FUTURA
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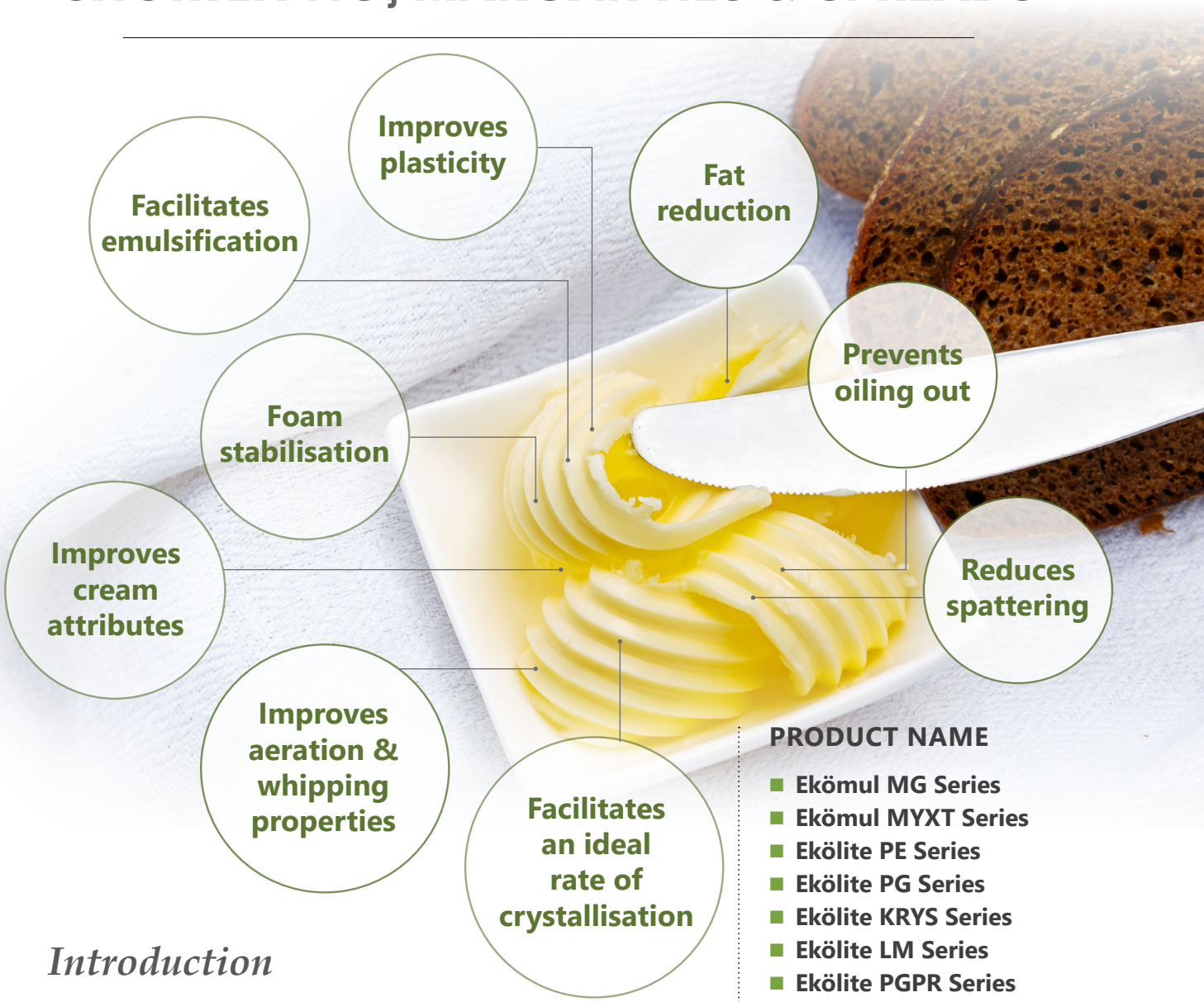
OILS & FATS

SHORTENING, MARGARINES & SPREADS



PRODUCT NAME

- Ekömul MG Series
- Ekömul MYXT Series
- Ekölite PE Series
- Ekölite PG Series
- Ekölite KRYS Series
- Ekölite LM Series
- Ekölite PGPR Series
- Ekölite CM Series

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

Introduction

The oils and fats industry has undergone immense developments in recent years to accommodate greater customer demands. Industry focus has shifted to low fat spreads, trans-free solutions, liquid systems and fillings for bakery and snack products from the traditional margarine and shortening products. The formulation of margarines and spreads has become more challenging, as different types of margarine and spreads require different emulsifier functionality depending on end product performance.

Futura offers a range of emulsifier solutions for all types of shortening, margarines and spread products dependent on required functionality:

- Distilled Monoglycerides, **Ekömul MG Series**
- Polyglycerol Esters, **Ekölite PE Series**
- Propylene Glycol Monoesters, **Ekölite PG Series**
- Polyglycerol Polyricinolecte, **Ekölite PGPR Series**
- Fat Crystallisers, **Ekölite KRYS Series**
- LACTEM, **Ekölite LM Series**
- CITREM, **Ekölite CM Series**
- Emulsifier Blends, **Ekömul MYXT Series**

Product Application Benefits

FUNCTIONALITY	PRODUCT CATEGORY							
	EKÖMUL MG SERIES	EKÖLITE PE SERIES	EKÖLITE PG SERIES	EKÖMUL PGPR SERIES	EKÖLITE KRYS SERIES	EKÖLITE LM SERIES	EKÖLITE CM SERIES	EKÖMUL MYXT SERIES
Facilitates emulsification	✓ ✓	✓	✓	✓ ✓ ✓ ✓				✓ ✓
Improves aeration & whipping properties	✓	✓ ✓	✓ ✓ ✓			✓ ✓ ✓ ✓		✓
Improves cream attributes	✓	✓ ✓	✓ ✓ ✓					✓
Foam stabilisation	✓	✓ ✓	✓ ✓ ✓					✓
Improves plasticity	✓	✓	✓					✓
Fat reduction	✓	✓		✓ ✓ ✓ ✓			✓ ✓ ✓	
Facilitates ideal rate of crystallisation	✓				✓			✓
Prevent oiling out	✓			✓ ✓	✓ ✓ ✓			✓
Reduces spattering	✓							

Product Application Guide

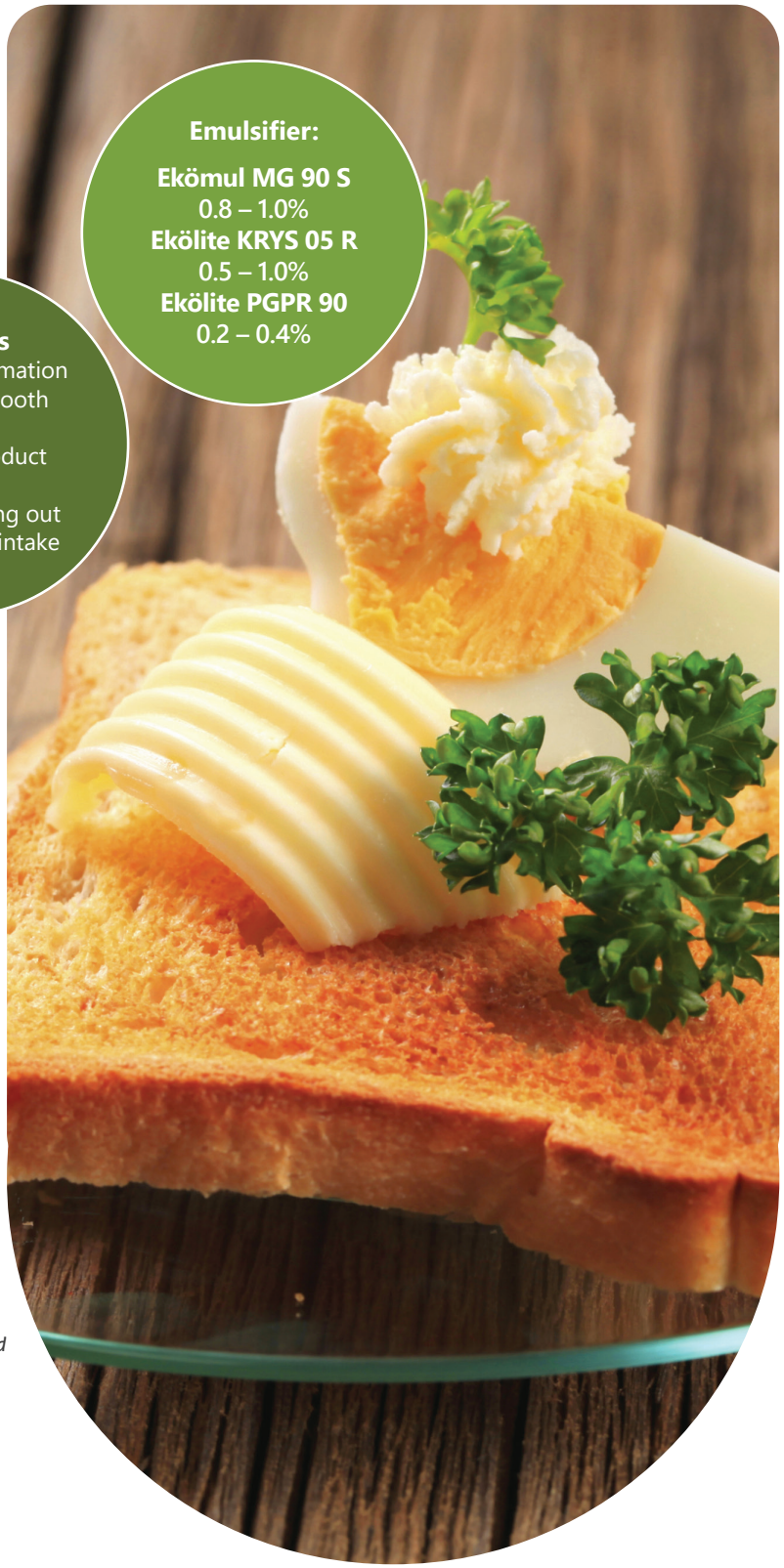
PRODUCT RANGE	BAKERY SHORTENING	TABLE MARGARINE	GENERAL PURPOSE MARGARINE	CAKE MARGARINE	PUFF PASTRY MARGARINE	LOW FAT SPREADS	CREAM FILLINGS	PAN RELEASE AGENT
EKÖMUL MG SERIES	✓	✓	✓	✓	✓	✓	✓	✓
EKÖLITE PE SERIES	✓	✓		✓	✓	✓	✓	
EKÖLITE PG SERIES	✓			✓			✓	
EKÖLITE PGPR SERIES						✓	✓	✓
EKÖLITE KRYS SERIES	✓	✓	✓	✓	✓	✓	✓	
EKÖLITE LM SERIES				✓				
EKÖLITE CM SERIES		✓	✓					
EKÖMUL MYXT SERIES	✓			✓	✓		✓	

LOW FAT SPREAD (33% FAT)

Functions
- Facilitates formation of fine and smooth emulsion
- Imparts product stability
- Prevents oiling out
- Reduced fat intake

Emulsifier:

Ekömul MG 90 S
0.8 – 1.0%
Ekölite KRYS 05 R
0.5 – 1.0%
Ekölite PGPR 90
0.2 – 0.4%



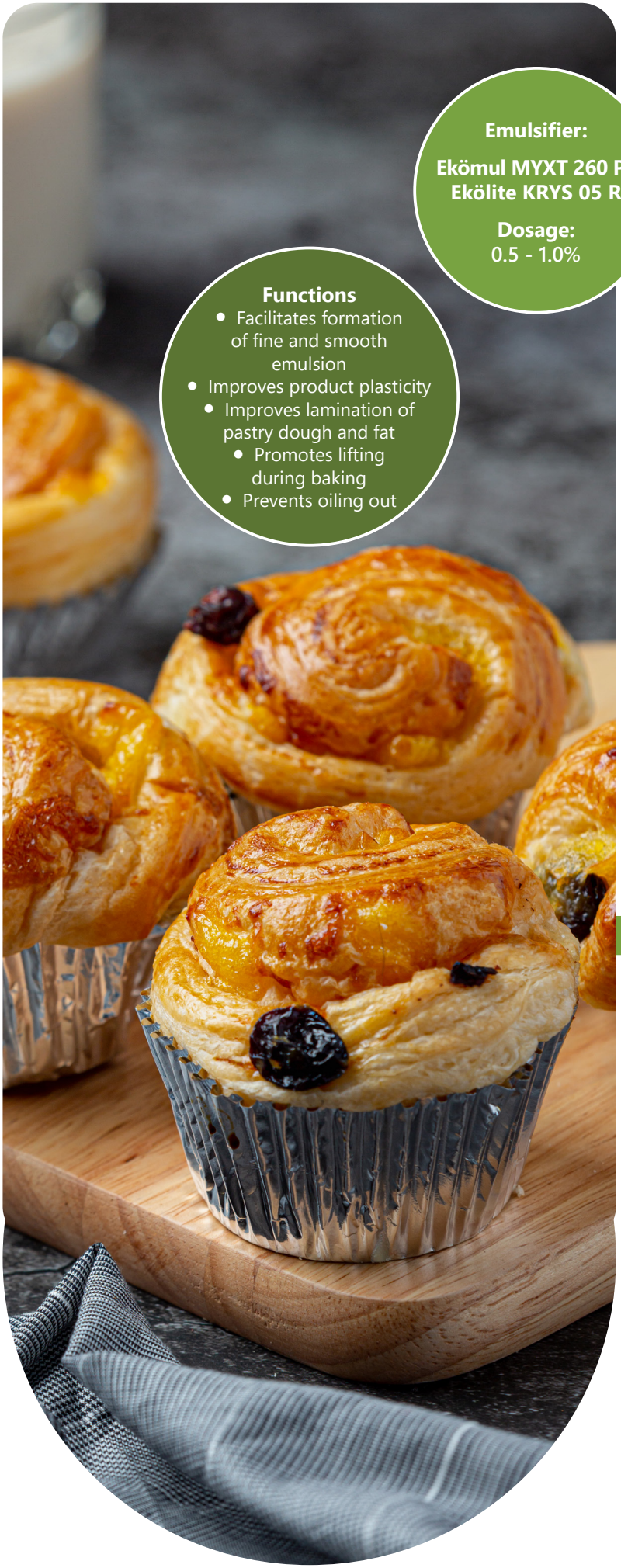
Reference Formula

OIL PHASE INGREDIENTS	%
Oils / Fats Blend	33.0
EKÖMUL MG 90 S *	**1.0**
EKÖLITE KRYS 05 R **	**0.5**
EKÖLITE PGPR 90 ***	**0.2**
Provitamin A (Beta Carotene 30%)	0.002
Vitamin E (tocopherols)	++
Butter Flavour	++
WATER PHASE INGREDIENTS	
Water	64.3
Skim Milk Powder ****	0.5
Salt	0.3
Potassium Sorbate	0.1
Citric Acid (to pH 4.5)	++
TOTAL	**100**

** **Ekömul MG 90 S** is an unsaturated distilled monoglycerides (DMG), used to facilitate formation of fine and smooth emulsion, and imparts product stability*
*** **Ekölite KRYS 05 R** is a Crystalliser, used to prevent oiling out*
**** **Ekölite PGPR 90** is a polyglycerol polyricinoleate (PGPR), used to stabilise the emulsion*
***** Optional*

Procedure

1. Heat oils / fats blend to 45 – 50°C.
2. Heat water phase ingredients to 40°C – 45°C and maintain the temperature.
3. In a separate tank, melt 1 part of the emulsifiers to 5 parts of the oil at approximately 70°C. *[Rule of thumb: Melt emulsifier at 5 – 10°C above its melting point]*
4. Once melted completely, dose into the mixing tank with the remaining oils / fats blend.
5. Maintain temperature at 45 – 50°C.
6. Add water phase ingredients, and mix the emulsion until homogeneous. *[Mixing speed and duration vary according to plant set up]*
7. Direct the emulsion to the texturising plant. *[Recommended process configuration for spread making is: chilling – kneading – chilling – kneading, or better known as "chilled – pin – chilled - pin"]*
8. Thereafter, direct the texturised spread to the packing line.
9. Pack the spread into desired format of packaging.
10. Transfer the spread for tempering at 5 – 15°C for minimum 5 days, or as long as possible.



Emulsifier:

Ekömul MYXT 260 PE
Ekölite KRYS 05 R

Dosage:
0.5 - 1.0%

Functions

- Facilitates formation of fine and smooth emulsion
- Improves product plasticity
- Improves lamination of pastry dough and fat
- Promotes lifting during baking
- Prevents oiling out

PUFF PASTRY MARGARINES

Reference Formula

OIL PHASE INGREDIENTS	%
Oils / Fats Blend	80.7
Ekömul MYXT 260 PE *	**0.6**
Ekölite KRYS 05 R **	**0.5**
Lecithin	0.2
Provitamin A (Beta Carotene 30%)	0.0025
Vitamin E (tocopherols)	++
Butter Flavour	++
WATER PHASE INGREDIENTS	
Water	16.0
Salt	2.0
Citric Acid (to pH 4.5)	++
TOTAL	**100**

PROCEDURE

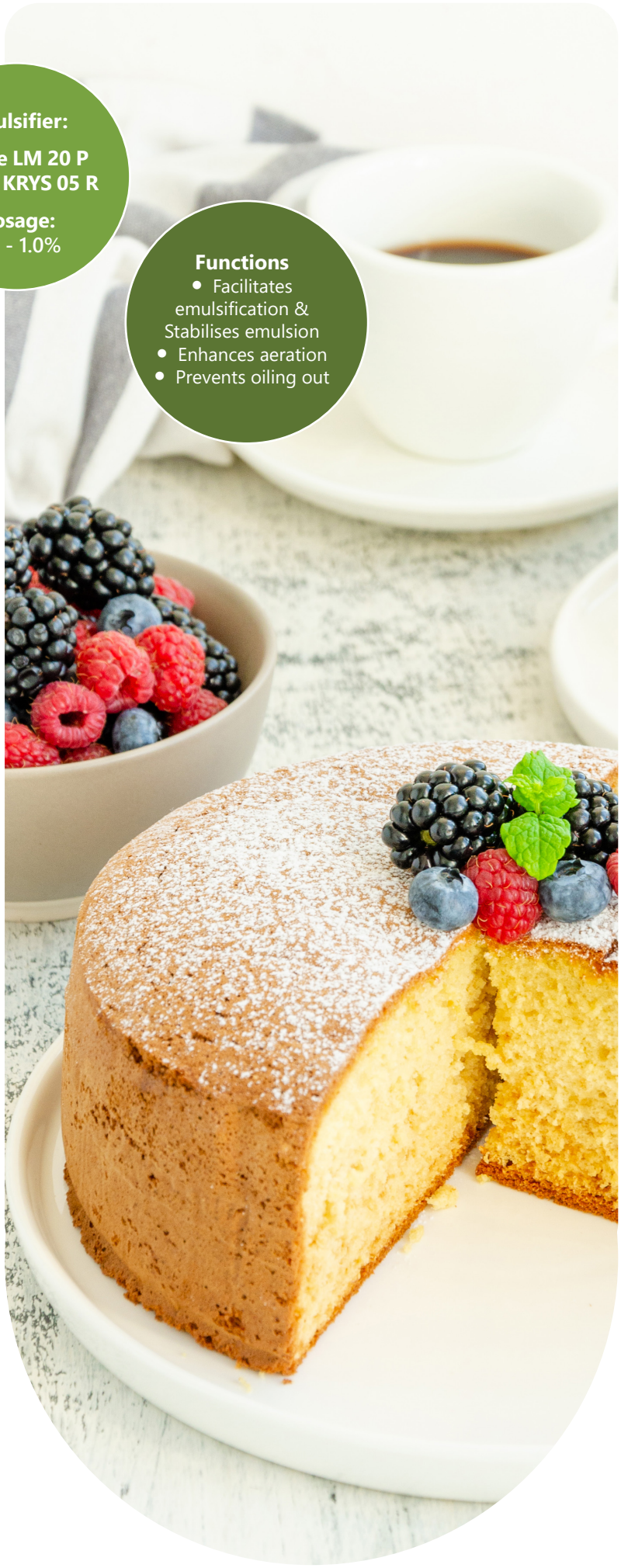
1. Heat oils / fats blend to 45 – 50°C.
2. Heat water phase ingredients to 40°C – 45°C and maintain the temperature.
3. In a separate tank, melt 1 part of the emulsifier to 5 part of the oil at approximately 70°C. *[Rule of thumb: Melt emulsifier at 5 – 10°C above its melting point]*
4. Once melted completely, dose into the mixing tank with the remaining oils / fats blend.
5. Maintain temperature at 45 – 50°C.
6. Add water phase ingredients, and mix the emulsion until homogeneous. *[Mixing speed and duration vary according to plant set up]*
7. Direct the emulsion to the texturising plant. *[Recommended process configuration for pastry margarine making is: chilling – kneading – chilling, or better known as "chilled – pin – chilled"]*
8. Thereafter, direct the texturised margarine to the resting tube.
9. Pack the margarine into desired format of packaging.
10. Transfer the margarine for tempering at 17 – 22°C for minimum 5 days.

CAKE MARGARINES

Emulsifier:
Ekölite LM 20 P
Ekölite KRYS 05 R

Dosage:
0.5 - 1.0%

Functions
- Facilitates emulsification & Stabilises emulsion
- Enhances aeration
- Prevents oiling out



Reference Formula

OIL PHASE INGREDIENTS	%
Oils / Fats Blend	79.89
EKÖLITE LM 20 P *	**0.6**
EKÖLITE KRYS 05 R **	**0.5**
Lecithin	0.2
Polysorbate	0.3
Provitamin A (Beta-carotene)	++
Vitamin E (tocopherols)	++
Butter Flavour	++
WATER PHASE INGREDIENTS	
Water	16.0
Salt	2.5
Acidity Regulator (e.g. Citric Acid)	0.01

** Ekölite LM 20 P is a lactic acid ester of mono-diglycerides, used to enhance aeration*
*** Ekölite KRYS 05 R is a Crystalliser, used to prevent oiling out*

REFERENCE PROCESSING

1. Heat oils / fats blend to 45 – 50°C.
2. Heat water phase ingredients to 40°C – 45°C and maintain the temperature.
3. In a separate tank, melt 1 part of the emulsifier to 5 part of the oil at approximately 70°C. *[Rule of thumb: Melt emulsifier at 5 – 10°C above its melting point]*
4. Once melted completely, dose into the mixing tank with the remaining oils / fats blend.
5. Maintain temperature at 45 – 50°C.
6. Add water phase ingredients, and mix the emulsion until homogeneous. *[Mixing speed and duration vary according to plant set up]*
7. Direct the emulsion to the texturizing plant. *[Recommended process configuration for cake margarine making is: chilling – kneading, or better known as "chilled – pin". Process modification is recommended according to desired product characteristics. For example, 2x kneading ("pin") is recommended if product firmness is desired]*
8. Pack the margarine into desired format of packaging.
9. Transfer the margarine for tempering at 20 – 22°C for minimum 3 days.

Product Specifications

BRAND NAME	PRODUCT NAME	MONOESTER	IODINE VALUE	MELTING POINT, APPROX.	RSPO CERTIFIED		FAT SOURCE	RECOMMENDED DOSAGE
					MB	SG		
EKÖMUL	**Distilled Monoglycerides & Mono and Di-glycerides MG-Series**							
	MG 95 HP	Min. 95%	Max. 2	65°C	✔	✔	Palm	0.2 - 1.0%
	MG 95 HO	Min. 95%	Max. 2	66°C	✔	✔	Palm	
	MG 95 PS	Min. 95%	Max. 2	67°C	✔		Proprietary Blend	
	MG 95 HV	Min. 95%	Max. 2	69°C	✔		Soya	
	MG 95 HVX	Min. 95%	Max. 2	69°C	Non Palm		Soya	
	MG 95 HR	Min. 95%	Max. 2	69°C	✔		Rapeseed	
	MG 95 HRX	Min. 95%	Max. 2	69°C	Non Palm		Rapeseed	
	MG 90 RX	Min. 90%	55-70	57°C	Non Palm		Rapeseed	
	MG 90 SP	Min. 90%	70-80	51°C	✔	✔	Proprietary Blend	
	MG 90 S	Min. 90%	95-110	45°C	✔		Sunflower	
	MG 90 SX	Min. 90%	95-110	45°C	Non Palm		Sunflower	
	Emulsifier Blends MYXT - Series							
	MYXT 220 KRI	Min. 20%	Max. 3	58°C	✔	✔	Palm	1.0 - 2.0%
	MYXT 260 PE	Min. 60%	Max. 3	60°C	✔		Palm	
	MYXT 101 PEI	-		<25°C	✔		Sunflower	
EKÖLITE	**Propylene Glycol Esters PG - Series**							
	PG 95 R	Min. 95%	Max. 3	44°C	Non Palm		Rapeseed	0.2 - 0.5%
	PG 95 P	Min. 95%	Max. 3	44°C	✔		Palm	
	PG 95 S	Min. 95%	Max. 3	44°C	✔		Palm	
		SAPONIFICATION VALUE	IODINE VALUE	MELTING POINT, APPROX.	RSPO CERTIFIED		FAT SOURCE	RECOMMENDED DOSAGE
					MB PALM	SG		
	Polyglycerol Esters PE - Series							
	PE 80 O	135-165	80-90	-	✔		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	
	PE 04 P	135-160	Max. 3	58°C	✔		Palm	
	PE 05 P	140-160	Max. 3	58°C	✔		Palm	
		FREE FATTY ACID	IODINE VALUE	MELTING POINT, APPROX.	RSPO CERTIFIED		FAT SOURCE	RECOMMENDED DOSAGE
					MB	SG		
	LACTEM - LM Series							
	LM 20 P	Max. 4 (AV)	Max. 2	45°C	✔		Palm	0.5 - 2.0%
	LM 20 P FLOW	Max. 4 (AV)	Max. 2	45°C	✔		Palm	
	Citric Acid Esters of Mono- and Diglycerides CM - Series							
	CM 12	SV (205-255)	Max. 3	59°C	✔	✔	Palm	
	Fat Crystallisers KRYS - Series							
	KRYS 01 S	Max. 1%	Max. 2	59°C	✔	✔	Palm	1.0 - 2.0%
	KRYS 02 S	Max. 0.3%	Max. 21	55°C	✔		Palm	
	KRYS 03 S	Max. 1%	Max. 2	59°C	✔	✔	Palm	
	KRYS 04 V	Max. 1%	Max. 2	65°C	Non Palm		Soya	
	KRYS 05 R	Max. 3 (AV)	Max. 2	65°C	Non Palm		Rapeseed	
	KRYS 07 M	Max. 1%	Max. 5	60-64°C			Rapeseed / Soya / Palm	
	KRYS 08 M	Max. 3 (AV)	Max. 3	62-66°C			Rapeseed / Palm	
	KRYS 11 S	Max. 1%	Max. 21	55°C	✔		Palm	
	Polyglycerol Polyricinoleote PGPR - Series							
	PGPR 90							

HEADQUARTERS
Futura Ingredients | Mewah Building, 5 International Business Park, 01-00 Singapore 609914
o +65 6829 5115 f +65 67200158 w futuraingredients.com
e enterpriseservices@ futuraingredients.com

MANUFACTURING SITE
Ecolex Sdn Bhd | Lot 11 Section 5 Fasa 2B, Jalan Sungai Pinang 4/2, Pulau Indah Industrial Park, Pulau Indah 42920 Selangor, Malaysia
o +603 3258 3000
f +603 3258 3160