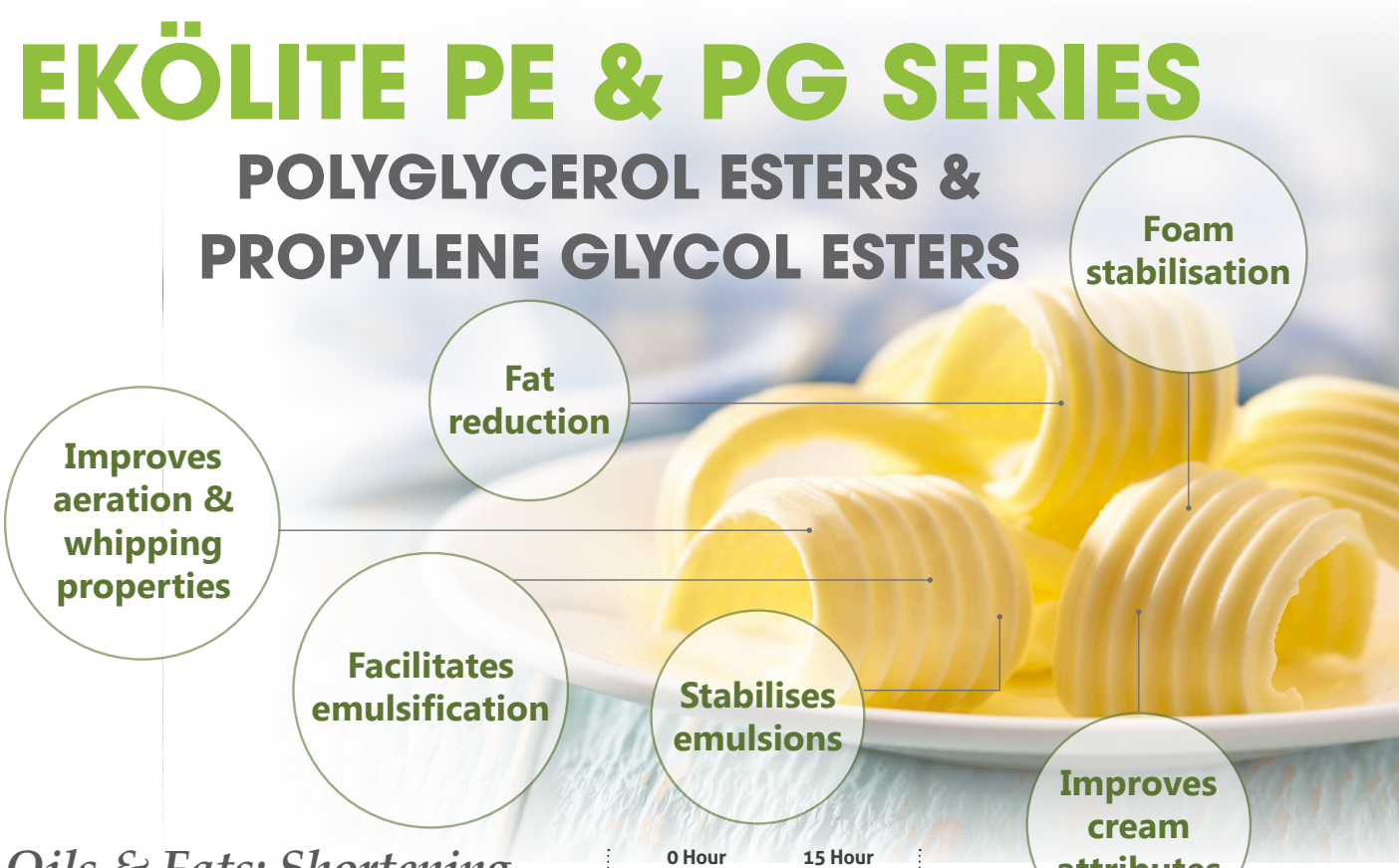
FUTURA ingredients
designed by nature

EKÖMUL MYXT SERIES

EMULSIFIER BLENDS

EKÖLITE PE & PG SERIES

POLYGLYCEROL ESTERS & PROPYLENE GLYCOL ESTERS



Oils & Fats: Shortening, Margarines & Spreads

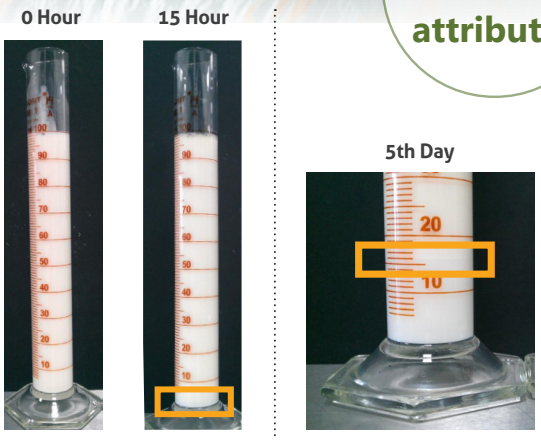
Key Application Benefits

a) Facilitates Emulsification & Stabilises Emulsions

In margarines and spreads emulsifiers function to stabilise water-in-oil (W/O) emulsions by reducing the interfacial tension between two immiscible liquids. This creates a finer distribution of water droplets in the emulsion, and when tempered, this imparts a more stable crystalline structure to margarines and spreads. Emulsifiers helps to stabilise the finished product during storage by preventing coalescence of the dispersed phase in the W/O emulsion, resulting a high quality product with longer shelf life.

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

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

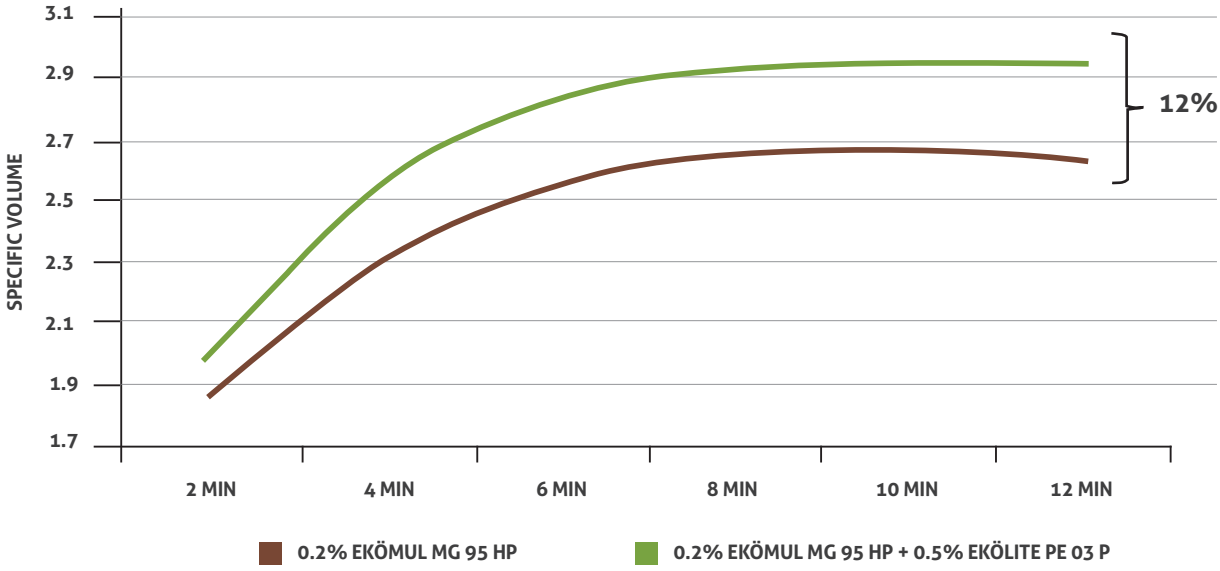


Note: *Emulsion stability test conducted with 50% oil: 50% water added with 0.2% Polyglycerol Esters. Samples were observed at 45°C.*

The addition of **Ekölite PE Series** Polyglycerol Esters in margarines and spreads facilitates emulsification and improves emulsion stability, enhancing product stability. When contrasted to **Ekömul MG 95 HP**, **Ekölite PE 03 P** out performs in terms of emulsion stability.

b) Improved Aeration & Whipping Properties

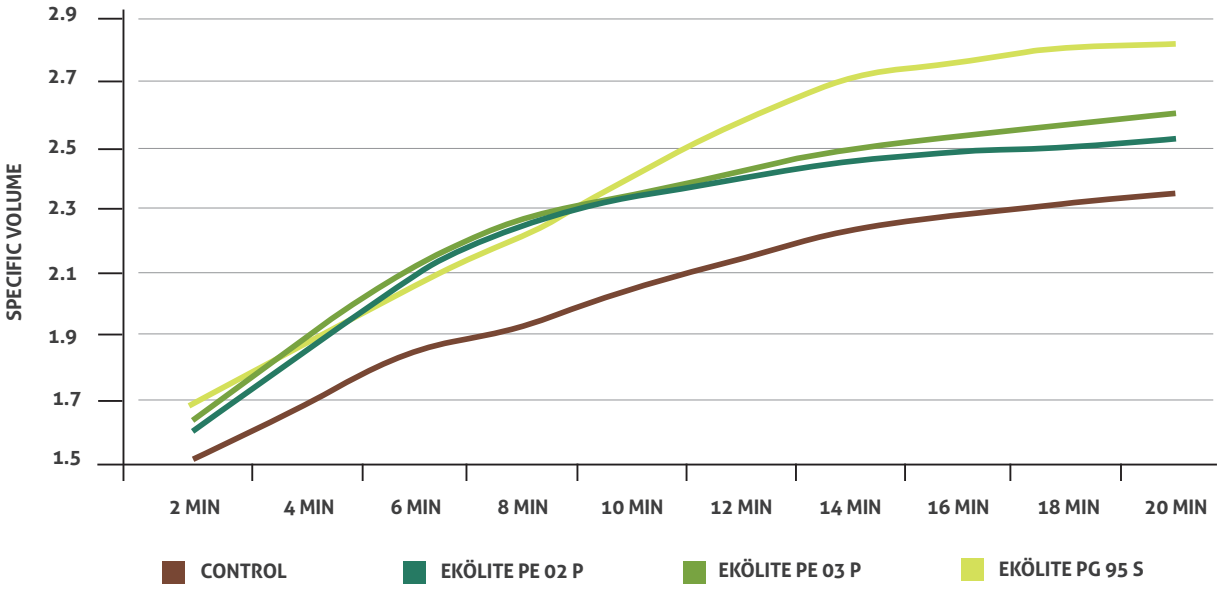
Shortening and margarines are generally used for baking, frying and cooking, as well as an ingredient in fillings, icings and for creaming. Emulsifiers help to improve creaming and whipping properties to deliver higher volume and increased softness. Emulsifiers help to ensure numerous fine air cells are created during the creaming process. **Ekölite PE series** and **Ekölite PG 95 S** further enhances aeration capabilities and foam stabilisation provided by **Ekömul MG series**.



Note: *Shortening incorporated with emulsifiers subjected to creaming test using cake mixer.*

The addition of **Ekömul MG series** improves the aeration and whipping properties of shortening. However, the combination of **Ekölite PE series** and **Ekömul MG series** further enhance the aeration capabilities of the shortening by 12%.

Ekölite PG 95 S imparts superior aeration benefits over **Ekölite PE series**, and is suitable for premium aerated margarine products such as cake margarine, cream margarine and fillings to deliver higher volume in baked cakes, creams and fillings.



Note: *Shortening incorporated with 0.5% emulsifiers, subjected to creaming test using cake mixer.*

c) Improved Cream Attributes & Foam Stabilisation

In aerated systems, incorporation of **Ekömul MG series** stabilises the cream structure after the aeration process, where it gives the final product the desired volume, texture and shape retention. **Ekömul MG series** also facilitates improved spreadability, colour and glossiness of creams.

The addition of **Ekölite PE series** and **Ekölite PG 95 S** further enhances volume and stability that distilled monoglycerides provide, by boosting fat dispersion in the aerated product, which in turn promotes a whiter, glossier cream from the increased fine air cells that are created.

Reference

Ekömul MG 95 HP

Ekölite PE 02 P

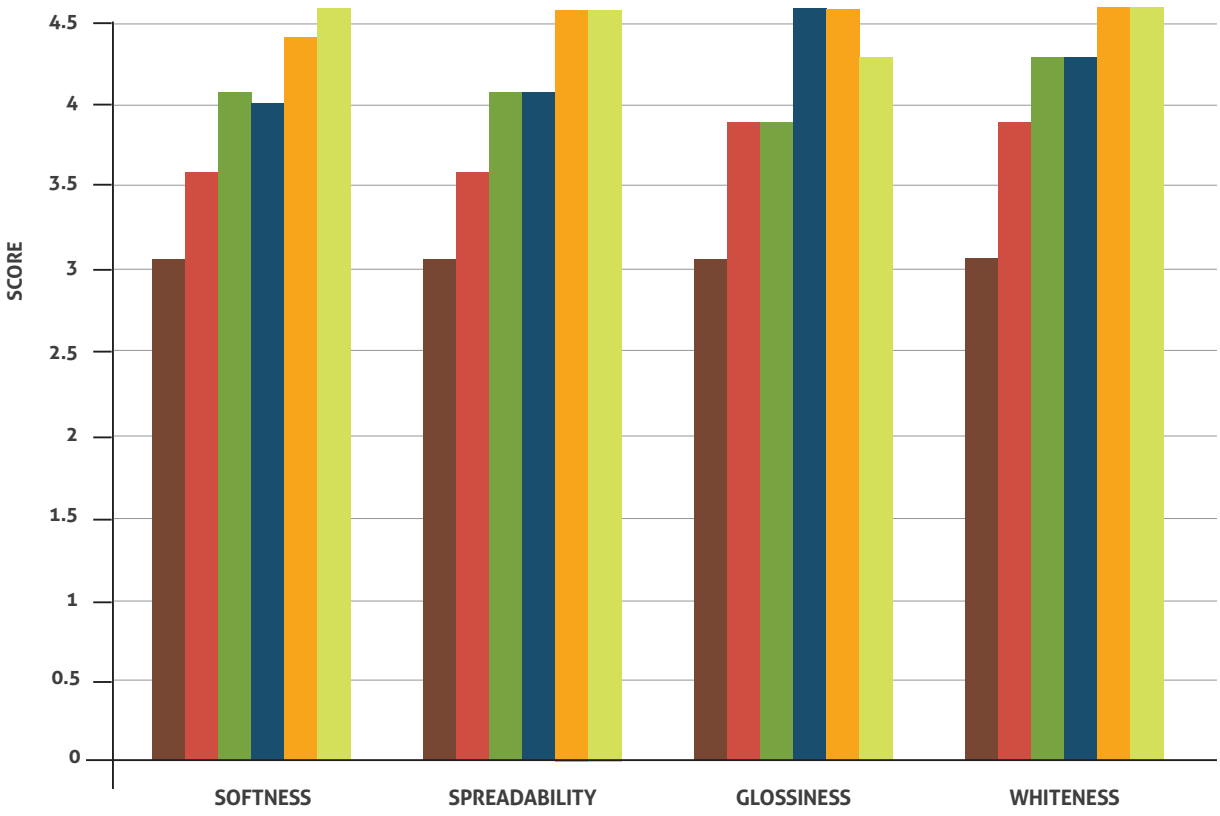
Ekölite PE 03 P

Ekömul MYXT 260 PEI

Ekölite PG 95 S

Note: *Cream rosettes using shortening formulated with 0.5% emulsifers. The cream rosettes of the reference sample has breakage and is not smooth. The smoothness and edges of cream rosettes improved with emulsifier addition with the following rating: PG 95 S / MYXT 260 PEI > PE 03 P > PE 02 P > MG 95 HP.*

In aerated systems, incorporation of **Ekömul MYXT 260 PEI** out performs **Ekölite PE series** in terms of cream structure stabilisation after the aeration process, where it gives a whiter, softer and more spreadable of creams.



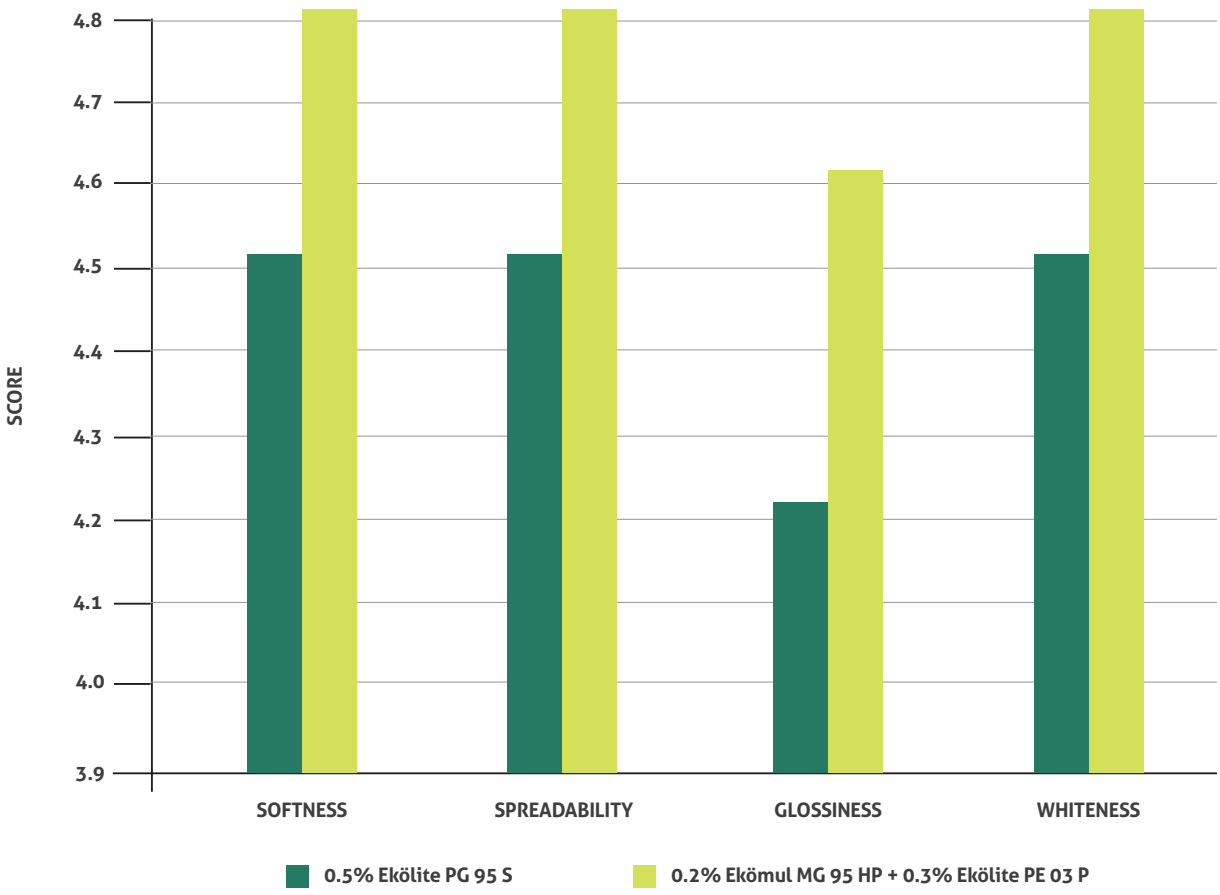
d) Synergy of Ekömul MG series with Ekölite PG 95 S

Combination of **Ekömul MG series** with **Ekölite PG 95 S** further enhances volume, cream stability and provides an extra boost to the cream spreadability, glossiness and texture as compared to usage of singular emulsifiers in cream margarine products.

0.5% Ekölite PG 95 S

0.2% Ekömul MG 95 HP +
0.3% Ekölite PG 95 S

Note: *Cream rosettes using shortening formulated with 0.5% emulsifiers. The cream rosettes of the reference sample has breakage and is not smooth. The smoothness and edges of cream rosettes improved with emulsifier addition with the following rating: MG 95 HP + PG 95 S > PG 95 S.*



Note: *Creams formulated with 0.5% emulsifiers.*

Product Specifications

BRAND NAME	PRODUCT NAME	MONOESTER	IODINE VALUE	MELTING POINT, APPROX	RSPO CERTIFIED		FAT SOURCE	RECOMMENDED DOSAGE
					MB	SG		
Ekömul	Emulsifier Blends MYXT - Series							
	MYXT 260 PEI	Min. 60%	MAX 3	60°C	✔		Palm	1.0 - 2.0%
Ekölite	Propylene Glycol Esters PG - Series							
	PG 95 S	Min. 95%	MAX 3	44°C	Non Palm		Rapeseed	0.2 - 0.5%
		SAPONIFICATION VALUE	IODINE VALUE	MELTING POINT, APPROX	RSPO CERTIFIED		FAT SOURCE	RECOMMENDED DOSAGE
					MB	SG		
	Polyglycerol Esters PE- Series							
	PE 80 O	135 - 165	App. 80	-	✔		Proprietary Blend	0.2 - 0.5%
	PE 03 P	130 - 160	MAX 3	58°C	✔		Palm	
	PE 02 P	125 - 145	MAX 3	58°C	✔		Palm	

Reference Formulations For Margarines

INGREDIENTS	GENERAL MARGARINE	CAKE MARGARINE	PREMIUM CAKE MARGARINE
Oil phase			
Oils / Fats Blend	80.172	79.784	79.884
Ekölite KRYS Series	1.000	1.000	1.000
Lecithin (Bleached)	0.100	0.100	0.100
Saturated DMG Ekömul MG 95 HP/ HO/ PS/ HV/ HR	0.200	-	-
Unsaturated DMG Ekömul MG 90 S/ SX/ SP/ R	0.04	-	-
Ekömul MYXT 260 PEI	-	0.500	0.400
Propylene Glycol Esters Ekölite PG 95 S	-	-	0.200
β-carotene	0.001	0.001	0.001
Oil soluble flavour	0.025	0.025	0.025
Water phase			
Water	16.00	16.00	16.00
Skim Milk Powder	0.5	0.5	0.5
Salt	2.00	2.00	1.50
Citric Acid	TO PH 5	TO PH 5	TO PH 5

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