Industrial Water Phosphate Selection Checklist

STPP vs SHMP for Scale Inhibition & Water Conditioning (2026)

Goway Chemical

https://gowaychemical.com

Practical procurement + engineering worksheet for faster selection and repeatable monitoring.

How to use this checklist

Fill the System Snapshot first. Then use the selection logic to choose STPP vs SHMP (or a blend). Finally, verify procurement documentation with the COA wording examples and run a short pilot using the monitoring templates.

1) System Snapshot (fill in first)

Plant / Line	_____	System type	[ ] Cooling Tower [ ] Boiler [ ] Ceramics [ ] Textile [ ] Process Loop [ ] Other: __
Operating temperature	_____ °C	Make-up water	[ ] City [ ] Well [ ] Surface [ ] RO/Softened [ ] Mixed
Cycles of concentration (Cooling Tower)	_____	Cleaning frequency	Every _____ weeks/months; downtime cost per event: $_____
Main issues	[ ] CaCO3 [ ] CaSO4 [ ] Silica [ ] Flow restriction [ ] Heat loss [ ] Corrosion risk		

2) Quick Selection Logic (STPP vs SHMP)

Choose STPP first when:
- Low-to-medium temperature loop (general conditioning).
- You want buffering / process stability benefits in addition to hardness control.
- You need cost-effective sequestration for moderate scale risk.
- Application is close to industrial cleaning synergy / detergents.

Consider a blend (STPP + SHMP) when:
- Cooling tower performance is inconsistent due to seasonal make-up water variation.
- You need both stability (STPP) and higher-efficiency inhibition (SHMP).
- You want a flexible starting program for pilot optimization.

Choose SHMP (68% P2O5) first when:
- High hardness load or scale-critical system.
- Boilers, demanding loops, or tight cooling tower cycles need stronger inhibition.
- You need higher active phosphate concentration (P2O5) for dosing efficiency.
- Ceramics/textile/process water requires strong dispersion and consistency.

Practical note: Best outcome = selection + monitoring + controlled trial (not more chemical).

3) Procurement-Ready COA Checklist (Must-Have Fields)

Request a lot-specific Certificate of Analysis (COA), not only a typical specification sheet. Verify identity, grade, assay/active content, impurities, and traceability.

Category	What to check (minimum)

Identity & Grade	Product name matches: STPP or SHMP. Grade clearly stated (Industrial Grade or your required grade).
Assay / Active Content	STPP: assay and/or P2O5 clearly stated. SHMP 68%: Total phosphate as P2O5 must be >= 68.0% min.
Impurities	Insoluble matter; Fe/iron (important for ceramics); heavy metals (as Pb) or your internal limits.
Traceability	Lot/batch number, production date, test date, QC signature/stamp, and SDS/TDS availability.

4) COA Wording Examples (Copy/Paste Templates)

For SHMP 68% - preferred phrasing:
- "Total Phosphate (as P2O5): >= 68.0% (min)"
- "Assay (as P2O5): 68.0% min"

Avoid weak / risky phrasing:
- "P2O5: ~68%"
- "P2O5: 67-69% (typical)"
- "P2O5: about 68%"

For STPP - preferred phrasing:
- "Sodium Tripolyphosphate (Na5P3O10) content: >= ___% (min)"
- "P2O5 content: >= ___% (min)"
- Optional: phase ratio/solubility notes if your process requires them.

Tip: Ask for lot-specific COA + SDS + TDS as a standard package.

5) Handling & Stability Notes (Operational Checklist)

- Store in a dry, sealed condition (avoid moisture pickup and caking).
- Use clean water and controlled mixing for solution preparation.
- Label and date any prepared solutions.
- Use a controlled fresh-solution schedule for polyphosphate solutions to reduce instability risks.
- Keep consistent dosing and maintain monitoring logs (see templates below).

6) Simple Water Quality Test Template (Field + Lab)

Goal: collect enough data to choose STPP vs SHMP and define a safe starting trial window. Start with 3-7 days baseline data before changing dosing.

A) Minimum field tests (daily/weekly)

Date	System	Temp (C)	pH	Conductivity (uS/cm)	Total Hardness (ppm as CaCO3)	Alkalinity (ppm as CaCO3)	Notes

Recommended tools: handheld pH meter, conductivity meter, hardness titration kit/strips.

B) Optional but high-value tests (weekly/monthly)

- Calcium hardness (ppm as CaCO3): _____
- Magnesium hardness (ppm as CaCO3): _____
- Chlorides (ppm): _____ (corrosion relevance)
- Silica (ppm): _____ (silica scaling risk)
- Iron (ppm): _____ (deposits / ceramics defects)
- Turbidity / TSS: _____ (dispersion needs)

C) Deposit / performance tracking (what engineers trust)

Pick 2-3 KPIs and track consistently: deposit trend, flow/pressure drop trend, heat transfer or energy KPIs, and cleaning frequency.

7) Trial Plan Template (Low-risk start)

Recommended duration: 2-4 weeks. If possible, keep a baseline line/batch for comparison. Define acceptance criteria before the trial.

Trial item	Your plan
Duration	____ weeks (recommended 2-4)

Dosing method	[ ] Continuous [ ] Slug [ ] Other: _____
Initial dosage window	_____ ppm (set by system chemistry and risk level)
Acceptance criteria	[ ] Reduced deposit trend [ ] Stable hardness drift [ ] Improved flow/DP trend [ ] Reduced cleaning frequency [ ] Stable operations

8) Buyer / Supplier Questions (Copy-Paste)

1) Please confirm grade and provide lot-specific COA with assay and impurity limits.
2) For SHMP 68%: COA must state "Total Phosphate (as P2O5) >= 68.0% min".
3) Provide SDS/TDS and packaging options (25kg/500kg/bulk).
4) Share lead time, MOQ, and a recommended pilot dosing window for our system.
5) Confirm consistency controls (batch-to-batch variability, insolubles control).

9) One-line Summary

STPP = versatile conditioning + buffering + hardness sequestration (often for moderate conditions). SHMP 68% = higher phosphate concentration and commonly selected for demanding scale inhibition programs. Best outcome = selection + monitoring + controlled trial (not more chemical).