

OnCap™ Antiblock Additives

Challenge

Many polymers will tend to cohere to themselves when subjected to intimate inter-surface contact. This can cause major problems in the processing of these polymers, such as during winding or unwinding of film rolls or separating and destacking of sheet or formed parts. This phenomenon is partly caused by the shrinkage of polymers as they cool down to room temperature, creating a vacuum between the contact layers that makes the surfaces difficult to separate.

Consequently, a large wound roll of polymer film can be transformed into a one large lump of polymer that is difficult to unwind without severely tearing or damaging the film. Similarly, a stack of sheet or formed parts will be very difficult to separate or destack, usually causing damage to the parts as they are separated and ultimately resulting in costly rejects and customer dissatisfaction.

This same tacky nature of polymers can cause the polymer to stick to the surfaces of processing equipment such as dies and take-away rolls. Polymer residue accumulation and colorant plate-out on tools can hinder production efficiencies and leave drag lines on finished parts.

Solution

The use of antiblock additives has been shown to be an effective means of reducing inter-surface cohesions from occurring. These additives work by creating a subtle roughness and spacing between the polymer contact surfaces. The rough surface reduces the cohesive properties of the polymer with itself, and helps open a small gap between the surfaces that allows air to flow in and prevent the formation of a vacuum. The propensity for the polymer to stick to processing equipment is also reduced.

The materials used to achieve these antiblocking or destacking properties are usually very fine, solid particulates in nature. Examples include inorganic materials such as talc and silica. Precise formulation design is critical to control the balance of desired effects and avoid possible negative side effects such as diminished optical properties (haze and transmission).

Value

The use of an appropriate antiblock additive is crucial to successful and trouble-free film and sheet processing. Manufacturing efficiencies are increased and operating costs lowered as sheet and film handling improves, and downtime to clean polymer and colorant accumulation on processing equipment is reduced. The overall sales potential of finished parts is enhanced and customer satisfaction rises as consumers are easily able to separate aesthetically pleasing parts and open bags.



Implementation

OnCap™ antiblock additives are available in concentrated pellet form in carrier systems that are compatible with most application resins. These additive concentrates are normally designed to be added at 1% to 3% addition rates. They are easy to use and can be fed with standard feeding equipment at the extruder or blended with the base polymer and conveyed to the feed equipment. Antiblocks can be combined with colorants into a single OnColor™ Smartbatch™ concentrate. The efficacy of antiblock additives may be determined in accordance with ASTM D1893 and D3354.

Applications

Antiblock additive concentrates may be used in any process where polymer film, sheet or thermoformed parts are wound or stacked, including sheet extrusion and cast or blown film. They are commonly used in flexible and rigid packaging and consumer applications.

PolyOne offers a one-stop source of color concentrates, additive concentrates, color and additive systems, and associated technology and support services. Our expertise extends across a wide variety of industrial and consumer markets. We have more than 20 manufacturing locations in North America, Europe and Asia, with color labs, design centers and sales offices located around the world.

Please contact your nearest sales office for assistance in choosing the right solution for your needs.

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