

POLYSORBATE 81 (TWEEN 81)

Low-EO Oleate Surfactant & Coupling Agent

OVERVIEW

Chemical Nature: Polyoxyethylene (5) Sorbitan Monooleate. Contains reduced Ethylene Oxide (5 moles) compared to standard Tween 80.

Appearance: Amber oily liquid. (HLB Value: 10.0)

Primary Application (Industrial): Powerful Coupling Agent. Its unique intermediate HLB bridges the gap between oil and water phases, solving separation issues in difficult formulations.

Key Functions: Excellent lubricity and stability in mineral oils and solvents.

SPECIFICATIONS

Polysorbate 81 appears as a viscous liquid with good water solubility. Due to its relatively high ethoxylation level compared to Spans, but lower than Tween 80, it exhibits superior properties as a wetting agent and dispersant in oil-rich systems.

Test Item	Unit	Min	Max
HLB Value	-	10.0	
Saponification Value	mg KOH/g	95	105
Hydroxyl Value	mg KOH/g	135	165
Acid Value	mg KOH/g	-	2
Moisture Content	%	-	3.0

MOLECULAR STRUCTURE & MECHANISM

- Hydrophilic Segment:** Polyoxyethylene chain introduced by ethoxylation. Note the reduced chain length (5 moles) compared to standard Tween 80.
- Hydrophobic Moiety:** Oleic acid residue derived from unsaturated fatty acid, providing significant oil solubility.
- Mechanism:** Bridging Capability. The lower degree of ethoxylation creates a unique intermediate HLB. This allows the molecule to function as a powerful coupling agent, effectively bridging the gap between oil and water phases in formulations where standard high-HLB emulsifiers fail.

KEY FEATURES

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Intermediate HLB (10.0)

Perfectly positioned between lipophilic Spans and hydrophilic Tweens. It effectively stabilizes emulsions that are too oily for standard Tween 80 to handle.

High Lubricity (Oleic Source)

Derived from Oleic Acid, it provides excellent surface lubrication, reducing friction in metal processing and textile fiber manufacturing.

Superior Mineral Oil Solubility

Due to its lower EO content (5 moles), it dissolves much more easily in mineral oils and solvents, making it ideal for oil-based concentrates.

Low-Foaming Profile

Generates significantly less foam than high-EO surfactants (like Tween 20/80), suitable for high-speed industrial agitation processes.

APPLICATIONS

- Metalworking Fluids (Cutting Oils):** Used to emulsify mineral oils in water for cooling and lubricating metal cutting machinery.
- Textile & Leather Auxiliaries:** Acts as an antistatic agent and fiber lubricant, helping threads pass through machines smoothly without breaking.
- Industrial Cleaning Solvents:** Emulsifies heavy greases and solvents, allowing them to be rinsed away with water.
- Agrochemicals:** Used in oil-based pesticide concentrates (EC formulations) to improve emulsion stability upon dilution.

STORAGE & PACKAGING

Storage: Store in a cool, dry, and well-ventilated area, away from direct sunlight and sources of heat. Keep container tightly sealed.

Transportation: Transport as a general chemical product, following standard safety and handling procedures.

Package Options:

- 25 Kg / drum
- 200 Kg / drum
- 1000 Kg IBC tote