

Polymer Add (Thailand) Co.,Ltd.

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MICRONISED CALCIUM STEARATE – FOR PVC COMPOUNDS

CAS Number

1592-23-0

Chemical Name and Synonyms

IUPAC Chemical Name : Calcium bis(octadecanoate)

Common Industry / Trade Synonyms

Calcium stearate

Calcium octadecanoate

Stearic acid calcium salt

Physical and Chemical Properties

Property	Description
Appearance	White to off-white fine powder
Density	~1.05–1.10 g/cm ³
Melting Range	150–160 °C (decomposition)
Solubility	Insoluble in water; dispersible in hydrocarbons
Particle Size Distribution (Micronised Grade)	D50: 6–10 µm D90: ≤ 20 µm D99: ≤ 30 µm

Known Uses (PVC-Specific)

Flexible PVC compounds	PVC calendering formulations
PVC pipes and fittings	PVC sheets and profiles
PVC wire and cable insulation	Rigid PVC compounds

Known Applications

Acid scavenger	Lubricant
Processing aid	Release agent
Stabilizer component	

1) Resin Systems and Role of Calcium Stearate

Primary Resin System:

- Polyvinyl Chloride (PVC)

Role in PVC Systems:

- Acts as an internal lubricant, reducing melt friction
- Functions as an acid scavenger, neutralizing hydrogen chloride generated during PVC processing

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- Supports thermal stabilizer systems, typically in combination with zinc-based or mixed-metal stabilizers
- Improves metal surface release during extrusion, calendering, and molding operations
- Calcium stearate functions as a supporting component within PVC stabilizer and lubrication packages rather than as a standalone stabilizer.

2) Typical Benefits of Micronised Calcium Stearate

- Benefits attributable specifically to micronised particle size:
- Faster and more uniform dispersion in PVC dry blends
- Reduced localized over-lubrication
- Improved surface appearance in thin sheets and profiles
- More consistent acid-scavenging efficiency at low dosage
- Reduced risk of visible specking or surface defects

3) Processing Conditions

- Suitable for high-speed PVC dry blending systems
- Compatible with hot–cold mixer sequences
- Performs consistently in extrusion, calendering, and injection molding
- Applicable to both rigid and flexible PVC formulations

Micronised grades are particularly effective under high shear and short residence time processing conditions.

4) Working Temperatures

- Typical PVC processing range: **160–200 °C**
- Calcium stearate remains stable and functional within standard PVC melt-processing windows
- Thermal contribution is indirect, supporting stabilizer systems rather than providing primary heat resistance

5) Typical Dosage

PVC System	Typical Dosage Range
Rigid PVC	0.2 – 0.6 phr
Flexible PVC	0.1 – 0.4 phr
Calendered PVC sheets	0.3 – 0.8 phr

Actual dosage depends on formulation design, stabilizer package, and processing method.

6) Competing Products for the Same Application (PVC Compounds)

Product	Chemical Class	Primary Function	Relative Position
Zinc Stearate	Metal soap	Lubricant Stabilizer	Strong lubrication Lower acid-scavenging capacity
Magnesium Stearate	Metal soap	Lubricant	Lower thermal contribution in PVC systems
Stearic Acid	Fatty acid	Internal lubricant	Limited stability at PVC processing temperatures
Paraffin Wax	Hydrocarbon wax	External lubricant	Improves surface release No acid-scavenging function
Polyethylene (PE) Wax	Synthetic polymer wax	External lubricant Processing lubricant	Stable at higher temperatures No HCl neutralization
Oxidized PE Wax	Functionalized polymer wax	Lubricant Dispersing aid	Improved polarity Limited stabilizing role
Montan Wax	Ester wax	Lubricant Mold release	Higher cost Niche usage
Hydrotalcite	Inorganic layered mineral	Acid scavenger	Effective HCl absorber Higher cost Different dispersion behavior

Positioning Note:

Calcium stearate is typically selected where a balanced combination of lubrication and acid scavenging is required. Wax-based lubricants function primarily as external lubricants and are commonly used in combination, rather than as direct substitutes.

Regulatory Note

Regulatory status depends on grade, purity, and intended use. Food-contact and regional compliance listings, where applicable, are addressed in separate regulatory documentation.

Disclaimer

The information provided is for technical reference only. No warranty, express or implied, is given regarding suitability for any particular application. Users are responsible for validation, formulation design, and regulatory compliance prior to commercial use.

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