

EKÖMUL MG Series & EKÖMUL XTND Series Distilled Monoglycerides

EKÖMUL MG Series & EKÖMUL XTND Series Distilled Monoglycerides Toolkit Reference Booklet. A comprehensive guide to understanding the physical properties and variants of distilled monoglycerides (DMGs) utilised in the food industry, particularly within bakery applications. This reference guide is to provide detailed insights into how DMGs can significantly enhance product quality through customisation.



Understanding Distilled Monoglycerides

Distilled monoglycerides (DMGs) are essential in the food industry for enhancing the texture, stability, and shelf life of various products. Their functionality can be customised to meet specific application needs, offering versatile solutions in food formulation.

Technology and customisation

Our cutting-edge spray cooling technology facilitates the customisation of DMG particle sizes, enabling optimal integration into food products. This booklet elaborates on the particle size variation and its beneficial impact on product quality.

Application variability

DMGs have a broad spectrum of applications in the food industry, from enhancing stability to improving texture. This booklet provides guidance on selecting the appropriate DMG for bakery applications.

Physical Form and Particle Size

Futura Ingredients' EKÖMUL Series, Distilled Monoglycerides are available in standard palm, RSPO Mass Balance and RSPO Segregated certified and non-palm variants.

DMGs are one of the most commonly used emulsifiers in bakery applications. Their effectiveness in such applications relies upon the efficiency of DMGs being dispersed during the dough preparation stage. The dispersibility properties in bakery applications are a balance between particle size and degree of unsaturation of the DMGs. Good dispersibility of the emulsifier during dough kneading leads to optimised functionality, allowing the user to achieve improved crumb softness and texture of baked goods.



- Customised, matching, and a range of standard solutions for bakery applications
- A diverse range of monoglycerides products based on
 - Particle size
 - Degree of unsaturation
 - Raw material sources
 - Sustainability requirement

Particle Size

With Futura Ingredients' best-in-class technology, our spray cool capabilities enable precise control over the particle size of DMGs, resulting in a diverse range of products tailored to customer needs.

Finer Particle Size Distribution (PSD) for enhanced dough dispersion and crumb softness

Our research indicates that finer particle sizes significantly improve the emulsifier's dispersibility during the dough preparation process. For example, our **EKÖMUL MG 90 HP 75** with average particle size (APS) of 75µm enables enhanced dispersibility which facilitates a more uniform distribution of DMGs within the dough matrix, contributing to an optimised interaction with starch. Consequently, this interaction leads to a softer crumb with finer crumb structure and an overall improvement in the quality of the baked goods.

EKÖMUL MG Series

Distilled monoglycerides (DMGs)

The particle size of our DMGs ranges from a standard 300 microns to as fine as 50 microns, as tabulated below.

APS* (MICRONS)	PRODUCT NAME
300	EKÖMUL MG 95 HP
200	EKÖMUL MG 95 HP 200
150	EKÖMUL MG 95 HP 150
100	EKÖMUL MG 95 HP 100
75	EKÖMUL MG 90 HP 75
50	EKÖMUL MG 90 HP 50

*Average particle size



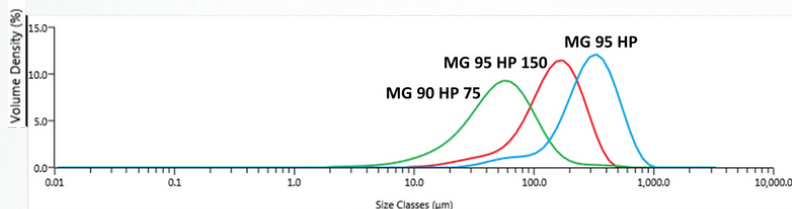
This Sales Tool Kit uses the following three grades of DMGs to demonstrate the physical appearance of different particle sizes, highlighting the variations.



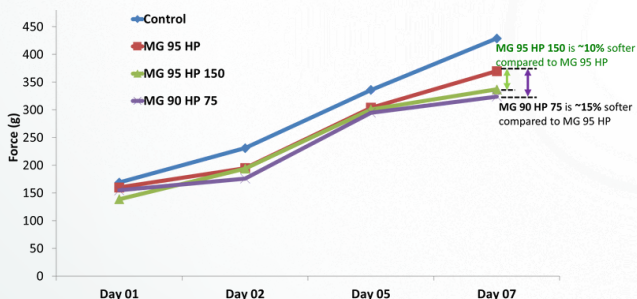
PRODUCT NAME EKÖMUL	MINIMUM MONO-GLYCERIDES	IODINE VALUE (IV)	APPEARANCE	AVERAGE PARTICLE SIZE (μ)
MG 95 HP	95%	2 max.	Bead	300
MG 95 HP 150	95%	2 max.	Microbead	150
MG 90 HP 75	95%	2 max.	Fine Powder	75

EKÖMUL MG Series

- Saturated / Particle Size



- Crumb Softness



Notes:

1. Test conducted with white sandwich bread recipe added with 0.5% DMG
2. Test method: AACC Standard Method 74-09 Bread Firmness Test; using Texture Analyser TA.XT PLUS
3. The higher the reading, the firmer the bread

Degree of Unsaturation

In the creation of DMGs, the degree of unsaturation is determined by the raw material used. The **EKÖMUL XTND series** is a specially designed DMG with a degree of unsaturation high enough to enhance dough dispersibility yet capable of being converted into powder formats for the ease of use. This degree of unsaturation, combined with particle size customisation, creates the **EKÖMUL XTND series** that provides optimum dough dispersibility, thereby ensuring superior crumb performance.

Futura Ingredients employs advanced spray cool technology within its manufacturing process to precisely adjust particle size distribution, a method that complements the inherent degree of unsaturation predetermined by the raw materials selected. This meticulous approach to manufacturing optimises water absorption and retention in the dough matrix throughout the baking process, leading to a softer, more uniform crumb structure. The deliberate combination of raw material attributes with cutting-edge manufacturing techniques serves to elevate the quality of bakery products significantly. Consequently, this harmonious integration establishes the **EKÖMUL XTND series** as a sophisticated solution tailored for advanced bakery applications.

The photo below illustrates the different water dispersibility properties as impacted by the degree of unsaturation. **EKÖMUL MG 95 HP** represents fully saturated DMG while **EKÖMUL XTND 95 P** represents partially unsaturated DMG with a small degree of unsaturation. **EKÖMUL XTND 95 P** demonstrates superior dispersion qualities over **EKÖMUL MG 95 HP**.



Test procedures:

1. One (1)g of emulsifier was added to 100g distilled water at ambient temperature.
2. Mixture is stirred clockwise 10 times.

Product Name

Acid value (mg KOH/g)

Total monoglyceride

Free glycerol

Iodine value (I₂/100g)

Melting Point

Average particle size (APS)

EKÖMUL MG 95 HP

3.0 max.

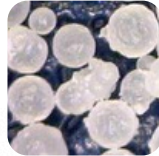
95.0% min.

1.0% max.

2.0 max.

Approx. 65°C

250-350 micron



EKÖMUL XTND 95 P

3.0 max.

95.0% min.

1.0% max.

18 - 26

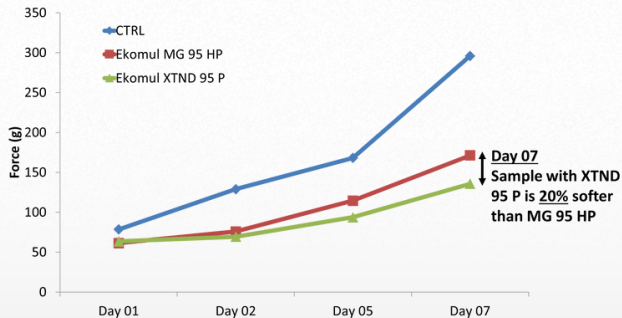
Approx. 60°C

160-210 micron



EKÖMUL MG 95 HP & XTND 95 P

• Crumb Softness



Notes:

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2. Test method: AACC Standard Method 74-09 Bread Firmness Test; using Texture Analyser TA.XT PLUS
3. The higher the reading, the firmer the bread