

# Atmer™ Anti-fog Additives



Anti-fogging  
Additives for  
Packaging &  
Agricultural  
Applications



# Atmer™ Anti-fogging Additives

Anti-fogging additives providing excellent performance against hot and cold fogging in plastic. Performance you can see clearly.

The Atmer™ range of anti-fogging additives provide excellent performance against hot and cold fog in polyolefins, PVC and EVA films.

The anti-fogging effect allows condensed water droplets to spread into a continuous and uniform transparent layer on the surface of the film, maintaining the transparency of the film, and therefore light transmission through the film, which is especially useful in a range of applications from agricultural films to retail and food packaging. With many physical forms, and products with a wide range of food contact approvals, there is a broad range of Atmer anti-fogging additives to choose from to suit your specific application and needs.

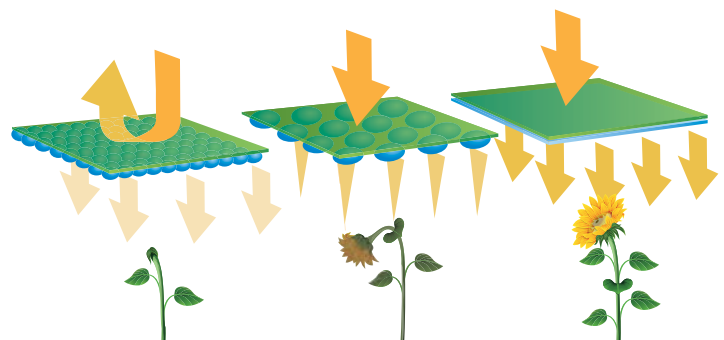
## Fogging in Plastic Films

Fogging is a term used to describe the formation of small discrete droplets of water on the surface of transparent plastic films. Fogging most commonly occurs when there is a temperature differential between the inside and the outside of an enclosed atmosphere causing localized cooling at the interface.

Fog formation in food wrapping film obscures the contents, significantly reducing the aesthetic quality of the packaged food. In agricultural films it can lead to reduced light transmission with a consequent reduction in growth and crop yield. It can also cause damage to the plants due to burning from a 'lens' effect and from continuous water drip.

## Keep Packaged Food Looking Good

Packaged foods can contain large amounts of moisture which causes condensation on the inside of packaging. This can make food less appealing to shoppers and in a competitive retail environment food needs to look pristine in order to stand out on supermarket shelves. Atmer anti-fogging additives prevent fog build up on the inside of packages, improving aesthetics and durability of chilled and hot foods.



Without anti-fog small droplets reflect light resulting in slower growth and ripening

Larger droplets drip and can focus light causing plant damage

Good anti-fog will result in a thin film of water which will drain away without dripping resulting in maximum light transmission with minimal plant damage



Food packaging with and without anti-fog

# Product Information


PRODUCT	DESCRIPTION	PHYSICAL FORM AT 25°C	RAW MATERIAL ORIGIN	RECOMMENDED USES
Anti-fog for Food Wrap				
Atmer™ 1006 *	Glycerol ester	Liquid	Vegetable	PE and EVA food wrap
Atmer™ 1010	Glycerol ester	Paste	Vegetable	Cling in food wrap
Atmer™ 1440 NV	Glycerol ester	Paste	Non-vegetable	Polyolefin food wrap
Atmer™ 100	Sorbitan ester	Liquid	Vegetable	PE and EVA food wrap
Atmer™ 7373	40% concentrate in polypropylene	Pellet	Non-vegetable	Long lasting benefits in polypropylene
Anti-fog for Agricultural Films				
Atmer™ 103	Sorbitan ester	Pastille	Vegetable/Non-vegetable†	LDPE and PVC agricultural films

\*Only available for supply in Asia


## Product Physical Forms

Atmer anti-fog products are available in up to four physical forms. Please check with your local sales contact for availability in your region.


Liquid




Paste



Pellet



Microbead







# Applications

## Agricultural Films

Agricultural film poses an extreme challenge for anti-fogging additives with the key factor being longevity of performance. Additives have to be designed to migrate to the surface more slowly and be compatible with the polymer matrix in order to slow the rate of extraction during the service life of the film. Different climate conditions also need to be considered as a change of additive and usage levels may be required.

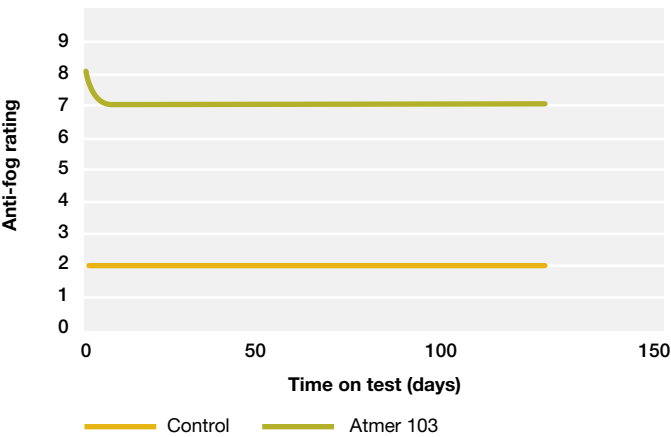
The use of anti-fogging additives in agricultural film causes condensed water droplets to spread into a thin continuous layer of water, which:

- Maintains light transmission of the polymer resulting in higher plant growth rates, higher crop yields per plant and earlier crop maturity
- Reduces burning of plants and crop spoilage
- Reduces constant water dripping

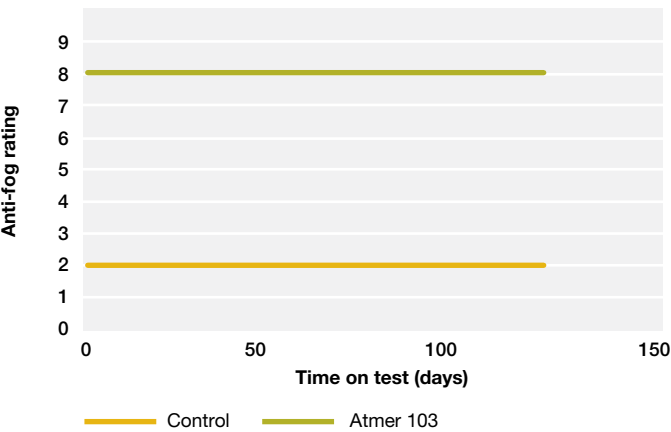
## Polyethylene Mono Layer Films

For mono layer agricultural films, the limit of film performance is typically around 12 months. Atmer™ 103 additive is recommended for use in LDPE and LLDPE based formulations.

1. Anti-fog performance of Atmer 103 accelerated greenhouse test LDPE film (180 µm) 2% additive



2. Anti-fog performance of Atmer 103 accelerated greenhouse test EVA film (4% VA, 180 µm) 2% additive



### Anti-fog performance scale

- |     |                                    |
|-----|------------------------------------|
| 1-3 | No anti-fogging performance        |
| 4-6 | Moderate anti-fogging performance  |
| 7-9 | Very good anti-fogging performance |





## Food Wrap Film

By adding a suitable anti-fogging additive to food wrap film, condensed water droplets are spread into a thin continuous layer, maintaining the transparency of the packaging and the durability of the contents. This also improves the presentation of the food to look more appealing to customers. In general, food wrap applications require short term anti-fogging performance lasting only the lifetime of the packaged food.

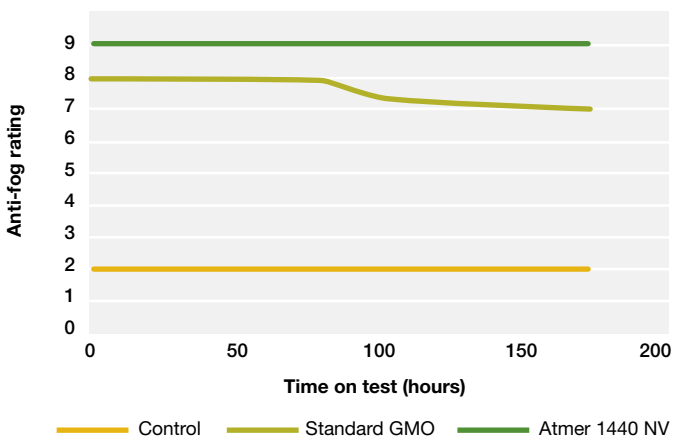
## Polyethylene Mono Layer Films

Atmer™ 1440 NV and Atmer™ 100 additives are preferred for polyethylene films at a use level of 0.5 – 1.0%.

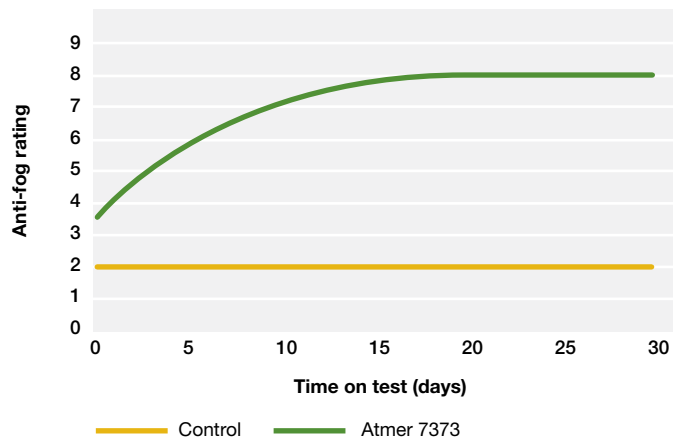
## Polypropylene

Atmer™ 7373 additive is recommended for polypropylene film at a use level of 2-5%.

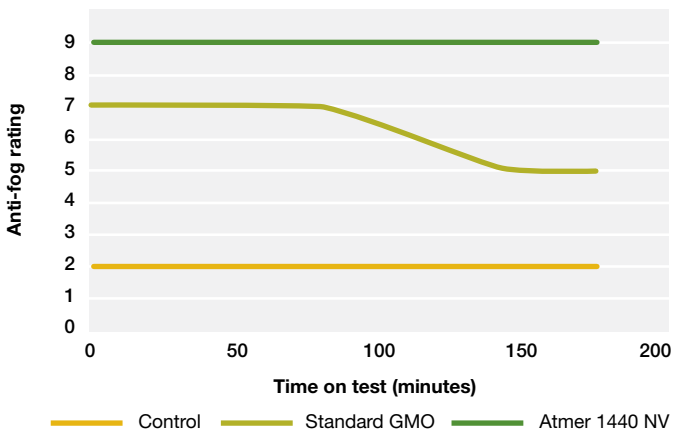
7. Comparative anti-fog performance of Atmer 1440 NV product - cold fog test LDPE film (50 µm) 1% additive



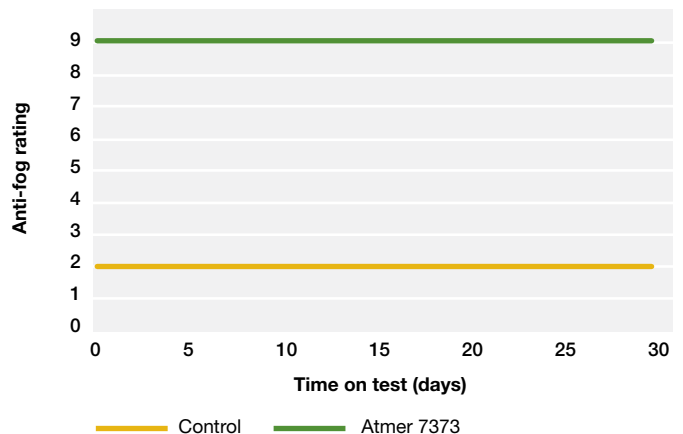
9. Comparative anti-fog performance of Atmer 7373 product - cold fog test PP homopolymer film (50 µm) 3.75% additive



8. Comparative anti-fog performance of Atmer 1440 NV product - hot fog test LDPE film (50 µm) 1% additive



10. Comparative anti-fog performance of Atmer 7373 product - hot fog test PP homopolymer film (50 µm) 3.75% additive



## Further Information

Cargill Bioindustrial sales and distribution are coordinated through an extensive worldwide network of technical and commercial experts. For further information or guidance please contact us:

[polymeradditives@cargill.com](mailto:polymeradditives@cargill.com)

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