



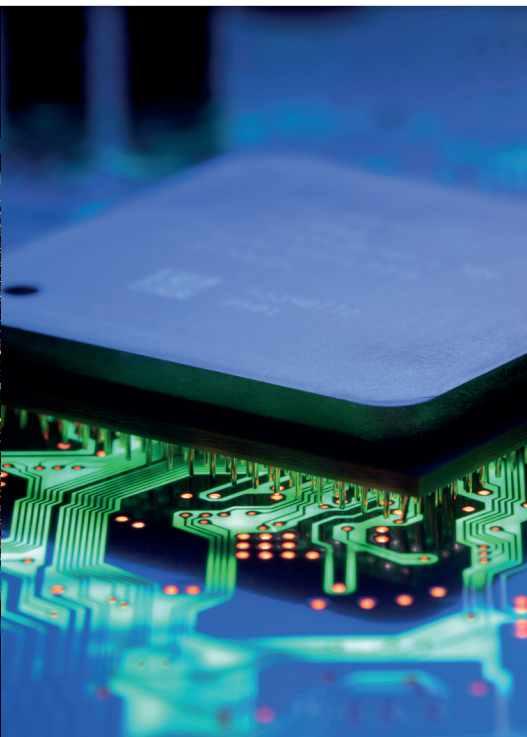
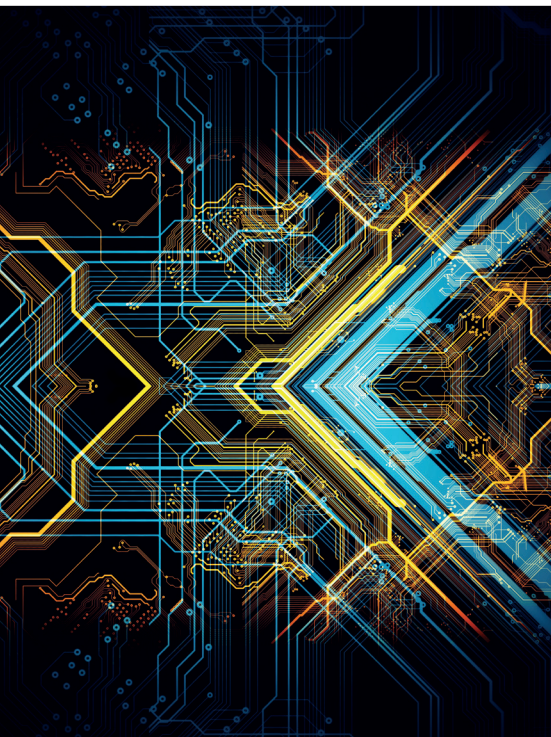
COLLOIDS

THE MAKERS OF MASTERBATCH

A MEMBER OF THE **TOSAF** GROUP



Electrically Conductive Polymers



Colloids Speciality Product Ranges

E-TEC – Electrically Conductive Polymers

T-TEC – High Performance Engineering Polymers

PACE – Engineering Polymers

Nigrosine Range – High Jet & Gloss Black Masterbatches



Electrically Conductive Polymers using Conductive Carbon Black

Electrically conductive polymers are required for applications where the build-up and discharge of static would be detrimental to a process, a finished product or be a risk to human safety in the workplace or in the wider environment.

Colloids has chosen conductive carbon black as the most reliable and cost-effective material when designing the **E-TEC® standard** range of conductive polymer compounds and concentrates.

There are three key areas to Colloids developing and producing the perfect carbon black filled conductive compounds:

1 Selecting the perfect carbon black type;

This is far from straight forward! To provide the highest electrically conductive properties the carbon black is required to:-

- Be a highly structured material with long and branched chains of agglomerated particles;
- Have a small particle size with high particle porosity;
- Have the correct chemical functionality on the surface of the particles.

2 Formulating the compound;

Even once the ideal carbon black has been selected for a given polymer application it is vital to ensure that the correct formulation is developed. The ideal loading of carbon black is governed by the “percolation threshold” where the tipping point in loading is identified at

which point adding further carbon black does not increase conductivity further.

Through an exhaustive R&D process Colloids have identified the correct carbon black loadings in each of our formulations to ensure that each polymer compound exhibits the required conductive properties whilst not impacting on the polymer’s mechanical properties or risking problems at the processing stages.

3 Optimising the compounding process;

It is vital to ensure that the correct loading of the correct carbon black is also correctly dispersed in the base polymer during the compounding process.

With the relatively high loading of carbon black Colloids’ strict production quality control ensures that excellent dispersion is achieved without impacting the carbon black’s conductive properties, thus ensuring a perfect conductive compound ready for further processing.



Dissipative and Conductive Compounds and Concentrates

The Colloids **E-TEC®** brand has been created to provide speciality compound and concentrate formulations for applications where varying degrees of permanent electrical conductivity is required. The standard range of

products are suitable for packaging, storage, handling and distribution applications whilst also being ideally suited for use in products used in electronic and electrical manufacturing and static-free work place applications.



Standard Range of Products

Colloids standard **E-TEC®** range includes formulations for:

- Polypropylene (PP) products for Extrusion and for Injection Moulding applications;
- Polyethylene (PE) products for Blown Film, for Blow Moulding and for Extrusion applications;
- Polystyrene (PS) products for Injection Moulding applications;
- Ethylene-Vinyl Acetate (EVA) products for Blown Film and Extruded Foam applications.

Colloids are able to offer our bespoke **E-TEC®** product development service for electrically dissipative and conductive polymer compounds not only for PP, PE, PS and EVA but also for a range of other polymers including, but not limited to:

- Polycarbonate (PC)
- Polycarbonate & ABS blends (PC/ABS)
- Polyamide-6 (PA6)
- Acrylonitrile Butadiene Styrene (ABS)
- Thermoplastic Polyurethane (TPU)
- Polycarbonate & Acrylonitrile Styrene Acrylate blends (PC/ASA)
- Styrene-Acrylonitrile Resin (SAN)
- Polybutylene Terephthalate (PBT)
- Polyoxymethylene (POM)
- Styrene Ethylene Butylene Styrene (SEBS)

Colloids highly experience R&D team are on hand, ready to discuss and develop electrically conductive and dissipative polymer compounds for customers' specific needs.



Bespoke Formulations using Carbon Black, Graphite or Graphene

For more specialised applications, for example for automotive markets, Colloids provide a bespoke **E-TEC®** product development service.

Colloids R&D department is on hand to develop conductive and static dissipative

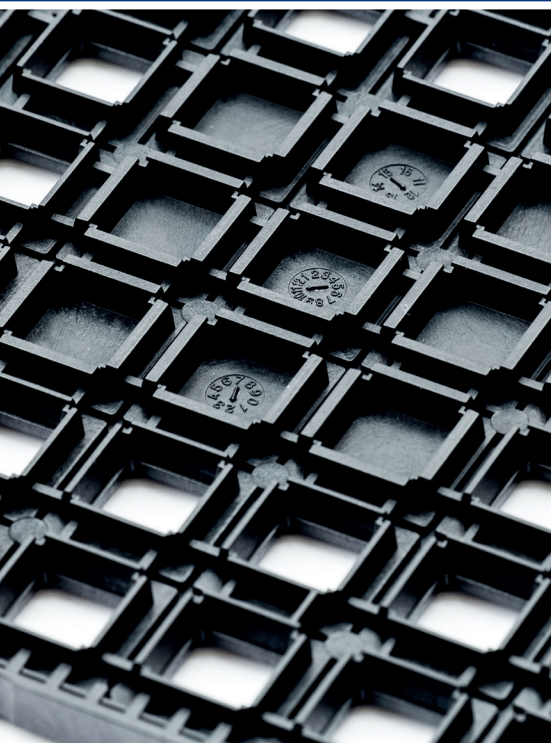
formulations using not only carbon black but also other conductive materials such as graphite or graphene. The use of graphite or graphene can provide the conductive polymer products with additional desirable properties and they can also be readily provided in masterbatch / concentrate form.



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Every effort has been made to provide accurate information in this leaflet. However, customers must satisfy themselves of the suitability of these masterbatches in their application. Colloids Limited does not offer or imply any responsibility in this respect.

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