TECHNICAL DATA SHEET

Trisodium Phosphate Dodecahydrate - ACS Reagent Grade

Revised: 07/22/2026

PRODUCT IDENTIFICATION

Product Name: Trisodium Phosphate Dodecahydrate - ACS Reagent Grade
CAS Number: 10101-89-0
Molecular Formula: $H_{24}Na_3O_{16}P$
Molecular Weight: 380.12 g/mol
Grade: Reagent Grade
Purity / Concentration: Not Available
Synonyms: TSP Dodecahydrate, Sodium Phosphate Tribasic Dodecahydrate

PRODUCT OVERVIEW

Trisodium Phosphate Dodecahydrate (CAS 10101-89-0) is a high-purity, ACS Reagent Grade chemical characterized by its strong alkaline properties and a minimum assay of 98.5%. This white crystalline powder is essential for precision laboratory applications where low impurity levels, such as iron at 0.1 ppm and heavy metals at 0.5 ppm, are critical for consistent results.

Grade Significance: Choosing ACS Reagent Grade ensures that the chemical meets the strict purity standards set by the American Chemical Society, providing the reliability and traceability necessary for high-stakes analytical work.

CERTIFICATE OF ANALYSIS — TYPICAL VALUES

PARAMETER	UNIT	TYPICAL	MIN	MAX	TEST METHOD
Assay	%	100.0	98	100.5	Titration/Gravimetric
pH	—	11.7	11.5	12.5	pH Meter
Arsenic As	ppm	≤ 5 ppm	—	—	ICP-MS
Heavy Metals As Pb	ppm	ND	0	100.0	ICP-MS (as Pb)
Iron	%	0.0030	—	0.01	ICP
Chloride Cl	%	0.02	0	0.3	ICP
Phosphate	ppm	175000 – 50 ppm	—	—	Per specification
Sulfate (SO_4^{2-})	%	0.4	0	0.5	ICP-MS
Insoluble Matter	%	0.01	0	0.14	Gravimetric
Insolubles	%	0.11	—	0.14	Filtration
Particle Size	µm	≤ 4 µm	—	—	Sieve Analysis

ND = Not Detected. Values are typical and may vary by lot.

PHYSICAL & CHEMICAL PROPERTIES

Appearance	White crystalline powder, hygroscopic	**Odor**	Odorless
Form	Solid	**Boiling Point**	100°C (212°F)
Melting / Freezing Point	Melting point equals 164 to 170 ° F	**Solubility**	Soluble in water
Molecular Formula	$H_{24}Na_3O_{16}P$	**Molecular Weight**	380.12 g/mol
Vapor Pressure (20°C)	0.01 mmHg (approx.)	**Density (25°C)**	0.88 g/mL

APPLICATIONS

1. **Laboratory Research** — Used as a high-purity buffering agent to maintain stable pH levels in sensitive chemical reactions and analytical processes.
2. **Industrial Cleaning** — Leverages its strong alkaline nature to effectively emulsify and remove heavy grease, oil, and stubborn stains from industrial surfaces.
3. **Food Processing** — Acts as a reliable emulsifier and stabilizer to improve the texture and consistency of various food products.
4. **Water Treatment** — Utilized to adjust water pH and mitigate mineral hardness, protecting infrastructure from scaling and corrosion.

STORAGE & HANDLING

This product is highly hygroscopic, meaning it readily absorbs moisture from the air, which can compromise its chemical integrity and physical form. Proper storage in a tightly sealed container is also essential to manage safety risks, as the material is classified as hazardous and can cause severe skin burns and eye irritation.

- Store in a cool, dry place away from moisture and incompatible substances.
- Use HDPE or glass containers for storage to prevent contamination.
- Avoid exposure to strong acids or bases to maintain chemical integrity.
- Ensure proper ventilation when handling to avoid inhalation of dust.
- Wear appropriate personal protective equipment (PPE) such as gloves and safety goggles.

AVAILABLE PACKAGING

- 2 lbs.
- 5 Lbs.
- 50 Lbs.

SAFETY SUMMARY (CROSS-REFERENCE TO SDS)

Signal Word: Danger

Hazard Statements:

- H314 (20.8%): Causes severe skin burns and eye damage [Danger Skin corrosion/irritation]
- H315 (74.6%): Causes skin irritation [Warning Skin corrosion/irritation]
- H319 (77.8%): Causes serious eye irritation [Warning Serious eye damage/eye irritation]
- H335 (44.9%): May cause respiratory irritation [Warning Specific target organ toxicity, single exposure; Respiratory tract irritation]

Emergency Contact: CHEMTEL - 800-255-3924 (24 Hours/Day, 7 Days/Week)

For complete safety information, refer to the Safety Data Sheet (SDS) for this product.

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