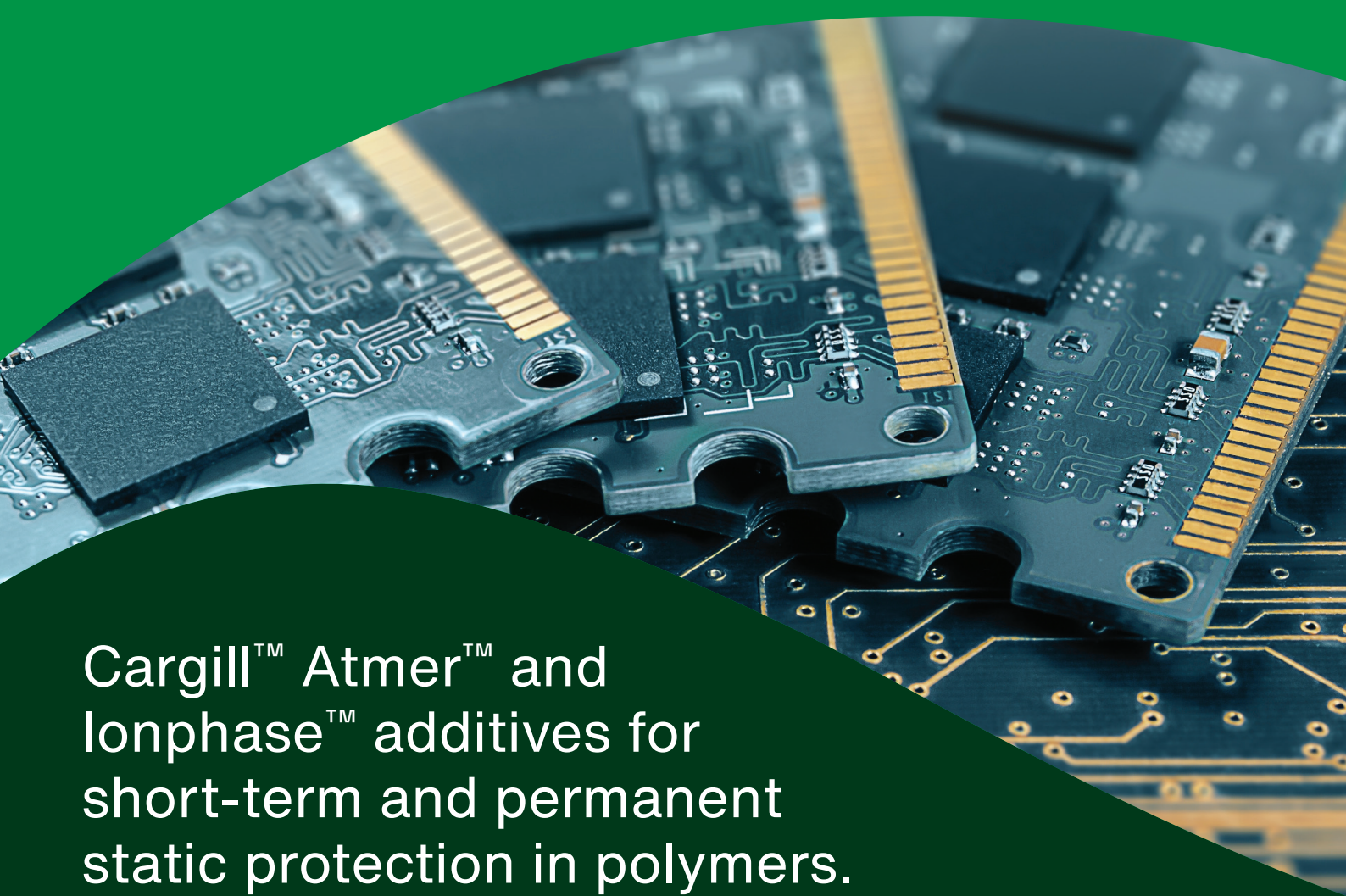




Static control additives



Cargill™ Atmer™ and
Ionphase™ additives for
short-term and permanent
static protection in polymers.

Minimize charge. Prevent dust. Protect electronics.

Smart solutions for static control challenges

A wide range of migrating and polymeric anti-static additives tailored to meet the demands for a variety of polymer applications.

Cargill's Polymer Additives business delivers a comprehensive portfolio of short-, medium-, and permanent anti-static additives designed to solve electrostatic challenges across a wide range of materials and applications.

Whether you're working with packaging, electronics, automotive components, or industrial materials, our Atmer™ (migrating) and Ionphase™ (permanent) additives offer tailored solutions to meet your performance, compliance, and longevity needs.

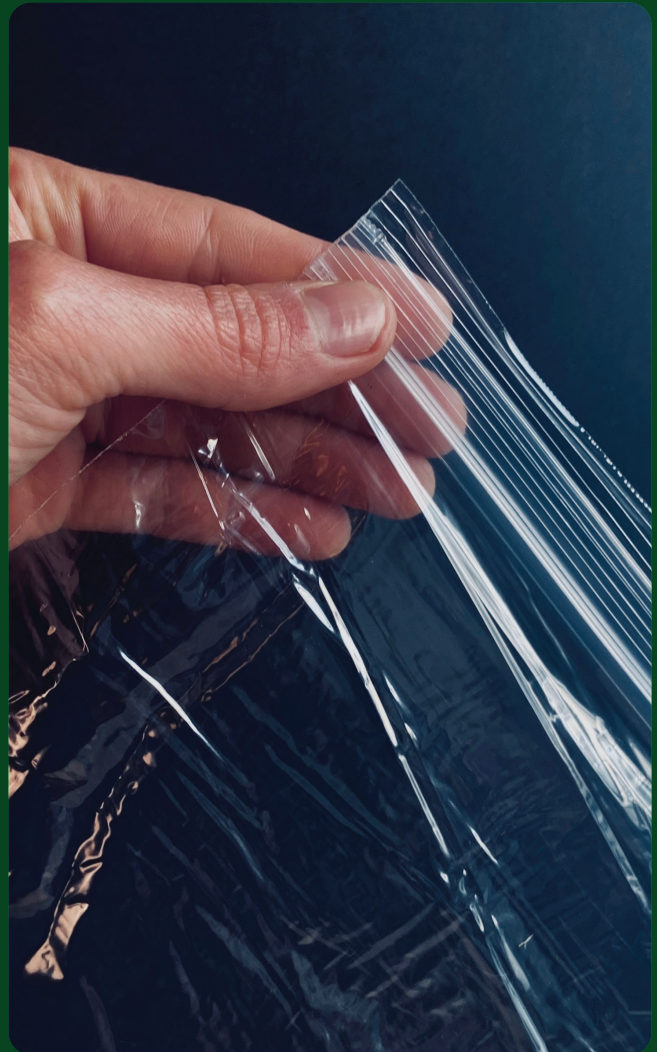
What are static control additives?

Static control additives are essential for allowing plastics to be the lightweight, high-performance material of choice while resisting the electrostatic challenges that can come along with the insulative nature of polymers.

Electrostatic charge, often simply called static, is generated when materials move against each other, leading to unwanted effects like dust attraction, product damage, or even safety hazards.

Cargill's static control additives work by lowering the resistivity of plastics, allowing charges to dissipate safely and effectively. This helps manufacturers reduce Electrostatic Discharge (ESD) risks, improve product cleanliness, and meet compliance standards.

We offer a range of anti-static technologies tailored to different performance needs - from short-term packaging solutions to permanent protection in electronics and industrial applications.





Why static control matters

Plastics are naturally insulative, making them prone to static buildup. This can lead to:

- **Dust attraction** that compromises product appearance and performance
- **Electrostatic discharge (ESD)** that damages sensitive electronics
- **Shocks, fires, or explosions** in hazardous environments
- **Handling and contamination issues** during manufacturing, packaging, and transport

Static control additives **reduce surface resistivity**, allowing charges to dissipate safely and effectively - protecting your products, processes, and people.

In industries where safety and compliance are non-negotiable, choosing the right additive is critical. Our experts can advise which products to use, how to optimize your formulation and how to test your end product's static performance to meet these guidelines.



Shocks & Explosions (EX)

Risk of electrostatic discharge that could ignite explosive atmospheres such as in automotive paint spraying or in factories handling powders such as flour.



Electrostatic Protected Area (EPA)

Required for the manufacture of electronic components to prevent damage from ESD.



Electrostatic Attraction (ESA)

ESA causes dust attraction to an object such as cosmetic or food packaging, household appliances or retail displays.

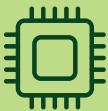
Why choose Cargill's static control additives?

Plastics are naturally prone to static buildup—but Cargill's static control additives are designed to solve that. Our solutions help manufacturers reduce risk, improve product quality, and meet safety standards across industries.



Minimize contamination and handling issues

Cargill's static control additives reduce static during transport, storage, and packaging.



Protect sensitive electronics

Prevents electrostatic discharge (ESD) with reliable, built-in static control.



Enhance workplace safety

Reduces the risk of shocks, fires, or explosions in EX-rated environments.



Improve product appearance and performance

Eliminates dust attraction on plastic surfaces.



Two technologies.

One goal: Reliable protection from static

From packaging to electronics, our static control additives are tailored to your needs. Choose from two proven technologies—each designed for specific applications and host polymers.

Atmer™ migrating static control additives

Short to medium-term performance

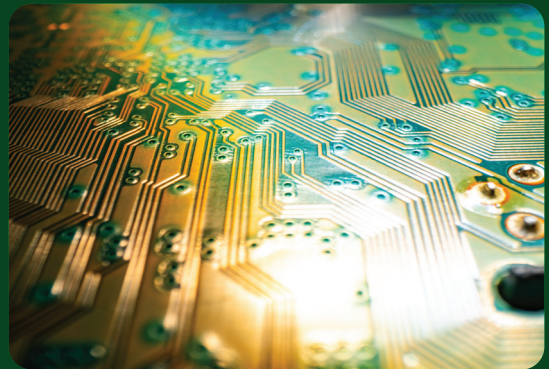
- Ideal for packaging and consumer goods
- Moisture-dependent migration to surface
- Easy to incorporate via masterbatch or extrusion



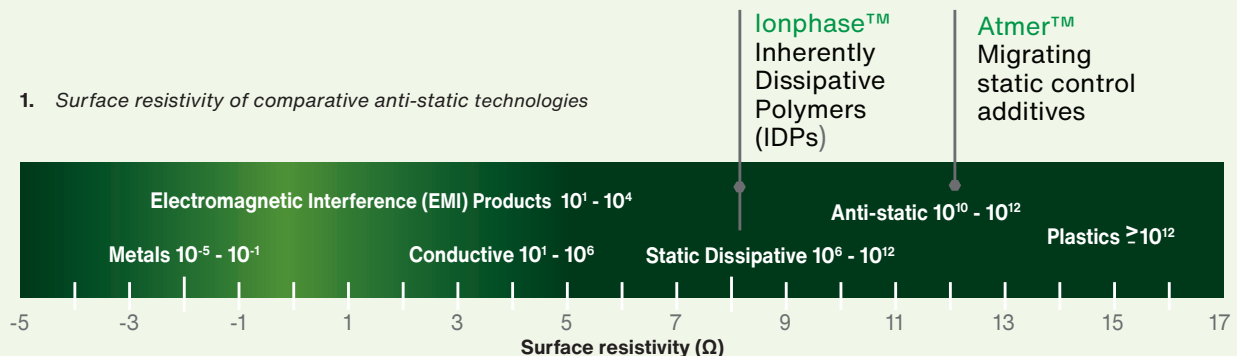
Ionphase™ permanent* static control additives

Long-lasting, humidity-independent performance

- Inherently dissipative polymers (IDPs)
- Internally incorporated for consistent resistivity



1. Surface resistivity of comparative anti-static technologies



* "Permanent" is a common description in the industry for the internally incorporated, non-migratory polymeric static control additives. It is used to emphasize the long-lasting permanence and durability of the polymeric static control additive, compared to the migrating type of additive, rather than the meaning of "permanent" literally. Non-migratory polymeric static control additives are based on inherently dissipative polymer technology. It provides electrostatic reduction throughout the product life cycle and therefore, it is usually classed as permanent in the industry. All references to "permanent" in this article are based on the above explanation.

Ionphase™ polymeric static control additives

Cargill™ Ionphase™ polymeric static control additives are a range of formatted engineered compounds of Inherently Dissipative Polymers (IDP), also known as permanent* anti-stats, which reduce the surface resistivity of polymers and provide safety and control for static related issues, without the need for added compatibilizers.

Key benefits

- Minimal change to host polymer properties, including color and transparency
- Good compatibility with host polymer
- Immediate and permanent effect
- Humidity independent
- Engineered additives give a uniform and homogenous distribution into host polymer
- Processability and surface quality
- Suitable for compounding, extrusion or injection molding
- Allows compliance with key industry standards for EPA and EX areas

How do polymeric static control additives work?

Polymeric static control additives are based on a high molecular weight polymer that is incorporated into the host polymer directly to provide a co-continuous ion network. Ions acting as charge carriers within the additive neutralize charge imbalance and therefore decay the static field. This can be measured as lowered resistivity of the material.

Polymeric static control additives are considered non-migrating and do not move out of the polymer. They therefore provide a permanent effect during the lifetime of the product. They are also humidity independent, and do not rely on atmospheric moisture to provide an effect.



Choosing the right Ionphase additive grade and addition level

Selecting the optimal Ionphase™ grade and dosage level is key to achieving the right balance of performance, safety and compliance. Our experts help guide you through the process based on several key factors, including:

- The end conversion method and final application
- The host polymer used
- The electrostatic performance target

Formulated for safety

The electrostatic performance target is related to the end application and safety requirements of the polymer. Certain applications require specific surface resistivity.

The level of resistivity can be controlled by varying the addition level as indicated in figure 2.



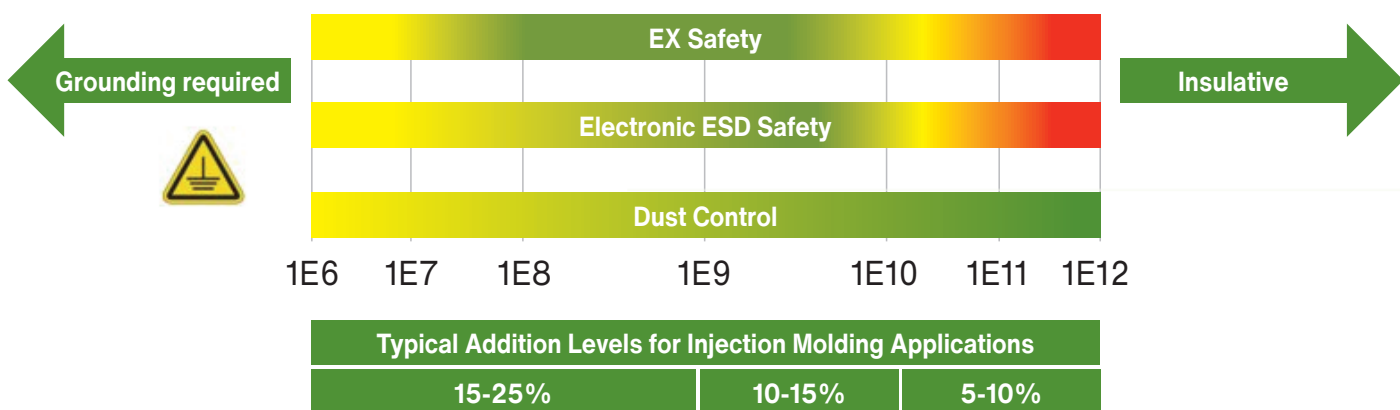
Where EX safety is a priority
1E8 Ω-1E9 Ω



Where ESD protection is required
1E9 Ω-1E10 Ω



Where optimum dust control is wanted
1E10 Ω-1E12 Ω



2. Surface resistivity requirements for various permanent anti-static additive applications with corresponding typical addition levels

Polymeric static control additives

Your polymer	Processing		Our recommendation	Physical form at 25 °C	Comments
	Extrusion	Compounding & injection molding			
Polyolefins	✓		lonphase™ PE0108M	Pellets	Suitable for blown film liners and other extrusion applications. Product has food contact compliancy according to EU 10/2011 regulation.
Polyolefins	✓		lonphase™ fSTAT series	Pellets	For use in general extrusion applications such as films, bags, liners and thermoformable sheets.
HDPE	✓		lonphase™ rSTAT series	Pellets	Designed for extrusion blow molding applications (IBCs, drums, canisters).
HDPE, PS, PA12		✓	lonphase™ U3	Pellets	Suitable for injection molding applications (ATEX, EPA, dust prevention).
PP		✓	lonphase™ U5	Pellets	Designed for use in colorable, translucent, and filled PP injection molding applications. Examples of end applications are PP electronics packaging, household appliances and automotive parts
ABS, PP	✓	✓	lonphase™ abSTAT	Pellets	Suitable for thermoformed trays used in electronics industry and for various injection molding applications (ATEX, EPA, dust prevention).
Styrenics (HIPS, GPPS)	✓		lonphase™ eSTAT series	Pellets	Suitable for thermoformed trays used in electronics industry.
Styrenics (PS, HIPS, ABS), POM	✓	✓	lonphase™ U2	Pellets	Recommended for thick POM sheets/profiles and various styrenics applications.
mPPO, PPS, PBT, PC		✓	lonphase™ hSTAT series	Pellets	Recommended for engineering plastics requiring high processing temperatures.
PC blends (PC/ASA, PC/ABS), PMMA, TPU, SEBS	✓	✓	lonphase™ U1	Pellets	Suitable for various injection molding and extrusion applications such as dust prevention in automotive interior parts and consumer appliances.
PMMA, PLA, PVC	✓	✓	lonphase™ trSTAT	Pellets	For use in transparent PMMA applications and for low processing temperature polymers.

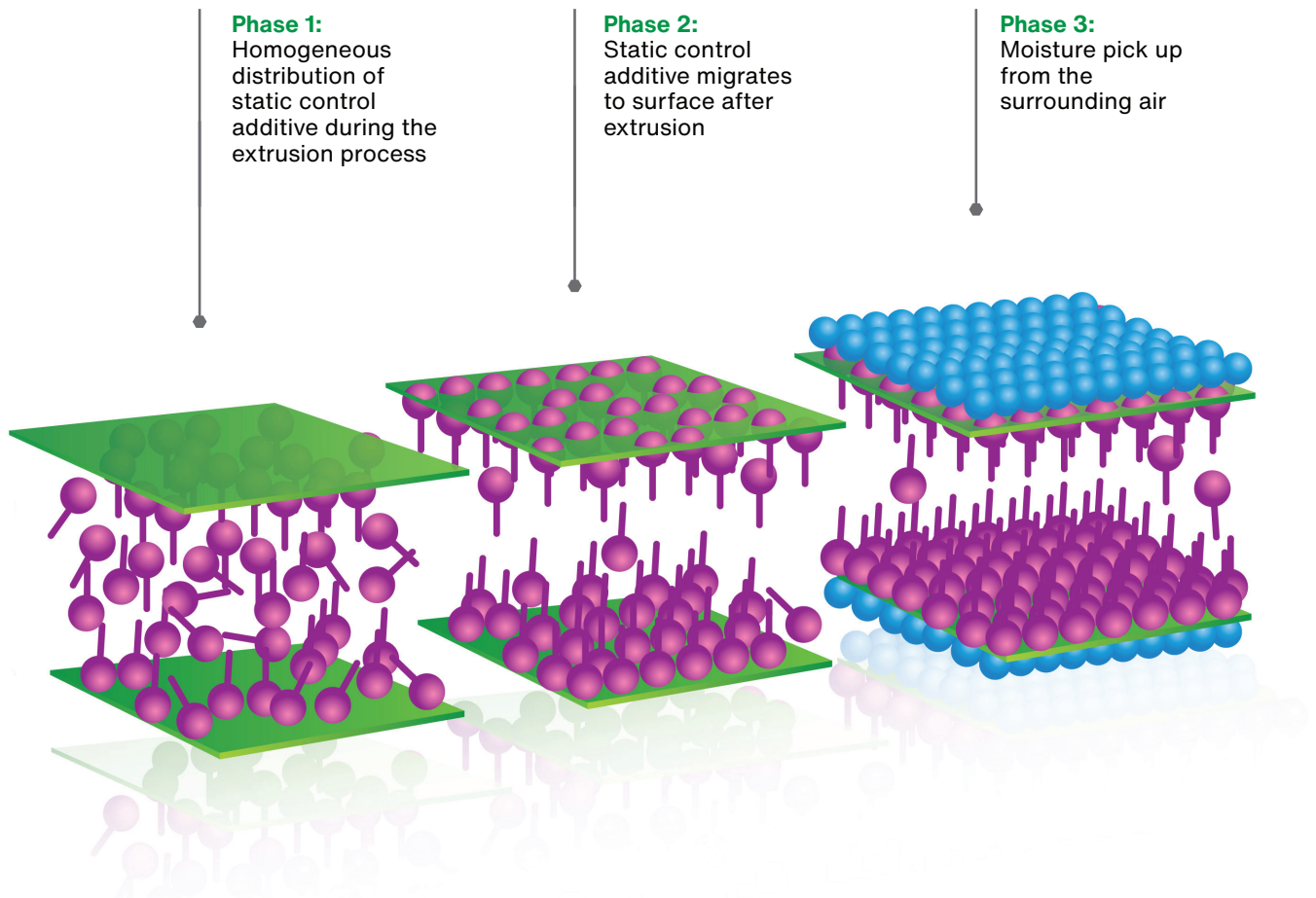
Atmer™ migrating static control additives

The Cargill™ Atmer™ range of migrating static control additives minimize electrostatic charge buildup in a range of polymers, offering short-term and medium-term performance longevity. These additives are useful for a variety of applications, mostly to reduce dust pick up in plastic packaging, and can be added to polymers as a masterbatch, during compounding or directly during extrusion. The Atmer range of additives are also available as highly loaded concentrates that are easier to dose and have a similar melting point.

Some Atmer products are compliant with various food contact regulations, contact us for specific food contact statements.

How do migrating static control additives work?

Atmer™ additives work by migrating through the polymer matrix towards the surface as it cools. At the surface they pick up moisture from the atmosphere, providing a pathway along which charge can pass to earth. The plastic material therefore becomes electrically neutral.



Migrating static control additives

Your polymer	Our recommendation	Description	Physical form at 25 °C	Origin	Comments
100% Active					
HDPE	Atmer™ 122	Glycerol ester	Microbead	Vegetable	Suitable where short term static control/ lubrication balance is required.
	Atmer™ 1012	Glycerol ester	Pastille	Non-vegetable	
	Atmer™ 129 NV	Glycerol ester	Microbead	Non-vegetable	Suitable where short term static control is required.
	Atmer™ 129	Glycerol ester	Microbead	Vegetable	
	Atmer™ 1013 NV	Glycerol ester	Pastille	Non-vegetable	
	Atmer™ 1013	Glycerol ester	Pastille	Vegetable	Suitable for use in polyolefins and styrenics
	Atmer™ 262	Ethoxylated amine	Liquid	Vegetable	
HIPS, ABS, non-transparent rigid PVC	Atmer™ 190	Alkyl sulfonate	Pastille	Synthetic	Only suitable for non-transparent applications.
Concentrates					
Polyolefins	Atmer™ 7001	50% concentrate in polypropylene	Pellets	Vegetable	Fast acting, long-lasting static control
	Atmer™ 7002	50% concentrate in polypropylene	Pellets	Vegetable	Offers static control and other mold release benefits. Recommended for use in PP closures
	Atmer™ 7103	50% concentrate in polyethylene	Pellets	Vegetable	A mixture of static control additives to provide a synergistic effect
	Atmer™ 7105	50% concentrate in polyethylene	Pellets	Vegetable	Fast acting, long-lasting static control
	Atmer™ 7300	50% concentrate in polyethylene	Pellets	Non-vegetable	Particularly recommended for use with expanded polyethylene as a process aid. Also offers additional mold release benefits, as well as well as being an effective anti-static additive with food contact compliance according to EU 10/2011 and FDA*
	Atmer™ 7306	40% concentrate in polyethylene	Pellets	Vegetable	Offers additional mold release benefits, as well as well as being an effective anti-static additive with food contact compliance according to EU 10/2011 and FDA*
	Atmer™ 7325	30% concentrate in universal polyolefin carrier	Pellets	Non-vegetable	Mixture of additives to provide a synergistic anti-static effect

*Contact us for food contact statement.





Scan QR code
for more information

Learn more at cargill.com/static
or email polymeradditives@cargill.com

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