Polymer Add (Thailand) Co.,Ltd.
Office - 106, Chalaremprakiat, Lor 9, Soi 22, Yak 5, Nongbon, Prawet, Bangkok, Thailand 10250
Factory - 188/3, Moo 8, Tambon Bangpu Mai, Amphoe Muang Samut Prakan, Samutprakan, Thailand 10280
Mobile - Thai : 0804531391, English: 0839415475, **E-mail** – contact@polymeradd.co.th

MICRONISED TALC

THE 5 BIGGEST COMMERCIAL APPLICATIONS

Micronised talc is one of the most widely used functional minerals in plastics because it can deliver reinforcement + processing benefits at an attractive cost/performance ratio. In polyolefins (especially PP), talc is valued not only as a filler but also as a heterogeneous nucleating agent that supports faster, more controlled crystallisation—helping manufacturers improve stiffness, dimensional stability, and cycle-time consistency.

While "talc" is often treated as a commodity, specification matters. The correct talc grade depends on the end-use: impact/stiffness balance, surface appearance, optical requirements, and processing conditions all influence the required particle size and colour.

1) POLYPROPYLENE (PP) AUTOMOTIVE & TPO COMPOUNDS

Why micronised talc is used

Automotive PP and TPO compounds demand high stiffness, dimensional stability, and heat performance at a controlled cost. Talc's platy morphology helps increase modulus and improve warpage control in parts like:

- dashboards / interior trims
- pillar covers, consoles, bezels
- under-hood PP/TPO components (depending on temperature class)

Typical specification targets (common industry ranges)

- **Particle size**:
    - D50: 1.5–3.5 µm
    - D90: ≤10–15 µm
- **Colour in mineral oil**:
    - Neutral white to off-white, minimal yellowness (important for light interior colours and consistent pigmentation)
- Other practical requirements: low grit/oversize, good dispersion, consistent lamellarity

Typical loading (broad practice)

- Often 10–30 wt% depending on target modulus and impact balance

Competitors / alternatives (used instead of or alongside talc):

- Wollastonite (higher reinforcement; more abrasive)
- Mica (strong reinforcement; can reduce impact if not balanced)
- Glass fibre (very high stiffness; affects surface, weight, processing)

- Calcium carbonate ($CaCO_3$) (cost filler; typically less modulus per % than talc)
- Kaolin / calcined clay (stiffness, heat; colour/abrasion can vary)

2) PP APPLIANCES, HOUSEWARES & INDUSTRIAL INJECTION MOULDING

Why micronised talc is used

This segment is huge because it covers many high-volume injection moulded parts where the manufacturer needs:

- stiffness and shape retention
- reduced warpage / shrink variability
- stable moulding cycles and consistent part dimensions

Common products:

- appliance housings / internal components
- storage items, crates, bins
- industrial moulded parts where rigidity and stability matter

Typical specification targets

- Particle size:
  - D50: 2–5 µm
  - D90: ≤15–20 µm
- **Colour in mineral oil**:
  - Neutral white, low speck count (important for visual quality and consistent masterbatch colouring)
- **Other**: controlled moisture, consistent feeding (powder vs compacted grades depending on plant)

Typical loading

- Often 5–20 wt% (higher if stiffness is the main driver and impact requirements are moderate)

Competitors / alternatives:

- $CaCO_3$ (very common for cost; can be used alone or blended with talc)
- Short glass fibre (where stiffness dominates and surface appearance is less critical)
- Mica (reinforcement; application-dependent)
- Kaolin/calcined clay (stiffness; colour/abrasion trade-offs)

- Chemical nucleators (phosphate salts, organic nucleators) as cycle-time enhancers but not stiffness replacers

3) CAPS, SEALS, AND CLOSURES (PP / PE)

Why micronised talc is used

Closures require tight dimensional control (threads, sealing surfaces) and consistent high-speed moulding. Micronised talc helps by:

- supporting crystallisation control (process stability)
- increasing stiffness for seal integrity and torque retention
- improving dimensional consistency across multi-cavity tools

Typical specification targets (more appearance + precision driven)

- **Particle size:**
  - D50: 2–5 µm
  - D90: ≤10–15 µm (tighter tail helps reduce specks/defects)
- **Colour in mineral oil:**
  - Very clean neutral white, minimal yellowness
  - Very low dark specks (critical for white and light-coloured caps)
- **Other**: low contamination, good dispersion, reliable feeding

Typical loading

- Often 5–15 wt% (varies by cap design, polymer grade, and property targets)

Competitors / alternatives:

- $CaCO_3$ (cost-driven stiffness; may require higher loading)
- Chemical nucleating agents (phosphate salts / organic nucleators) to reduce cycle time (low dosage, not reinforcing)
- Wollastonite (less common in closures due to abrasion/processing trade-offs)
- Kaolin/calcined clay (used selectively; depends on appearance and wear tolerance)

4) PP PIPE COMPOUNDS (PRESSURE / HOT WATER / INDUSTRIAL)

Why micronised talc is used

Pipes require long-term resistance to deformation under load (creep), dimensional stability, and performance at elevated temperature for hot-water systems. Talc contributes:

- higher modulus and stiffness

- nucleation-driven crystallinity control
- improved dimensional stability

Typical specification targets (performance + consistency)

- **Particle size**:
    - D50: 1.5–3.5 µm
    - D90: ≤10–12 µm (coarse tail control helps reliability)
- **Colour in mineral oil:**
    - Generally neutral to slightly off-white acceptable (appearance usually less critical than closures)
    - Low speck/contamination still important for quality and consistency
- Other: low impurities, stable dispersion

Typical loading

- Often 10–40 wt% depending on design targets and whether other fillers are present

Competitors / alternatives:

- $CaCO_3$ (cost filler; typically less reinforcing than platy talc at equal loading)
- Wollastonite (high reinforcement, but abrasion and cost trade-offs)
- Glass fibre (high stiffness, but processing/surface/weight trade-offs)
- Chemical nucleators (used to tune crystallisation kinetics, not to replace reinforcement)

5) POLYETHYLENE (PE) FILM: ANTIBLOCKING AND HANDLING IMPROVEMENT

Why micronised talc is used

Film producers need rolls to unwind cleanly, bags to open easily, and film layers not to stick together (“blocking”). Antiblock additives create micro-roughness on the surface to reduce intimate contact area. Talc is widely used because it offers

- antiblocking effectiveness
- relatively low abrasiveness compared to some alternatives
- balanced haze/appearance (grade dependent)

Typical specification targets (surface + optics driven)

- **Particle size**:
    - D50: 2–6 µm (application-dependent)
    - D90: ≤10–20 µm (tighter control for better optical balance)

- **Colour in mineral oil**:
    - Neutral white is preferred to avoid visible colour shift or haze/yellowness
- Other: low abrasion, consistent dispersion, low contamination

Typical loading

- Usually ppm levels to low wt% depending on film type, thickness, and target blocking force

Competitors / alternatives (very common in films):

- Synthetic silica (strong antiblock; can increase abrasion and haze depending grade)
- Diatomaceous earth (DE) (effective antiblock; optics/abrasion trade-offs)
- Calcined clay (can work well; may introduce colour shift in some cases)
- $CaCO_3$ (used sometimes; effect depends heavily on grade/dispersion)