Incroslip™

When stability and performance matter most

Reasons to buy

- Minimal impact on taste and odour
- Improved oxidative stability
- Improved long-term properties in molded parts

CRODA
Polymer Additives

At the heart of better plastics

Incroslip™

When stability and performance matter most

The use of slip & anti-block additives in plastics is a practical requirement to bring easier processing & handling. However, performance needs in complex and consumer sensitive applications increasingly demand more from an additive.

With over 30 years' experience in production, applications and research into additives for plastics, Croda has developed the Incroslip range of speciality additives specifically for challenging applications.

The Incroslip range not only offers processor and end-user flexibility, performance and better quality plastics as expected, they also provide exceptional stability with reduced odour and colour degradation.

Key benefits

- High slip performance with improved stability
- High temperature performance
- Low taste, low odour

Case study

Incroslip Q

Eliminating potential taint and taste issues that occur in drinks bottles is a high priority for consumer focused brand owners. This is true of a manufacturer of bottled water who approached Croda Polymer Additives to reduce poor organoleptic properties that were present due to using a standard fatty amide torque release agent for the bottle cap.

The manufacturer was using an ozone sterilisation process so Croda suggested using Incroslip Q, a tailored solution that can minimise taint and taste issues while providing the level of torque release force required to remove caps.

Incroslip Q helped the manufacturer to balance good organoleptic properties through the ozone sterilisation process and good cap closure properties to ensure a well-received consumer product.

Product selection

The Incroslip range has been optimised to provide different combinations of slip and oxidative stability to suit different application requirements.

Product	Physical form	Primary effect	Application	Comments
Incroslip™ B	Bead	Torque release	Caps & closures	For use when ultimate stability is required, particularly in the ozonation bottle sterilisation processes
Incroslip C	Powder / Bead	Torque release	Caps & closures	For use when high slip is required in general use applications with good organoleptic properties
Incroslip G	Bead	Friction reduction	Automotive or un-stabilised plastics	For use when high slip, improved temperature and light stability are required
Incroslip Q	Bead	Torque release	Caps & closures	For use when both slip and stability are required

Applications

Torque release

Slip additives allow screw caps and closures to be tightly applied to bottles while still allowing easy removal in end use. This is vital for beverages containing pressurised carbonated drinks and syrup like liquids. The Incroslip range also can aid in the molding and release of caps in injection and compression molding processes.

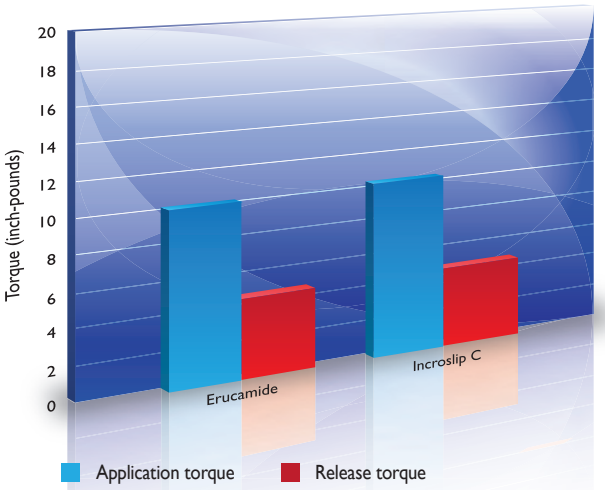

Figure 1: Torque release - Injection molded HDPE, one piece closure against PET neck

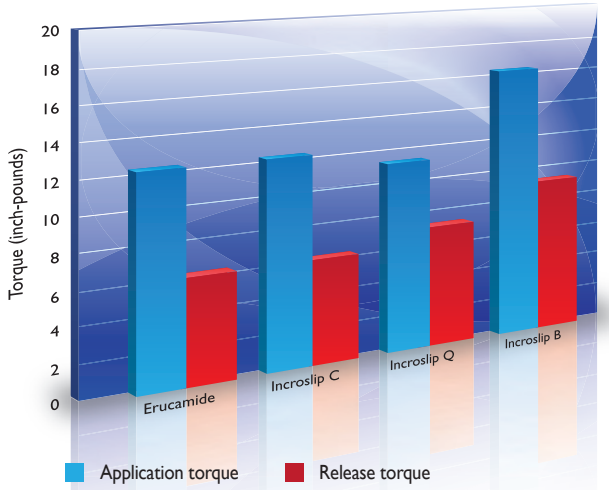

Figure 2: Torque release - Injection molded PP, one piece closure against PET neck

Oxidative stability and organoleptic properties

Standard torque release additives can suffer from some taint, taste and odour issues. This impacts sensitive applications like bottled water where taste and odour cannot be affected. Extensive odour testing of the Incroslip range has shown significantly reduced odour when compared with standard torque release additives.

Using dynamic olfactometry, the odour of polypropylene with and without different Incroslip additives was tested prior to and at the end of a two day thermal ageing process conducted at 120°C. The test included comparative results from erucamide and behenamide.

The results show that Incroslip B, C and Q do not change the odour profile of polypropylene significantly and perform similar to behenamide - a fully saturated amide.

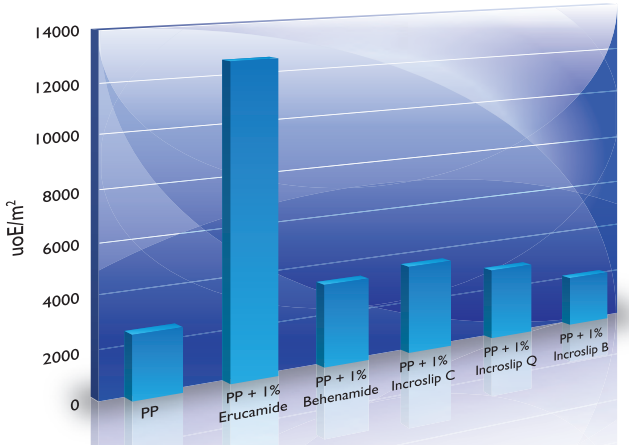

Figure 3: Odour characteristics of Incroslip range against standard fatty amides using dynamic olfactometry

Applications

Mold release

Today's demanding applications can require a slip & anti-block additive to work harder for longer. Croda has developed Incroslip G, an enhanced additive that provides colour and oxidative stability as well as high slip and improved blocking performance. Incroslip G can be used for applications where high temperatures and long-term part durability is required.

Compared with a standard erucamide slip additive, Incroslip G provides a similar reduction in coefficient of friction ensuring the same extrusion and mold release properties.

Where Incroslip G adds extra value and performance is its thermal and oxidative stability. In an accelerated ageing test, Incroslip G showed a decreased rate of degradation compared to a standard amide slip additive.

Automotive interiors provide a particular challenge to the stability of additives in plastic components due to potentially high interior temperatures and exposure to UV light.

Using Incroslip G ensures a longer lasting additive effect in long-term durable applications.

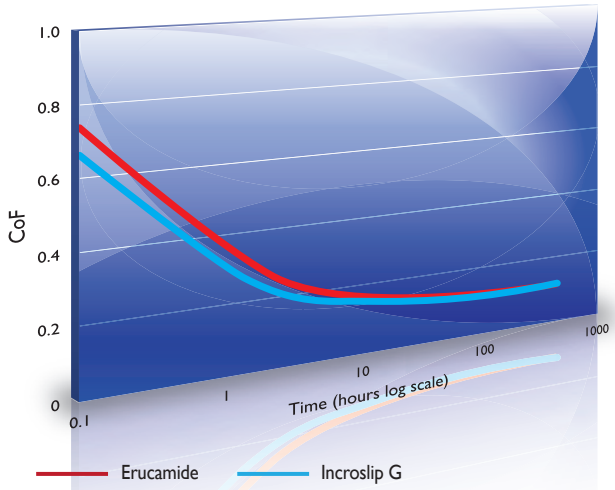

Figure 4: Comparison of the effects of Incroslip G and standard erucamide (500ppm) on the slip (CoF) of LDPE

Case Study

Incroslip G

Standard erucamide functions well in release and initial anti-scratch, however, after prolonged exposure to temperature and light such as a car interior, the erucamide can start to oxidise resulting in unwanted low molecular weight oxidation products. These can impair scratch resistance on the surface of molded parts and impart an unpleasant "sticky" feel.

Incroslip G has been formulated to reduce to a minimum unstable species therefore maximising the performance over an extended period of time.

In prolonged simulated exposure conditions, Incroslip G can extend the time before performance loss by between 2 to 3 times that of standard erucamide. Additionally, Incroslip G forms a harder lubricant layer, giving improved scratch resistance. This combined with the benefit of high stability and better organoleptics ensures a longer lifetime of the end product.

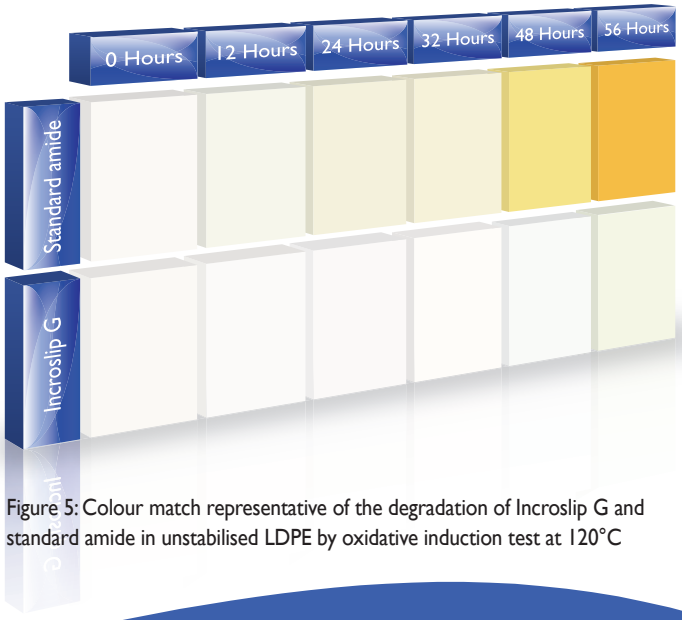

Figure 5: Colour match representative of the degradation of Incroslip G and standard amide in unstabilised LDPE by oxidative induction test at 120°C

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.

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11/13 BP008/1