

EINAR® PLANT-BASED, FOOD-GRADE POLYMER ADDITIVES

Anti-fog additive for polyethylene (PE) films



PRODUCT NAME

Einar® 611

APPLICATION

Anti-fog for LDPE, LLDPE,
and EVA films

BRINGING GOOD THINGS TOGETHER

Palsgaard®

The plant-based, food-grade anti-fog solution for polyethylene (PE) films

PE film is commonly used in a very broad range of packaging applications and the need for efficient anti-fogs is essential for the quality and appearance of fresh packaged food.

With **Einar® 611** you can overcome concerns of food safety and add a more sustainable profile to your PE films and EVA copolymers and improve their anti-fog performance without affecting costs.

KEY FEATURES

- ✓ Highly effective replacement for conventional anti-fog chemistries such as glycerol monooleate or sorbitan esters
- ✓ A custom-designed polyglycerol ester made from vegetable oils
- ✓ An internal anti-fog additive for additive masterbatches based on polyethylene
- ✓ An excellent solution for coextruded and laminated film
- ✓ Worldwide regulatory approval for food-contact applications
- ✓ Available in paste form

KEY BENEFITS

- ✓ Prevents fogging from chilled and hot packaged food and keeps packaging transparent during storage across a very broad range of PE applications
- ✓ Helps to reduce food waste as products will stay fresh for longer and continue to appeal to consumers
- ✓ No worries in food contact applications
- ✓ No adverse effects on mechanical, optical, and barrier properties
- ✓ Efficient performance with low loading levels in both cold- and hot fog applications
- ✓ High heat resistance and low volatility
- ✓ Consultancy and technical evaluations available from our applications team

EINAR® PLANT-BASED, FOOD-GRADE POLYMER ADDITIVES

Einar® 611 for PE anti-fog applications

Einar® 611 is a specialised, highly efficient anti-fog chemistry. It is ideally suited for demanding applications in coextruded and laminated packaging films where the anti-fog is often added to a very thin section of the entire film.

Einar® 611 provides fast and long term anti-fog performance and has proven to work well in cold fog applications at very low temperatures. It has high extraction resistance in the polymer where it is incorporated and therefore is very good at maintaining its high efficiency through a lamination process. The recommended loading level for most applications is 0.2 - 0.4%.

In hot fog applications it can be difficult to achieve a high performance as well as a prolonged effect. **Einar® 611** is the ideal solution for PE films in applications such as hot packaged foods where it lowers the surface tension, causing the water droplets to spread into a transparent film.

Einar® 611 product details

Physical/chemical properties:	polyglycerol ester	
	free fatty acids, max.	3%
	free glycerol and polyglycerol, max.	7%
	melting point, approx.	80°C
	colour	off-white
	form at 25°C	paste
Storage conditions:	Should be stored in a cool and dry place in tightly closed packaging	
Packaging:	180 kg/396.8 lb net in steel drum	
Product form:	Einar® 611 comes in paste form	
Total shelf-life:	min. 12 months	

Guidelines for use

Einar® 611 should be incorporated into the polymer matrix via a masterbatch.

COLD FOG TEST OF 0.4% EINAR® 611

Measured in 50µm LDPE film

1 min	E	E	E	E	E	E
5 min	E	E	E	E	E	E
15 min	D	E	E	E	E	E
60 min	D	E	E	E	D	E
180 min	D	E	E	E	D	E
	1 day	7 days	1 month	2 months	6 months	18 months

Days after film manufacture

CONTROL TEST OF 0.4%

COMPETITOR POLYGLYCEROL ESTER

Measured in 50µm LDPE film

1 min	E	C	D	E	C
5 min	E	B	C	E	D
15 min	E	B	B	E	D
60 min	E	C	C	E	D
180 min	E	E	E	E	D
	1 day	7 days	1 month	2 months	6 months

Days after film manufacture

HOT FOG TEST OF 0.4% EINAR® 611

Measured in 30µm LLDPE film

1 min	E	E	E	E	E	E
5 min	E	E	E	E	E	E
15 min	E	E	E	E	E	E
60 min	E	B	E	E	E	B
180 min	B	B	B	B	E	B
	1 day	1 week	2 weeks	1 month	2 months	3 months

Days after film manufacture

CONTROL TEST OF 0.4%

POLYGLYCEROL ESTER OF ANIMAL ORIGIN

Measured in 30µm LLDPE film

1 min	E	E	E	E	E	E
5 min	E	E	D	D	E	E
15 min	D	E	D	C	E	E
60 min	E	B	E	E	E	B
180 min	B	B	B	B	B	B
	1 day	1 week	2 weeks	1 month	2 months	3 months

Days after film manufacture

Einar® 611 shows excellent anti-fogging performance in PE films

Sustainable solutions for the polymers industry

Health and Safety

Einar® is identified as non-toxic and is not expected to cause irritation to the skin, eyes or lungs. Detailed MSDS is available on request.

Legal status and other regulatory information

Einar® 611

- is a dual use additive for use in food (E475) and polymers
- complies with the purity requirements of FAO/WHO regarding food additives (JECFA)
- is manufactured in accordance with Danish- and EU regulations and under hygienic conditions
- may be used in plastic materials and articles intended to come into contact with food-stuffs in accordance with Regulation (EC) No. 10/2011 on plastic materials and articles intended to come into contact with food
- may be used as a component of articles intended for food contact in accordance with FDA 21 CFR 172.854 and TOR Nos. 1996-007, 1998-005, 1998-021, and 21 CFR 174.5 (d) (1)
- Kosher & Halal certificates and REACH registration available on request

To find out more or to order samples of Einar® 611, visit polymers.palsgaard.com or contact us via polymers@palsgaard.com

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Heart working people