

Reasons to buy

- Excellent anti-static performance
- Concentrates for easier dispersion
- Application know-how

Atmer™ Anti-static

Reduce static charge & minimise dust pick up



CRODA
Polymer Additives

Innovation you can build on™

Atmer™ Anti-static

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Croda Polymer Additives is well known for their migratory additives that provide a range of benefits which include slip, anti-fog and anti-static. Croda's long history of surfactant manufacture means it is well placed to choose the best performing chemistries for applications as varied as industrial moldings and retail packaging.

The Atmer range of anti-static additives is no exception with many different technologies and physical forms being offered to provide the required static reduction for different processes.

Croda's additives can be used both internally and externally to reduce static charge, either as short term or long term anti-static additives.



Go to Croda Direct to see the full video at www.crodapolymeradditives.com

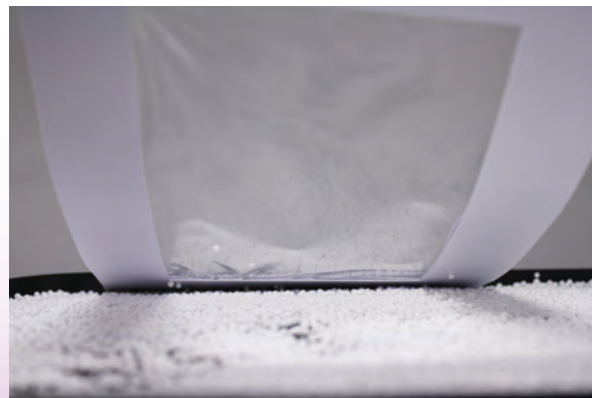
Importance of Anti-static Additives

A simple experiment inducing static charge on two films clearly shows one of the problems caused by electrostatic build up during manufacture and processing of plastics.



Polyethylene film without anti-static additive

Polystyrene balls are attracted to the underside of the charged surface. Dust pick up affects both the appearance and performance of end products and packaging.



Polyethylene film with inclusion of Atmer 129/262

Static charge is dissipated by the anti-static agent so the polystyrene balls are not attracted to the film.



Product range

Trade name	Description	Physical form at 25 °C	Raw material origin	Primary effect	Recommended uses
Anti-static					
Atmer 122	Glycerol ester	Microbead	Vegetable	Anti-static	Polyolefins and flexible PVC Lubrication/anti-stat balance
Atmer 125*	Glycerol ester	Microbead	Vegetable	Anti-static	LDPE and flexible PVC Lubrication/anti-stat balance
Atmer 129 NV	Glycerol ester	Microbead	Non-vegetable	Anti-static	Polyolefins and flexible PVC
Atmer 129	Glycerol ester	Microbead	Vegetable	Anti-static	Polyolefins and flexible PVC
Atmer 1012	Glycerol ester	Pastille	Non-vegetable	Anti-static	Polyolefins and flexible PVC Lubrication/anti-stat balance
Atmer 1013 NV	Glycerol ester	Pastille	Non-vegetable	Anti-static	Polyolefins and flexible PVC
Atmer 1013	Glycerol ester	Pastille	Vegetable	Anti-static	Polyolefins
Atmer 110	Ethoxylated sorbitan ester	Liquid	Vegetable/Synthetic	Anti-static (External)	All polymers, particularly PET
Atmer 116	Ethoxylated sorbitan ester	Liquid	Vegetable/Synthetic	Anti-static (External)	All polymers, particularly PET
Atmer 154	Alkoxyated fatty acid ester	Liquid	Vegetable/Synthetic	Anti-static	Flexible PVC
Atmer 262	Ethoxylated amine	Liquid	Vegetable	Anti-static	Polyolefins and styrenics
Atmer 190	Alkyl sulphonate	Pastille	Synthetic	Anti-static	HIPS, ABS, non-transparent rigid PVC

Concentrates					
Atmer 7001	50% concentrate in polypropylene	Pellet	Vegetable	Anti-static	Fast acting, long-lasting anti-static effect
Atmer 7002	50% concentrate in polypropylene	Pellet	Vegetable	Anti-static, Mold release	Recommended for PP closures for anti-static and other mold release benefits
Atmer 7103	50% concentrate in polyethylene	Pellet	Vegetable	Anti-static	Mixture of additives to provide a synergistic anti-static effect
Atmer 7105	50% concentrate in polyethylene	Pellet	Vegetable	Anti-static	Fast acting, long-lasting anti-static effect
Atmer 7300	50% concentrate in polyethylene	Pellet	Non-vegetable	Processing aid, Anti-static	Additional mold release benefits as well as effective anti-static agent with wide food approvals
Atmer 7306	40% concentrate in polypropylene	Pellet	Vegetable	Anti-static	Additional mold release benefits as well as effective anti-static agent with wide food approvals
Atmer 7325	30% concentrate in universal polyolefin carrier	Pellet	Non-vegetable	Anti-static	Mixture of additives to provide a synergistic anti-static effect

*Only available for supply in Asia

Product Physical Forms

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



Static Electricity in Plastics

Most plastic materials are electrical insulators and have the ability to support high static charge build up. This can be a particular problem for films which have large surface area to volume ratios.

Static electricity is produced by charge separation caused by the movement of one material over another. Static build up can result in issues including:

- Increased handling problems during transport, storage and packaging
- Dust attraction affecting both appearance and performance of plastic products
- Risk of electrical shock to employees working with the plastics and consumers that use them
- Risk of electrical discharge causing fire or explosion

Atmer Anti-static Agents

Choosing an anti-static system can depend on a number of different considerations that should be reviewed when selecting an Atmer additive.

Internal or External Additive

The Atmer range has both internal and external additives. Internal additives are incorporated directly into plastic materials during compounding and give a long-lasting benefit. External additives are dissolved in an appropriate solvent and are then applied by spraying a wet coating onto the surface, or by dipping, depending upon the product and manufacturing process.

Migrating Additives

Phase 1:

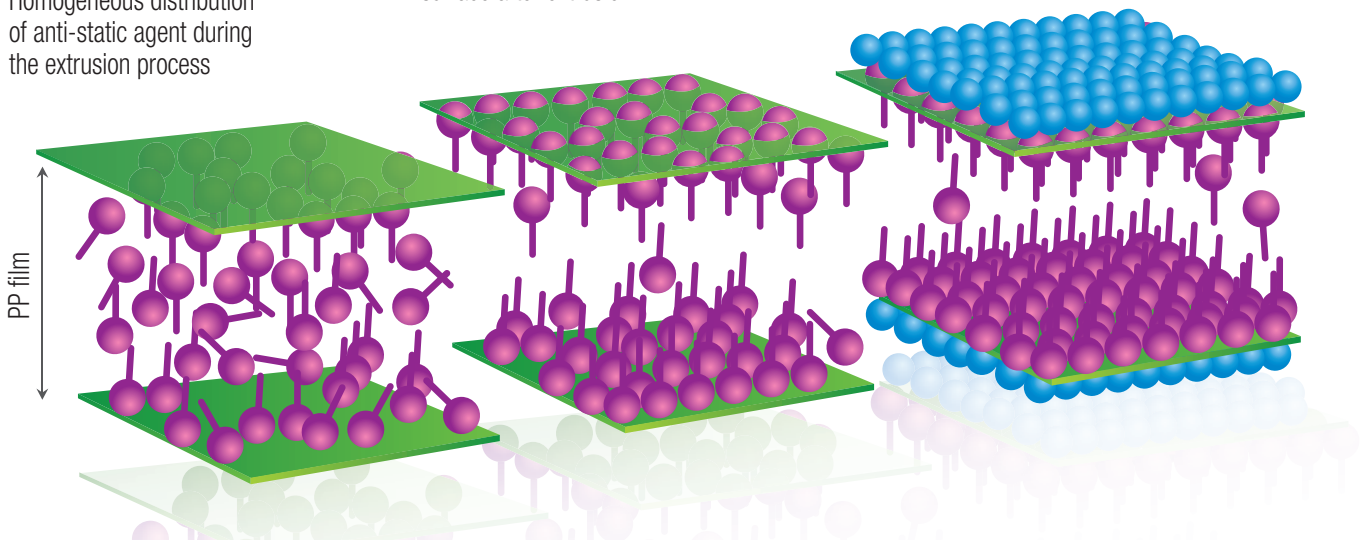
Homogeneous distribution of anti-static agent during the extrusion process

Phase 2:

Anti-static agent migrates to surface after extrusion

Phase 3:

Moisture pick up from the surrounding air



Longevity of Action

Depending on the end application, Croda can offer anti-static additives that give short term or longer term benefits. Short term anti-static benefits are useful when static resistance in processing and handling immediately after extrusion is required. Long term anti-static benefits are beneficial for applications where protection against static build up in end use or in storage are required.

Croda can also provide synergistic blends that give both short term and long term static resistance.

Applications

Polyolefins

Atmer 129 and Atmer 1013 are effective in all polyolefins, generating a fast build up of anti-static performance. Additionally, they improve demolding and have a synergistic effect with ethoxylated amines.

The use of Atmer 262 in combination with Atmer 129, produces an additive blend that offers a better anti-static effect than when used in isolation. The blend works by Atmer 129 migrating to the surface rapidly, which causes an increased migration rate of Atmer 262.

Application	Atmer 129/262 blend usage level
Film < 50 micron	0.15 - 0.25%
Film > 50 micron	0.25 - 0.5%
Molding	0.5 - 1.0%

Case Study



Atmer 7325 Delivers Dust-Free Retail Packaging

A producer of injection molded polypropylene screw top jars was experiencing problems with dust pick-up on personal care packaging. This seriously compromised the high quality appearance of the glossy white retail package. The dust pick-up was occurring in warehousing, where the packages were being stored for a number of months before being placed upon supermarket shelves. Dust pick-up continued to occur on shelf over the average three month shelf-life of the product.

Croda recommended using Atmer 7325, an optimised and easy to dose synergistic blend of short and long term anti-statics. The addition of Atmer 7325 enabled the producer to minimise dust pick-up while in warehousing and then on the shop floor; improving overall product appearance.

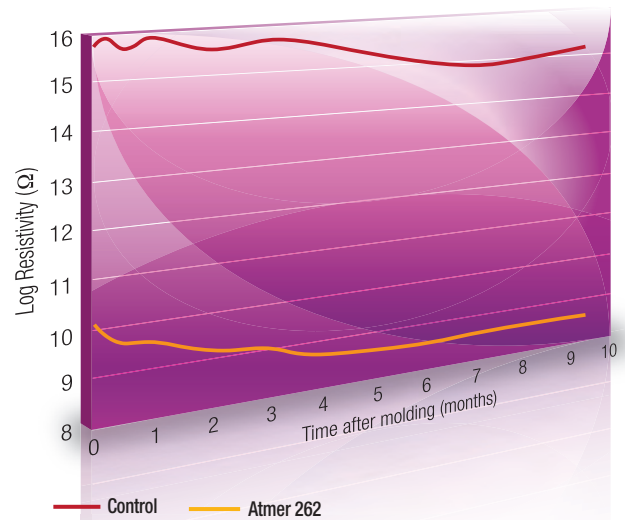


Figure 1: Long term effect of Atmer 262 in LDPE molded plaques (0.5% addition)

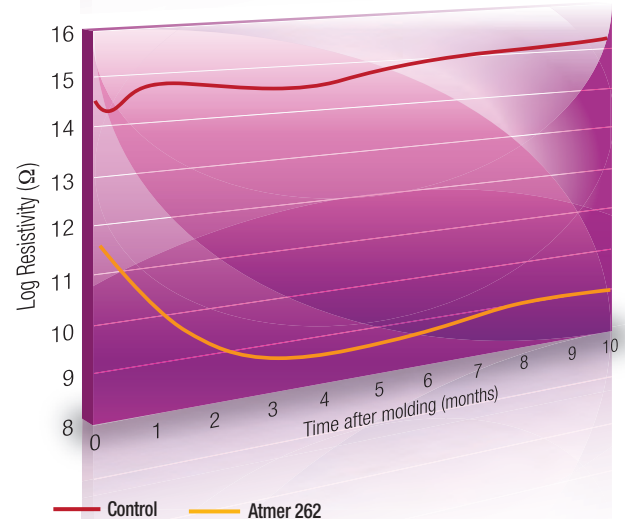


Figure 2: Long term effect of Atmer 262 in PP molded plaques (0.5% addition)

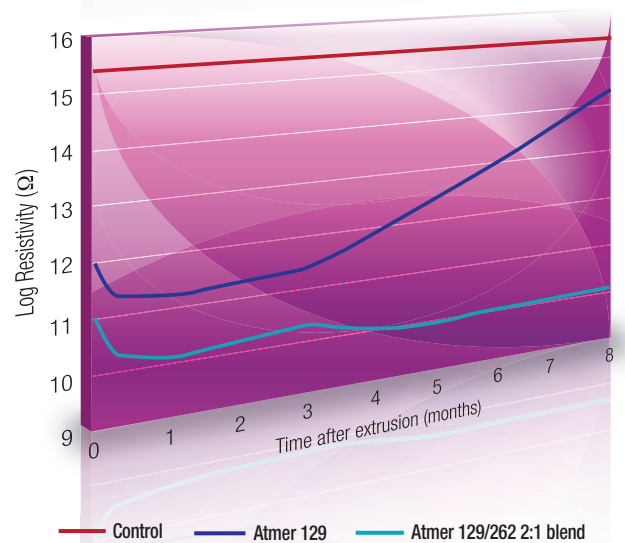


Figure 3: Long term effect of anti-static additives in PP copolymer film (50 μm, 0.2% additive)

Styrenics

Atmer 262 is effective when used as an anti-static additive in styrenics. It is recommended for use in transparent applications giving relatively long-lasting anti-static benefits. It shows excellent heat stability and improved colour compared to other amines.

Atmer 190 also shows long term anti-static properties in styrenics. It demonstrates excellent heat stability and is suitable for processing at higher temperatures or where broad food contact approval is needed. Atmer 190 is not recommended for transparent applications.

Polymer	Product & usage level
Clear PS	Atmer 262, 1-2%
SAN	Atmer 262, 1-3%
HIPS	Atmer 190, 2-3%
ABS	Atmer 190, 2-4%

PVC

Atmer 129, Atmer 154 and Atmer 190 are all recommended for use in PVC giving long-lasting anti-static effects. Atmer 190 is not recommended for use in transparent applications.

Fabrication process	Product & usage level
Flexible PVC	Atmer 129, 0.5-1 phr Atmer 154, 1 phr
Rigid PVC	Atmer 129, 4 phr Atmer 190, 1 phr

phr = parts per hundred resin

Questions?

To find out more about Croda products and optimising anti-static performance please contact your nearest regional office or visit www.crodapolymeradditives.com

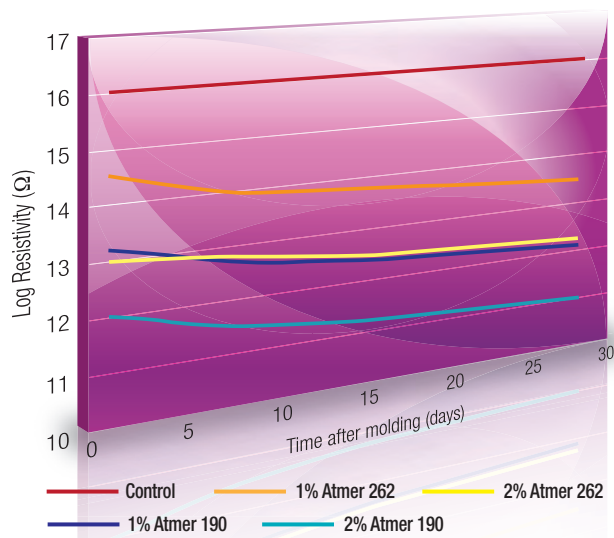


Figure 4: Anti-static effect of Atmer 262 & 190 in High Impact Polystyrene (HIPS) at 1% and 2% additive

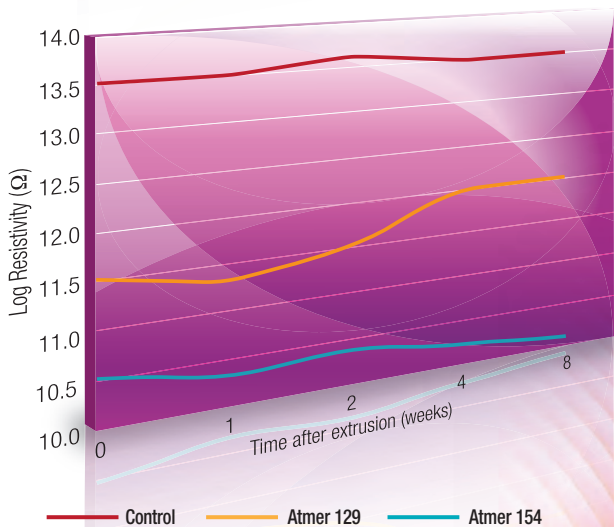


Figure 5: Anti-static effect of Atmer 129 and Atmer 154 in flexible PVC at 3 phr

Potential Problems with Anti-static Charge Minimisation

Humidity: Irrespective of additives used, humidity has an impact on anti-static performance. At low humidity (<30% RH), the anti-static performance will start to deteriorate rapidly as there is not enough water in the atmosphere to easily form a conductive film with the anti-static on the surface.

Presence of other additives: Performance of anti-static additives can be affected by both inorganic fillers and pigments which may adsorb the additive onto their surface, restricting migration of additive to the surface. Other migratory additives such as slip and anti-fog may also compete at the surface and reduce the anti-static effect. It is important to trial the additive system in a formulation representative of the final application, as addition levels may need to be adjusted to give the correct balance of properties in the end product or application.

Other process variables which may affect anti-static performance are corona treatment, high winding tension and laminated film layers. All of these variables can impact the migration properties of additives reducing the capability of the additive to perform.



Further Information

Croda sales and distribution are coordinated through an extensive worldwide network of associates and agents. For details of your local representative please contact your nearest Croda regional office.

Visit our global website at www.crodapolymeradditives.com

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