



FACT SHEET

CALCIUM TARTRATE INSTABILITY IN WINE

Calcium tartrate (CaT) precipitation is an increasingly common cause of post-bottling crystal deposits. Climate change, winemaking inputs, and high pH are key drivers. Early detection and targeted treatment are the most effective defences.

WHY CaT INSTABILITY IS RISING

- **Climate change** — heat and drought stress elevate calcium in grapes
- **Higher pH wines** increase free tartrate ions (T^{2-}) that bind with calcium
- **Higher alcohol** lowers CaT solubility
- **Calcium inputs** from cement tanks, calcium carbonate, casein, and calcium-based bentonites
- **Loss** of protective colloids from aggressive filtration

KEY RISK THRESHOLDS

Parameter	Risk Indicator
Calcium	> 60 mg/L
pH	Higher → more T^{2-} ions
Alcohol	Higher → less soluble

⚠ CaT is ~10x less soluble than KHT and is NOT temperature-sensitive — cold stabilisation alone will not prevent it.

TREATMENT OPTIONS TO REMOVE EXCESS CALCIUM

Treatment	Best Applied	Duration	Cost	Notes
Racemic tartaric acid (Ca ²⁺ -Stab™)	Fermenting must	6 weeks	Moderate	Risk of over-acidification; stoichiometric calcium removal
Micronised calcium tartrate (CaFinish™)	Finished wine	2–4 weeks	High	Requires <12°C; promotes crystal growth. Regular homogenisation also increases its efficacy
Cation exchange resins	Must or wine	Variable	Variable	Effective but requires specialist equipment
Electrodialysis	Finished wine	Variable	High	Effective; requires capital investment

TESTING FOR CALCIUM

- AAS / ICP: highly accurate, requires major equipment
- Ion-selective electrodes: portable but less accurate in wine matrix
- Colorimetric test kits (e.g. Vintessential 4A210 for Spectrophotometers or Vintessential 4B210 for Autoanalysers): rapid (<10 min), spectrophotometer-compatible, accurate vs ICP

★ **Pair calcium analysis with pH measurement to accurately assess your instability risk.**

PREVENTION GUIDELINES

- **Manage vineyard hydric stress** — optimise irrigation and soil health
- **Limit calcium inputs** — check bentonite quality, casein purity, and tank condition
- **Maintain pH and acidity** — use yeasts/bacteria that preserve malic/citric acids
- **Preserve protective colloids** — avoid aggressive filtration
- CMC, KPA, and mannoproteins are NOT effective against CaT
- **Measure** calcium, pH, and alcohol to understand your specific risk
- **Apply** targeted calcium removal treatments at correct dosages

Source: Hughes V, Seabrook A, Gamble C, Yammine S — Winechek Grape Grower winemaker June edition 2026 | For dosage and application, follow individual product manufacturer recommendations