

EKÖLITE SE 65 S

SORBITAN TRISTEARATE

EKÖLITE PE 18 M

POLYGLYCEROL ESTER

Anti-
crystalliser
in palm
based
cooking oil

Oils & Fats: Cooking Oil Introduction

The issue of cloudiness in palm based cooking oil commonly occurs in temperate climates and at air-conditioned retail distribution chains. It is important to prevent crystallisation as consumers perceive cloudy oils as being "off" and unacceptable. Cloud formation is due to fat crystallisation when it is subjected to low temperature. **Ekölite SE 65 S** and **Ekölite PE 18 M** are designed to delay fat crystal formation in cooking oil, functioning as an anti-crystalliser.

Crystallisation starts with nucleation. Nucleation occurs when triglycerides pack together, leading to supersaturation as temperature drops, triglycerides crystallise progressively.

Crystallisation of palm based cooking oil can be delayed by addition of **Ekölite SE 65 S** or **Ekölite PE 18 M**. The addition of an anti-crystalliser is a cost effective solution when compared with blending palm olein with soft oils or increasing the unsaturation of palm olein through double fractionation.

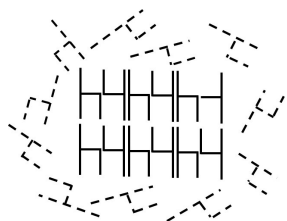
PRODUCT NAME

- **Ekölite SE 65 S**
- **Ekölite PE 18 M**



Winner of
Frost & Sullivan's
2016 Best Practices Award
Entrepreneurial Company
of the Year

Winner of
Frost & Sullivan's
2018 Best Practices Award
Food Ingredients
Company of the Year

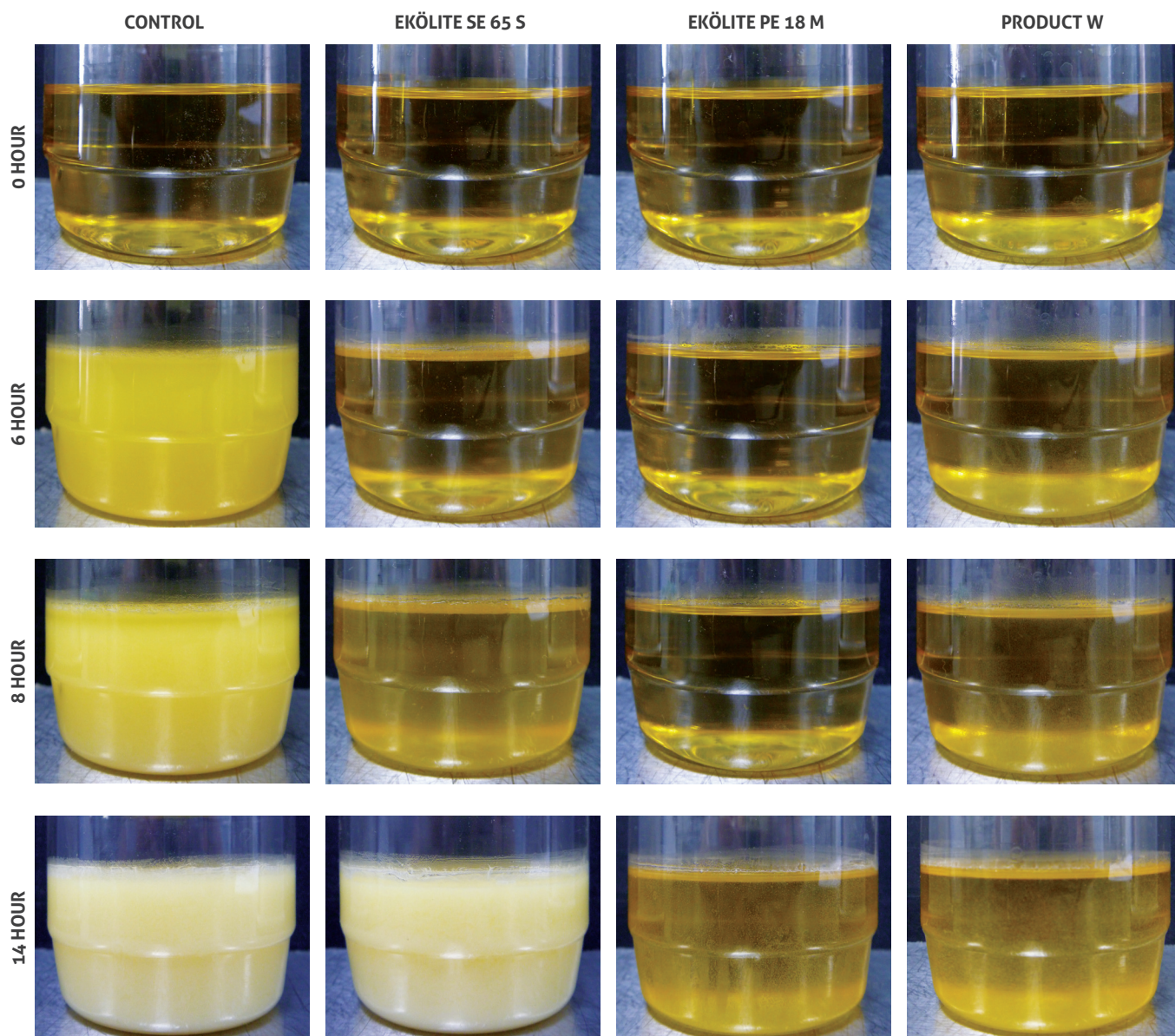


A graphical representation of crystallisation of triglycerides
Solid lines indicate crystallised triglycerides; Dotted lines indicate fluid triglycerides.

Anti-Crystalliser in Cooking Oil

Both **Ekölite SE 65 S** and **Ekölite PE 18 M** interact with triglyceride molecules, which interrupts the overall molecule alignment, thus inhibiting supersaturation and depressing the formation of the fat nuclei and crystals. Both **Ekölite SE 65 S** and **Ekölite PE 18 M** function to

increase the resistance of crystal formation and enable cooking oil to remain clear for a longer period, **Ekölite PE 18 M** exhibits better anti-crystallisation properties at the same dosage as illustrated in the following test.

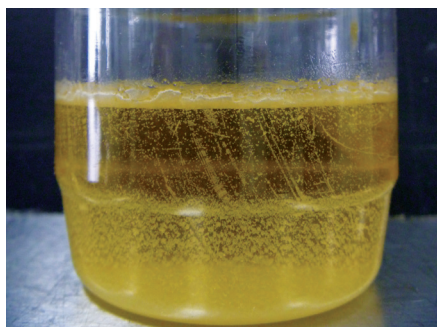


Note: Palm olein (Iodine Value 56g I₂/ 100g) incorporated with 0.08% of Sorbitan Tristearate (**Ekölite SE 65 S**) and Polyglycerol Esters (**Ekölite PE 18 M** and Product W), observed at different hours at 16°C.

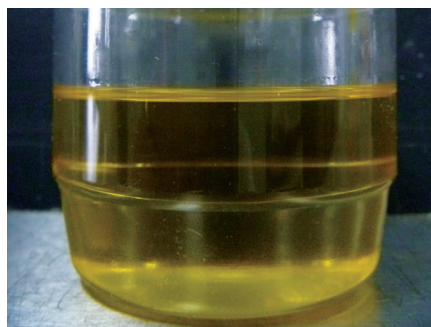
The efficiency of both **Ekölite SE 65 S** and **Ekölite PE 18 M** as an anti-crystalliser to prevent clouding or crystallisation in cooking oil varies with the quality of cooking oil (iodine

value of the palm olein and fractionation technology used), storage temperature and dosage level of **Ekölite SE 65 S** and **Ekölite PE 18 M** used.

Palm Olein of Different Quality



Palm Olein (IV 56)



Palm Olein (IV 60)

Note: Palm olein (single fractionated) of different quality (IV 56 and IV 60) stored at 20°C for 1 day.

PRODUCT	RECOMMENDED DOSAGE	RECOMMENDED WORKING TEMPERATURE
Ekölite SE 65 S	0.05 – 0.15%	Above 18°C
Ekölite PE 18 M	0.05 – 0.15%	Above 10°C

Note: Both emulsifiers should not be tested at temperature below 10°C.

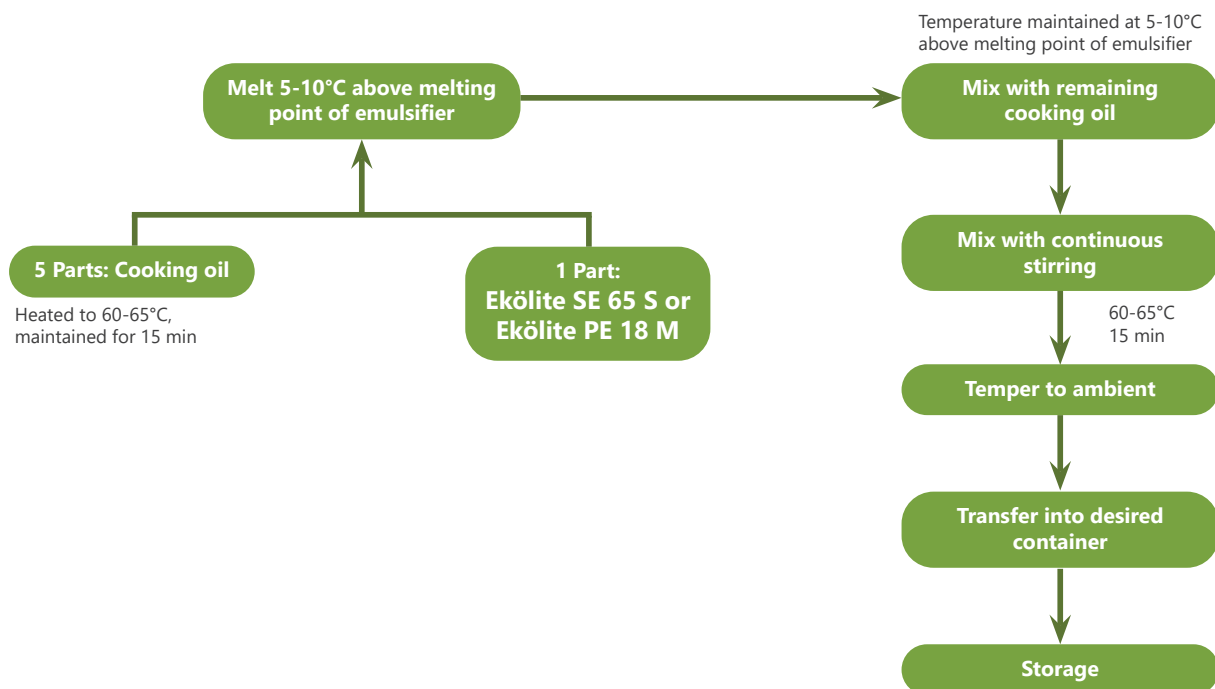
Ekölite PE 18 M performs better as an anti-crystalliser at lower storage temperature than **Ekölite SE 65 S** at the same dosage level. However, **Ekölite PE 18 M** is not permitted to be used in European countries.

Do take note that excessive dosage of both **Ekölite SE 65 S** and **Ekölite PE 18 M** will cause an adverse effect on the cooking oil quality, where pro-crystallisation will occur instead.

Comparative Product Specifications

PRODUCT NAME	SORBITAN TRISTEARATE	POLYGLYCEROL ESTER
	EKÖLITE SE 65 S	EKÖLITE PE 18 M
Form	Bead	Paste
Appearance	Slightly Yellowish	Cream
Feedstock	Palm	Palm
Acid Value	Max 7	Max 12
Iodine Value	Max 3	12 – 18
Melting Point, °C	56	-
Saponification Value	176-188	165-195
Hydroxyl Value	66-80	-
Shelf Life, months	24	18
E number	E492	-
US FDA Number	21 CFR 178.3400	21 CFR 172.854

Process Flow of Dosing Sorbitan Tristearates or Polyglycerol Esters into Cooking Oil



Disclaimer: The information and recommendations contained herein are to the best of our knowledge reliable. However, nothing herein is to be construed as a warranty of representation in respect of safety in use, suitability, efficacy or otherwise including freedom from patent infringement. Users should conduct their own tests to determine the suitability of our product for their own specific purposes and the legal status for their intended use of the product.

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