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# P<sup>tecn</sup>o Plast

The Monthly Magazine for the Plastics Industry

international



LISTEN TO  
THE PRESENT  
AND LOOK TO  
THE FUTURE



“The role of a leader it’s not to elaborate his own ideas, but create an environment where great ideas can grow.”

# REPI proposing a real circularity example thanks to an exceptional partner

**REPI, manufacturer of liquid colours and additives for plastic packaging, took part for the 4th time at NPE, Orlando, Fl. (USA), with a booth in the West Hall, the one dedicated to polymers.**

**F**ocus was on its colour and additive solutions for thermoplastics polymers in general: PET, PC, PMMA, ABS, PVC. Especially, the ranges of additives for recycling raised a lot of interest. These products allow users adding growing percentages of recycled polymers in their final products. Be it r-PET or polycarbonate for instance, in fact REPI offers aesthetics additives that correct off-shade raw material such as toners, antioxidants or heat stabilizers, as well as performance aids such as Intrinsic Viscosity Enhancers that make the recycled material mechanically valid for its purpose. Attention on the topic was, no surprise very high. Everything going in the direction of circularity is, in fact under the magnifying glass, not only from the industry, but a lot from the consumers side, that show growing concern and consciousness around the key concepts of reducing, reusing, and recycling to preserve the future of our planet earth.

The ranges of REPI's Anti Yellow, Optical Brighteners and IV Enhancers have been representing over the years a valid aid to r-PET recyclers and packaging converters. Such additives can be used at different stages of r-PET value chain, eg. from recycling up to preform or tray manufacturing with no impact on processes, thus offering max flexibility in its addition, that can vary batch after batch. The increasing demand for recycled percentages and the scarcity of food grade r-PET flakes are presenting challenges related to quality and colour consistency between a batch and another.

Especially what both recyclers and converters struggle to manage is the drop of L\* of CieLab numbers while respectively recycling and moulding or extruding the final packaging.

While, in fact it is possible to correct off-shade r-PET pellets with custom-made formulations that act both on the a\* and on the b\*, the darkening of material (precisely the drop of L\*) is very difficult to avoid.

Here comes StabiPlus™ additive: a liquid formulation acting specifically as proactive stabilizer that prevents r-PET from aging and discoloration, cycle after cycle. The additive can be used both at recycling stage, added to a mechanical recycling process with SSP, and directly by converters at their packaging production stage, that can enjoy flexibility in addition ratios. StabiPlus™ offers a new protection technology that does not affect In-



**Picture 1:** Bottles of 100% r-PET from mechanical recycling containing StabiPlus™. Being a liquid formulation, concentration is very high and related dosages minimal.

trinsic Viscosity and therefore mechanical properties of the recycled PET while widening the window for sustainable use of recycled PET.

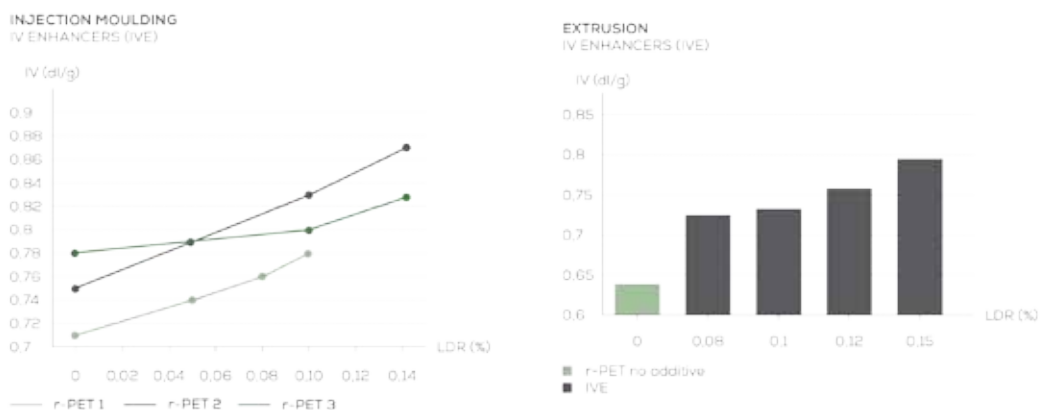
[www.repi.com](http://www.repi.com)

Moving to the performance aid side, instead, REPI's IV Enhancers come into play. We are speaking about linear chain extenders, that avoiding cross-linking, allow r-PET IV to grow by over 0,05 dl / g.

direct results can be appreciated in r-PET bottles that show a top load performance at the same level as a virgin PET.

What made the participation of REPI at the NPE 2024 special, however was the presentation of REPI's innovative Colour Management System (CMS), thanks to a joint development together with an exceptional partner: Krauss Maffei.

On its huge booth in Hall West (the one dedicated



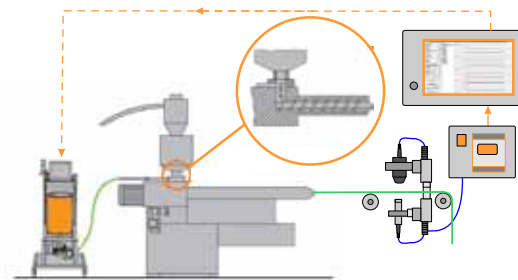
**Picture 2:** performance of REPI's IV Enhancers at growing dosage on r-PET in injections moulding and at growing dosage.

to machinery) Krauss Maffei was able to reproduce a real Closed Loop Process, in which REPI's CMS played a crucial role.



**Picture 3:**  
REPI's dosing units contain the basic colours necessary to obtain the target blue shade.

REPI's Colour Management System is an online monitoring system able to automatically adjust colour or additive dosage during an extrusion process by means of a software connection a spectrophotometer and the dosing unit/s.



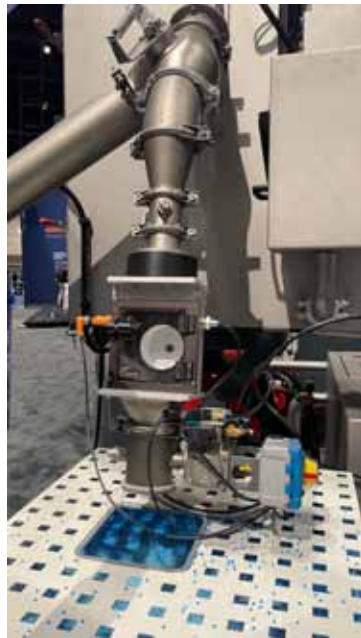
**Picture 4:**  
The Colour management system

In the live simulation at Krauss Maffei's booth, everything started with the injection moulding of transparent preforms made of virgin polypropylene. These were then sent to a shredder, directly connected to an extruder (picture 3) producing r-PP granules that were coloured blue by three REPI's dosing units. Such blue granules were conveyed then to an injection moulding machine producing bottle openers, made of 100% recycled plastics (picture 4)



**Picture 5:**  
bottle openers with 100% r-PP

In order to better simulate a real recycling closed loop, where the incoming material is often uneven in shade, a 4th REPI dosing unit was used to inject a "disturbing colour" into the extruder. The CMS worked to neutralize the off shade by varying the dosing of the three basic colours. This was possible thanks to a spectrophotometer that after reading the Lab\* values of the resulting granules sent proper input to the 3 operating units that adjusted dosage to stay in the set tolerances.



**Picture 5 and 6:**  
spectrophotometer reading granules and giving back Lab\* values.

Live demonstrations ran all day long for the five days of the exhibition, raising amazing interest in visitors, all eager to find a way to keep the shade consistency of their recycled polymer as stable as possible throughout the entire production process.

REPI's CMS comes as integral development to the core business of REPI, represented by the formulation and production of liquid colours and additives for thermoplastic polymers and thermoset resins.

Thanks to the experience collected over the years observing extrusion and injection moulding processes of customers and partners, REPI was able to develop an innovative aid to the growing need of control and correction necessary especially due to the increasing use of recycled polymers.

Very good experience has been collected so far also on PET and r-PET sheet extrusion processes, where the spectrophotometer is mounted on a frame moving above the sheet and reading colour consistency to give the feedback back to the dosing unit.

A remote control is offered to the customer, that in case of need can rely on immediate remote intervention on the system by REPI's Technical engineers.

The software is so developed in order to work in transmission and reflection modes meaning that not only coloured, but also transparent

sheets with transparent additives (such as Anti Yellow and toners) can be read. The dosing time corrections are normally linked to the speed/output of the extruder and corrections are automatically calculated up to a minimum of 0,00001 %.

The Colour Management System can control three or more units at a time, depending on the needs and no matter of which the polymer in process is.

To conclude, now more than ever before, the plastic industry stakeholders are called to cooperate to contrast emotional arguments with their extensive know-how and innovation potential. The aim is of making the end-user realize that recycled products can be absolutely equal to those made from virgin material, and in addition they really enable the circular economy by saving resources and energy.

Walking for the NPE show showed once again how advanced the plastics industry is and how much is still to be developed and innovated, something that can be best reached with meaningful co-operations and partnerships, and the Colour Management System at the partner's booth has been a tangible example.

