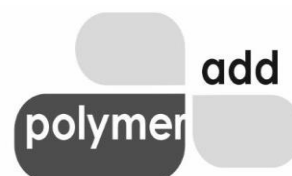


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APPLICATION PROFILE MICRONISED LITHIUM BENZOATE

PRODUCT FORM AND PURPOSE

QUALIFYING COMMERCIAL APPLICATIONS

Micronised Lithium Benzoate has two relevant polypropylene uses: as a solid nucleating additive during polypropylene compounding and as a fine solid catalyst or catalyst-supporting process additive during polypropylene polymerisation. In both cases, the micronised form is used to provide a large, evenly distributed solid surface area.

This profile is limited to processes in which Lithium Benzoate is introduced as a micronised solid and remains present as fine, distributed particles or catalyst residue in the finished polypropylene. Pharmaceutical, battery, pyrotechnic, lubricant, solution and reactive-curing uses are outside the scope.

WHY THE MICRONISED FORM IS USED

Polypropylene is normally processed below the approximately 288-300°C decomposition range reported for Lithium Benzoate. The additive can therefore remain solid during typical polypropylene processing. In nucleation, each well-dispersed particle can provide a heterogeneous surface on which polypropylene crystals begin to form during cooling. In polymerisation service, the finer powder provides greater accessible surface area and more uniform contact within the reactor system.

Micronisation increases the number of active solid sites available from a given addition level and reduces the risk of coarse specks or local over-concentration. Uniform dispersion is essential: agglomerates behave as fewer, larger sites and can cause uneven catalyst contact, inconsistent crystallisation or visible defects.

USE 1 NUCLEATING AGENT FOR POLYPROPYLENE

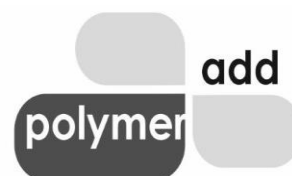
Polypropylene Application	Function of Micronised Lithium Benzoate
Injection-moulded PP parts	Dispersed solid nucleation sites promote more uniform crystallisation during mould cooling and can support shorter, more consistent cooling cycles.
Extruded PP sheet and thermoformed articles	Fine distribution supports uniform crystallisation across the sheet, helping dimensional consistency and downstream thermoforming.
PP film	A well-dispersed particulate nucleant can refine crystal structure and support more consistent optical and

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Polypropylene Application	Function of Micronised Lithium Benzoate
	mechanical properties, subject to film trials.
PP fibres and nonwovens	Uniformly dispersed particles provide repeatable nucleation during rapid cooling of fine filaments, subject to filtration and spinning trials.
Nucleating masterbatch	The powder is pre-dispersed in a compatible PP carrier, so the final let-down distributes the solid nucleant evenly in the finished compound.

USE 2 POLYMERISATION CATALYST OR PROCESS ADDITIVE

Micronised Lithium Benzoate is also identified commercially for use in the polymerisation of polypropylene resins. In this application, the fine powder is introduced into the polymerisation system as a solid catalyst or catalyst-supporting process additive. Reduced particle size improves accessible surface area, distribution and contact with the reaction medium compared with coarse crystals.

This use is process specific. It belongs in this profile only where the selected polypropylene technology retains Lithium Benzoate as fine catalyst residue distributed through the polymer particles and ultimately the finished resin. The reactor licensor or polymer producer must confirm compatibility with the catalyst system, dosing point, reaction conditions and residue limits.

COMMERCIAL RELEVANCE TO POLYPROPYLENE PROCESSORS

Lithium Benzoate is commercially identified both as a benzoate-type nucleating agent for polypropylene and as a catalyst or process additive in polypropylene polymerisation. Its value is tied to efficient distribution of a low-dose solid rather than to filler loading. Particle-size distribution, deagglomeration and accurate feeding are therefore more important than bulk addition.

CRITICAL PRODUCT REQUIREMENTS

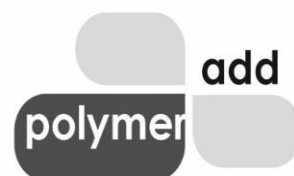
Requirement	Commercial Relevance
Chemical identity	Lithium Benzoate, CAS 553-54-8; molecular formula $C_7H_5LiO_2$.
Micronised particle size	Current micronised profile: D50 3-5 μm and D90 below 20 μm by laser diffraction. The final commercial specification must state the agreed test method and dispersion procedure.
Moisture control	Low moisture and sealed storage are necessary for stable feeding, free flow and consistent incorporation into polypropylene.

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Requirement	Commercial Relevance
Assay and cleanliness	High chemical purity and control of visible contamination are important because the additive is used at low concentration and defects can remain visible.
Thermal suitability	The powder must remain solid and chemically stable through the customer's actual polypropylene compounding and conversion temperature profile.

FUNCTION IN THE FINISHED POLYPROPYLENE

During cooling from the melt, the retained Lithium Benzoate particles act as heterogeneous nucleation surfaces. More numerous, evenly distributed sites can initiate crystallisation at more locations, producing a finer and more uniform crystalline structure than an inadequately nucleated control.

Where Lithium Benzoate is used during polymerisation and retained in the resin, the micronised catalyst residue becomes distributed within the polypropylene matrix. Its particle size and distribution must remain controlled so that catalyst agglomerates do not create contamination, colour variation, weak points or processing defects in the final product.

The expected practical effects may include a higher crystallisation temperature, faster or more repeatable solidification, improved dimensional consistency and changes in stiffness or optical appearance. These are formulation-dependent outcomes and must be confirmed against the customer's untreated polypropylene and current nucleating package.

DISCLAIMER

This Application Profile is provided for general technical and commercial guidance only. Product suitability, dosage, processing conditions and final performance depend on the customer's formulation, equipment and intended application. Customers must conduct their own trials and confirm compatibility, regulatory compliance, safety and finished-product performance before commercial use. The information provided does not constitute a product-performance guarantee or specification unless separately agreed in writing.

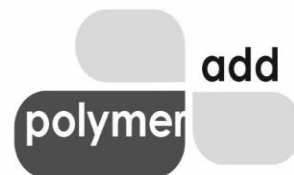
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FORMULATION AND TRIAL BASIS

The correct addition level should be established by a concentration ladder rather than fixed in advance. Trials should compare an untreated control, the customer's current nucleant and at least three Lithium Benzoate levels prepared under identical compounding and moulding conditions.

The processor should measure dispersion, crystallisation temperature and enthalpy by DSC, moulding or extrusion cycle, shrinkage, warpage, stiffness, impact performance, haze or clarity where relevant, colour and visible specks. The trial should also confirm that filtration screens, spinnerets or fine flow channels are not affected by agglomerates.

DISPERSION AND INCORPORATION

Direct powder dosing is possible only where the feeder can meter a low addition consistently and the compounder can disperse the powder without agglomeration. A compatible polypropylene masterbatch is normally the more controllable route for very low dosage, fine filtration or high-throughput production.

The micronised powder should be introduced under dry conditions with adequate distributive mixing. Excessive residence time or unnecessarily high temperature should be avoided. The customer must verify that the powder remains as discrete, well-distributed particles after compounding and is not converted, dissolved or reacted by another formulation component.

APPLICATION BOUNDARY

This profile covers polypropylene products in which micronised Lithium Benzoate remains embedded either as a dispersed solid nucleating phase or as retained fine catalyst residue. A proposed use falls outside this profile if the Lithium Benzoate dissolves completely, is removed from the polymer, is fully consumed by reaction, or no longer remains as a distinct dispersed solid phase in the finished product.

DEVELOPMENT BASIS

For nucleating use, the processor should confirm the polypropylene type and melt-flow rate, conversion process, peak melt temperature, residence time, existing additive package, target performance, dosing method and filtration level. For polymerisation use, the producer must additionally confirm the catalyst system, reactor technology, dosing point, reaction conditions, retained-residue requirement and any effect on downstream stabilisation. Final particle-size limits, moisture, assay, packing and dosage should be agreed only after production-scale trials establish a stable window.

DISCLAIMER

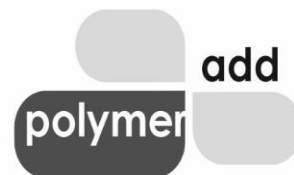
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