



Banish those charges!

**Many polymers are susceptible to electrostatic charging.
An additive solves the problem.**

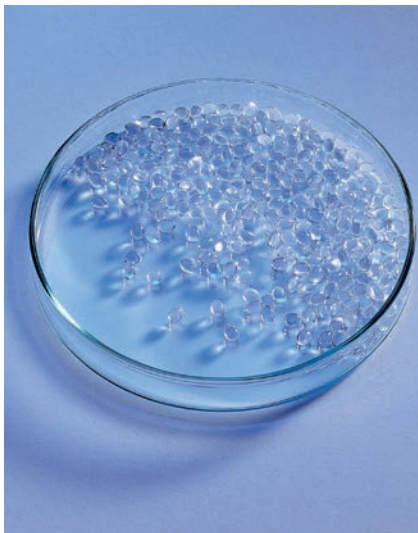
The crackling in your hair when you take off a pullover made of synthetic fiber can be slightly disconcerting. But in industrial applications electrostatic charging of plastics has more serious consequences, including damage to components. Addition of TPU pellets eliminates the problem, giving materials longlasting antistatic properties. This additive is supplied as masterbatch, and is easy to process.

► **WHEN A POLYMER** surface that is electrically neutral comes in contact with another surface and then is rapidly removed, it can become charged. Failure to dissipate this charge can result in uncontrolled sudden discharge. About a year ago, BASF introduced a new product into

its TPU range: Elastostat antistatic TPU pellets. Elastostat is supplied in masterbatch form and so is easy to process. It belongs to the ›Elastostat‹ range of products, representing over 30 years of expertise from BASF Polyurethanes in the field of thermoplastic polyurethanes.

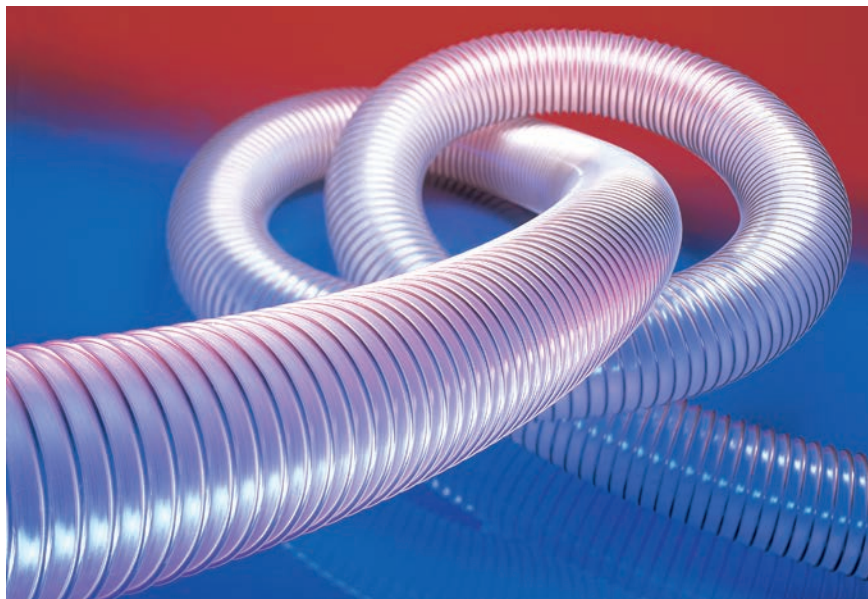
The antistatic impact of ›Elastostat‹ is permanent

Elastostat provides significant advantages over comparable solutions currently available: It can be used in a wide range of plastics and provides permanent anti-



Elastostat is supplied as masterbatch. These TPU pellets can be used in a wide variety of plastics to provide permanent antistatic properties. The product has good compatibility with standard plastics

static properties. And there is no requirement for special conditions – a particular humidity level for example. The material also has very good compatibility with standard plastics such as polyethylene (PE), polypropylene (PP), polystyrene (PS) and polyvinyl chloride (PVC).



To avoid electrostatic charging of the material conveyed, tubes and hoses can be produced by adding Elastostat pellets

main on the surface for long periods, and charge levels of several thousand volts can accumulate.

Materials with surface resistivity between 10^6 and $10^{12} \Omega$ are termed electrostatically ›dissipative‹ or ›IDPs‹ (intrinsic dissipative polymers). The new antistatic additives operate within this area.

electrode as in IEC 60093 – the standard that defines the internationally recognized test method for surface resistivity of solid, electrically insulating materials.

The surface resistivity measured depends on the size, shape and arrangement of the test electrodes. To improve comparability a conversion factor was applied to the test results so that they are based on one particular arrangement. This gives a surface resistivity that is about ten times the measured value.

Applications in transport and industrial packaging

The good compatibility of this TPU masterbatch with standard polymers – and its excellent antistatic impact – were clearly apparent as soon as the product was launched. Results are also now available showing the effect of various addition rates of Elastostat in specific high-usage plastics - PP and high- and low-density PE for example. Testing with low-density PE showed that material with excellent antistatic properties is produced by adding just 10 percent of Elastostat.

Even at this low level, addition of the TPU masterbatch reduces surface resistivity to a value well below $10^{12} \Omega$, with very little effect on the processing parameters and mechanical properties of the main polymer.



»Excellent antistatic properties are achieved by adding just 10%«

Anja Oltmanns, Key Account Sales Manager, BASF Polyurethanes GmbH

The decisive parameter defining the electrostatic charging and discharge properties of a material is its surface resistivity. Official regulations in Germany use three terms to define electrostatic properties: conductive, dissipative, and insulating. Surface resistivity in conductive materials is below $10^6 \Omega$. These materials can dissipate charges rapidly, with the possibility of damage for example to sensitive electronic components.

The surface resistivity of insulating materials is above $10^{12} \Omega$. Most plastics are insulators, so can easily become electrostatically charged by friction. This very low conductivity means that charges re-

Easy to use in extrusion and injection molding

Elastostat provides users with a highly specialized product, but one that is easy to use in both injection molding and extrusion. It is color-neutral, so there are no color restrictions. Users can add the pellets without any need for additional compounding. The polymer matrix is homogeneous, and there are no delamination effects.

The antistatic action of the TPU masterbatch – and its compatibility with various plastics with a wide range of addition rates – have been studied in detail by BASF experts. Tests used a ring



One example of an application for this additive: intermediate bulk containers (IBCs) for industrial transports



BASF has a continuous program of collaboration with users on further development and new applications for its Elastostat products: one result from recent tests is that Elastostat is also compatible with PVC

These specific properties make Elastostat particularly valuable in sectors like industrial packaging. When this is produced from polyolefins, anti-static properties are essential for transport of combustible liquids or fine powders.

Addition of this TPU masterbatch in extrusion processes can produce hoses or packaging films that avoid any electrostatic charging of the product conveyed. Elastostat is also used in IBCs (intermediate bulk containers). These are often used for industrial transport and mostly consist of an inner PE container, an outer tubular metal frame, and a pallet.

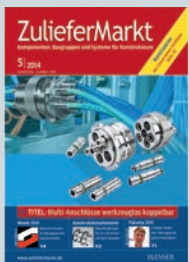
Weathering resistance tests

The first practical tests are now underway with IBCs using Elastostat for antistatic properties – and one of the factors of greatest interest to technologists here is the resistance of the material to weathering.

BASF has a continuous program of collaboration with users on further development of the Elastostat product line. One example of a new application is antistatic PVC floorcoverings. Initial tests have confirmed good compatibility of Elastostat in these materials. ■

Translated by BASF SE

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INFO

BASF Polyurethanes GmbH, Lemförde
Phone: +49 5443 12-2559
www.basf.com



Delivery time: currently 8 to 10 weeks
Available: directly at the manufacturer, worldwide