

## 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

**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.

**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.

**High Lubricity (Oleic Source)**

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

**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