

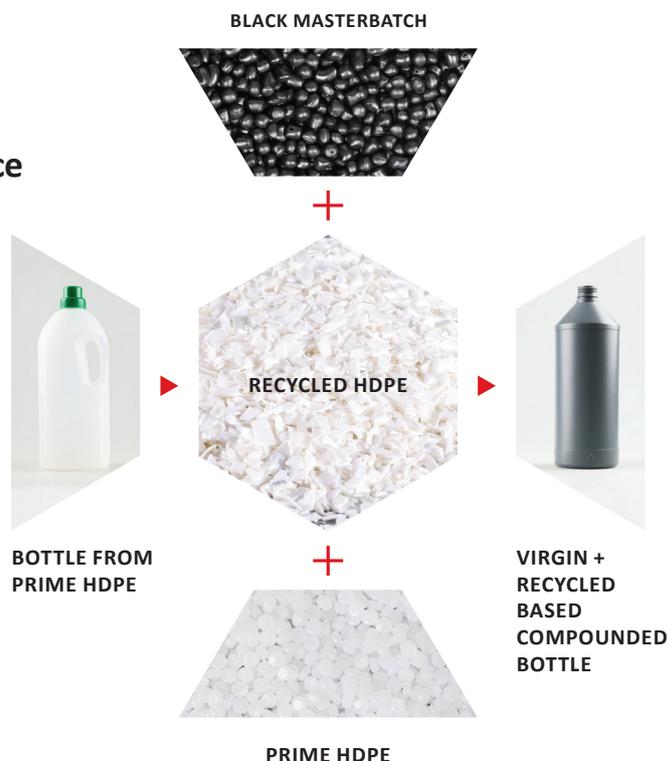
TIPELIN 6010B, TIPELIN 6301B AND TIPELIN BS 502-43

HIGH PERFORMANCE BLENDING OF rHDPE (PCR/PIR)

Improved thermal and colour stability simplifies economical post-consumer (PCR) or post-industrial (PIR) recycling to support **multiple recycling processes and increase the acceptance for recycled materials.**

TARGETED APPLICATIONS

- ▶ Bottles up to 10 litres for food packaging (without recycled content) and non-food applications
- ▶ Packing of cosmetic products
- ▶ Blow moulded products in Automotive applications
- ▶ Corrugated pipes
- ▶ Bottles for aggressive chemicals



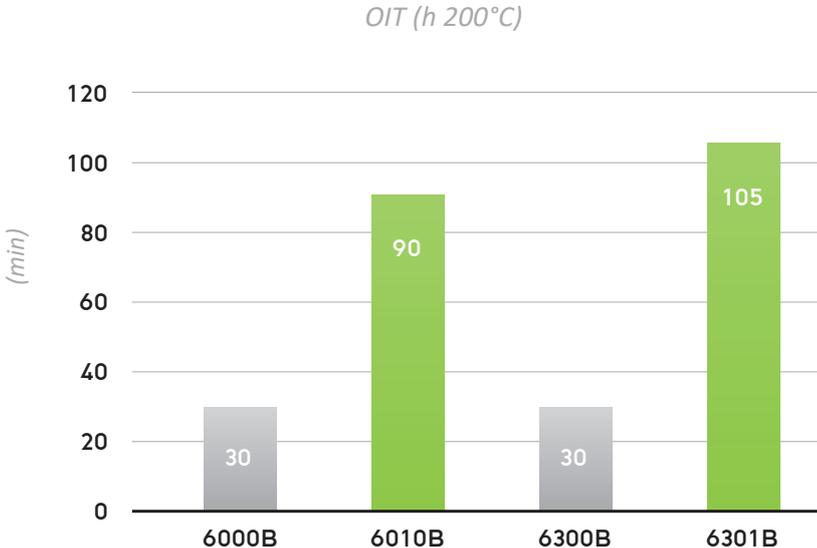
KEY BENEFITS FOR YOU

- ▶ The improved additive package for the grades allows **higher share of rHDPE** in blends without the need for extra dosing of stabiliser.
- ▶ High Oxidation Induction Time (OIT) values reflect the **long-term stability** of these grades / rHDPE blends made thereof under demanding conditions, as well as their **potential for multiple use** in the recycling loop.
- ▶ Superior mechanical performance (**High Stiffness and excellent Top Load**) due to high flexural modulus values.
- ▶ High Quality Blends with rHDPE shares **larger than 30%** are possible. (*)
- ▶ In addition, TIPELIN High Recycling Performance Grades use an efficient colour stability package: **no variances in colour shade performance** occur neither due to **multiple processing** of these grades / rHDPE blends, nor during the **long-term use** of end products made from them.
- ▶ **Improved machine utilisation and reduction of off-spec production** in stop-and-go operation. Effective extruder cleaning to reduce black/brown spots after production starts.
- ▶ More aesthetic packaging: smoother surface, very low yellowness index.
- ▶ Downgauging opportunity due to the good stiffness/impact balance.

(*) The actual rHDPE share of a blend is dependent on the quality of the recycled material and on the design of the final product.

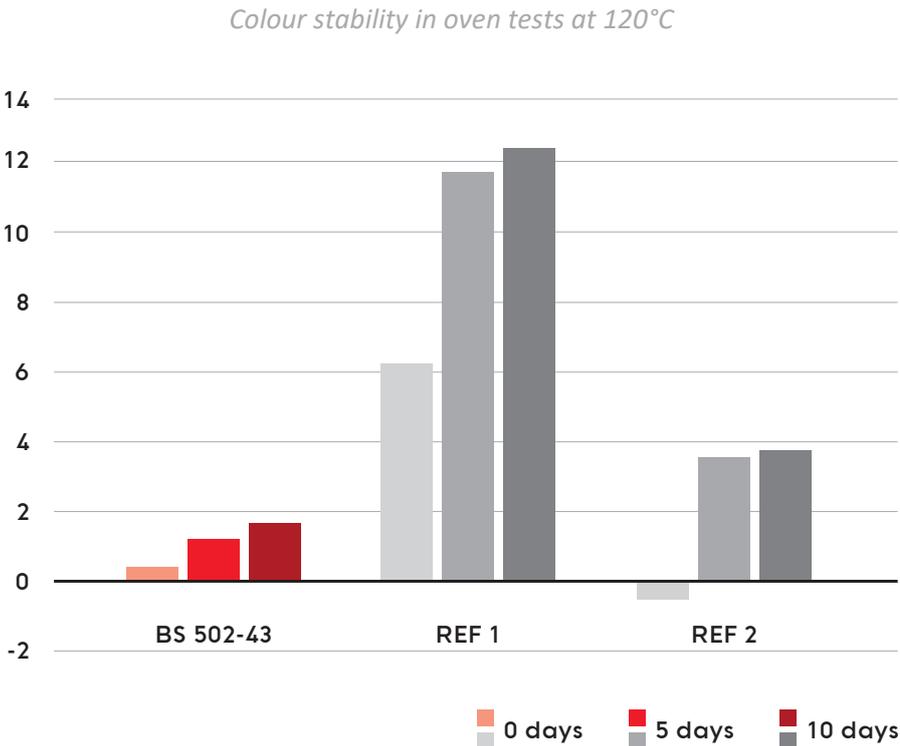
HEAT STABILITY OF TIPELIN 6301B AND TIPELIN 6010B

Compared to market references TIPELIN 6301B and TIPELIN 6010B supply almost triple heat stability without any risk of gel formation and risk of discolouration, even after multiple recycling loops.



LONG-TERM COLOUR STABILITY OF UNIMODAL GRADE TIPELIN BS 502-43

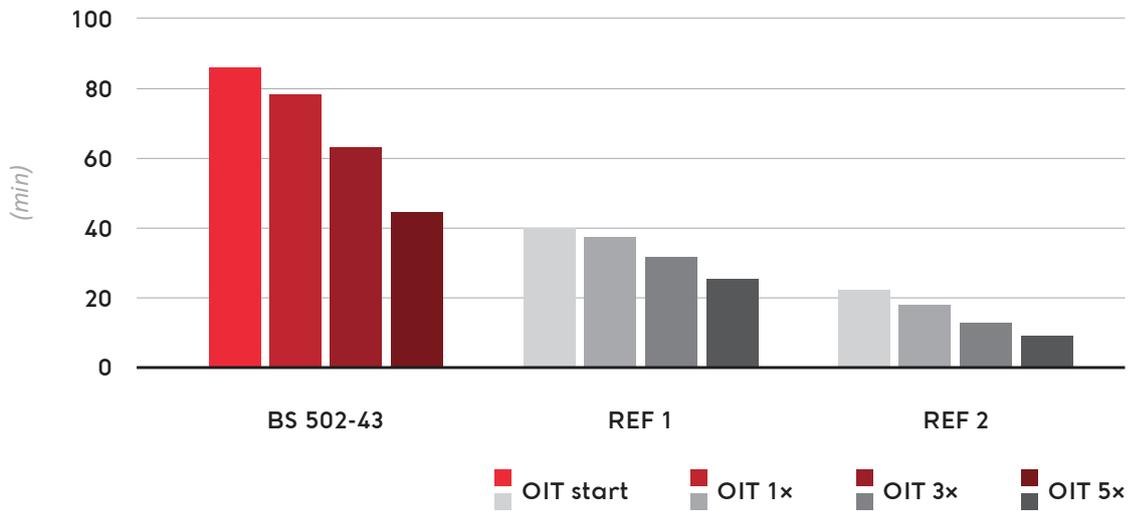
Compared to market references TIPELIN BS 502-43 keeps its natural whitish colour even after accelerated aging period at 120°C due to its specific stabilisation package. This results in the more attractive appearance of this grade in non-coloured end products.



THERMO-OXIDATIVE STABILITY IN MULTIPLY EXTRUSION

Due to their higher OIT values the polymer chains of TIPELIN BS 502-43 are protected against the negative effect of high temperature combined with oxygen — even if more recycling loops are applied. The material copes with more recycling without quality deterioration — offering a production opportunity of an environmental tax-free product.

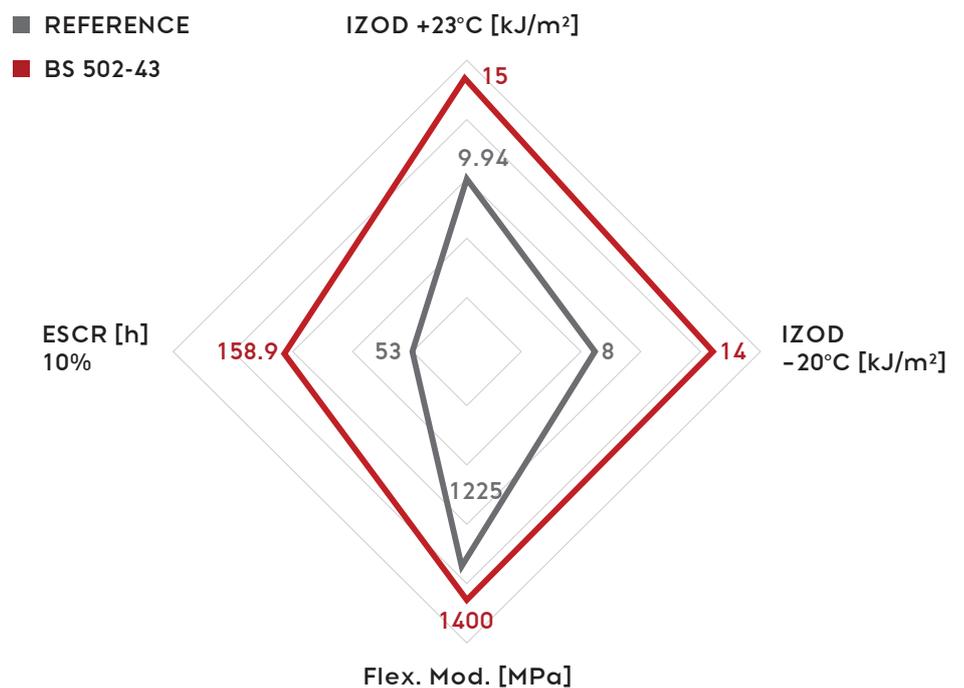
Oxidative induction time trend (OIT 200°C) – in multiply extrusion [min.]



TIPELIN BS 502-43 PROVIDES EXCELLENT MECHANICAL PROPERTIES

Compared to other unimodal market references the TIPELIN BS 502-43 shows a much better stiffness/impact balance. This enables a downgauging opportunity and the reduction of plastics used.

Its higher ESCR value shows better resistance against aggressive chemicals and ensures longer term durability.



TIPELIN BS 502-43 POTENTIAL SAVINGS EXAMPLE

Comparison of TIPELIN BS 502-43 with improved additive package vs. conventional unimodal HDPE

First test set up:

One-litre volume angular bottle. Colour: natural

Product weight target 61 gr

Cut-off / flashes part: 31 wt.%, recycling ratio: 0 wt.%

Blow moulding machine with screw diameter 65 mm, 2 cavity, production capacity approx.: 60 kg/h

Second test set up:

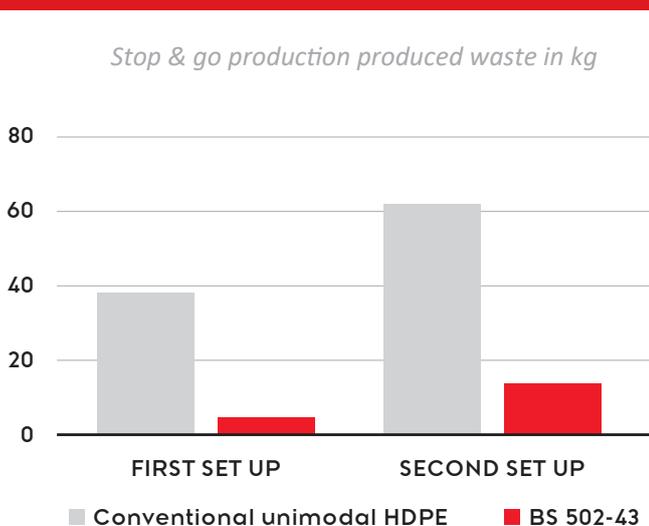
0.5-litre volume bottle. Colour: natural

Product weight target 38 gr

Cut-off / flashes part: 28 wt.%, recycling ratio: 0 wt.%

Blow moulding machine screw diameter 55 mm, 2 cavity, production capacity approx: 38 kg/h

Extruder stop-and-go to see how many bottles contain burned particles. Those bottles were selected and then weight measured



Conclusion

- ▶ Avoiding of approx. 45 minutes off-grade production after restart of the lines
- ▶ Waste reduction by approx. 75 wt.% during one stop-and-go
- ▶ Reduction of CO₂ for waste production
- ▶ Higher efficiency and output of prime parts
- ▶ Improved machine utilisation
- ▶ Less sorting effort

For further information and technical data sheets, please contact our Technical Service department or your sales representative.



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