GFL™
GUJARAT FLUOROCHEMICALS
VALUE THROUGH GREEN CHEMISTRY

INOLUB™
Fluoropolymer Additives

I-SAN

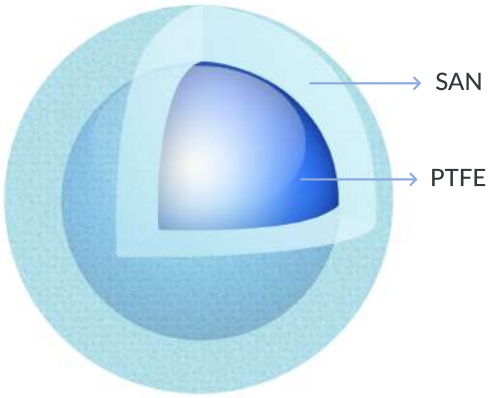
SAN Encapsulated PTFE

GREEN
CHEMISTRY
ADDING VALUE

EXPANDING FLUOROPOLYMER HORIZONS

Chemistry

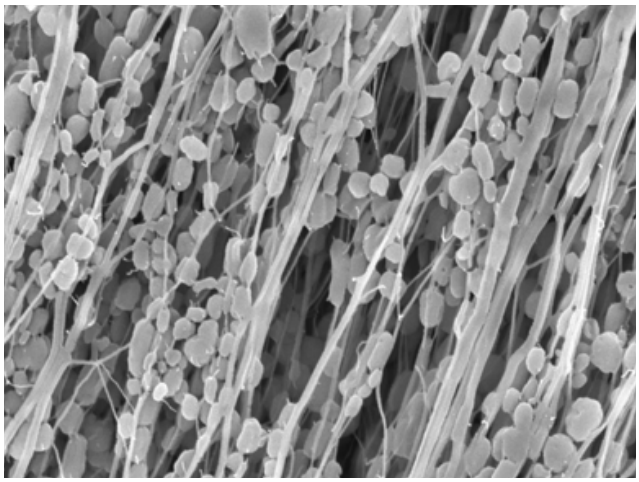
PTFE is used as an anti-dripping additive in the manufacturing of flame-retardant thermoplastics. For this requirement, a high molecular weight emulsion polymerized PTFE provides the best performance. Such PTFE typically has poor flow characteristics, which result in poor dispersibility in the polymer matrix. Use of high shear forces, to improve the mixing, will lead to pre-mature fibrillation of the PTFE powder which results in low performance. To improve the handling and the dispersibility of PTFE in polymeric matrixes, the PTFE particles are encapsulated by a shell of Styrene-acrylonitrile (SAN) polymer. This SAN shell is formed by in-situ polymerization of Styrene and Acrylonitrile monomers in the presence of PTFE particles, produced via emulsion polymerization. The product is a SAN encapsulated PTFE polymer particle, called I-SAN. The encapsulation of PTFE with SAN has two primary benefits: it minimizes the pre-mature fibrillation of the PTFE particles during the mixing process and the resulting free flowing I-SAN has good dispersibility in various polymer resins.



Representational image

Anti – Dripping Mechanism

During compounding, shear is applied to PTFE particles present in the polymer matrix. Due to this shear, high molecular weight PTFE particles form a microscopic node and fibril structure (50 nm fibril thickness). This structure forms a network in the matrix which supports char formation during burning. Emulsion-polymerized PTFE is used for this application as suspension-polymerized PTFE forms significantly less nodes and fibrils. As a result, the quantity of emulsion PTFE required to provide anti-dripping characteristics is much less than with suspension PTFE.



Grade	Dispersibility	Fibrillation
I-SAN	••••	••••
Emulsion PTFE	•	•••
Suspension PTFE	••	••

Key features of I-SAN

- PFOA Free
- Uniform granules
- Free flowing powder
- Excellent dispersibility in polymer resins and compounds
- Excellent anti-drip properties
- High Fibrillation

End-uses

INOLUB™ I-SAN is used as drip suppressant in flame retardant polymers for housings of business machines and household electrical appliances, as well as electronic components.

Properties of I-SAN

Grade	Units	I-SAN50	I-SAN60
PROPERTIES			
PTFE	wt.%	50	60
BD	g/l	450	450
D50	µm	500	500
MP	°C	342	342
Flowability	g/10 min.	250	250
COMPLIANCE			
177.1550	Food Contact Surfaces	✓	✓
EC10/2011	Food Contact	✓	✓

Application and dosing

I-SAN can be used in many polymer compounds, such as PC, PC/ABS, PPO, PBT, PA, ABS, HIPS & PP, with typical dosing between 0.1% and 0.5% depending on FR requirement. These compounds can be used to produce molded or extruded articles or as a component of other industrial products. I-SAN enhances the ability of the polymer compound to comply with UL-94 V0.

Regulatory

I-SAN does not contain PFOA and PFOS, intentionally or unintentionally and complies with REACH regulations for POPs as per (EU) 2019/1021 & EU 2020/784.

Sustainability

GFL is committed to social, environmental and economic sustainability through responsible processes, practices and greener initiatives not only in our products but also in our principles. The Company measures the impact of its business operations through 3 key pillars of Sustainability, namely People, Planet & Profit.

Disclaimers for warranty and liability exclusions

1. Save and except where a claim arises as a result of a manufacturing defect in the Product, the purchaser shall be responsible for all claims raised by end customers in relation to the Product relating to end-use or application including but not limited to, as a result of, delay of any order by the purchaser, inaccurate details of availability of Products displayed on the purchaser's website, lags or issues in the purchaser's end use or application, or any other negligence or default on the part of the purchaser or any of its authorized purchasers, affiliates, distributors, and their respective directors, officers, employees, agents, customers, successors and assigns.

2. This Product has been designed as per the certificate of analysis. Neither GFL nor any of its affiliates, distributors, and their respective directors, officers, employees, agents, customers, successors, and assigns assumes any responsibility for the end-use or application of any products including but not limited to those which do not conform with the specifications mentioned herein; any combination claims or modifications whatsoever.

3. GFL expressly acknowledges and agrees that it shall not be liable for any damages, or any other loss, whether direct, indirect, consequential, incidental, or special, suffered by the purchaser or any other third party, arising from any defect, error, fault, or failure to perform with respect to the specifications mentioned herein, even if the purchaser or third party has been advised of the possibility of such defect, error, fault, or failure.

4. It is the sole responsibility of the purchaser to evaluate the Product for meeting its end-use requirements. The purchaser acknowledges that they have undertaken their own due diligence with respect to the application of the Product.

5. It is the sole responsibility and liability of the purchaser to determine the suitability of the Products supplied in order to ensure that the final product is safe for any desired end-use and its performance is as intended, in compliance with all applicable legal and regulatory requirements.

6. The purchaser is responsible for inspection and testing of the Products in order to satisfy itself as to the suitability of the Products for the purchaser's particular purpose. The purchaser is responsible for the appropriate, safe, legal use, processing, and handling of the Products.

7. GFL accepts no liability in respect of use of the Products in conjunction with other materials. The certificate of analysis and the specifications relate exclusively to the Products when used independently and not in conjunction with any other goods or materials.

8. GFL disclaims and provides no warranties or representations as to the merchantability or fitness of the Product for a particular purpose, end use, application, or the results obtained thereof. The purchaser agrees that neither party nor their affiliates shall provide any warranty on behalf of GFL, to any entity in relation to the Product

ABOUT
the Company

An ISO 9001:2015, ISO 14001:2015, ISO 45001:2018 and SA 8000:2014 certified organization, GFL is a leading producer of Fluoropolymers, Fluorospecialities, Refrigerants and Chemicals for applications in varied industries. GFL derives its strength from expertise in fluorine chemistry, vertical integration and strong R&D, enabling it to provide one of the best quality products by meeting the regulatory compliances, to our clientele globally.

GFL is committed to 'Green Chemistry' and offers environment-friendly products using sustainable technologies. Our extensive research and development in the field of Fluoropolymers enable us to comply with global compliances and regulations and facilitate our customers to choose greener products manufactured by sustainable technologies.

For more information about our company and I-SAN, please refer: www.inolub.com

Value through green chemistry

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