A Material Difference

Dryflex®

TPEs for the Impact Modification of Recycled Polymers

HEXPOL® TPE

CONTENTS

INTRODUCTION

With an ever increasing refuse stream, Government waste prevention programmes and new industry targets, the demand for products made from recycled materials is rising, meaning that recyclability is becoming an increasingly important attribute for polymers. However, thermomechanical degradation from the repeated melting during the recycling process, weathering and contamination can all have negative effects on properties and performance.

Dryflex TPE impact modifiers can be added to the recyclate, helping to transform the properties from stiff and brittle to flexible and tough and improve the impact resistance and aesthetics of the finished product. Dryflex TPE compounds are being used as impact modifiers in both primary and secondary recyclate supply streams.

Please use this guide as an introduction to the Dryflex TPE impact modifiers and **contact us** to discuss your specific requirements.

WHY USE IMPACT MODIFIERS?

Compatibilisation

Dryflex TPE impact modifiers can also function as a compatibiliser when used with commingled sources of non-polar polymers such as PP, PE and PS. When added to an immiscible polymer blend, the TPE modifies interfacial properties and stabilises the morphology, creating a polymer alloy and improving dispersion and processing characteristics.

Improved Processing

Depending on the purity of the recycled polymer feedstock, the addition of Dryflex TPE impact modifiers can also help to improve melt viscosity, aiding processing and cycle times. In comparison to pure PS, with the addition of Dryflex TPE impact modifiers, we have also seen an improvement in the ease of de-moulding parts.

TPE COMPOUNDS VS SBS

In the past we have seen a rather inconsistent approach to impact modification, where any available compounds or polymers are thrown into the recyclate mix. This can lead to inconsistencies and unpredictable results. With our Dryflex TPE impact modifier grades we have adopted a more qualified approach.

We have tested many different formulations with both virgin and recycled polymer for impact strength and have also compared these results against data collated from common materials used in the industry such as pure SBS. The Dryflex TPE impact modifier grades help to increase the value, processability and potential applications for recovered PP and PS.

ADDITION LEVELS

Depending on the desired performance levels, Dryflex TPE impact modifier grades can be added at a suggested loading weight between 5 and 25%.

There can be significant gains in impact resistance at a moderate level of modifier addition. For example, in a grade of PS regrind, with a 15% addition of Dryflex TPE there is an 160% increase in impact resistance, as measured to Charpy ISO 179 (type 1 test piece, notch A). In a virgin crystal polystyrene, a 25% addition of Dryflex TPE impact modifier gave over a 430% increase in impact resistance.

We have developed two grades of impact modifier in natural and black for use with PS recyclate: Dryflex 51574 SE Natural and Dryflex 51575 SE Black

TEST RESULTS

Figure 1.
Increase In Impact Resistance Of Virgin Crystal Polystyrene

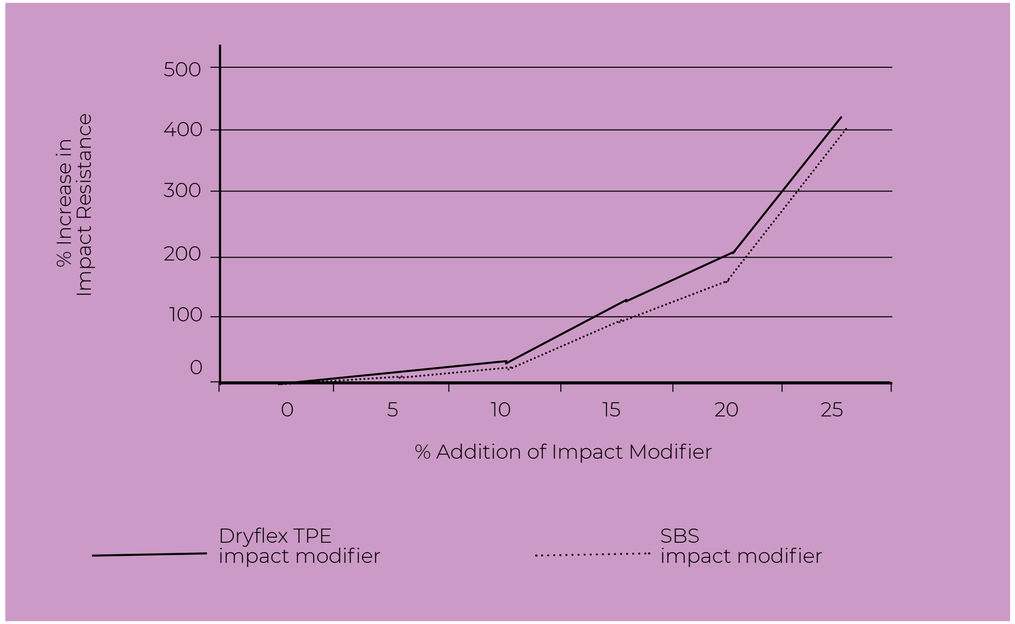
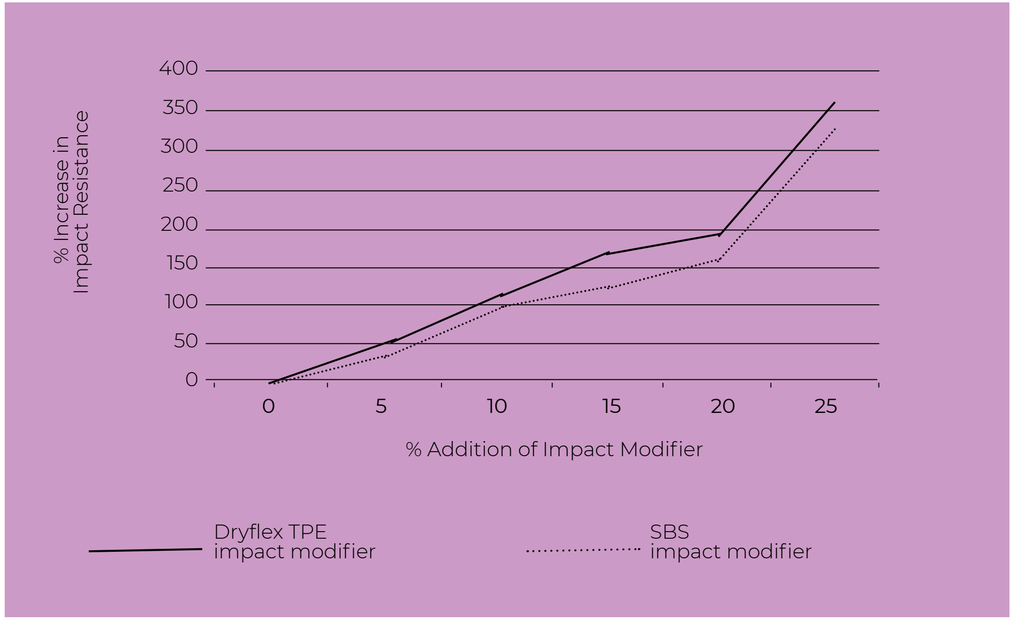


Figure 2.
Increase In Impact Resistance Of Polystyrene Regrind



ABOUT US

HEXPOL® TPE

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80,000+
T/P.A. CAPACITY

Across our **Sweden**, **UK**, **German**, **China** & **North America** operations. Our companies

50+
YEARS HISTORY

We've a proud history in flexible polymer compounding & were among the **1st to produce TPEs** in Europe. About us

34,795+
FORMULATIONS

A comprehensive portfolio in **TPE**, **TPS**, **TPO**, **TPU**, **TPV**, **soft PVC** & **Biobased** technologies. Learn more about Our products

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