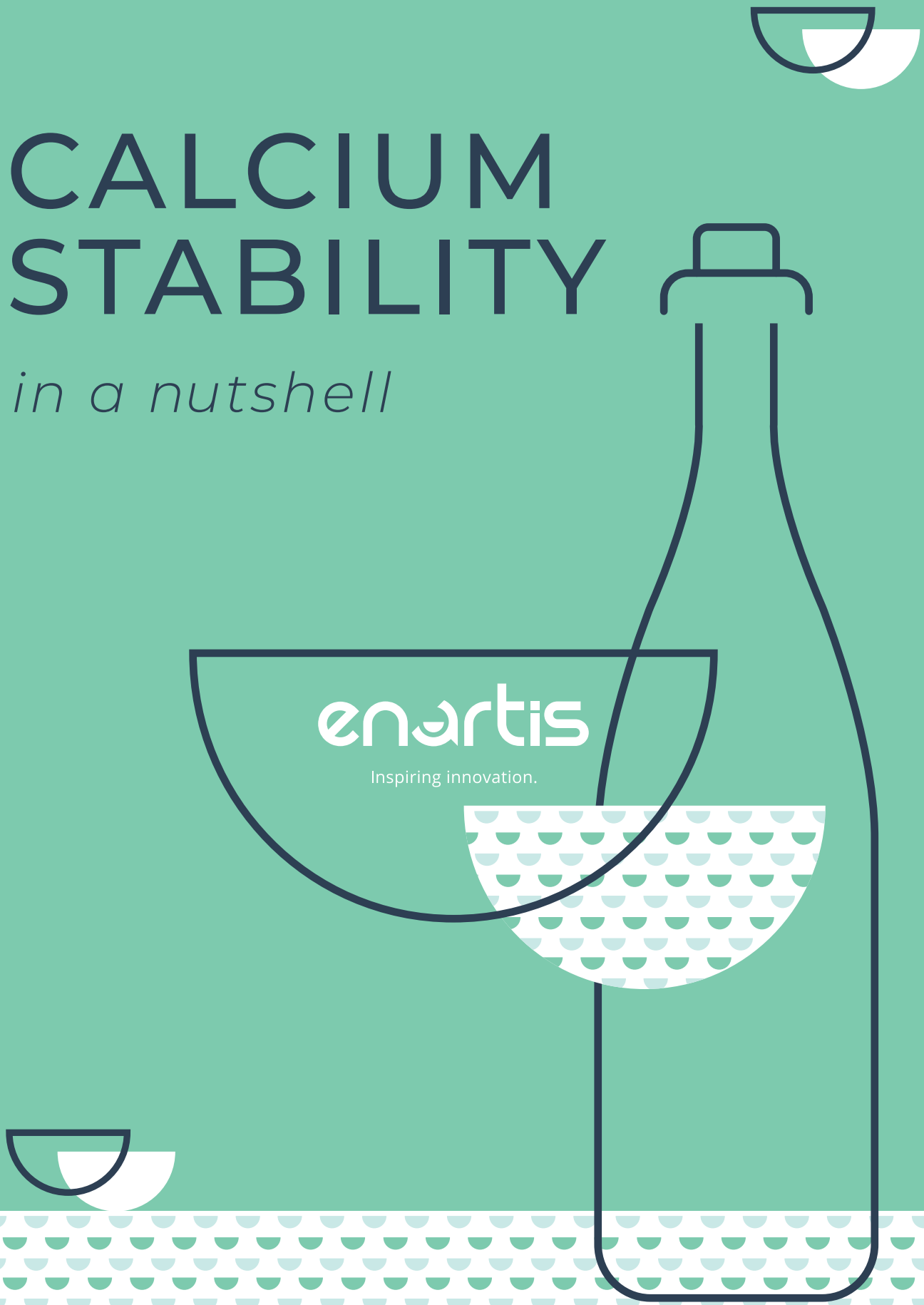
CALCIUM STABILITY

in a nutshell



ESSENTIAL CHEMISTRY

Precipitation of calcium tartrate is becoming more frequent all over the world and causing both economic and brand damage that companies should be aware of.
The cause of the problem is still unknown but may be found in climate change, viticultural and enological practices or the use of untreated concrete tanks. Whatever the origin, it is important to know how to identify wines that are potentially calcium unstable and how to treat them.

- Calcium content (0.04 - 0.15 g/L) of wine is 10-20 times lower than potassium.
- Calcium precipitates mainly as calcium tartrate (CaT).
- CaT solubility is only 3 times lower at -4°C than at 20°C: cooling has little effect on the rate of CaT precipitation.
- Potassium bitartrate precipitation does not induce that of CaT.
- Low calcium content and the presence of inhibiting factors in wine makes the formation of CaT germs that start the crystallization process unpredictable.

WINE COMPOUNDS THAT HAVE AN INHIBITING EFFECT ON CALCIUM PRECIPITATION					
GLUCONIC ACID	MALIC ACID	CITRIC ACID	COLLOIDS	POTASSIUM	MAGNESIUM

MAIN FACTORS PROMOTING CaT PRECIPITATION

The main factors promoting calcium precipitation are calcium, pH and tartaric acid. In particular, pH has a tremendous impact. The increase of only 0.1 points has a dramatic effect on the speed and intensity of precipitation.

HOW TO RECOGNIZE CALCIUM TARTRATE PRECIPITATE

Both CaT and potassium bitartrate form white (or red in the case of red wine) crystals and a sandy precipitate. To distinguish one salt from the other, perform the following trial

- put some crystals in a flask or beaker
- add some clean water
- warm the solution between 80-100°C
- stir occasionally

If crystals do not dissolve, it is calcium tartrate

ENARTIS SOLUTION FOR CALCIUM STABILITY

HOW TO CHECK IF WINE IS CALCIUM UNSTABLE

- Analyze wine calcium content (Ca1). In the case of white and rosé wine, run the test on protein stable wines.
- Take a 100 mL sample of wine and add 0.4 g of micronized calcium tartrate.
- Stir for 15 minutes and store the sample at -4°C for 24 hours.
- At the end of the cooling treatment, filter the wine using 0.45-micron membrane and analyze calcium content (Ca2).
- Calculate ΔCa = (Ca1-Ca2)

ΔCa < 15 ppm	Stable
15 ppm < ΔCa < 25 ppm	Lightly unstable
ΔCa > 25 ppm	Very unstable

WHAT TO DO IF WINE IS CALCIUM UNSTABLE?

Promote a rapid formation and precipitation of CaT crystals by seeding with **Enocristal Ca**. **Enocristal Ca** is a stabilizing agent based on micronized calcium tartrate selected for its chemical purity. Due to the less than one micron size of its granules, **Enocristal Ca** acts as crystallization nuclei and accelerates the formation of crystals, thus making the crystallization process predictable and controlled.

ADVANTAGES OF USING ENOCRISTAL Ca

- **Simple:** its use does not require any special equipment or ability.
- **Safe:** it is insoluble, sensorially neutral, not consumable by wine microorganisms.
- **Respectful of wine quality:** it only causes a minimal loss of total acidity (less than cold treatment or ED).
- **Respectful of the environment:** cooling is not necessary and it is complementary to the use of stabilizing colloids.

HOW TO USE ENOCRISTAL Ca?

- Dissolve **Enocristal Ca** in wine at a ratio of 1:20 and add to wine during pump-over.
- Keep the product in suspension until complete homogenization in the entire volume of wine.
- Wine temperature must be between 10 - 15°C for the entire duration of the treatment.
- Leave **Enocristal Ca** in contact with wine for 15 days.
- Filter at the end of treatment.

LEVEL OF INSTABILITY	SUGGESTED DOSAGE
15 < ΔCa < 25	20 g/hL
ΔCa > 25	50 g/hL

enartis

Inspiring innovation.

ENARTIS PACIFIC LTD
69 Chadstone Road | Malvern East VIC 3145 | Australia | Phone: + 61 (03) 9428 0037

NEW ZEALAND BRANCH
PO Box 4304 | Marewa, Napier | Phone: + 64 (06)8434 413

www.enartis.com