

Micronised Polypropylene as a Functional Filtration Medium in High-Purity Liquid Processing

1. Introduction & Scope

Micronised polypropylene (PP) as a filtration medium in a high-purity liquid processing system, demonstrating how engineered PP powders can function as a clean, inert alternative to mineral-based filter aids in applications requiring strict contamination control.

2. Role of Micronised Polypropylene

- Primary filtration medium providing fine particulate retention
- Precoat layer deposited on filtration equipment to form a porous filtration structure
- Chemical compatibility barrier between process liquid and filter hardware
- Contamination-free alternative to mineral-based filter aids
- Sacrificial process material, fully removed after each filtration cycle and not incorporated into the final liquid product

3. Why Micronised Polypropylene as a Filtration Medium

- Chemical inertness toward esters and organic liquids
- Zero inorganic contamination (no ash, silica, or metals)
- No extractables or leachables, suitable for high-purity systems
- Mechanical stability under filtration pressure
- Clean cake release, enabling reliable filter operation

4. Micronised Polypropylene – Functional & Physical Requirements

Polymer Requirements

Parameter	Specification
Polymer type	Isotactic polypropylene homopolymer
Melting point	Approx. 160–165 °C
D50	10–25 µm
D100	Nearest to 150 microns

5. Project Details : Micronised PP as Filtration Medium for DINP (electronic grade)

In this project, micronised polypropylene is used as a sacrificial filtration medium for the polishing filtration of DINP (electronic grade) using a vertical pressure leaf filter. The filtration system consists of a polypropylene filter cloth or mesh acting as the mechanical backbone, onto which a hydraulically deposited layer of micronised PP forms the active filtration medium. The micronised PP precoat captures trace catalyst residues and ultra-fine particulates from the DINP while maintaining chemical compatibility, cleanliness, and stable filtration performance.

6. Other Products and Product Groups Using Micronised PP as a Sacrificial Filter Aid.

Micronised polypropylene can be used as a sacrificial filtration medium in polishing filtration of the following specific product groups:

PRODUCT GROUP	SPECIFIC PRODUCTS
Plasticisers	DINP DIDP DOTP DINCH Specialty ester plasticisers
Polymer liquid systems	PVC plastisols Polyurethane prepolymers Epoxy resins Acrylic and polyester resin solutions.
High-purity oils and lubricants	White oils (pharma / cosmetic grade) PAO oils synthetic ester lubricants
Electrical and electronic fluids	Transformer oils Capacitor fluids Electronic-grade insulating liquids
Specialty and electronic-grade chemicals	High-purity esters Intermediates and solvents requiring polishing filtration.

Positioning vs. Mineral Filter Aids

Conventional mineral-based filter aids such as diatomaceous earth, perlite, or silica have long been used in pressure-leaf and polishing filtration systems. While effective for general industrial filtration, these materials inherently introduce inorganic content into the process environment and may contribute trace ash, silica, or metal residues that are undesirable in high-purity liquid processing.

Micronised polypropylene offers a fundamentally different filtration approach. As a polymer-based filtration medium, it introduces no inorganic components, ensuring zero ash content and eliminating the risk of mineral carryover into sensitive liquid systems. Its chemical inertness toward esters, oils, and organic liquids enables use in applications where contamination control, extractables, and leachables are critical considerations.

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Unlike brittle mineral filter aids, micronised polypropylene forms a mechanically stable yet compliant filtration cake, supporting consistent flow behavior and clean cake release during discharge. As a sacrificial filtration medium, it is fully removed after each filtration cycle and does not become part of the final product, preserving product purity while enabling reliable and repeatable filtration performance.

In high-purity and electronic-grade applications, micronised polypropylene is therefore positioned not as a replacement for commodity mineral filter aids, but as a functional process material designed specifically for contamination-sensitive filtration environments.

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