PTFE Additive Powder

Gujarat Fluorochemicals Ltd.

Version No: **2.3**
Safety Data Sheet according to OSHA HazCom Standard (2012) requirements

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SECTION 1 IDENTIFICATION

Product Identifier

Product name	PTFE Additive Powder
Chemical Name	polytetrafluoroethylene
Synonyms	INOLUB™200, 300 SERIES.600, 700, 800 SERIES
Chemical formula	$(C_2F_4)x$
Other means of identification	Not Available
CAS number	9002-84-0

Recommended use of the chemical and restrictions on use

Relevant identified uses	Addtive

Name, address, and telephone number of the chemical manufacturer, importer, or other responsible party

Registered company name	**Gujarat Fluorochemicals Ltd.**
Address	12/A, GIDC Dahej Industrial Estate India
Telephone	+91-2641-618333
Fax	+91-2641-618012
Website	www.inolub.com
Email	inolub@gfl.co.in

Emergency phone number

Association / Organisation	**Gujarat Fluorochemicals ltd**
Emergency telephone numbers	+91-2641-618080-81
Other emergency telephone numbers	Not Available

SECTION 2 HAZARD(S) IDENTIFICATION

Classification of the substance or mixture

NFPA 704 diamond

Note: The hazard category numbers found in GHS classification in section 2 of this SDSs are NOT to be used to fill in the NFPA 704 diamond. Blue = Health Red = Fire Yellow = Reactivity White = Special (Oxidizer or water reactive substances)

Classification	Not Applicable

Label elements

Hazard pictogram(s)	Not Applicable
SIGNAL WORD	NOT APPLICABLE

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Hazard statement(s)

Not Applicable

Hazard(s) not otherwise specified

Not Applicable

Precautionary statement(s) Prevention

Not Applicable

Precautionary statement(s) Response

Not Applicable

Precautionary statement(s) Storage

Not Applicable

Precautionary statement(s) Disposal

Not Applicable

SECTION 3 COMPOSITION / INFORMATION ON INGREDIENTS

Substances

CAS No	%[weight]	Name
9002-84-0	>99.9	polytetrafluoroethylene

Mixtures

See section above for composition of Substances

SECTION 4 FIRST-AID MEASURES

Description of first aid measures

Eye Contact	If this product comes in contact with eyes: ▸ Wash out immediately with water. ▸ If irritation continues, seek medical attention. Removal of contact lenses after an eye injury should only be undertaken by skilled personnel. For THERMAL burns: ▸ Do not remove contact lens ▸ Lay victim down, on stretcher if available and pad **BOTH** eyes, make sure dressing does not press on the injured eye by placing thick pads under dressing, above and below the eye. Seek urgent medical assistance, or transport to hospital. ▸
Skin Contact	If skin or hair contact occurs: ▸ Flush skin and hair with running water (and soap if available). Seek medical attention in event of irritation. In case of burns: ▸ Immediately apply cold water to burn either by immersion or wrapping with saturated clean cloth. ▸ Do not remove or cut away clothing over burnt areas. Do not pull away clothing which has adhered to the skin as this can cause further injury. ▸ Do not break blister or remove solidified material. ▸ Quickly cover wound with dressing or clean cloth to help prevent infection and to ease pain. ▸ For large burns, sheets, towels or pillow slips are ideal; leave holes for eyes, nose and mouth. ▸ Do not apply ointments, oils, butter, etc. to a burn under any circumstances. ▸ Water may be given in small quantities if the person is conscious. ▸ Alcohol is not to be given under any circumstances. ▸ Reassure. ▸ Treat for shock by keeping the person warm and in a lying position. ▸ Seek medical aid and advise medical personnel in advance of the cause and extent of the injury and the estimated time of arrival of the patient. For thermal burns: ▸ Decontaminate area around burn. Consider the use of cold packs and topical antibiotics. For first-degree burns (affecting top layer of skin) ▸ Hold burned skin under cool (not cold) running water or immerse in cool water until pain subsides. ▸ Use compresses if running water is not available. ▸ Cover with sterile non-adhesive bandage or clean cloth. ▸ Do NOT apply butter or ointments; this may cause infection. Give over-the counter pain relievers if pain increases or swelling, redness, fever occur. For second-degree burns (affecting top two layers of skin) ▸ Cool the burn by immerse in cold running water for 10-15 minutes.

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	- Use compresses if running water is not available. - Do not apply ice as this may lower body temperature and cause further damage. - Do not break blisters or apply butter or ointments; this may cause infection. - Protect burn by cover loosely with sterile, nonstick bandage and secure in place with gauze or tape. To prevent shock: (unless the person has a head, neck, or leg injury, or it would cause discomfort): - Lay the person flat. - Elevate feet about 12 inches. - Elevate burn area above heart level, if possible. - Cover the person with coat or blanket. - Seek medical assistance. For third-degree burns Seek immediate medical or emergency assistance. In the mean time: - Protect burn area cover loosely with sterile, nonstick bandage or, for large areas, a sheet or other material that will not leave lint in wound. - Separate burned toes and fingers with dry, sterile dressings. - Do not soak burn in water or apply ointments or butter; this may cause infection. - To prevent shock see above. - For an airway burn, do not place pillow under the person's head when the person is lying down. This can close the airway. - Have a person with a facial burn sit up. - Check pulse and breathing to monitor for shock until emergency help arrives.
Inhalation	- If dust is inhaled, remove from contaminated area. - Encourage patient to blow nose to ensure clear breathing passages. - Ask patient to rinse mouth with water but to not drink water. - Seek immediate medical attention.
Ingestion	- Immediately give a glass of water. - First aid is not generally required. If in doubt, contact a Poisons Information Centre or a doctor.

Most important symptoms and effects, both acute and delayed

See Section 11

Indication of any immediate medical attention and special treatment needed

Treat symptomatically.
For polytetrafluoroethylene (PTFE) and other related polyfluorinated polymers:
Pyrolysis products of this material have been known to produce an influenza-like syndrome in man, lasting 24-48 hours.
(ILO)

SECTION 5 FIRE-FIGHTING MEASURES

Extinguishing media

- Do not direct a solid stream of water or foam into burning molten material; this may cause spattering and spread the fire.
- Foam.
- Dry chemical powder.
- BCF (where regulations permit).
- Carbon dioxide.
- Water spray or fog - Large fires only.

Special hazards arising from the substrate or mixture

Fire Incompatibility	- Avoid contamination with oxidising agents i.e. nitrates, oxidising acids, chlorine bleaches, pool chlorine etc. as ignition may result

Special protective equipment and precautions for fire-fighters

Fire Fighting	- Alert Fire Brigade and tell them location and nature of hazard. - Wear breathing apparatus plus protective gloves. - Prevent, by any means available, spillage from entering drains or water courses. - Use water delivered as a fine spray to control fire and cool adjacent area. - Do not approach containers suspected to be hot. - Cool fire exposed containers with water spray from a protected location. - If safe to do so, remove containers from path of fire. - Equipment should be thoroughly decontaminated after use.
Fire/Explosion Hazard	- Combustible solid which burns but propagates flame with difficulty; it is estimated that most organic dusts are combustible (circa 70%) - according to the circumstances under which the combustion process occurs, such materials may cause fires and / or dust explosions. - Organic powders when finely divided over a range of concentrations regardless of particulate size or shape and suspended in air or some other oxidizing medium may form explosive dust-air mixtures and result in a fire or dust explosion (including secondary explosions).

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	- Avoid generating dust, particularly clouds of dust in a confined or unventilated space as dusts may form an explosive mixture with air, and any source of ignition, i.e. flame or spark, will cause fire or explosion. Dust clouds generated by the fine grinding of the solid are a particular hazard; accumulations of fine dust (420 micron or less) may burn rapidly and fiercely if ignited - particles exceeding this limit will generally not form flammable dust clouds; once initiated, however, larger particles up to 1400 microns diameter will contribute to the propagation of an explosion. - In the same way as gases and vapours, dusts in the form of a cloud are only ignitable over a range of concentrations; in principle, the concepts of lower explosive limit (LEL) and upper explosive limit (UEL) are applicable to dust clouds but only the LEL is of practical use; - this is because of the inherent difficulty of achieving homogeneous dust clouds at high temperatures (for dusts the LEL is often called the "Minimum Explosible Concentration", MEC). - When processed with flammable liquids/vapors/mists,ignitable (hybrid) mixtures may be formed with combustible dusts. Ignitable mixtures will increase the rate of explosion pressure rise and the Minimum Ignition Energy (the minimum amount of energy required to ignite dust clouds - MIE) will be lower than the pure dust in air mixture. The Lower Explosive Limit (LEL) of the vapour/dust mixture will be lower than the individual LELs for the vapors/mists or dusts. - A dust explosion may release of large quantities of gaseous products; this in turn creates a subsequent pressure rise of explosive force capable of damaging plant and buildings and injuring people. - Usually the initial or primary explosion takes place in a confined space such as plant or machinery, and can be of sufficient force to damage or rupture the plant. If the shock wave from the primary explosion enters the surrounding area, it will disturb any settled dust layers, forming a second dust cloud, and often initiate a much larger secondary explosion. All large scale explosions have resulted from chain reactions of this type. - Dry dust can be charged electrostatically by turbulence, pneumatic transport, pouring, in exhaust ducts and during transport. - Build-up of electrostatic charge may be prevented by bonding and grounding. - Powder handling equipment such as dust collectors, dryers and mills may require additional protection measures such as explosion venting. - All movable parts coming in contact with this material should have a speed of less than 1-meter/sec. - A sudden release of statically charged materials from storage or process equipment, particularly at elevated temperatures and/ or pressure, may result in ignition especially in the absence of an apparent ignition source. - One important effect of the particulate nature of powders is that the surface area and surface structure (and often moisture content) can vary widely from sample to sample, depending of how the powder was manufactured and handled; this means that it is virtually impossible to use flammability data published in the literature for dusts (in contrast to that published for gases and vapours). - Autoignition temperatures are often quoted for dust clouds (minimum ignition temperature (MIT)) and dust layers (layer ignition temperature (LIT)); LIT generally falls as the thickness of the layer increases. Combustion products include: , carbon monoxide (CO) , carbon dioxide (CO2) , hydrogen fluoride(HF) , other pyrolysis products typical of burning organic material. **CARE**: Contamination of heated / molten liquid with water may cause violent steam explosion, with scattering of hot contents. - Polytetrafluoroethylene (PTFE) and related polyfluorinated polymers does not burn without an external flame. - WARNING: Wear neoprene gloves when handling refuse from fire where polytetrafluoroethylene (PTFE) was present.

SECTION 6 ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

See section 8

Environmental precautions

See section 12

Methods and material for containment and cleaning up

Minor Spills	- Clean up all spills immediately. - Avoid contact with skin and eyes. - Wear impervious gloves and safety glasses. - Use dry clean up procedures and avoid generating dust. - Vacuum up (consider explosion-proof machines designed to be grounded during storage and use). - Do not use air hoses for cleaning - Place spilled material in clean, dry, sealable, labelled container.
Major Spills	- Clear area of personnel and move upwind. - Alert Fire Brigade and tell them location and nature of hazard. - Control personal contact with the substance, by using protective equipment and dust respirator.

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	▸ Prevent spillage from entering drains, sewers or water courses. ▸ Avoid generating dust. ▸ Sweep, shovel up. Recover product wherever possible. ▸ Put residues in labelled plastic bags or other containers for disposal. ▸ If contamination of drains or waterways occurs, advise emergency services.

Personal Protective Equipment advice is contained in Section 8 of the SDS.

SECTION 7 HANDLING AND STORAGE

Precautions for safe handling

Safe handling	▸ The greatest potential for injury caused by molten materials occurs during purging of machinery (moulders, extruders etc.) ▸ It is essential that workers in the immediate area of the machinery wear eye and skin protection (such as full face, safety glasses, heat resistant gloves, overalls and safety boots) as protection from thermal burns. ▸ Fumes or vapours emitted from hot melted materials, during converting operations, may condense on overhead metal surfaces or exhaust ducts. The condensate may contain substances which are irritating or toxic. Avoid contact of that material with the skin. Wear rubber or other impermeable gloves when cleaning contaminated areas. ▸ Avoid process temperatures above decomposition temperatures. Overheating may occur at excessively high cylinder heats, overworking of the melt by wrong screw configuration, or by long dwell time in the machine. Under such conditions, thermal emissions and heat-degradation products might, without proper ventilation, reach hazardous concentrations in the converting area. Hot purgings should be collected only as thin flat strands to allow for rapid cooling. Hot purgings should be cooled by quenching in water in a well-ventilated area. Limit all unnecessary personal contact. ▸ ▸ Wear protective clothing when risk of exposure occurs. ▸ Use in a well-ventilated area. ▸ Avoid contact with incompatible materials. ▸ When handling, do not eat, drink or smoke. ▸ Keep containers securely sealed when not in use. ▸ Avoid physical damage to containers. ▸ Always wash hands with soap and water after handling. ▸ Work clothes should be laundered separately. ▸ Use good occupational work practice. ▸ Observe manufacturer's storage and handling recommendations contained within this SDS. ▸ Atmosphere should be regularly checked against established exposure standards to ensure safe working conditions are maintained. ▸ Organic powders when finely divided over a range of concentrations regardless of particulate size or shape and suspended in air or some other oxidizing medium may form explosive dust-air mixtures and result in a fire or dust explosion (including secondary explosions) ▸ Minimise airborne dust and eliminate all ignition sources. Keep away from heat, hot surfaces, sparks, and flame. ▸ Establish good housekeeping practices. ▸ Remove dust accumulations on a regular basis by vacuuming or gentle sweeping to avoid creating dust clouds. Use continuous suction at points of dust generation to capture and minimise the accumulation of dusts. Particular attention should be given to overhead and hidden horizontal surfaces to minimise the probability of a "secondary" explosion. According to NFPA Standard 654, dust layers 1/32 in.(0.8 mm) thick can be sufficient to warrant immediate cleaning of the area. ▸ Do not use air hoses for cleaning. ▸ Minimise dry sweeping to avoid generation of dust clouds. Vacuum dust-accumulating surfaces and remove to a chemical disposal area. Vacuums with explosion-proof motors should be used. ▸ Control sources of static electricity. Dusts or their packages may accumulate static charges, and static discharge can be a source of ignition. ▸ Solids handling systems must be designed in accordance with applicable standards (e.g. NFPA including 654 and 77) and other national guidance. ▸ Do not empty directly into flammable solvents or in the presence of flammable vapors. ▸ The operator, the packaging container and all equipment must be grounded with electrical bonding and grounding systems. Plastic bags and plastics cannot be grounded, and antistatic bags do not completely protect against development of static charges. Empty containers may contain residual dust which has the potential to accumulate following settling. Such dusts may explode in the presence of an appropriate ignition source. ▸ Do not cut, drill, grind or weld such containers. ▸ In addition ensure such activity is not performed near full, partially empty or empty containers without appropriate workplace safety authorisation or permit.
Other information	▸ Store in original containers. ▸ Keep containers securely sealed. ▸ Store in a cool, dry area protected from environmental extremes. ▸ Store away from incompatible materials and foodstuff containers. ▸ Protect containers against physical damage and check regularly for leaks. Observe manufacturer's storage and handling recommendations contained within this SDS. For major quantities: ▸ Consider storage in bunded areas - ensure storage areas are isolated from sources of community water (including

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	- stormwater, ground water, lakes and streams}. - Ensure that accidental discharge to air or water is the subject of a contingency disaster management plan; this may require consultation with local authorities.

Conditions for safe storage, including any incompatibilities

Suitable container	- Lined metal can, lined metal pail/ can. - Plastic pail. - Polyliner drum. - Packing as recommended by manufacturer. - Check all containers are clearly labelled and free from leaks.
Storage incompatibility	Avoid contamination of water, foodstuffs, feed or seed. For saturated perfluorocarbons: - Standard oxidation-reduction potentials do not apply to PFCs. The materials are unaffected by electrochemical reactions and do not dissociate in aqueous media. - They are essentially already fully oxidised and are unaffected by standard oxidizing agents such as permanganates, - chromates, etc. The only known oxidation takes place only at high temperatures by thermal decomposition. - Likewise, the materials are only reduced under extreme conditions, requiring reducing agents such as elemental sodium Avoid - magnesium, aluminium and their alloys, brass and steel. The most potentially reactive of this class, the perfluorinated tertiary amines and the quite analogous perfluorinated ethers, are similarly unreactive. Fluorinated tert-amines do not form salts or complexes with strong acids and are not attacked by most oxidizing or reducing agents For polytetrafluoroethylene (PTFE) and other related polyfluorinated polymers: Avoid storage with strong oxidising agents, tetrafluoroethylene, hexafluoroethylene, perfluoroisobutylene, carbonyl fluoride and hydrogen fluoride.

SECTION 8 EXPOSURE CONTROLS / PERSONAL PROTECTION

Control parameters

OCCUPATIONAL EXPOSURE LIMITS (OEL)

INGREDIENT DATA

Not Available

EMERGENCY LIMITS

Ingredient	Material name	TEEL-1	TEEL-2	TEEL-3
polytetrafluoroethylene	Polytetrafluoroethylene	12 mg/m3	130 mg/m3	790 mg/m3

Ingredient	Original IDLH	Revised IDLH
polytetrafluoroethylene	Not Available	Not Available

Exposure controls

Appropriate engineering controls

Engineering controls are used to remove a hazard or place a barrier between the worker and the hazard. Well-designed engineering controls can be highly effective in protecting workers and will typically be independent of worker interactions to provide this high level of protection.
The basic types of engineering controls are:
Process controls which involve changing the way a job activity or process is done to reduce the risk.
Enclosure and/or isolation of emission source which keeps a selected hazard "physically" away from the worker and ventilation that strategically "adds" and "removes" air in the work environment. Ventilation can remove or dilute an air contaminant if designed properly. The design of a ventilation system must match the particular process and chemical or contaminant in use.

Employers may need to use multiple types of controls to prevent employee overexposure.

General exhaust is adequate under normal operating conditions. If risk of overexposure exists, wear SAA approved respirator. Correct fit is essential to obtain adequate protection. Provide adequate ventilation in warehouse or closed storage areas. Air contaminants generated in the workplace possess varying "escape" velocities which, in turn, determine the "capture velocities" of fresh circulating air required to effectively remove the contaminant.

Type of Contaminant:	Air Speed:
solvent, vapours, degreasing etc., evaporating from tank (in still air)	0.25-0.5 m/s (50-100 f/min)
aerosols, fumes from pouring operations, intermittent container filling, low speed conveyer transfers, welding, spray drift, plating acid fumes, pickling (released at low velocity into zone of active generation)	0.5-1 m/s (100-200 f/min.)
direct spray, spray painting in shallow booths, drum filling, conveyer loading, crusher dusts, gas discharge (active generation into zone of rapid air motion)	1-2.5 m/s (200-500 f/min)

Continued...

grinding, abrasive blasting, tumbling, high speed wheel generated dusts (released at high initial velocity into zone of very high rapid air motion).	2.5-10 m/s (500-2000 f/min.)

Within each range the appropriate value depends on:

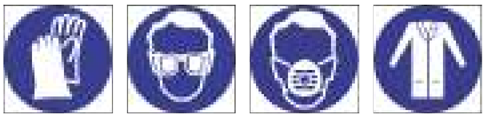
Lower end of the range	Upper end of the range
1: Room air currents minimal or favourable to capture	1: Disturbing room air currents
2: Contaminants of low toxicity or of nuisance value only	2: Contaminants of high toxicity
3: Intermittent, low production.	3: High production, heavy use
4: Large hood or large air mass in motion	4: Small hood - local control only

Simple theory shows that air velocity falls rapidly with distance away from the opening of a simple extraction pipe. Velocity generally decreases with the square of distance from the extraction point (in simple cases). Therefore the air speed at the extraction point should be adjusted, accordingly, after reference to distance from the contaminating source. The air velocity at the extraction fan, for example, should be a minimum of 1-2 m/s (200-400 f/min.) for extraction of solvents generated in a tank 2 meters distant from the extraction point. Other mechanical considerations, producing performance deficits within the extraction apparatus, make it essential that theoretical air velocities are multiplied by factors of 10 or more when extraction systems are installed or used. For molten materials:

Provide mechanical ventilation; in general such ventilation should be provided at compounding/ converting areas and at fabricating/ filling work stations where the material is heated. Local exhaust ventilation should be used over and in the vicinity of machinery involved in handling the molten material. Keep dry!!

Processing temperatures may be well above boiling point of water, so wet or damp material may cause a serious steam explosion if used in unvented equipment.
For polytetrafluoroethylene (PTFE) and other related polyfluorinated polymers:
In processes such as extrusion moulding, engineering controls should be designed to draw thermal degeneration products from the workers breathing zone.
NOTE: When hydrogen fluoride is first detected continue to run equipment with the heat source to the polymer turned off. Ventilate the area and remove non-essential personnel from the area. In case of a major decomposition event evacuate all personnel immediately

Personal protection



Eye and face protection

- Safety glasses with side shields
- Chemical goggles.
- Contact lenses may pose a special hazard; soft contact lenses may absorb and concentrate irritants. A written policy document, describing the wearing of lenses or restrictions on use, should be created for each workplace or task. This should include a review of lens absorption and adsorption for the class of chemicals in use and an account of injury experience. Medical and first-aid personnel should be trained in their removal and suitable equipment should be readily available. In the event of chemical exposure, begin eye irrigation immediately and remove contact lens as soon as practicable. Lens should be removed at the first signs of eye redness or irritation - lens should be removed in a clean environment only after workers have washed hands thoroughly. [CDC NIOSH Current Intelligence Bulletin 59], [AS/NZS 1336 or national equivalent]

Skin protection

See Hand protection below

Hands/feet protection

The selection of suitable gloves does not only depend on the material, but also on further marks of quality which vary from manufacturer to manufacturer. Where the chemical is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.
The exact break through time for substances has to be obtained from the manufacturer of the protective gloves and.has to be observed when making a final choice.
Personal hygiene is a key element of effective hand care. Gloves must only be worn on clean hands. After using gloves, hands should be washed and dried thoroughly. Application of a non-perfumed moisturiser is recommended. Suitability and durability of glove type is dependent on usage. Important factors in the selection of gloves include:

- frequency and duration of contact,
- chemical resistance of glove material,
- glove thickness and
- dexterity

Select gloves tested to a relevant standard (e.g. Europe EN 374, US F739, AS/NZS 2161.1 or national equivalent).

- When prolonged or frequently repeated contact may occur, a glove with a protection class of 5 or higher (breakthrough time greater than 240 minutes according to EN 374, AS/NZS 2161.10.1 or national equivalent) is recommended.
- When only brief contact is expected, a glove with a protection class of 3 or higher (breakthrough time greater than 60 minutes according to EN 374, AS/NZS 2161.10.1 or national equivalent) is recommended.
- Some glove polymer types are less affected by movement and this should be taken into account when considering gloves for long-term use.
- Contaminated gloves should be replaced.

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	As defined in ASTM F-739-96 in any application, gloves are rated as: · Excellent when breakthrough time > 480 min · Good when breakthrough time > 20 min · Fair when breakthrough time < 20 min · Poor when glove material degrades For general applications, gloves with a thickness typically greater than 0.35 mm, are recommended. It should be emphasised that glove thickness is not necessarily a good predictor of glove resistance to a specific chemical, as the permeation efficiency of the glove will be dependent on the exact composition of the glove material. Therefore, glove selection should also be based on consideration of the task requirements and knowledge of breakthrough times. Glove thickness may also vary depending on the glove manufacturer, the glove type and the glove model. Therefore, the manufacturers' technical data should always be taken into account to ensure selection of the most appropriate glove for the task. Note: Depending on the activity being conducted, gloves of varying thickness may be required for specific tasks. For example: · Thinner gloves (down to 0.1 mm or less) may be required where a high degree of manual dexterity is needed. However, these gloves are only likely to give short duration protection and would normally be just for single use applications, then disposed of. · Thicker gloves (up to 3 mm or more) may be required where there is a mechanical (as well as a chemical) risk i.e. where there is abrasion or puncture potential Gloves must only be worn on clean hands. After using gloves, hands should be washed and dried thoroughly. Application of a non-perfumed moisturiser is recommended. ▸ When handling hot materials wear heat resistant, elbow length gloves. ▸ Rubber gloves are not recommended when handling hot objects, materials ▸ Protective gloves eg. Leather gloves or gloves with Leather facing Experience indicates that the following polymers are suitable as glove materials for protection against undissolved, dry solids, where abrasive particles are not present. ▸ polychloroprene. ▸ nitrile rubber. ▸ butyl rubber. ▸ fluorocaoutchouc. ▸ polyvinyl chloride. Gloves should be examined for wear and/ or degradation constantly.
Body protection	See Other protection below
Other protection	▸ When handling hot or molten liquids, wear trousers or overalls outside of boots, to avoid spills entering boots. ▸ Usually handled as molten liquid which requires worker thermal protection and increases hazard of vapour exposure. ▸ **CAUTION:** Vapours may be irritating. No special equipment needed when handling small quantities. **OTHERWISE:** ▸ Overalls. ▸ Barrier cream. ▸ Eyewash unit.

Respiratory protection

Type A-P Filter of sufficient capacity. (AS/NZS 1716 & 1715, EN 143:2000 & 149:2001, ANSI Z88 or national equivalent)

Required Minimum Protection Factor	Half-Face Respirator	Full-Face Respirator	Powered Air Respirator
up to 10 x ES	A P1 Air-line*	- -	A PAPR-P1 -
up to 50 x ES	Air-line**	A P2	A PAPR-P2
up to 100 x ES	-	A P3	-
		Air-line*	-
100+ x ES	-	Air-line**	A PAPR-P3

* - Negative pressure demand ** - Continuous flow
A(All classes) = Organic vapours, B AUS or B1 = Acid gasses, B2 = Acid gas or hydrogen cyanide(HCN), B3 = Acid gas or hydrogen cyanide(HCN), E = Sulfur dioxide(SO2), G = Agricultural chemicals, K = Ammonia(NH3), Hg = Mercury, NO = Oxides of nitrogen, MB = Methyl bromide, AX = Low boiling point organic compounds(below 65 degC)

For molten materials:

- Respirators may be necessary when engineering and administrative controls do not adequately prevent exposures.
- The decision to use respiratory protection should be based on professional judgment that takes into account toxicity information, exposure measurement data, and frequency and likelihood of the worker's exposure - ensure users are not subject to high thermal loads which may result in heat stress or distress due to personal protective equipment (powered, positive flow, full face apparatus may be an option).
- Published occupational exposure limits, where they exist, will assist in determining the adequacy of the selected respiratory protection. These may be government mandated or vendor recommended.
- Certified respirators will be useful for protecting workers from inhalation of particulates when properly selected and fit tested as part of a complete respiratory protection program.
- Use approved positive flow mask if significant quantities of dust becomes airborne.

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- Try to avoid creating dust conditions.

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Appearance	Use may require material be molten. Molten or heated material may be compounded, moulded or extruded.

Physical state	Solid	**Relative density (Water = 1)**	Not Available
Odour	Not Available	**Partition coefficient n-octanol / water**	Not Available
Odour threshold	Not Available	**Auto-ignition temperature (°C)**	Not Available
pH (as supplied)	Not Available	**Decomposition temperature**	Not Available
Melting point / freezing point (°C)	Not Available	**Viscosity (cSt)**	Not Available
Initial boiling point and boiling range (°C)	Not Available	**Molecular weight (g/mol)**	Not Available
Flash point (°C)	Not Available	**Taste**	Not Available
Evaporation rate	Not Available	**Explosive properties**	Not Available
Flammability	Not Available	**Oxidising properties**	Not Available
Upper Explosive Limit (%)	Not Available	**Surface Tension (dyn/cm or mN/m)**	Not Applicable
Lower Explosive Limit (%)	Not Available	**Volatile Component (%vol)**	Not Available
Vapour pressure (kPa)	Not Available	**Gas group**	Not Available
Solubility in water (g/L)	Immiscible	**pH as a solution (1%)**	Not Available
Vapour density (Air = 1)	2.14-2.20	**VOC g/L**	Not Available

SECTION 10 STABILITY AND REACTIVITY

Reactivity	See section 7
Chemical stability	Product is considered stable and hazardous polymerisation will not occur.
Possibility of hazardous reactions	See section 7
Conditions to avoid	See section 7
Incompatible materials	See section 7
Hazardous decomposition products	See section 5

SECTION 11 TOXICOLOGICAL INFORMATION

Information on toxicological effects

Inhaled	The material is not thought to produce adverse health effects or irritation of the respiratory tract (as classified by EC Directives using animal models). Nevertheless, good hygiene practice requires that exposure be kept to a minimum and that suitable control measures be used in an occupational setting. At temperatures of over 400 deg. C the polymer begins to decompose with the reaction becoming faster as temperature rises. Fumes from burning materials containing PTFE irritate the upper airway and may be harmful if exposure is prolonged. Overheated or burnt PTFE releases hydrogen fluoride (a highly irritating and corrosive gas) and small amounts of carbonyl fluoride (highly toxic). Processing for an overly long time or processing at overly high temperatures may cause generation and release of highly irritating vapours, which irritate eyes, nose, throat, causing red itching eyes, coughing, sore throat. Not normally a hazard due to non-volatile nature of product
Ingestion	The material has **NOT** been classified by EC Directives or other classification systems as "harmful by ingestion". This is because of the lack of corroborating animal or human evidence. High molecular weight material; on single acute exposure would be expected to pass through gastrointestinal tract with little

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	change / absorption. Occasionally accumulation of the solid material within the alimentary tract may result in formation of a bezoar (concretion), producing discomfort.
Skin Contact	The material is not thought to produce adverse health effects or skin irritation following contact (as classified by EC Directives using animal models). Nevertheless, good hygiene practice requires that exposure be kept to a minimum and that suitable gloves be used in an occupational setting. Molten material is capable of causing burns. Open cuts, abraded or irritated skin should not be exposed to this material Entry into the blood-stream, through, for example, cuts, abrasions or lesions, may produce systemic injury with harmful effects. Examine the skin prior to the use of the material and ensure that any external damage is suitably protected.
Eye	Although the material is not thought to be an irritant (as classified by EC Directives), direct contact with the eye may cause transient discomfort characterised by tearing or conjunctival redness (as with windburn). Slight abrasive damage may also result.
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. Poly (tetrafluoroethylene) is used in the treatment for a number of urological disorders. Exposure of some experimental animals by local injection showed persistent chronic inflammatory reaction on histology of the sites taken. Repeated administration of 25% PFA (a derivative of PTFE) produced liver and testicular changes but subsequent studies did not reproduce these effects. This material contains a substantial amount of polymer considered to be of low concern. These are classified under having MWs of between 1000 to 10000 with less than 25% of molecules with MWs under 1000 and less than 10% under 500; or having a molecular weight average of over 10000. There has been some concern that this material can cause cancer or mutations but there is not enough data to make an assessment.

	TOXICITY	IRRITATION
PTFE Additive Powder	Not Available	Not Available
polytetrafluoroethylene	Oral (rat) LD50: 1250 mg/kg[2]	Not Available

Legend: *1. Value obtained from Europe ECHA Registered Substances - Acute toxicity 2.* Value obtained from manufacturer's SDS. Unless otherwise specified data extracted from RTECS - Register of Toxic Effect of chemical Substances*

POLYTETRAFLUOROETHYLENE	Perfluorinated compounds are potent peroxisome proliferators. The material may produce peroxisome proliferation. Peroxisomes are single, membrane limited organelles in the cytoplasm that are found in the cells of animals, plants, fungi, and protozoa. The substance is classified by IARC as Group 3: Not classifiable as to its carcinogenicity to humans. Evidence of carcinogenicity may be inadequate or limited in animal testing.

Acute Toxicity	✗	**Carcinogenicity**	⊘
Skin Irritation/Corrosion	⊘	**Reproductivity**	⊘
Serious Eye Damage/Irritation	⊘	**STOT - Single Exposure**	⊘
Respiratory or Skin sensitisation	⊘	**STOT - Repeated Exposure**	⊘
Mutagenicity	⊘	**Aspiration Hazard**	⊘

Legend: ✗ *– Data available but does not fill the criteria for classification*
✓ *– Data available to make classification*
⊘ *– Data Not Available to make classification*

SECTION 12 ECOLOGICAL INFORMATION

Toxicity

	ENDPOINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE
PTFE Additive Powder	Not Available	Not Available	Not Available	Not Available	Not Available
polytetrafluoroethylene	Not Available	Not Available	Not Available	Not Available	Not Available

Continued...

Legend:	*Extracted from 1. IUCLID Toxicity Data 2. Europe ECHA Registered Substances - Ecotoxicological Information - Aquatic Toxicity 3. EPIWIN Suite V3.12 (QSAR) - Aquatic Toxicity Data (Estimated) 4. US EPA, Ecotox database - Aquatic Toxicity Data 5. ECETOC Aquatic Hazard Assessment Data 6. NITE (Japan) - Bioconcentration Data 7. METI (Japan) - Bioconcentration Data 8. Vendor Data*

For polytetrafluoroethylene (PTFE) and other related polyfluorinated polymers:
Ecotoxicity is expected to be low based on the near zero water solubility of the polymer. Material is considered inert and is not expected to e biodegradable or toxic.

Persistence and degradability

Ingredient	Persistence: Water/Soil	Persistence: Air
polytetrafluoroethylene	HIGH	HIGH

Bioaccumulative potential

Ingredient	Bioaccumulation
polytetrafluoroethylene	LOW (LogKOW = 1.2142)

Mobility in soil

Ingredient	Mobility
polytetrafluoroethylene	LOW (KOC = 106.8)

SECTION 13 DISPOSAL CONSIDERATIONS

Waste treatment methods

Product / Packaging disposal	▸ Do not allow wash water from cleaning or process equipment to enter drains. ▸ It may be necessary to collect all wash water for treatment before disposal. ▸ In all cases disposal to sewer may be subject to local laws and regulations and these should be considered first. Where in doubt contact the responsible authority.

SECTION 14 TRANSPORT INFORMATION

Labels Required

Marine Pollutant	NO

Land transport (DOT): NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS

Air transport (ICAO-IATA / DGR): NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS

Sea transport (IMDG-Code / GGVSee): NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS

Transport in bulk according to Annex II of MARPOL and the IBC code

Not Applicable

SECTION 15 REGULATORY INFORMATION

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

POLYTETRAFLUOROETHYLENE (9002-84-0) IS FOUND ON THE FOLLOWING REGULATORY LISTS

- International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs
- US - California Permissible Exposure Limits for Chemical Contaminants
- US - Hawaii Air Contaminant Limits
- US - Pennsylvania - Hazardous Substance List
- US - Rhode Island Hazardous Substance List
- US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory
- US TSCA Chemical Substance Inventory - Interim List of Active Substances

Federal Regulations

Superfund Amendments and Reauthorization Act of 1986 (SARA)

SECTION 311/312 HAZARD CATEGORIES

Flammable (Gases, Aerosols, Liquids, or Solids)	No

Continued...

Gas under pressure	No
Explosive	No
Self-heating	No
Pyrophoric (Liquid or Solid)	No
Pyrophoric Gas	No
Corrosive to metal	No
Oxidizer (Liquid, Solid or Gas)	No
Organic Peroxide	No
Self-reactive	No
In contact with water emits flammable gas	No
Combustible Dust	No
Carcinogenicity	No
Acute toxicity (any route of exposure)	No
Reproductive toxicity	No
Skin Corrosion or Irritation	No
Respiratory or Skin Sensitization	No
Serious eye damage or eye irritation	No
Specific target organ toxicity (single or repeated exposure)	No
Aspiration Hazard	No
Germ cell mutagenicity	No
Simple Asphyxiant	No

US. EPA CERCLA HAZARDOUS SUBSTANCES AND REPORTABLE QUANTITIES (40 CFR 302.4)

None Reported

State Regulations

US. CALIFORNIA PROPOSITION 65

None Reported

National Inventory Status

National Inventory	Status
Australia - AICS	Y
Canada - DSL	Y
Canada - NDSL	N (polytetrafluoroethylene)
China - IECSC	Y
Europe - EINEC / ELINCS / NLP	N (polytetrafluoroethylene)
Japan - ENCS	Y
Korea - KECI	Y
New Zealand - NZIoC	Y
Philippines - PICCS	Y
USA - TSCA	Y
Legend:	*Y = All ingredients are on the inventory* *N = Not determined or one or more ingredients are not on the inventory and are not exempt from listing(see specific ingredients in brackets)*

SECTION 16 OTHER INFORMATION

Revision Date	22/06/2018
Initial Date	22/06/2018

Other information

Classification of the preparation and its individual components has drawn on official and authoritative sources as well as independent review by the Chemwatch Classification committee using available literature references.

Continued...

The SDS is a Hazard Communication tool and should be used to assist in the Risk Assessment. Many factors determine whether the reported Hazards are Risks in the workplace or other settings. Risks may be determined by reference to Exposures Scenarios. Scale of use, frequency of use and current or available engineering controls must be considered.

Definitions and abbreviations

PC－TWA: Permissible Concentration-Time Weighted Average
PC－STEL: Permissible Concentration-Short Term Exposure Limit
IARC: International Agency for Research on Cancer
ACGIH: American Conference of Governmental Industrial Hygienists
STEL: Short Term Exposure Limit
TEEL: Temporary Emergency Exposure Limit。
IDLH: Immediately Dangerous to Life or Health Concentrations
OSF: Odour Safety Factor
NOAEL :No Observed Adverse Effect Level
LOAEL: Lowest Observed Adverse Effect Level
TLV: Threshold Limit Value
LOD: Limit Of Detection
OTV: Odour Threshold Value
BCF: BioConcentration Factors
BEI: Biological Exposure Index

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end of SDS