EINAR® PLANT-BASED, FOOD-GRADE POLYMER ADDITIVES

Anti-fog additives for polypropylene (PP) films

PRODUCT NAME	APPLICATION
Einar® 618	Cold fog protection in PP films
Einar® 422	Hot fog protection in PP films

BRINGING GOOD THINGS TOGETHER

Palsgaard®

The plant-based, food-grade anti-fog solutions for polypropylene (PP) films

The excellent properties of PP film, such as stiffness, transparency and barrier properties, are creating a steadily growing demand for PP film in food packaging applications and as a result, efficient anti-fog solutions for both cast and BOPP film are becoming a top priority.

With **Einar® 618** and **Einar® 422** you can overcome concerns over food safety and add a more sustainable profile to your PP films and even 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
- Custom-designed polyglycerol/glycerol esters made from vegetable oils
- No adverse effects on mechanical, optical, and barrier properties
- Internal anti-fog additives for additive masterbatches based on polypropylene
- Custom designed for PP applications
- Worldwide approval for food-contact applications

KEY BENEFITS

- Prevent fogging from chilled and hot packaged food and keep packaging trans-parent during storage across a very broad range of PP applications
- Help to reduce food waste as products will stay fresh for longer and continue to appeal to consumers
- No worries in food-contact applications
- 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® 618 for PP cold fog applications

Einar® 618 will provide good anti-fog performance in PP film and is primarily suited for cold fog applications but will also have good properties in a hot fog use. **Einar® 618** works well in both cast and BOPP film and will be a fast acting anti-fog, producing clear and transparent film for an extended period of time.

The recommended loading level of **Einar® 618** is 1.0 - 1.5% when incorporated in a random copolymer PP layer and loading levels for homopolymer PP film are 1.5 - 2.0%

Einar® 422 for PP hot fog applications

Einar® 422 is a new hot fog development and will be an excellent choice for any PP anti-fog application for packing of hot foods on display or microwaved ready meals. Performance is immediate and consistent throughout the period of storage at elevated temperatures.

The recommended loading level of **Einar® 422** is 0.5 - 1.0% when incorporated in a random copolymer PP layer and loading levels for homopolymer PP film are 1.0 - 1.5%.

Einar® 618 product details

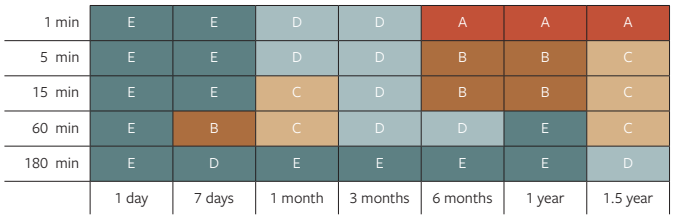
Physical/chemical properties:	polyglycerol ester	
	free fatty acids, max.	4%
	(as oleic acid), max.	7%
	total fatty acid ester content, min.	90%
	melting point, approx.	30°C
	colour	off-white
	form at 25°C	paste
Storage conditions:	Should be stored in a cool and dry place in tightly closed packaging	
Packaging:	180 kg/396.8 lb net in steel drum	
Product form:	Einar® 618 comes in paste form	
Total shelf-life:	min. 12 months	

Einar® 422 product details

Physical/chemical properties:	blend of glycerol- and propylene glycol esters	
	monoglycerides, min.	45%
	acid value, max.	3.0 mg KOH/g
	melting point, approx.	56°C
	colour	off-white
	form at 25°C	pellets
Storage conditions:	Should be stored in a cool and dry place in tightly closed packaging	
Packaging:	25 kg multiply paperbag with an inner PE bag	
Product form:	Einar® 422 comes in pellet form	
Total shelf-life:	min. 24 months	

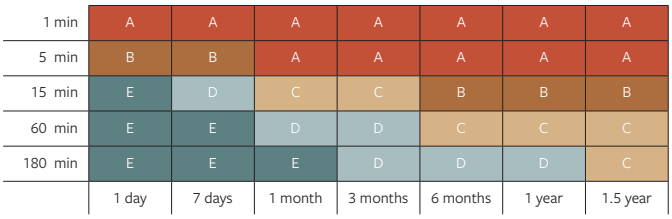
COLD FOG TEST OF 1.5% EINAR® 618

Measured in 30µm R-PP



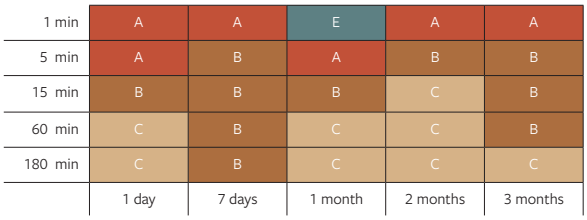
HOT FOG TEST OF 1.5% EINAR® 422

Measured in 30µm R-PP



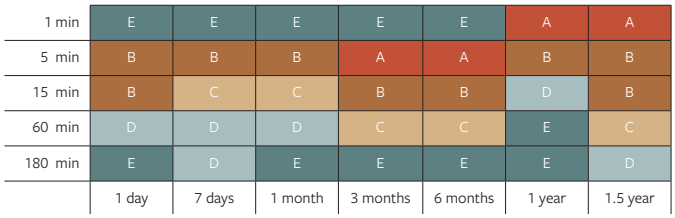
COLD FOG TEST OF 1.5% NON-VEG. GLYCEROL ESTER

Measured in 30µm R-PP



HOT FOG TEST OF 1.5% NON-VEG. GLYCEROL ESTER

Measured in 30µm R-PP



Sustainable solutions for the polymers industry

Guidelines for use

Einar® 618 and **Einar® 422** should be incorporated into the polymer matrix via a masterbatch or by direct addition at the resin manufacturer.

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® 618 and **Einar® 422**

- are a dual use additive for use in food (E475) and polymers
- comply with the purity requirements of FAO/WHO regarding food additives (JECFA)
- are 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 foodstuffs in accordance with Regulation (EC) No. 10/2011 on plastic materials and articles intended to come into contact with food
- are GRAS according to FDA 21 CFR 184.1505, and may in accordance with FDA 21 CFR 174.5 be used as components of articles intended for contact with food
- Roundtable of Sustainable Palm Oil (RSPO) certificate available on request with order
- Kosher & Halal certificates and REACH registration available on request

To find out more or to order samples of Einar® 618 or Einar® 422, visit polymers.palsgaard.com or contact us via polymers@palsgaard.com

BRINGING GOOD THINGS TOGETHER

Palsgaard®
Heart working people

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