

FERRO-PLAST s.r.l.

Atmer™ anti-static

for easier processing & minimal dust pick up



CRODA
Polymer Additives

At the heart of better plastics

Easier processing & minimal dust pick up

Static electricity in plastics

Plastic materials are good insulators and as such can support the build-up of high static charges. Static electricity is produced by charge separation caused by the movement of one material over another eg. by the passage of film over rollers, by high velocity cooling air passing over surfaces, or by incidental contact between plastic parts during transport or storage. The build-up of static charges can result in the following processing difficulties:

- Increased handling problems during transport, storage and packing
- Dust contamination, affecting both appearance and performance of end-products
- Risk of electrical shocks to employees working at the machines
- Risk of electrical discharge causing fire or explosion

Atmer™ anti-static agents for thermoplastic polymers

Croda Polymer Additives produces a range of anti-static agents that are incorporated into the polymer during the extrusion process. They migrate to the surface and interact with atmospheric moisture reducing surface resistivity and hence dissipating high electric charge densities, to give a long-lasting anti-static effect to the plastic part.

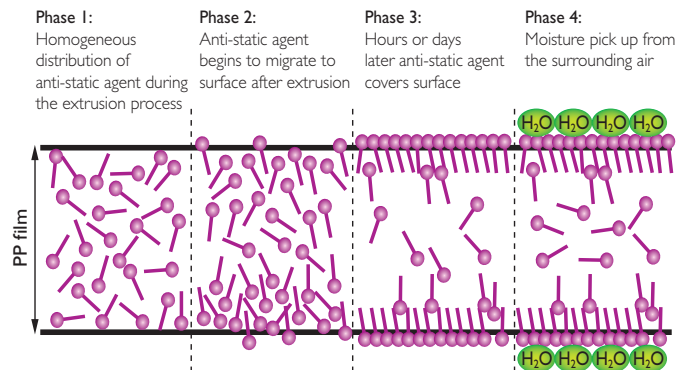


Figure 1: How Atmer anti-static agents work

Product range

The Atmer range includes 'internal' and 'external' additives. Internal additives are incorporated directly into the plastic material during compounding, giving a long-lasting effect. External additives are dissolved in an appropriate solvent, such as water or alcohol (typically between 2% and 5%) and are applied by spraying, wet coating or dipping depending upon the product and the manufacturing process giving an immediate but temporary effect.

Product	Description	Physical form at 25°C	Recommended uses
Atmer 110	Ethoxylated sorbitan ester	Liquid (E)	All polymers
Atmer 122	Glycerol ester	Microbead (I)	Polyolefins and flexible PVC. Provides a balance between anti-static effect and lubrication effect
Atmer 129	Glycerol ester	Microbead (I)	Polyolefins and flexible PVC. Synergistic effect with Atmer 163
Atmer 129V	Vegetable glycerol ester	Microbead (I)	Polyolefins and flexible PVC. Synergistic effect with Atmer 163
Atmer 154	Alkoxyated fatty acid ester	Liquid (I)	Flexible PVC
Atmer 163	Synthetic ethoxylated amine	Liquid (E/I)	Polyolefins and styrenics. Synergistic effect with Atmer 129
Atmer 190	Alkyl sulphonate	Pastille (E/I)	HIPS, ABS, non-transparent rigid PVC
Atmer 191	Alkyl sulphonate	Powder (E/I)	HIPS, ABS, non-transparent rigid PVC
Atmer 1012	Glycerol ester	Pastille (I)	Polyolefins and flexible PVC. Provides a balance between anti-static effect and lubrication effect
Atmer 1013	Glycerol ester	Pastille (I)	Polyolefins and flexible PVC
Atmer 1013V	Vegetable glycerol ester	Pastille (I)	Polyolefins and flexible PVC

E = external, I = internal

Atmer 7000 Series

In addition to the pure products detailed previously, Atmer anti-static agents can also be provided as concentrates in a range of polymers marketed as the Atmer 7000 series (see Atmer Additive Concentrates brochure).

Applications

Polyolefins

Atmer 129 and 1013 are effective in all polyolefins, generating a fast build up of anti-static performance. They improve de-molding and have a synergistic effect with ethoxylated amines. The addition of a blend of Atmer 129 and 163 gives a better anti-static effect than either used in isolation. Atmer 129 migrates to the surface rapidly and causes a vastly increased migration of Atmer 163.

Application	Atmer 129/163 (2:1) Usage level
Film < 50 micron	0.15 - 0.25%
Film > 50 micron	0.25 - 0.5%
Molding	0.5 - 1.0%

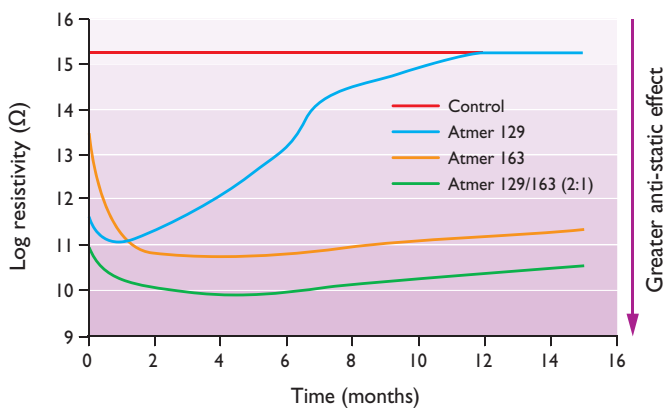


Figure 2: Long-term anti-static effect of Atmer 129 & 163 in LDPE film (50µm) 0.2% additive

Styrenics

Atmer 163 is an effective anti-static agent in styrenics. It is recommended for use in transparent applications giving a relatively long-lasting anti-static effect. It shows excellent heat stability and improved colour compared to other amines. It also shows a synergistic effect with Atmer 129 or 1013.

Atmer 190 and 191 also show long term anti-static effect in styrenics. They demonstrate excellent heat stability and are suitable for high temperature processing, and additionally have broad food contact approvals. They are not recommended for transparent applications.

Polymer	Product & usage level
Clear PS	Atmer 163, 1-2%
SAN	Atmer 163, 1-3%
HIPS	Atmer 190/191, 2-3%
ABS	Atmer 190/191, 2-4%

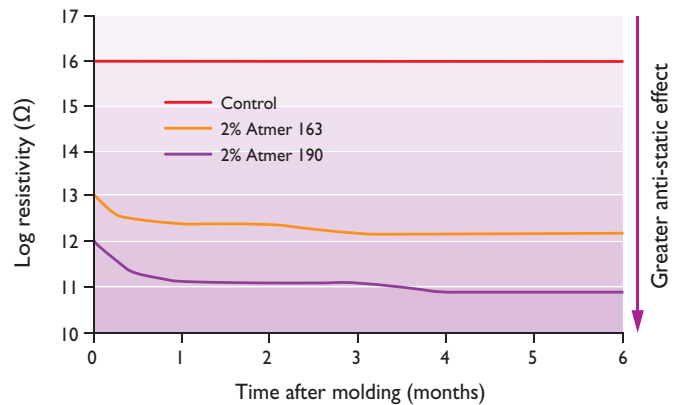


Figure 3: Long-term anti-static effect of Atmer 163 & 190 in ABS moldings 2% additive

PVC

Atmer 129, 154 and 190/191 are all recommended for use in PVC giving a long lasting anti-static effect. Atmer 190 and 191 are not recommended for transparent applications.

Fabrication process	Product & usage level
Flexible PVC	Atmer 129, 0.5-1phr Atmer 154, 1phr
Rigid PVC	Atmer 129, 4phr Atmer 190/191, 1phr

phr = parts per hundred resin

Technical partnership

Extensive technical assistance is offered to our customers, supported by our purpose-built plastics applications laboratory at our manufacturing site in the UK. With over 30 years' experience of additives for the plastics industry, our technical service team can offer you advice on selecting the most effective additive and dosage for your plastics application.

Quality standard

Atmer sets the performance standard for anti-static agents in polyolefins and styrenics. Croda can offer various grades of anti-static agents that have been optimised for the demands of individual application areas. The Atmer range is subject to stringent quality control procedures during and after manufacture; SQC data on key variables can be provided on request.



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.croda.com/europe/pa

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