psig) on max 1-1/2" pipe Seal material 19BN
- ❖ BS Standards 7786:2006 Grade H



Installation

- ❖ Beginning at the end of the thread, wrap in a overlapping haphazard fashion in the direction of the thread
- ❖ Apply 2 or 3 drops of installation aid directly from the separate dispenser and smear over the P.T.F.E. with the finger. This is a non-hazardous biodegradable material
- ❖ Concentrate at the end of the pipe and cover only 10 to 15mm of the thread
- ❖ The manufacturer's guidelines on the number of wraps are:
 - 1/2" pipe = 12 (Fine threads) to 18 (Coarse threads)
 - 1+1/2" pipe = 16 (Fine threads) to 24 (Coarse threads)

For other pipe diameters adjust the number of wraps



Packaging

- ❖ Twineflon® is supplied in 175m lengths in a hand held container with a protected unique 360° cutter and integrated dispenser containing installation aid
- ❖ 25 containers are contained in each display carton with 6 display cartons per master carton (150 pcs.)



date 202305 / rev. 03



RESITAPE Srl
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Tel. (+39) 02 9541181
E-mail: info@resitape.com

175metri – codice prodotto R12D06 – Made in Italy
Twineflon® è un marchio Resitape srl, Italia www.resitape.com



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Fax: +39 02/95411836

e-mail: info@resitape.com

Invoices: invoices@resitape.com

Website: www.resitape.com

ATTACHMENT B

EXAMPLES OF SAFETY DATA SHEETS FROM DIFFERENT THREAD SEALING PRODUCTS RETRIEVED ONLINE

Safety data sheet

according to 1907/2006/EC, Article 31

Printing date 13.02.2023

Version number 20 (replaces version 19)

Revision: 13.02.2023

SECTION 1: Identification of the substance/mixture and of the company/undertaking

- **1.1 Product identifier**
- **Trade name:** GRF KOLMAT JR 875G*12 L58
- **1.2 Relevant identified uses of the substance or mixture and uses advised against**
No further relevant information available.
- **Application of the substance / the mixture** Sealant
- **1.3 Details of the supplier of the safety data sheet**
- **Manufacturer/Supplier:**
Bison International
Dr.A.F.Philipsstraat 9
NL-4462 EW Goes
PO Box 160
NL-4460 AD Goes
tel. [REDACTED]
fax. [REDACTED]
e mail: [REDACTED]@boltonadhesives.com
- **Further information obtainable from:** Bison QESH
- **1.4 Emergency telephone number:**
National Poisons Information Centre: [REDACTED] (8.00 a.m. to 10.00 p.m. 7 days a week)
Healthcare Professionals: [REDACTED] (24 hour service)

SECTION 2: Hazards identification

- **2.1 Classification of the substance or mixture**
- **Classification according to Regulation (EC) No 1272/2008**



GHS07

Eye Irrit. 2 H319 Causes serious eye irritation.
STOT SE 3 H335 May cause respiratory irritation.

Aquatic Chronic 3 H412 Harmful to aquatic life with long lasting effects.

- **2.2 Label elements**
- **Labelling according to Regulation (EC) No 1272/2008**
The product is classified and labelled according to the CLP regulation.
- **Hazard pictograms**



GHS07

- **Signal word** Warning
- **Hazard-determining components of labelling:**
pumice
- **Hazard statements**
H319 Causes serious eye irritation.
H335 May cause respiratory irritation.

(Contd. on page 2)

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Safety data sheet

according to 1907/2006/EC, Article 31

Printing date 13.02.2023

Version number 20 (replaces version 19)

Revision: 13.02.2023

Trade name: GRF KOLMAT JR 875G*12 L58

(Contd. of page 1)

H412 Harmful to aquatic life with long lasting effects.

Precautionary statements

P101 If medical advice is needed, have product container or label at hand.

P102 Keep out of reach of children.

P271 Use only outdoors or in a well-ventilated area.

P280 Wear eye protection / face protection.

P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P501 Dispose of contents/container in accordance with national regulations.

Additional information:

EUH208 Contains Cement, portland, chemicals, Flue dust, portland cement, N-1-naphthylaniline. May produce an allergic reaction.

Labelling of packages where the contents do not exceed 125 ml

Hazard pictograms



GHS07

Signal word Warning

Hazard-determining components of labelling:

pumice

Hazard statements

H335 May cause respiratory irritation.

H412 Harmful to aquatic life with long lasting effects.

Precautionary statements

P101 If medical advice is needed, have product container or label at hand.

P102 Keep out of reach of children.

P271 Use only outdoors or in a well-ventilated area.

P501 Dispose of contents/container in accordance with national regulations.

2.3 Other hazards

Results of PBT and vPvB assessment

PBT: Not applicable.

vPvB: Not applicable.

SECTION 3: Composition/information on ingredients

3.2 Mixtures

Description: Sealant

Dangerous components:

CAS: 1332-09-8 EC number: 603-719-3	pumice ⚠ Eye Irrit. 2, H319; STOT SE 3, H335	25-50%
CAS: 12001-85-3 EINECS: 234-409-2	Naphthenic acids, zinc salts ⚠ Aquatic Acute 1, H400; Aquatic Chronic 1, H410; ⚠ Skin Irrit. 2, H315; Eye Irrit. 2, H319	≥0.25-<1%
CAS: 65997-15-1 EINECS: 266-043-4	Cement, portland, chemicals ⚠ Eye Dam. 1, H318; ⚠ Skin Irrit. 2, H315; Skin Sens. 1B, H317; STOT SE 3, H335	≥0.1-<1%

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according to 1907/2006/EC, Article 31

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Revision: 13.02.2023

Trade name: GRF KOLMAT JR 875G*12 L58

CAS: 68475-76-3 EINECS: 270-659-9 Reg.nr.: 01-2119486767-17	Flue dust, portland cement ☠ Eye Dam. 1, H318; ☠ Skin Irrit. 2, H315; Skin Sens. 1, H317; STOT SE 3, H335	(Contd. of page 2) ≥0.1-<1%
CAS: 1314-13-2 EINECS: 215-222-5 Index number: 030-013-00-7 Reg.nr.: 01-2119463881-32	zinc oxide ☠ Aquatic Acute 1, H400; Aquatic Chronic 1, H410	≥0.25-<1%
CAS: 90-30-2 EINECS: 201-983-0	N-1-naphthylaniline ☠ STOT RE 2, H373; ☠ Aquatic Acute 1, H400; Aquatic Chronic 1, H410; ☠ Acute Tox. 4, H302; Skin Sens. 1B, H317	≥0.1-<0.25%

· **Additional information:** For the wording of the listed hazard phrases refer to section 16.

SECTION 4: First aid measures

- **4.1 Description of first aid measures**
- **General information:** No special measures required.
- **After inhalation:**
Supply fresh air; consult doctor in case of complaints.
No special measures required.
- **After skin contact:** Generally the product does not irritate the skin.
- **After eye contact:**
Rinse opened eye for several minutes under running water. If symptoms persist, consult a doctor.
- **After swallowing:** If symptoms persist consult doctor.
- **4.2 Most important symptoms and effects, both acute and delayed**
No further relevant information available.
- **4.3 Indication of any immediate medical attention and special treatment needed**
No further relevant information available.

SECTION 5: Firefighting measures

- **5.1 Extinguishing media**
- **Suitable extinguishing agents:** Use fire extinguishing methods suitable to surrounding conditions.
- **5.2 Special hazards arising from the substance or mixture**
No further relevant information available.
- **5.3 Advice for firefighters**
- **Protective equipment:** No special measures required.

SECTION 6: Accidental release measures

- **6.1 Personal precautions, protective equipment and emergency procedures** Not required.
- **6.2 Environmental precautions:**
Inform respective authorities in case of seepage into water course or sewage system.
Do not allow to enter sewers/ surface or ground water.
- **6.3 Methods and material for containment and cleaning up:** Ensure adequate ventilation.
- **6.4 Reference to other sections**
See Section 7 for information on safe handling.

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Safety data sheet

according to 1907/2006/EC, Article 31

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Trade name: GRF KOLMAT JR 875G*12 L58

 See Section 8 for information on personal protection equipment.
 See Section 13 for disposal information.

(Contd. of page 3)

SECTION 7: Handling and storage

- **7.1 Precautions for safe handling** No special precautions are necessary if used correctly.
- **Information about fire - and explosion protection:** No special measures required.
- **7.2 Conditions for safe storage, including any incompatibilities**
- **Storage:**
- **Requirements to be met by storerooms and receptacles:** No special requirements.
- **Information about storage in one common storage facility:** Not required.
- **Further information about storage conditions:** Keep container tightly sealed.
- **Storage class:** 11
- **7.3 Specific end use(s)** No further relevant information available.

SECTION 8: Exposure controls/personal protection

· 8.1 Control parameters

· **Ingredients with limit values that require monitoring at the workplace:**

65997-15-1 Cement, portland, chemicals

OEL (Ireland)	Long-term value: 1 mg/m ³ respirable fraction
---------------	---

1314-13-2 zinc oxide

OEL (Ireland)	Short-term value: 10 mg/m ³ Long-term value: 2* mg/m ³ *respirable fraction
---------------	---

- **Additional information:** The lists valid during the making were used as basis.

· 8.2 Exposure controls

- **Appropriate engineering controls** No further data; see item 7.
- **Individual protection measures, such as personal protective equipment**

· **General protective and hygienic measures:**

The usual precautionary measures are to be adhered to when handling chemicals.

Keep away from foodstuffs, beverages and feed.

Immediately remove all soiled and contaminated clothing

Wash hands before breaks and at the end of work.

Avoid contact with the eyes.

Avoid contact with the eyes and skin.

- **Respiratory protection:** Not required.

· **Hand protection**



Protective gloves

The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.

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according to 1907/2006/EC, Article 31

Printing date 13.02.2023

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(Contd. of page 4)

Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation

- **Material of gloves**

Recommended thickness of the material: > 0,12 mm

Nitrile rubber, NBR

- **Penetration time of glove material**

For the mixture of chemicals mentioned below the penetration time has to be at least 10 minutes (Permeation according to EN 374 Part 3: Level 1).

- **Eye/face protection**



Tightly sealed goggles

SECTION 9: Physical and chemical properties

- **9.1 Information on basic physical and chemical properties**

- **General Information**

- **Physical state**

Solid

- **Colour:**

According to product specification

- **Odour:**

Recognisable

- **Odour threshold:**

Not determined.

- **Melting point/freezing point:**

Undetermined.

- **Boiling point or initial boiling point and boiling range**

Undetermined.

- **Flammability**

Not determined.

- **Lower and upper explosion limit**

- **Lower:**

Not determined.

- **Upper:**

Not determined.

- **Flash point:**

Not applicable.

- **Decomposition temperature:**

Not determined.

- **pH**

Not applicable.

- **Viscosity:**

- **Kinematic viscosity**

Not applicable.

- **Dynamic:**

Not applicable.

- **Solubility**

- **water:**

Insoluble.

- **Partition coefficient n-octanol/water (log value)**

Not determined.

- **Vapour pressure:**

Not applicable.

- **Density and/or relative density**

- **Density at 20 °C:**

1.768 g/cm³

- **Relative density**

Not determined.

- **Vapour density**

Not applicable.

- **Particle characteristics**

See item 3.

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according to 1907/2006/EC, Article 31

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· 9.2 Other information		All relevant physical data were determined for the mixture. All non-determined data are not measurable or not relevant for the characterization of the mixture.
· Appearance:		
· Form:		Pasty
· Important information on protection of health and environment, and on safety.		
· Auto-ignition temperature:		Product is not selfigniting.
· Explosive properties:		Product does not present an explosion hazard.
· Solvent content:		
· Solids content:		100.0 %
· Change in condition		
· Evaporation rate		Not applicable.
· Information with regard to physical hazard classes		
· Explosives		Void
· Flammable gases		Void
· Aerosols		Void
· Oxidising gases		Void
· Gases under pressure		Void
· Flammable liquids		Void
· Flammable solids		Void
· Self-reactive substances and mixtures		Void
· Pyrophoric liquids		Void
· Pyrophoric solids		Void
· Self-heating substances and mixtures		Void
· Substances and mixtures, which emit flammable gases in contact with water		Void
· Oxidising liquids		Void
· Oxidising solids		Void
· Organic peroxides		Void
· Corrosive to metals		Void
· Desensitised explosives		Void

SECTION 10: Stability and reactivity

- **10.1 Reactivity** No further relevant information available.
- **10.2 Chemical stability**
- **Thermal decomposition / conditions to be avoided:**
No decomposition if used according to specifications.
- **10.3 Possibility of hazardous reactions** No dangerous reactions known.
- **10.4 Conditions to avoid** No further relevant information available.
- **10.5 Incompatible materials:** No further relevant information available.
- **10.6 Hazardous decomposition products:** Danger of forming toxic pyrolysis products.

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Trade name: GRF KOLMAT JR 875G*12 L58

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SECTION 11: Toxicological information

11.1 Information on hazard classes as defined in Regulation (EC) No 1272/2008

Acute toxicity Based on available data, the classification criteria are not met.

LD/LC50 values relevant for classification:

1314-13-2 zinc oxide

Oral	LD50	>5000 mg/kg (rat)
------	------	-------------------

90-30-2 N-1-naphthylaniline

Oral	LD50	1625 mg/kg (rat)
------	------	------------------

Skin corrosion/irritation Based on available data, the classification criteria are not met.

Serious eye damage/irritation

Causes serious eye irritation.

Respiratory or skin sensitisation Based on available data, the classification criteria are not met.

Germ cell mutagenicity

Not applicable.

Based on available data, the classification criteria are not met.

Carcinogenicity Based on available data, the classification criteria are not met.

Reproductive toxicity Based on available data, the classification criteria are not met.

STOT-single exposure May cause respiratory irritation.

STOT-repeated exposure Based on available data, the classification criteria are not met.

Aspiration hazard Based on available data, the classification criteria are not met.

Additional toxicological information:

Acute effects (acute toxicity, irritation and corrosivity) Not applicable.

Sensitisation Not applicable.

Repeated dose toxicity Not applicable.

11.2 Information on other hazards

Endocrine disrupting properties

None of the ingredients is listed.

SECTION 12: Ecological information

12.1 Toxicity

Aquatic toxicity: No further relevant information available.

12.2 Persistence and degradability No further relevant information available.

12.3 Bioaccumulative potential No further relevant information available.

12.4 Mobility in soil No further relevant information available.

12.5 Results of PBT and vPvB assessment

PBT: Not applicable.

vPvB: Not applicable.

12.6 Endocrine disrupting properties

The product does not contain substances with endocrine disrupting properties.

12.7 Other adverse effects

Remark: Harmful to fish

Additional ecological information:

General notes:

Water hazard class 1 (German Regulation) (Self-assessment): slightly hazardous for water

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Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system.
Harmful to aquatic organisms

SECTION 13: Disposal considerations

· 13.1 Waste treatment methods

· Recommendation

Must not be disposed together with household garbage. Do not allow product to reach sewage system.

Disposal must be made according to official regulations.

· Uncleaned packaging:

· Recommendation:

Packagings that may not be cleansed are to be disposed of in the same manner as the product.

SECTION 14: Transport information

· 14.1 UN number or ID number

· ADR/ADN, IMDG, IATA

not regulated

· ADN

-
not regulated

· 14.2 UN proper shipping name

· ADR/ADN, ADN, IMDG, IATA

not regulated

· 14.3 Transport hazard class(es)

· ADR/ADN, ADN, IMDG, IATA

· Class

not regulated

· 14.4 Packing group

· ADR/ADN, IMDG, IATA

not regulated

· 14.5 Environmental hazards:

· Marine pollutant:

No

· 14.6 Special precautions for user

Not applicable.

· 14.7 Maritime transport in bulk according to IMO instruments

Not applicable.

· Transport/Additional information:

Not dangerous according to the above specifications.

· IMDG

· Remarks:

Under certain conditions substances in Class 3 (flammable liquids) can be classified in packinggroup III.

See IMDG, Part 2, Chapter 2.3, Paragraph 2.3.2.2

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Printing date 13.02.2023

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Revision: 13.02.2023

Trade name: GRF KOLMAT JR 875G*12 L58

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· UN "Model Regulation":	not regulated
---------------------------------	---------------

SECTION 15: Regulatory information

· **15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture**

· Directive 2012/18/EU

· **Named dangerous substances - ANNEX I** None of the ingredients is listed.

· **DIRECTIVE 2011/65/EU on the restriction of the use of certain hazardous substances in electrical and electronic equipment – Annex II**

None of the ingredients is listed.

· **REGULATION (EU) 2019/1148**

· **Regulation (EC) No 273/2004 on drug precursors**

None of the ingredients is listed.

· **Regulation (EC) No 111/2005 laying down rules for the monitoring of trade between the Community and third countries in drug precursors**

None of the ingredients is listed.

· **15.2 Chemical safety assessment:** A Chemical Safety Assessment has not been carried out.

SECTION 16: Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

· **Relevant phrases**

H302 Harmful if swallowed.

H315 Causes skin irritation.

H317 May cause an allergic skin reaction.

H318 Causes serious eye damage.

H319 Causes serious eye irritation.

H335 May cause respiratory irritation.

H373 May cause damage to organs through prolonged or repeated exposure.

H400 Very toxic to aquatic life.

H410 Very toxic to aquatic life with long lasting effects.

· **Classification according to Regulation (EC) No 1272/2008**

Serious eye damage/irritation

Specific target organ toxicity (single exposure)

Hazardous to the aquatic environment - long-term (chronic) aquatic hazard

The classification of the mixture is generally based on the calculation method using substance data according to Regulation (EC) No 1272/2008.

· **Department issuing SDS:** Bison QESH

· **Contact:** Reach coordinator

· **Date of previous version:** 24.01.2022

· **Version number of previous version:** 19

· **Abbreviations and acronyms:**

ADR: Accord relatif au transport international des marchandises dangereuses par route (European Agreement Concerning the International Carriage of Dangerous Goods by Road)

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Safety data sheet

according to 1907/2006/EC, Article 31

Printing date 13.02.2023

Version number 20 (replaces version 19)

Revision: 13.02.2023

Trade name: GRF KOLMAT JR 875G*12 L58

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IMDG: International Maritime Code for Dangerous Goods
IATA: International Air Transport Association
GHS: Globally Harmonised System of Classification and Labelling of Chemicals
EINECS: European Inventory of Existing Commercial Chemical Substances
ELINCS: European List of Notified Chemical Substances
CAS: Chemical Abstracts Service (division of the American Chemical Society)
LC50: Lethal concentration, 50 percent
LD50: Lethal dose, 50 percent
PBT: Persistent, Bioaccumulative and Toxic
vPvB: very Persistent and very Bioaccumulative
Acute Tox. 4: Acute toxicity – Category 4
Skin Irrit. 2: Skin corrosion/irritation – Category 2
Eye Dam. 1: Serious eye damage/eye irritation – Category 1
Eye Irrit. 2: Serious eye damage/eye irritation – Category 2
Skin Sens. 1: Skin sensitisation – Category 1
Skin Sens. 1B: Skin sensitisation – Category 1B
STOT SE 3: Specific target organ toxicity (single exposure) – Category 3
STOT RE 2: Specific target organ toxicity (repeated exposure) – Category 2
Aquatic Acute 1: Hazardous to the aquatic environment - acute aquatic hazard – Category 1
Aquatic Chronic 1: Hazardous to the aquatic environment - long-term aquatic hazard – Category 1
Aquatic Chronic 3: Hazardous to the aquatic environment - long-term aquatic hazard – Category 3

*** Data compared to the previous version altered.**

IE-EN



Scheda di dati di Sicurezza secondo il Regolamento (CE) Nr 1907/2006 e successive modifiche ed integrazioni

LOCTITE 55

pagine 1 di 10

SDS n. : 168432
V004.5

revisione: 25.05.2023

Stampato: 03.08.2023

Sostituisce versione del: 23.05.2023

SEZIONE 1: Identificazione della sostanza o della miscela e della società/impresa

1.1. Identificatore del prodotto

LOCTITE 55

1.2. Usi identificati pertinenti della sostanza o della miscela e usi sconsigliati

Uso previsto:

Colla

1.3. Informazioni sul fornitore della scheda di dati di sicurezza

Henkel Italia S.r.l. a socio unico
Cod. Fisc. e P. IVA 00100960608
Via Amoretti 78
20157 Milano

Italia

Telefono:

@henkel.com

Per aggiornamenti della scheda di sicurezza vi preghiamo di visitare il nostro sito
<https://mysds.henkel.com/index.html#/appSelection> o www.henkel-adhesives.com.

1.4. Numero telefonico di emergenza

In caso di incidente contattare uno dei seguenti numeri di telefono disponibili, tutti i giorni ventiquattr' ore su ventiquattro:

Numeri di emergenza CAV:

1. CAV Cardarelli – Napoli tel. [REDACTED]
2. CAV Careggi – Firenze tel. [REDACTED]
3. CAV Maugeri – Pavia tel. 0382-24444
4. CAV Niguarda – Milano tel. 02-66101029
5. CAV Papa Giovanni XXIII – Bergamo tel. 800883300
6. CAV Umberto I – Roma tel. 06-49978000
7. CAV Gemelli – Roma tel. 06-3054343
8. CAV Università – Foggia tel. 800183459
9. CAV Bambin Gesù – Roma tel. 06 68593726
10. CAV AOUI – Verona tel. 800011858

Numero telefonico di supporto alla lettura della Scheda di Sicurezza:

Numero verde : 800 452 661

SEZIONE 2: Identificazione dei pericoli

2.1. Classificazione della sostanza o della miscela

Classificazione (CLP):

La sostanza o la miscela non sono pericolose secondo il Regolamento (CE) n. 1272/2008 (CLP).

2.2. Elementi dell'etichetta

Elementi dell'etichetta (CLP):

La sostanza o la miscela non sono pericolose secondo il Regolamento (CE) n. 1272/2008 (CLP).

2.3. Altri pericoli

Il prodotto non è pericoloso se usato in accordo con le raccomandazioni d'uso.

Le seguenti sostanze sono presenti in concentrazione $\geq$ al limite di concentrazione per la dichiarazione in sezione 3 e soddisfano i requisiti per PBT/vPvB o sono state identificate come interferenti del sistema endocrino(ED):

La miscela non contiene sostanze in concentrazione $\geq$ al limite di dichiarazione nella sezione 3, classificate PBT, vPvB o ED.

SEZIONE 3: Composizione/informazioni sugli ingredienti

3.2. Miscele

Dichiarazione degli ingredienti in accordo con CLP (CE) n°1272/2008:

Non contiene sostanze pericolose oltre i limiti previsti del regolamento (CE)

SEZIONE 4: Misure di primo soccorso

4.1. Descrizione delle misure di primo soccorso

Inalazione:

Portare all'aperto. Se i sintomi persistono consultare un medico.

Contatto con la pelle:

Risciacquare con acqua corrente e sapone.

Consultare il Medico se l'irritazione persiste.

Contatto con gli occhi:

Sciacquare immediatamente con acqua corrente (per almeno 10 minuti), consultare uno specialista.

Ingestione:

Sciacquare la bocca, bere 1-2 bicchieri d'acqua, non provocare il vomito, consultare un medico.

4.2. Principali sintomi ed effetti, sia acuti e che ritardati

Il contatto prolungato o ripetuto può provocare irritazione cutanea.

Il contatto prolungato o ripetuto può provocare irritazione oculare.

4.3. Indicazione dell'eventuale necessità di consultare immediatamente un medico e trattamenti speciali

Vedere la sezione: Descrizione delle misure di primo soccorso

SEZIONE 5: Misure antincendio

5.1. Mezzi di estinzione

Mezzi di estinzione idonei:

acqua, anidride carbonica, schiuma, polvere

Mezzi estinguenti che non devono essere utilizzati per ragioni di sicurezza:

Getto d'acqua ad alta pressione

5.2. Pericoli speciali derivanti dalla sostanza o dalla miscela

In caso di incendio possono venirsi a formare monossido di carbonio (CO), anidride carbonica (CO₂) e ossidi nitrici (NO_x).
Biossido di silicio

5.3. Raccomandazioni per gli addetti all'estinzione degli incendi

Indossare un autorespiratore e indumenti a protezione completa, come una tuta da lavoro.

Avvertenze aggiuntive:

In caso di incendio raffreddare i recipienti esposti con getti d'acqua.

SEZIONE 6: Misure in caso di rilascio accidentale**6.1. Precauzioni personali, dispositivi di protezione e procedure in caso di emergenza**

Evitare il contatto con gli occhi e la pelle.
Indossare indumenti protettivi.
Assicurarsi che vi sia sufficiente ventilazione.

6.2. Precauzioni ambientali

Non immettere nelle fognature, nelle acque superficiali e freatiche

6.3. Metodi e materiali per il contenimento e per la bonifica

Smaltimento del materiale contaminato conformemente a la sezione 13.
Raccogliere quanto più materiale possibile.
Raccogliere il materiale versato. Evitare la creazione di polvere.
Conservare in un contenitore chiuso parzialmente riempito fino allo smaltimento.

6.4. Riferimento ad altre sezioni

Vedere le avvertenze alla sezione 8.

SEZIONE 7: Manipolazione e immagazzinamento**7.1. Precauzioni per la manipolazione sicura**

Evitare il contatto con gli occhi e con la pelle.
Vedere le avvertenze alla sezione 8.

Misure igieniche:

Lavarsi le mani prima delle pause e a fine turno.
Durante il lavoro non mangiare, bere o fumare.
Osservare buone norme igieniche industriali.

7.2. Condizioni per lo stoccaggio sicuro, comprese eventuali incompatibilità

Conservare in luogo fresco ed asciutto.
Tenere i recipienti ben chiusi.
Consultare la Scheda Tecnica
Non immagazzinare con generi alimentari.

7.3. Usi finali particolari

Colla

SEZIONE 8: Controllo dell'esposizione/protezione individuale

8.1. Parametri di controllo

Limiti di esposizione professionale

Valido per
Italia

Ingrediente [Sostanza regolamentata]	ppm	mg/m ³	Tipo di valore	Annotazioni	Regolamentazione
calcare 1317-65-3 [Particelle (insolubile o non molto solubile) non diversamente classificate, particelle respirabili]		3	Media ponderata (8 ore)	Fonte del valore limite: ACGIH	OEL (IT)
calcare 1317-65-3 [Particelle (insolubile o non molto solubile) non diversamente classificate, particelle inalabili]		10	Media ponderata (8 ore)	Fonte del valore limite: ACGIH	OEL (IT)
talco (Mg ₃ H ₂ (SiO ₃) ₄) 14807-96-6 [TALCO (SENZA FIBRE DI ASBESTO), FRAZIONE RESPIRABILE]		2	Media ponderata (8 ore)	Fonte del valore limite: ACGIH	OEL (IT)

Indici di esposizione biologica:
nessuno

8.2. Controlli dell'esposizione:

Istruzioni per la configurazione di impianti tecnici:
Garantire una buona ventilazione/aspirazione

Protezione delle vie respiratorie:
Assicurarsi che vi sia sufficiente ventilazione.

Protezione delle mani:
Guanti di protezione contro agenti chimici (EN 374).
Materiali idonei per brevi contatti o spruzzi (consigliato: indice di protezione minimo 2, corrispondente a > 30 minuti di tempo di permeazione in conformità con la EN 374):
Gomma nitrile (NBR; >= 0,4 mm spessore)
Materiali idonei anche per contatti diretti prolungati (consigliato: indice di protezione minimo 6, corrispondente a > 480 minuti di tempo di permeazione in conformità con la EN 374):
Gomma nitrile (NBR; >= 0,4 mm spessore)
Le indicazioni si basano su dati bibliografici ed informazioni di case produttrici di guanti o sono derivate per analogia da sostanze simili. Va ricordato che - a causa di molteplici fattori di influenza (ad es. la temperatura) - il tempo utile di un guanto di protezione contro agenti chimici nella prassi può risultare molto più breve rispetto al tempo di permeazione individuato ai sensi della EN 374. In presenza di segni di logoramento i guanti devono essere sostituiti.

Protezione degli occhi:
Se vi è pericolo di schizzarsi occorre indossare occhiali di sicurezza con protezioni laterali o occhiali di sicurezza specifici per le lavorazioni chimiche.
Le attrezzature di protezione degli occhi devono essere conformi alla norma EN166.

Protezione del corpo:
Usare indumenti protettivi adatti.
L'abbigliamento di protezione deve essere conforme alla norma EN 14605 per schizzi di liquido o EN 13982 per le polveri.

Indicazioni per l'equipaggiamento di protezione individuale:
Le informazioni fornite sui dispositivi di protezione individuale sono solo a scopo informativo. Deve essere effettuata una valutazione completa del rischio prima di utilizzare questo prodotto per determinare il dispositivo di protezione individuale adeguato alle condizioni locali. I dispositivi di protezione individuale devono essere conformi alla norma EN pertinente.

SEZIONE 9: Proprietà fisiche e chimiche**9.1. Informazioni sulle proprietà fisiche e chimiche fondamentali**

Stato di fornitura	pasta
Colore	opaco
Odore	tipo olio minerale
Forma	solido
Punto di fusione	Non applicabile, Determinazione tecnicamente non possibile.
Temperatura di solidificazione	Non applicabile, Il prodotto è un solido.
Punto di ebollizione	> 150 °C (> 302 °F)
Infiammabilità	Non applicabile Prodotto non infiammabile (punto di infiammabilità superiore a 93°C)
Limite di esplosività	Non applicabile, Il prodotto è un solido.
Punto di infiammabilità	> 93 °C (> 199.4 °F); Closed cup
Temperatura di autoaccensione	Non applicabile, Il prodotto è un solido.
Temperatura di decomposizione	Non applicabile, La sostanza/miscela non è auto-reattiva, non è un perossido organico e non si decompone nelle condizioni d'uso previste
pH	Non applicabile, Il prodotto è apolare / aprotica.
Viscosità (cinematica)	Non applicabile, Il prodotto è un solido.
Solubilità (qualitativa)	leggero
(20 °C (68 °F); Solv.: acqua)	
Coefficiente di ripartizione: n-ottanolo/acqua	Non applicabile miscela
Pressione di vapore	< 0,13 mbar
(20 °C (68 °F))	
Densità	Non applicabile, Determinazione tecnicamente non possibile.
Densità relativa di vapore:	Non applicabile, Il prodotto è un solido.
Caratteristiche delle particelle	Non applicabile, la miscela è una pasta.

9.2. ALTRE INFORMAZIONI

Altre informazioni non applicabili a questo prodotto

SEZIONE 10: Stabilità e reattività**10.1. Reattività**

Reagisce con ossidanti, acidi e soluzioni alcaline

10.2. Stabilità chimica

Stabile se immagazzinato osservando le raccomandazioni.

10.3. Possibilità di reazioni pericolose

Vedere la sezione reattività

10.4. Condizioni da evitare

Stabile in normali condizioni di conservazione e d'uso.
Calore eccessivo.

10.5. Materiali incompatibili

Vedere la sezione reattività.

10.6. Prodotti di decomposizione pericolosi

Non se ne conoscono in condizioni normali di utilizzo.

SEZIONE 11: Informazioni tossicologiche**Dati tossicologici generali:**

Il contatto prolungato o ripetuto può provocare irritazione oculare.

Il contatto prolungato o ripetuto può provocare irritazione cutanea.

11.1 Informazioni sulle classi di pericolo definite nel regolamento (CE) n. 1272/2008**Tossicità orale acuta:**

Dati relativi alla sostanza non disponibili.

Nessun dato disponibile.

Tossicità dermica acuta:

Nessun dato disponibile.

Tossicità per inalazione acuta:

Dati relativi alla sostanza non disponibili.

Nessun dato disponibile.

Corrosione/irritazione cutanea:

Nessun dato disponibile.

Lesioni oculari gravi/irritazioni oculari gravi:

Nessun dato disponibile.

Sensibilizzazione respiratoria o cutanea:

Nessun dato disponibile.

Mutagenicità sulle cellule germinali:

Nessun dato disponibile.

Cancerogenicità

Nessun dato disponibile.

Tossicità per la riproduzione:

Nessun dato disponibile.

Tossicità specifica per organi bersaglio (STOT)- esposizione singola:

Nessun dato disponibile.

Tossicità specifica per organi bersaglio (STOT)- esposizione ripetuta:

Nessun dato disponibile.

Pericolo in caso di aspirazione:

Nessun dato disponibile.

11.2 Informazioni su altri pericoli

non applicabile

SEZIONE 12: Informazioni ecologiche**Dati ecologici generali:**

Non immettere nelle fognature, nelle acque superficiali e freatiche

12.1. Tossicità**Tossicità (Pesce):**

Nessun dato disponibile.

Tossicità (organismi acuatichi invertebrati):

Nessun dato disponibile.

Tossicità cronica per gli organismi acquatici invertebrati:

Nessun dato disponibile.

Tossicità (Alga):

Nessun dato disponibile.

Tossicità per i micro-organismi:

Nessun dato disponibile.

12.2. Persistenza e degradabilità

Dati relativi alla sostanza non disponibili.

Nessun dato disponibile.

12.3. Potenziale di bioaccumulo

Dati relativi alla sostanza non disponibili.

Nessun dato disponibile.

12.4. Mobilità nel suolo

Dati relativi alla sostanza non disponibili.

Nessun dato disponibile.

12.5. Risultati della valutazione PBT e vPvB

Questa miscela non contiene sostanze valutate come PBT o vPvB

12.6. Proprietà di interferenza con il sistema endocrino

non applicabile

12.7. Altri effetti avversi

Nessun dato disponibile.

SEZIONE 13: Considerazioni sullo smaltimento

13.1. Metodi di trattamento dei rifiuti

Smaltimento del prodotto:

Effettuare lo smaltimento in conformità alle specifiche norme locali e nazionali.

Non immettere nelle fognature, nelle acque superficiali e freatiche

Smaltimento di imballaggi contaminati:

Usare contenitori per riciclaggio solo quando completamente vuoti.

Codice rifiuti

08 04 10 Adesivi e sigillanti di scarto, diversi da quelli di cui alla voce 08 04 09.

I codici di smaltimento rifiuti EWC non sono legati al prodotto, bensì alla sua provenienza d'origine. Per questo motivo l'azienda produttrice non può fornire codici rifiuti per prodotti che vengano impiegati in campi diversi.

SEZIONE 14: Informazioni sul trasporto

14.1. Numero ONU o numero ID

Sostanza non pericolosa ai sensi di RID, ADR, ADN, IMDG, IATA-DGR

14.2. Nome di spedizione dell'ONU

Sostanza non pericolosa ai sensi di RID, ADR, ADN, IMDG, IATA-DGR

14.3. Classi di pericolo connesso al trasporto

Sostanza non pericolosa ai sensi di RID, ADR, ADN, IMDG, IATA-DGR

14.4. Gruppo d'imballaggio

Sostanza non pericolosa ai sensi di RID, ADR, ADN, IMDG, IATA-DGR

14.5. Pericoli per l'ambiente

Sostanza non pericolosa ai sensi di RID, ADR, ADN, IMDG, IATA-DGR

14.6. Precauzioni speciali per gli utilizzatori

Sostanza non pericolosa ai sensi di RID, ADR, ADN, IMDG, IATA-DGR

14.7. Trasporto marittimo alla rinfusa conformemente agli atti dell'IMO

non applicabile

SEZIONE 15: Informazioni sulla regolamentazione**15.1. Disposizioni legislative e regolamentari su salute, sicurezza e ambiente specifiche per la sostanza o la miscela**

Sostanze che riducono lo strato di ozono (Regolamento (CE) N. 1005/2009):	Non applicabile
Assenso preliminare in conoscenza di causa (PIC) (Regolamento (UE) N. 649/2012):	Non applicabile
Inquinanti organici persistenti (POPs) (Regolamento (UE) 2019/1021):	Non applicabile
Contenuto COV (EU)	< 3 %

15.2. Valutazione della sicurezza chimica

La valutazione della sicurezza chimica non è stata svolta

Norme nazionali/avvertenze (Italy):

Informazioni generali: (IT):	D.Lgs n. 152 del 3 aprile 2006 “Testo Unico Ambientale” e successive modifiche e adeguamenti D.Lgs n. 81 del 9 aprile 2008 “Testo Unico salute e sicurezza sui luoghi di lavoro” Regolamento europeo 1907/2006 REACH DPR n. 22 del 05/02/97 Rifiuti D.Lgs. n. 65 del 14/03/03 Classificazione, imballaggio ed etichettatura dei preparati pericolosi Direttiva 67/548/CEE e successivi adeguamenti fino al XXIX incluso (Direttiva 2004/73/CE) D.Lgs 334 del 17/08/99 Rischi di incidenti rilevanti (Direttiva Seveso Bis). Regolamento n. 648/2004/CE (Regolamento Detergenti) Direttiva europea 98/8/CE Biocidi e successivi adeguamenti. Regolamento (EC) N. 1272/2008 Regolamento europeo 790/2009.
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SEZIONE 16: Altre informazioni

ED:	Sostanza identificata come avente proprietà di interferenza endocrina
EU OEL:	Sostanza con un limite di esposizione sul posto di lavoro dell'Unione europea
EU EXPLD 1:	Sostanza elencata nell'Allegato I del Reg. (CE) n. 2019/1148
EU EXPLD 2:	Sostanza elencata nell'Allegato II del Reg. (CE) n. 2019/1148
SVHC:	Sostanze estremamente preoccupanti (Elenco di sostanze candidate REACH)
PBT:	Sostanza conforme ai criteri di persistenza, bioaccumulabilità e tossicità
PBT/vPvB:	Sostanza conforme ai criteri di persistente, bioaccumulabile e tossico oltre che molto persistente e molto bioaccumulabile
vPvB:	Sostanza che soddisfa i criteri di molto persistente e molto bioaccumulabile

Ulteriori informazioni:

La presente scheda di sicurezza è stata rilasciata per le vendite da Henkel a clienti che acquistano direttamente da Henkel, è emessa in base al Regolamento (CE) n. 1907/2006 e fornisce informazioni in accordo con i regolamenti applicabili solamente nell'Unione Europea. In tal senso, non viene fornita alcuna dichiarazione, garanzia o indicazione di alcun tipo come conformità a legislazioni o regolamenti di qualunque giurisdizione o paese fuori dall'Unione europea. Quando è intenzione esportare in paesi esterni all'Unione Europea, vi chiediamo cortesemente di consultare la scheda di sicurezza corrispondente al paese interessato per assicurarsi della conformità o di contattare il dipartimento Henkel di Product Safety and Regulatory Affairs ([REDACTED]@henkel.com) prima di esportare in paesi esterni all'Unione Europea

Le indicazioni si basano sulle nostre attuali conoscenze e si riferiscono al prodotto allo stato di fornitura. Esse hanno lo scopo di descrivere i nostri prodotti dal punto di vista sicurezza e non intendono garantire alcuna caratteristica.

Gentile cliente,

Henkel è impegnata a creare un futuro sostenibile promuovendo opportunità lungo l'intera catena del valore. Se vorrete contribuire scegliendo di passare dalla versione cartacea alla versione elettronica della SDS, la prego di contattare il rappresentante locale del Customer Service. Vi raccomandiamo di utilizzare un indirizzo mail non personale (per esempio SDS@your company.com).

Le modifiche rilevanti in questa scheda di dati di sicurezza sono indicate con linee verticali al margine sinistro nel corpo di questo documento. Il testo corrispondente è mostrato in un colore differente su sfondo grigio.



SAFETY DATA SHEET

Revision Date 26-Jul-2021

Version 9

1. IDENTIFICATION

Product identifier

Product Name PX 14 THREAD SEALANT 16 OZ.

Other means of identification

Product Code 80633

Recommended use of the chemical and restrictions on use

Recommended Use Sealant

Uses advised against No information available

Details of the supplier of the safety data sheet

Manufacturer Address

ITW Permatex
6875 Parkland Blvd.
Solon, Ohio 44139 USA
Telephone: 1-87-Permatex

May Also Be Distributed by:

ITW Permatex Canada
101-2360 Bristol Circle
Oakville, ON Canada L6H 6M5
Telephone: [REDACTED]

24-hour emergency phone number

Chem-Tel: [REDACTED]
International Emergency:
00+1+ [REDACTED]
Contract Number: MIS0003453

E-mail address: [REDACTED]@permatex.com

2. HAZARDS IDENTIFICATION

Classification

OSHA Regulatory Status

This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Carcinogenicity	Category 1A
Specific target organ toxicity (single exposure)	Category 1
Flammable liquids	Category 3

Label elements

Emergency Overview

Signal word

Danger

May cause cancer
Causes damage to organs
Flammable liquid and vapor

**Appearance** White**Physical state** Paste / Gel Liquid**Odor** Alcoholic**Precautionary Statements - Prevention**

Obtain special instructions before use
 Do not handle until all safety precautions have been read and understood
 Use personal protective equipment as required
 Do not breathe dust/fume/gas/mist/vapors/spray
 Wash face, hands and any exposed skin thoroughly after handling
 Do not eat, drink or smoke when using this product

Precautionary Statements - Response

Specific treatment (see .? on this label)
 IF exposed: Call a POISON CENTER or doctor/physician

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
 If eye irritation persists: Get medical advice/attention
 IF ON SKIN: Wash with plenty of soap and water
 If skin irritation occurs: Get medical advice/attention
 In case of fire: Use CO₂, dry chemical, or foam to extinguish.

Precautionary Statements - Storage

Store locked up

Precautionary Statements - Disposal

Dispose of contents/container to an approved waste disposal plant

Hazards not otherwise classified (HNOC)

Not applicable

Other Information

May be harmful if swallowed. Toxic to aquatic life with long lasting effects.

Unknown acute toxicity 31.47105 % of the mixture consists of ingredient(s) of unknown toxicity

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical name	CAS No	Weight-%
TALC	14807-96-6	15 - 40
ETHANOL	64-17-5	10 - 30
2-PROPANOL	67-63-0	1 - 5
TITANIUM DIOXIDE	13463-67-7	1 - 5
METHANOL	67-56-1	1 - 5
METHYL ISOBUTYL KETONE	108-10-1	0.1 - 1

4. FIRST AID MEASURES

Description of first aid measures**General advice**

Call 911 or emergency medical service. Remove and isolate contaminated clothing and shoes.

Eye contact	In case of contact with substance, immediately flush skin or eyes with running water for at least 20 minutes.
Skin contact	Wash skin with soap and water.
Inhalation	Move victim to fresh air. If breathing is irregular or stopped, administer artificial respiration. Administer oxygen if breathing is difficult.
Ingestion	IF SWALLOWED: Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Call a physician.
Self-protection of the first aider	Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.

Most important symptoms and effects, both acute and delayed

Symptoms See section 2 for more information.

Indication of any immediate medical attention and special treatment needed

Note to physicians Keep victim warm and quiet.

5. FIRE-FIGHTING MEASURES

Suitable extinguishing media

Dry chemical, CO₂, water spray or regular foam, Water spray, fog or regular foam, Use water spray or fog; do not use straight streams

Unsuitable extinguishing media

CAUTION: All these products have a very low flash point. Use of water spray when fighting fire may be inefficient

Specific hazards arising from the chemical

Vapors may form explosive mixtures with air. Vapors may travel to source of ignition and flash back. Most vapors are heavier than air. They will spread along ground and collect in low or confined areas (sewers, basements, tanks). Vapor explosion hazard indoors, outdoors or in sewers. Those substances designated with a "P" may polymerize explosively when heated or involved in a fire. Runoff to sewer may create fire or explosion hazard. Substance may be transported hot.

Explosion data

Sensitivity to Mechanical Impact None.

Sensitivity to Static Discharge None.

Protective equipment and precautions for firefighters

Move containers from fire area if you can do it without risk.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Personal precautions ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area). All equipment used when handling the product must be grounded. Do not touch or walk through spilled material. Stop leak if you can do it without risk.

Other Information Water spray may reduce vapor; but may not prevent ignition in closed spaces.

Environmental precautions

Environmental precautions Prevent entry into waterways, sewers, basements or confined areas. See section 12 for additional ecological information.

Methods and material for containment and cleaning up

Methods for containment	A vapor suppressing foam may be used to reduce vapors. Absorb or cover with dry earth, sand or other non-combustible material and transfer to containers.
Methods for cleaning up	Use clean non-sparking tools to collect absorbed material. Dike far ahead of liquid spill for later disposal.
Prevention of secondary hazards	Clean contaminated objects and areas thoroughly observing environmental regulations.

7. HANDLING AND STORAGE

Precautions for safe handling

Advice on safe handling	Handle in accordance with good industrial hygiene and safety practice. Avoid contact with skin, eyes or clothing. Wash thoroughly after handling. Wash contaminated clothing before reuse. Use personal protective equipment as required. Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
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Conditions for safe storage, including any incompatibilities

Storage Conditions	Keep away from heat, sparks, flame and other sources of ignition (i.e., pilot lights, electric motors and static electricity). Store locked up.
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Incompatible materials	Strong oxidizing agents
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8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

Exposure Guidelines

Chemical name	ACGIH TLV	OSHA PEL	NIOSH IDLH
TALC 14807-96-6	TWA: 2 mg/m ³ particulate matter containing no asbestos and <1% crystalline silica, respirable particulate matter	(vacated) TWA: 2 mg/m ³ respirable dust <1% Crystalline silica, containing no Asbestos TWA: 20 mppcf if 1% Quartz or more; use Quartz limit	IDLH: 1000 mg/m ³ TWA: 2 mg/m ³ containing no Asbestos and <1% Quartz respirable dust
ETHANOL 64-17-5	STEL: 1000 ppm	TWA: 1000 ppm TWA: 1900 mg/m ³ (vacated) TWA: 1000 ppm (vacated) TWA: 1900 mg/m ³	IDLH: 3300 ppm TWA: 1000 ppm TWA: 1900 mg/m ³
2-PROPANOL 67-63-0	STEL: 400 ppm TWA: 200 ppm	TWA: 400 ppm TWA: 980 mg/m ³ (vacated) TWA: 400 ppm (vacated) TWA: 980 mg/m ³ (vacated) STEL: 500 ppm (vacated) STEL: 1225 mg/m ³	IDLH: 2000 ppm TWA: 400 ppm TWA: 980 mg/m ³ STEL: 500 ppm STEL: 1225 mg/m ³
TITANIUM DIOXIDE 13463-67-7	TWA: 10 mg/m ³	TWA: 15 mg/m ³ total dust (vacated) TWA: 10 mg/m ³ total dust	IDLH: 5000 mg/m ³ TWA: 2.4 mg/m ³ CIB 63 fine TWA: 0.3 mg/m ³ CIB 63 ultrafine, including engineered nanoscale
METHANOL 67-56-1	STEL: 250 ppm TWA: 200 ppm S*	TWA: 200 ppm TWA: 260 mg/m ³ (vacated) TWA: 200 ppm (vacated) TWA: 260 mg/m ³ (vacated) STEL: 250 ppm (vacated) STEL: 325 mg/m ³ (vacated) S*	IDLH: 6000 ppm TWA: 200 ppm TWA: 260 mg/m ³ STEL: 250 ppm STEL: 325 mg/m ³
METHYL ISOBUTYL KETONE 108-10-1	STEL: 75 ppm TWA: 20 ppm	TWA: 100 ppm TWA: 410 mg/m ³ (vacated) TWA: 50 ppm (vacated) TWA: 205 mg/m ³ (vacated) STEL: 75 ppm (vacated) STEL: 300 mg/m ³	IDLH: 500 ppm TWA: 50 ppm TWA: 205 mg/m ³ STEL: 75 ppm STEL: 300 mg/m ³

NIOSH IDLH Immediately Dangerous to Life or Health

Other Information	Vacated limits revoked by the Court of Appeals decision in AFL-CIO v. OSHA, 965 F.2d 962
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(11th Cir., 1992).

Appropriate engineering controls

Engineering Controls	Showers Eyewash stations Ventilation systems
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Individual protection measures, such as personal protective equipment

Eye/face protection	Wear safety glasses with side shields (or goggles).
Skin and body protection	Wear protective natural rubber, nitrile rubber, Neoprene™ or PVC gloves.
Respiratory protection	Use NIOSH-approved air-purifying respirator with organic vapor cartridge or canister, as appropriate.
General Hygiene Considerations	Handle in accordance with good industrial hygiene and safety practice. Regular cleaning of equipment, work area and clothing is recommended.

9. PHYSICAL AND CHEMICAL PROPERTIES**9.1. Information on basic physical and chemical properties**

Physical state	Paste / Gel Liquid
Appearance	White
Odor	Alcoholic
Odor threshold	No information available

Property	Values	Remarks • Method
pH	No information available	
Melting point / freezing point	No information available	
Boiling point / boiling range	82 °C / 179.6 °F	
Flash point	25 °C / 77 °F	Tag Closed Cup
Evaporation rate	< 1	Butyl acetate = 1
Flammability (solid, gas)	No information available	
Flammability Limit in Air		
Upper flammability limit:	12.7%	
Lower flammability limit:	2.3%	
Vapor pressure	33 mm Hg @ 68°F	
Vapor density	>1	Air = 1
Relative density	1.06-1.10	
Water solubility	Partially soluble	
Solubility(ies)	No information available	
Partition coefficient	No information available	
Autoignition temperature	No information available	
Hyphen	No information available	
Kinematic viscosity	No information available	
Dynamic viscosity	No information available	
Explosive properties	No information available	
Oxidizing properties	No information available	

Other Information

Softening point	No information available
Molecular weight	No information available
Density	No information available
Bulk density	No information available
SADT (self-accelerating decomposition temperature)	No information available

10. STABILITY AND REACTIVITY

Reactivity

No information available

Chemical stability

Stable under normal conditions

Possibility of Hazardous Reactions

None under normal processing.

Conditions to avoid

Heat, flames and sparks.

Incompatible materials

Strong oxidizing agents

Hazardous Decomposition Products

Carbon oxides

Fluorides

11. TOXICOLOGICAL INFORMATION**Information on likely routes of exposure**

Inhalation	May cause damage to organs through prolonged or repeated exposure if inhaled.
Eye contact	Contact with eyes may cause irritation. May cause redness and tearing of the eyes.
Skin contact	May cause skin irritation and/or dermatitis.
Ingestion	Ingestion may cause irritation to mucous membranes.

Chemical name	Oral LD50	Dermal LD50	Inhalation LC50
ETHANOL 64-17-5	= 7060 mg/kg (Rat)	-	= 124.7 mg/L (Rat) 4 h
2-PROPANOL 67-63-0	5050 mg/kg	12800 mg/kg	= 72600 mg/m ³ (Rat) 4 h
TITANIUM DIOXIDE 13463-67-7	> 10000 mg/kg (Rat)	-	-
METHANOL 67-56-1	= 6200 mg/kg (Rat)	= 15840 mg/kg (Rabbit)	= 22500 ppm (Rat) 8 h
METHYL ISOBUTYL KETONE 108-10-1	= 2080 mg/kg (Rat)	= 3000 mg/kg (Rabbit)	2000 - 4000 ppm (Rat) 4 h

Symptoms related to the physical, chemical and toxicological characteristics

Symptoms No information available.

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Sensitization No information available.
 Germ cell mutagenicity No information available.
 Carcinogenicity The table below indicates whether each agency has listed any ingredient as a carcinogen.

Chemical name	ACGIH	IARC	NTP	OSHA
TALC 14807-96-6	-	Group 3	-	X
ETHANOL 64-17-5	A3	Group 1	Known	X
TITANIUM DIOXIDE 13463-67-7	-	Group 2B	-	X
METHYL ISOBUTYL KETONE 108-10-1	A3	Group 2B	-	X

ACGIH (American Conference of Governmental Industrial Hygienists)

A3 - Animal Carcinogen

IARC (International Agency for Research on Cancer)

Group 1 - Carcinogenic to Humans

Group 2B - Possibly Carcinogenic to Humans

Not classifiable as a human carcinogen

NTP (National Toxicology Program)

Known - Known Carcinogen

OSHA (Occupational Safety and Health Administration of the US Department of Labor)

X - Present

Chronic toxicity

May cause adverse effects on the bone marrow and blood-forming system. May cause adverse liver effects. Contains a known or suspected reproductive toxin.

Target organ effects

Central nervous system, Blood, Central Vascular System (CVS), Eyes, Gastrointestinal tract (GI), Liver, Reproductive system, Respiratory system, Skin, Lungs.

The following values are calculated based on chapter 3.1 of the GHS document

ATEmix (oral)	3922 mg/kg
ATEmix (dermal)	14604 mg/kg
ATEmix (inhalation-dust/mist)	23.6 mg/l
ATEmix (inhalation-vapor)	1633391.6 mg/l

12. ECOLOGICAL INFORMATION**Ecotoxicity**

0.01105 % of the mixture consists of component(s) of unknown hazards to the aquatic environment

Persistence and degradability

No information available.

Bioaccumulation

No information available.

Mobility

No information available.

Chemical name	Partition coefficient
ETHANOL 64-17-5	-0.32
2-PROPANOL 67-63-0	0.05
METHANOL 67-56-1	-0.77
METHYL ISOBUTYL KETONE 108-10-1	1.19

Other adverse effects

No information available

13. DISPOSAL CONSIDERATIONS**Waste treatment methods****Disposal of wastes**

This material, as supplied, is a hazardous waste according to federal regulations (40 CFR 261).

Contaminated packaging

Do not reuse container.

US EPA Waste Number

D001, U154 U161

This product contains one or more substances that are listed with the State of California as a hazardous waste.

Chemical name	California Hazardous Waste Status
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ETHANOL 64-17-5	Toxic Ignitable
2-PROPANOL 67-63-0	Toxic Ignitable
METHANOL 67-56-1	Toxic Ignitable

14. TRANSPORT INFORMATION

DOT

UN/ID No 1133
Proper shipping name Adhesives, Limited Quantity (LQ)
Transport hazard class(es) 3
Packing Group III
Emergency Response Guide Number 128

IATA

UN number or ID number ID 8000
Proper shipping name Consumer commodity
Transport hazard class(es) 9
ERG Code 9L

IMDG

UN number or ID number 1133
Proper shipping name Adhesives, Limited Quantity (LQ)
Transport hazard class(es) 3
Packing Group III
EmS-No F-E, S-D

15. REGULATORY INFORMATION

International Inventories

TSCA Complies
DSL/NDL Complies
EINECS/ELINCS Complies
ENCS Not determined
IECSC Complies
KECL Complies
PICCS Complies
AICS Not determined

Legend:

TSCA - United States Toxic Substances Control Act Section 8(b) Inventory
DSL/NDL - Canadian Domestic Substances List/Non-Domestic Substances List
EINECS/ELINCS - European Inventory of Existing Chemical Substances/European List of Notified Chemical Substances
ENCS - Japan Existing and New Chemical Substances
IECSC - China Inventory of Existing Chemical Substances
KECL - Korean Existing and Evaluated Chemical Substances
PICCS - Philippines Inventory of Chemicals and Chemical Substances
AICS - Australian Inventory of Chemical Substances

US Federal Regulations

SARA 313

Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product contains a chemical or chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372

Chemical name	SARA 313 - Threshold Values %
2-PROPANOL - 67-63-0	1.0
METHANOL - 67-56-1	1.0

METHYL ISOBUTYL KETONE - 108-10-1	0.1
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SARA 311/312 Hazard Categories

Acute health hazard	Yes
Chronic Health Hazard	No
Fire hazard	Yes
Sudden release of pressure hazard	No
Reactive Hazard	No

CWA (Clean Water Act)

This product does not contain any substances regulated as pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42)

CERCLA

This material, as supplied, contains one or more substances regulated as a hazardous substance under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302)

Chemical name	Hazardous Substances RQs	CERCLA/SARA RQ	Reportable Quantity (RQ)
METHANOL 67-56-1	5000 lb	-	RQ 5000 lb final RQ RQ 2270 kg final RQ
METHYL ISOBUTYL KETONE 108-10-1	5000 lb	-	RQ 5000 lb final RQ RQ 2270 kg final RQ

US State Regulations**California Proposition 65**

This product contains the following Proposition 65 chemicals

Chemical name	California Proposition 65
ETHANOL 64-17-5	Carcinogen Developmental
TITANIUM DIOXIDE 13463-67-7	*Carcinogen (airborne, unbound particles of respirable size)
METHANOL 67-56-1	Developmental
METHYL ISOBUTYL KETONE 108-10-1	Carcinogen Developmental

- *The asterisked chemical(s) listed are not subject to Proposition 65 because they are not airborne in the finished product
- Ethanol has been shown to be carcinogenic in long-term studies only when consumed as alcoholic beverage
- Ethanol has been shown to be a reproductive toxin only when consumed as an alcoholic beverage

U.S. State Right-to-Know Regulations

Chemical name	New Jersey	Massachusetts	Pennsylvania
TALC 14807-96-6	X	X	X
ETHANOL 64-17-5	X	X	X
2-PROPANOL 67-63-0	X	X	X
TITANIUM DIOXIDE 13463-67-7	X	X	X
WATER 7732-18-5	-	-	X
METHANOL 67-56-1	X	X	X
POLYTETRAFLUOROETHYLENE 9002-84-0	-	-	X
METHYL ISOBUTYL KETONE 108-10-1	X	X	X

U.S. EPA Label Information

EPA Pesticide Registration Number Not applicable

WHMIS Hazard Class

D2A - Very toxic materials, Non-controlled

16. OTHER INFORMATION, INCLUDING DATE OF PREPARATION OF THE LAST REVISION

NFPA	Health hazards	2	Flammability	3	Instability	0	-	
HMIS	Health hazards	2	Flammability	3	Physical hazards	0	Personal protection	B

NFPA (National Fire Protection Association)
HMIS (Hazardous Material Information System)

Revision Date 26-Jul-2021

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End of Safety Data Sheet

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SAFETY DATA SHEET

(According to Regulation EC n.1907/2006 Art. 31 annex II, as modify by EC n.830/2015 and n.878/2020 Regulation)

1. IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1. Product identifier

Product name: Twineflon® / R12D06
Product information: Natural Polytetrafluoroethylene (PTFE) tapes with Installation aid

1.2. Relevant identified uses of the substance or mixture and uses advised against

Recommended use: Metal and plastic pipes thread sealant for hydraulic use, industrial products.
Restrictions on use: Other than those identified

1.3. Details of the supplier of the safety data sheet

Manufacturer: Resitape Srl
Address: Via per Cascina Rogorino, 1
20060 Gessate (MI) - Italy
Telephone: [REDACTED]
Fax: +39 02 95411836
Web site: www.resitape.com
E-mail: [REDACTED]@resitape.com

1.4. Emergency telephone number: [REDACTED] (daytime)

2. HAZARD IDENTIFICATION

2.1. Classification of the substance o mixture

This material is not classified as health or environmental hazardous according to CLP Regulation (EC) N° 1272/2008, as amended, on classification, labelling, and packaging of substances and mixtures.

2.2. Labels elements

According to CLP Regulation (EC) 1272/2008 as amended.

Pictograms: None
Signal word: None
Hazard Statement: None
Precautionary Statement: None

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When thermally decomposed, inhalation of the fumes may cause fever, breathing difficulties, cough and shivering. Contamination of tobacco products with P.T.F.E. powder may cause effects similar to those above – known as Fume fever.

2.3. Other hazards

In accordance with Regulation 1272/2008/EC (CLP)

No specific hazards are known respecting the directions for storage and handling.

The product does not contain any substance identified as having endocrine disrupting properties above the legal limits in accordance with the criteria established in Commission Delegated Regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605. The product does not contain any substance above the legal limits included in the list established in accordance with Article 59 (1), of Regulation (EC) No 1907/2006 to have endocrine disrupting properties or identified as having endocrine disrupting properties, in accordance with the criteria established in Commission Delegated Regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605.

The product does not contain any substances above the legal limits that meet the criteria for classification as PBT (persistent/bioaccumulative/toxic) or vPvB (very persistent/very bioaccumulative).

3. COMPOSITION/INFORMATION ON INGREDIENTS

Ingredient	CAS N°	REACH N°	% by Weight	Classification
Polytetrafluorethylene (homopolymer)	9002-84-0	Not applicable	≥ 99.9	//
Installation aid	Mixture		100	//

This product is considered non-hazardous when used according to accepted practices for the intended use. See also chapter 16 "Other information".

For information on ingredient occupational exposure limits or PBT or vPvB status, see sections 8 and 12 of this SDS.

4. FIRST AID MEASURES

4.1. Description of first aid measures

No first aid measures are needed in normal condition

Inhalation	In case of inhalation of decomposition products, remove patient to fresh air loosening clothing and seek medical attention.
Eye contact	N/A
Skin contact	N/A
Ingestion	N/A

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4.2. Most important symptoms and effects, both acute and delayed

See Section 11.1 Information on toxicological effects

4.3. Indication of any immediate medical attention and special treatment required

In case of unease and seek medical attention

5. FIREFIGHTING MEASURES

5.1. Extinguishing media

Suitable extinguishing: Use media suitable for surrounding fire.

Not suitable: N/A

5.2. Special hazards arising from the substance or mixture

Under fire conditions: In case of fire, avoid inhalation of combustion gases.

The high temperature could generate a thermal decomposition of the product.

See section 10.6. In case of fire avoid inhaling the smoke.

5.3. Advice for fire-fighters

When fire fighting conditions are severe and total thermal decomposition of the product is possible, wear full protective clothing and self-contained, positive pressure or pressure demand breathing apparatus with full face-piece and helmet.

Fluoropolymers can rise the relative toxicity of the combustion gases formed

6. ACCIDENTAL RELEASE MEASURES

6.1. Personal precautions, protective equipment, and emergency procedures

N/A

6.2. Environmental precautions

N/A

6.3. Methods and material for containment and cleaning up

In case of Spillage: Sweep up to avoid slippage, use drums with cover

Waste Disposal: Conform to all applicable regulations.

6.4. Reference to other sections

Refer to Section 8 and Section 13 for more information

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7. HANDLING AND STORAGE

7.1. Precautions for safe handling

Bulk quantities of PTFE polymers should be stored away from flammable materials and in well-ventilated areas. However, in most situations, whether in storage or use, the quantity of material involved is small, and so no special measures should be taken. Provide suitable exhaust ventilation at machines when processing at elevated temperatures.

7.2. Conditions for safe storage including any incompatibilities

No special storage requirements.

7.3. Specific end use(s)

See information in Section 7.1 and 7.2 for handling and storage recommendations.

For the identified uses listed in Section 1, the recommendations in Section 7 should be observed. See Section 8 exposure controls and personal protection recommendations.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1. Control parameters

There are no known occupational limits specific to the substance listed in Section 3.

8.2. Exposure controls

No special protection by way of clothing or equipment is required to handle the product. However as in any industrial activity good hygiene and housekeeping practises should be applied. Provide temperature safety devices.

When product is heated provide appropriate local exhaust. Use general dilution ventilation and/or local exhaust ventilation to maintain levels of thermal decomposition products below their exposure guidelines.

9. PHYSICAL AND CHEMICAL PROPERTIES

	PTFE Thread	Installation aid
Appearance:	Solid, thin, flexible tape or wire	light yellow
Colour:	Natural white or transparent	
Odour:	None	
pH:	N/A	6,8 ± 0,2
Viscosity:	N/A	
Specific Gravity	0,25-2,20 g/cm ³	
Melting Point:	330-345 °C	
Boiling Point:	N/A	
Solubility in H ₂ O:	Insoluble	Soluble

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Solubility (other)	Insoluble in all common solvents
Flash Point:	Does not flash
Auto Ignition Temp.:	575 °C approx.
Explosive properties:	N/A
Oxidising properties:	N/A

10. STABILITY AND REACTIVITY

10.1. Reactivity

This material may be reactive with certain agents under certain conditions (see the remaining headings in this section).

10.2. Chemical stability

Stable product

10.3. Possibility of hazardous reactions

Stable product

10.4. Conditions to avoid

Not determined

10.5. Incompatible materials

Inert. Although reaction with alkali and alkaline earth metals.

Reactions with metals in powder form occur from 370°C onwards.

Incompatible with elemental fluorine and interhalogen compounds at elevated temperatures and pressures (no reaction at room temperature and normal pressures).

10.6. Hazardous decomposition products

No hazardous decomposition products if storage and handling requirements are followed.

Thermal decomposition: > 260 °C continuous. Significant decomposition above 400°C

Combustion gases formed during the decomposition could be:

- Carbon monoxide
- Hydrogen fluoride
- Carbonyl fluoride
- Tetrafluoroethylene
- Hexafluoropropylene
- Perfluoroisobutylene

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11. TOXICOLOGICAL INFORMATION

11.1. Information on Toxicological effects

General:	According to experience the product is considered to be harmless to health if handled in the correct manner.
Acute:	Flu like transient sickness. The warm vapor may be causes an irritation of human respiratory system with may cause fever, breathing difficulties, cough, and shivering.
Chronic:	Long-term exposure to the product is not thought to produce chronic effects adverse to the health (as classified by EC Directives using animal models); nevertheless exposure by all routes should be minimised as a matter of course.
Routes of Entry:	a) Inhalation – high dust concentrations may be an irritant to the upper respiratory tract. b) Eyes – mechanical irritation c) Skin – not irritating and not absorbing. May cause physical abrasion. d) Ingestion – inert when ingested by rats.

Ingredient	Toxicity	Irritation
Polytetrafluorethylene	Oral (rat) LD 50: 1250 mg/kg *	<u>Not Available</u>

* Value obtained from manufacturer's SDS.

12. ECOLOGICAL INFORMATION

12.1. Toxicity*

Ingredient	End point	Test Duration (hr)	Species	Value	Source
Polytetrafluorethylene	N/A	N/A	N/A	N/A	N/A

* Value obtained from manufacturer's SDS.

12.2. Persistence and degradability*

Ingredient	Persistence: Water/Soil	Persistence: Air
Polytetrafluorethylene	High	<u>High</u>

* Value obtained from manufacturer's SDS.

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12.3. Bioaccumulative potential*

Ingredient	Bioaccumulation
Polytetrafluorethylene	Low

12.4. Mobility in soil

No product test data available.

12.5. Results of the PBT and vPvB assessment

According to Annex XIII of Regulation (EC) No.1907/2006 concerning the Registration, Evaluation, Authorization and Restriction of Chemicals (REACH): The product does not contain substances that meet the PBT (persistent/bioaccumulative/toxic) criteria or the vPvB (very persistent/very bioaccumulative) criteria

12.6. Endocrine-disrupting properties

The product does not contain any substance identified as having endocrine disrupting properties above the legal limits, in accordance with the criteria established in Commission Delegated Regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605. The product does not contain any substance above the legal limits included in the list established pursuant to Article 59 (1), of Regulation (EC) No. 1907/2006 to have endocrine disrupting properties or identified as having endocrine disrupting properties, in accordance with the criteria established in Commission Delegated Regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605.

12.7. Other adverse effects

The product is insoluble in water, has very low volatility and has no harmful effect on the environment.

13. DISPOSAL CONSIDERATIONS

13.1. Waste treatment methods

This product has been classified as a non-hazardous waste. Dispose of waste and residues in accordance with local authority requirements. May be buried on an authorised landfill site or incinerated above 800°C.

Please refer to the European Waste Code (EWC-2000/532/EC and amendments) to assign the correct waste code.

14. TRANSPORT INFORMATION

Transport in accordance with CDG-CPL/ADR for road, RID for rail, IMDG for sea and ICAO-IATA for air. Not classified as hazardous for carriage under the above regulations.

UN-N°: Not applicable

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15. REGULATORY INFORMATION

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

Carcinogenicity

Ingredient	CAS N.	Classification	Regulation
Polytetrafluorethylene (homopolymer)	9002-84-0	Gr. 3: Not classifiable	International Agency for Research on Cancer

Comply with REACH Regulation 1907/2006, RoHS Directives 2011/65/EU and 2015/863, CLP Regulation as amended with EC Regulation n.830/2015 and EC Regulation n.878/2020.

15.2. Chemical Safety Assessment

According to Directives 2008/1272/EC and 2010/453/EC (Hazard Information and Packaging for Supply):
Not applicable

16. OTHER INFORMATION

Revision information:

Section updates in this revision

- Section 1 (1.3)
- Section 2 (2.3)
- Section 11 (11.1)
- Section 12 (12.5; 12.6)

The information herein is based on data considered to be accurate as of the date of preparation of the Material Safety Data Sheet. However, no warranty or representation, expressed or implied, is made as to the accuracy or completeness of the foregoing data and safety information. The use assumes all liability for any damage or injury resulting from abnormal use, from any failure to adhere to recommended practices or from any hazards inherent in the nature of the product.