

EINAR® PLANT-BASED, FOOD-GRADE POLYMER ADDITIVES

Anti-fog additive for polyethylene films



PRODUCT NAME

Einar® 611

APPLICATION

Anti-fog for LDPE, LLDPE,
and EVA films

Palsgaard®

The plant-based, food-grade anti-fog solution for polyethylene 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 renewable component 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® 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% saponification value 110-140 mg KOH/g melting point approx. 75°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 or 25 kg/55,1 lb HDPE cans
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. The physical form of the additive requires that liquid dosing is used in order to meter the additive adequately.

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	B	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

Excellent	E
Acceptable	D
Better	C
Poor	B
Very poor	A

Plant-based, food-grade solutions for the polymer industry

Health and Safety

Einar® polymer additives are safe to use, identified as non-toxic and not expected to cause irritation to the skin, eyes or lungs. They are made from renewable, plant-based material under hygienic conditions. SDS is available on request.

Legal status and other regulatory information

Einar® 611

- Is a dual use additive for use in plastics and in food
- Complies with the purity requirements of food additives (FAO, WHO, JECFA)
- Food contact approval for EU, USA, Mercosur, China
Detailed information available on request