

**THE FINEST DEGREE IN  
REEFER EXPERTISE  
GRAPES**



# RECOMMENDED REEFER TRANSPORT PARAMETERS GRAPES

## DID YOU KNOW?

**Grapes have a low glycemic index, which means they don't raise your blood sugar too quickly.**

Grape is one of the fruits which has been subject of permanent research and development during the last decades: many cultivars have been developed, area of production extended and seasons became longer every year.

Varieties have different colors, taste and textures and here are some of them: Emperor, Flame Seedless, Sugraone, Black Seedless, Red Globe, Thomson Seedless, Crimson Seedless, Red Seedless, White Seedless.

Worldwide production is estimated to be around **80 million tons per year**, and it is forecasted to further increase.

## MATURITY INDICES

- Harvest is mainly determined by Soluble Solids Content (SSC), sugar/acid ratio and total acid; these may largely vary among cultivars, according to destination and nature of the market.
- Minimum color requirement is a marketing-imposed criteria.
- Grapes are non-climacteric fruits, characterized by relatively low respiration rate and low ethylene production.

## QUALITY INDICES

- High SSC or Sugar/Acid ratio are factors set to meet high consumer acceptance.
- Berry firmness and lack of defects as decay, cracked or dried berries, stem browning, shriveling, sunburn or insect damage are parameters to indicate the quality.

## OPTIMUM TRANSPORT PARAMETERS

- Grape clusters, berries and stems are characterized by a relatively low respiration rate. The stem respiration is about 15 times higher than berry respiration.
- Temperature effects are intuitive: berries are faster exposed to chill injury and stems are faster decaying. -1°C to 0°C is a good balance for long-term conservation. Rapid pre-cooling, fumigation using SO<sub>2</sub> and low constant storage temperature are factors required to optimize potential shelf life.
- Grapes are not particularly sensitive to ethylene, however long exposure to medium-high concentration of ethylene may have adverse effects.
- Grapes cannot be fumigated during transport using SO<sub>2</sub> pads. Mixing grapes with other commodities is not recommended.
- High relative humidity is required to minimize moisture loss and maintain stems in good condition. Optimum humidity is 90-95%; during transport, grapes may lose up to 3% of their weight over the conservation period.

## SUGGESTED PARAMETERS TO BE SET ON REEFER

- Temperature: -1°C to 0°C, depending on variety and SSC (Soluble Solids Concentration)
- Fresh air exchange: 5 to 10 CMH
- Dehumidification: OFF
- Controlled Atmosphere (CA) tests on several grape varieties (especially those of organic provenience); the benefit is slight.

NOTE: Above general recommendations are provided only for the sake of assisting our customers. They are non-binding as the parameters may vary depending on the cargo variety and its maturity. CMA CGM cannot be held accountable for the information and contents provided herein.

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Sources: UC Davis; BMT Netherlands B.V.

