

## Carboxymethyl Cellulose (CMC) – How does it work?

CMC prevents crystals from growing through the electrostatic attraction between negatively charged carboxymethyl groups and the positive surface charge of potassium bitartrate (KHT) crystals. The strength of the attraction is related to charge distribution on the surfaces, so different CMCs will have variable effectiveness.

## Wine Treated with ColdStab Cel:

	Viscosity mPas	Viscosity cP	pH	Dry matter %	Tartrate stability ( $\Delta\chi$ ) $\mu\text{S}$	Filterability 10 g/hL 0.45 $\mu\text{m}$	
						IF ( $\Delta$ CONTROL)	IFM ( $\Delta$ CONTROL)
ColdStab Cel	60	50	7	20.95	5	-4	-6

## Protein Stability:

Because some CMCs, especially the longer chain polymers, can crosslink with proteins in wine to form a haze, it is essential, to ensure wines are protein-stable before any CMC additions. CMCs should be the final addition to any wine (aside from  $\text{SO}_2$  or gasses). All fining, blending, acid adjustments, concentrate additions, etc. must be made before CMC treatment and the wine must be free of any particulate matter. Additional care must be taken with lysozyme-treated wines, as lysozyme is a protein and can generate a haze if present.

**ColdStab Cel**, however, has very low reactivity with protein and color compounds, so it won't cause color or protein precipitation or hazing in the majority of wines. Because of its medium chain composition and low viscosity, **ColdStab Cel** makes wine both tartrate-stable and microfilterable with minimal interaction with color or proteins.

## Dosage:

A combination of **LGA (LGA 20 or LGA 30)** with **ColdStab Cel** creates a synergistic reaction. Carry out lab trials to determine the right dosage of **ColdStab Cel** for tartaric stability, e.g. 100 g/hL (8.32 lb/1000 gal). To create this synergy, add **LGA** before **ColdStab Cel** in the following ratio:  
30% **LGA**—70% **ColdStab Cel** (43 g/hL of **LGA** + 100 g/hL of **ColdStab Cel**).

For wines with higher innate stability where the required dose of **ColdStab Cel** is reduced, the ratio of **LGA** can be increased to 50% **LGA**—50% **ColdStab Cel** (50 g/hL **LGA 30** + 50 g/hL **ColdStab Cel**). Dissolve **ColdStab Cel** separately 1:10 in wine. Add the **LGA (LGA 20 or LGA 30)** to the source wine per the **LGA** addition protocol. When the **ColdStab Cel** is completely dissolved, follow the **LGA** addition to the tank with the **ColdStab Cel** and mix thoroughly.

Bench trials are recommended to ensure appropriate addition rates and product suitability.