



**HIGH PERFORMANCE
ADDITIVES
FOR RECYCLING**

REPAFT



REDUCE



RE-USE



RECYCLE

REPI is committed to **promoting** and contributing to **sustainable** development for **future** generations.

REFIT represents the company's vision on how to integrate technology into sustainability.

REFIT involves all REPI's internal manufacturing processes and range of solutions to support recycling of polymers.

REPI actively promotes sustainability and recycling through membership to:

The logo for NAPCOR, featuring a small triangle icon followed by the text 'NAPCOR' in a sans-serif font.

NAPCOR





PRODUCT RANGE

ANTI YELLOW ADDITIVES

The range comprises different formulations able to balance the appearance of r-PET and restore brightness, as well as to correct off-shade material.

Formulations are available for injection moulding of preforms and extrusion of sheets. Concentrated formulations for use during r-PET pellets production complete the range.

KEY FEATURES

- Reduce the yellow index (b value of CIELab coordinate)
- Improve brightness (L value of CIELab coordinate)
- Stabilise the red/green shades (a value of CIELab coordinate)
- Typical let down ratio: 0,01 – 0,05%
- Meet EU and FDA food contact regulations

CASE STUDY

- r-PET production on extruder with output 1350 kg/h
- 3 grades of Anti Yellow additives on amorphous granules: AY 00015 – AY 00201 – AY 00153

	r-PET	AY00015 0.03%	AY00201 0.03%	AY 00153 0.03%	AY00015 0.015%	AY00201 0.015%	AY 00153 0.015%	
		Δ vs r-PET						
L*	44.48	-4.79	-2.93	-6.71	-3.42	-1.93	-2.49	
a*	-6.66	0.78	0.79	1.97	0.50	0.42	0.69	
b*	6.31	-6.32	-6.40	-14.84	-2.96	-3.36	-7.30	

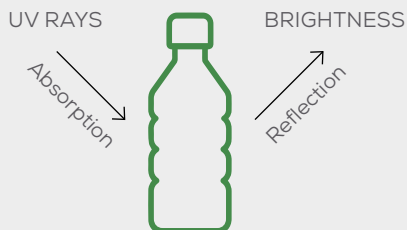
OPTICAL BRIGHTENERS

Such additives are often used to boost brightness and gloss of PET and r-PET packaging and enhance its whiteness when coloured.

Especially when used in combination with recycled PET, REPI's OB correct darkening of polymer.

KEY FEATURES

- Gloss increase (bright shades)
- Brightness / whiteness boost
- Typical let down ratio: 0,2 – 0,3%
- Meet EU and FDA food contact regulations





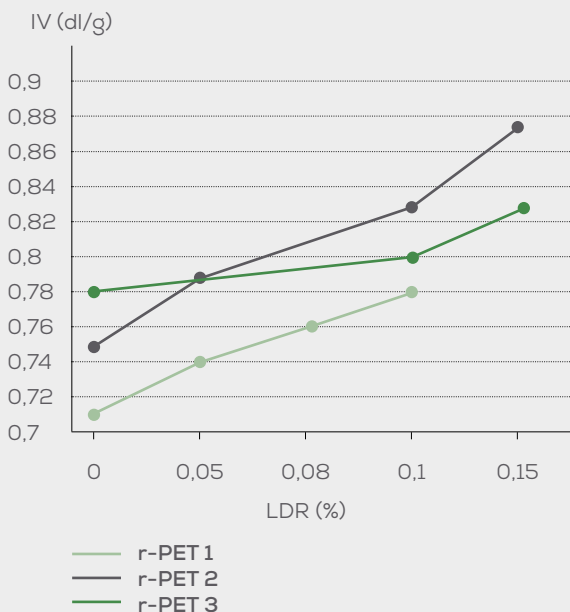
IV ENHANCERS

Normally r-PET has a lower Intrinsic Viscosity than virgin PET. For applications requiring higher mechanical properties IV Enhancer can be the solution. It is a chain extender increasing molecular weight and mechanical properties accordingly.

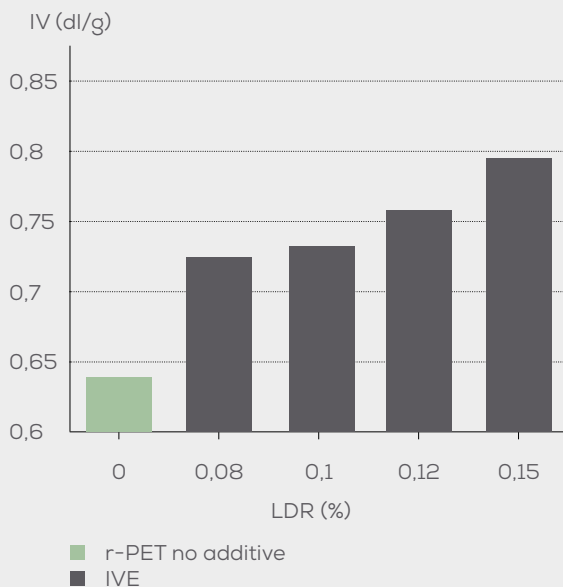
KEY FEATURES

- IV increase from 0,05 dl/g to over 0,10 dl/g depending on the LDR
- Suitable for injection, extrusion and recycling processes
- Improves mechanical properties of sheets and bottles
- IVE additives enable to speed up or to substitute the long SSP process
- Mainly linear chain extension- no cross link: the molecular weight (mw) and mechanical properties increase accordingly
- Typical let down ratio: 0,05 - 0,15%
- Meet EU and FDA food contact regulations

INJECTION MOULDING IV ENHANCERS (IVE)



EXTRUSION IV ENHANCERS (IVE)





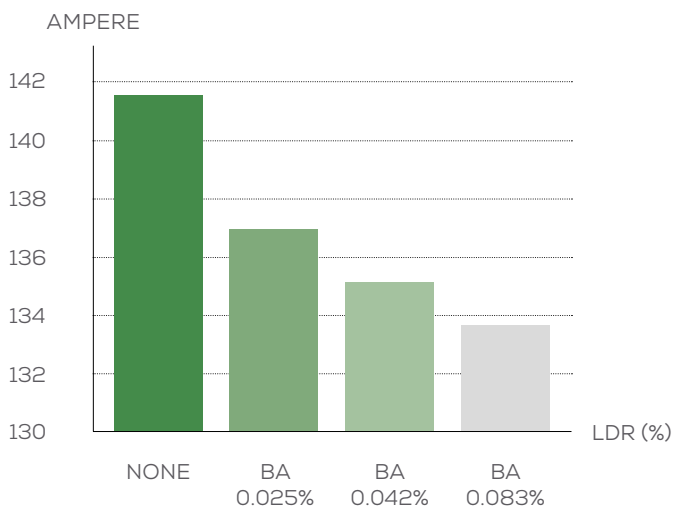
BLOWING ADDITIVES

Sustainability also means saving energy during production processes. These additives offer advanced IR absorption capability of lamps at the blowing stage resulting in reduced energy consumption. Heating phase is more homogeneous and blowing process is smoother.

KEY FEATURES

- Lower energy usage and improved preform heating
- Increase productivity per hour
- Facilitate blowing of thick and preforms with special shapes
- Typical let down ratio: 0,02 – 0,03%
- Meet EU and FDA food contact regulations

BLOWING ADDITIVES (BA)
ENERGY ABSORPTION





COLOURS CAN BE A SMART SOLUTION

Give elegant and premium look to recycled packaging taking advantage of the appearance and lower brightness of r-PET.

Depending on r-PET percentage that composes a packaging and depending on its source, additives may not be enough to get to the expected aesthetics.

REFIT Colours play a crucial role in this context allowing to obtain attractive packaging while maintaining its sustainability.

The REFIT Fumé Range includes a selection of colour shades which, favoring r-PET starting point, give packaging a "premium" and attractive aesthetics.





LOW CARBON FOOTPRINT TECHNOLOGY

The liquid colour and additive technology has a lower carbon footprint compared to solid masterbatch.

This can be proven in each step of the liquid lifecycle, mainly due to the following reasons:

- the higher concentration of liquids leads to less energy consumption during transport
- manufacturing technology needs significantly less energy

REPI LIQUID TECHNOLOGY Carbon Footprint Contribution

	I	II	III	IV	V	VI	VII
PROCESS STEP	RAW MATERIALS	RAW MATERIALS TRANSPORT	COLOUR/ ADDITIVE MANUFACT.	COLOUR/ ADDITIVE PACKAGING	COLOUR/ ADDITIVE TRANSPORT	COLOUR/ ADDITIVE PROCESSING	COLOUR/ LIFECYCLE UP TO WASTE DISPOSAL
DRIVERS	CARRIER SYSTEM	COLOUR CONCENTRAT.	PROCESSING TECHNOLOGY	PACKAGING TECHNOLOGY / PACKAGING MATERIALS	COLUR CONCENTRAT.	COLOUR/ ADDITIVE CHANGE	LDR
RATIONALS	Carbon footprint of liquid carrier can reduce CF against solid MB	Carbon footprint proportional to volume and weight being transported <hr/> High colour concentration (lower LDR) will lower the carbon footprint	Processing technology at room temperature	Less packaging used thanks to lower volumes of colour/ additive	Carbon footprint proportional to volume and weight being transported <hr/> High colour concentration (lower LDR) will lower the carbon footprint	Faster colour change and therefore shorter transition time and less waste production <hr/> Efficiency of setup change	Faster colour change and therefore shorter transition time and less waste production <hr/> Efficiency of setup change



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