

# Masterbatches **FOR THERMOPLASTIC POLYESTER**



what is precious to you?

Bringing life  
to plastics and  
plastics to life.

Exceptional  
transparency,  
excellent surface  
appearance, easy  
processing and  
recycling have  
made PET one of  
the most widely  
specified resins  
for packaging. Its  
versatility and  
performance  
continue to spur  
packaging  
innovations and  
market growth.





# Clariant

## **EXPERTISE BUILT ON EXPERIENCE**



Long the material of choice for packaging liquid foodstuffs such as mineral water, soft drinks and edible oils, PET is rapidly gaining popularity for the bottling of milk and fruit juice, and more recently beer and wine. Cosmetics and detergent packaging are also major applications.

Offering virtually unlimited color choices plus numerous manufacturing options, PET encourages design freedom. It is the ideal material to create distinctive packaging that strengthens brand recognition and attracts consumers.

In addition, the outstanding physical properties of PET help extend product shelf life by better protecting package contents. And because polymer recovered from packaging is readily recycled, PET also helps protecting the environment.

Clariant  
Masterbatches  
is leader in the field  
of high-performance  
colorants and  
additives for PET.  
Our customers  
have access to  
technologically  
advanced research  
and development  
laboratories, as well  
as dedicated and  
highly experienced  
technical service  
specialists.



Leading the way in PET color and additives for many years, Clariant has developed synergistic alliances with all the companies involved in the packaging production process, including molding-machine and auxiliary-equipment manufacturers, packaging producers, and the food industry. These alliances have contributed to the development of increasingly sophisticated and creative packaging to meet the needs of a market in constant evolution.

As standards evolve with the market needs and become more stringent to ensure the safety of consumers, masterbatches must

be carefully selected to prevent any negative effect on either the packaging or its contents. Issues of concern can range from compromised secondary operations such as gas barrier coating to altered organoleptic qualities of the foodstuff due to migration. Our products ensure strict compliance with packaging standards, even for the most sensitive foodstuff.

Today's packaging industry presents demanding new performance challenges. For example, products like beer, pulp-containing fruit juices and long-life milk are much more susceptible to degradation

than mineral water, soft drinks and similar products with quick market turnover. Packaging for such products must provide long-term protection against oxidation, light exposure and loss of carbon dioxide, and a shelf life expectancy similar to glass.





Faster-cycling processing machinery and lighter-weight packaging have led to significant changes in the quality and physical form of masterbatches. Clariant offers a full range of products suitable for a wide variety of production technologies and dosing systems.

In addition to the traditional granular form offered in sizes ranging from micro to extra large granule size, masterbatches are also available in liquid form, to be used with dedicated dosing systems that Clariant is able to propose to customers.

When the most effective solution is to combine color and additive into one single product, Clariant's range of multi-purpose masterbatches is ideal for improving both the aesthetic appearance and performance of the final product.



In order to improve the likelihood that a successful packaging will be created, Clariant laboratories equipped with machines to produce PET preforms and bottles to customers' high-style specifications. The ability to evaluate the impact of specific colors and effects directly on the finished product dramatically speeds color selection and enhancement, significantly reduces development costs, and eliminates the need to stop production for new product testing.







# Product range

## COLORS

Clariant offers a full range of colors, ideal for the creation of distinctive, award-winning packaging.

### **RENOL®-ne**

#### **Carrier: bottle grade PET**

Standard masterbatches, suitable for use in all types of preform and bottle production machines, whether using any dosing system. The product does not require prior drying and guarantees excellent mixing with the PET resin.

### **RENOL®-ne/C**

#### **Carrier: post-crystallized, bottle grade PET**

Crystallized version of RENOL®-ne.

### **RENOL®-nt**

#### **Carrier: low melting point copolymer polyester**

Masterbatches based on a special grade of low melting point copolymer polyester, ideal for creating packaging with excellent color quality and homogeneity, even with low dosage or limited plastification capabilities.

### **RENOL®-nb**

#### **Carrier: copolymer polyester**

Masterbatches based on a special grade of copolymer polyester, allowing the achievement of excellent color quality and homogeneity in containers, even with a low dosage or machines with limited plastification capabilities. No prior drying is required.

### **RENOL®-ng/G**

#### **Carrier: PETG**

Masterbatches specifically developed for coloring PETG.

### **HIFORMER®**

#### **Pigment preparations in liquid form**

Liquid colorants with high concentrations of pigments, based on a carrier highly compatible with PET, HIFORMER® makes it possible to achieve bright colors and optimal color consistency, even at very low dosage rates (between 0.01 and 0.1%).

These products have been formulated to be used with all types of dosing pumps available on the market (peristaltic, gear, screw).

# Product range

## MULTIFUNCTION MASTERBATCHES

CESA®-combi masterbatches offer excellent cost/performance ratio improving both the aesthetic appearance and the performance of the end-product, while also optimizing inventory levels and productivity.

UV resistance, anti-oxidant properties, slip and anti-blocking effects, as well as barrier effects, are some of the polymer modification technologies that can be combined with the coloring properties.

CESA®-combi have been designed to meet specific customer requirements and are available for all the carriers of the RENOL® product range and in liquid form too (HIFORMER®).















## Product range **ADDITIVES**

### UV Absorbers

Our CESA®-light product portfolio includes a range of UV absorbers developed for PET packaging to protect UV-sensitive ingredients like beverages and personal care products.

CESA®-light masterbatches protect against the ultraviolet radiation, which is known to be the cause of alterations in color, odor, taste and nutritional values of the package contents.

Specifically created to prolong product shelf-life, CESA®-light masterbatches are particularly suitable for food packaging in accordance with the most common European and worldwide regulations.

CESA®-light masterbatches are offered at various compositions and concentration of active substances to meet any technical or market requirement.

### UV TRANSMITTANCE PET BOTTLES

Transmittance (%)

100

90

80

70

60

50

40

30

20

10

0

300 310 320 330 340 350 360 370 380 390 400 410 420  
Wavelength (nm)

— CESA®-light 7501 - 1,3%  
— CESA®-light FEA0050148 - 0,15%  
— CESA®-light NEA0050188 - 0,6%

PET bottle wall thickness: 300μ

Among our full product portfolio, CESA®-light 7501 is a standard solution to screen out UV up to 370 - 380 nm.

CESA®-light NEA00501688-ZN offers a more extended protection up to 380 - 390 nm at reduced dosing level.

Least addition rate can be obtained by the cost-performing range of CESA®-light in liquid carrier.

Among our range, CESA®-light FEA0050148-LF and CESA®-light FEA0050169-LF offer superior protection at dosing level as low as 0.06 - 0.15%.



#### **Gas barriers**

CESA®-absorb masterbatches decrease the permeability of PET to oxygen and carbon dioxide. They provide excellent active and passive barrier effect, thus extending shelf-life of food and beverages sensitive to oxidation like beer and wine.

CESA®-absorb OCA0050140-ZN is an efficient solution for PET bottles, providing significant advantages in barrier performance and optical properties.

#### **Acetaldehyde reducers**

Acetaldehyde (AA) is a volatile substance which is known to be the cause of off-taste in bottled water.

With the use of specific CESA®-nox systems, AA content can be reduced to meet the most stringent technical specifications.

CESA®-nox FEA0050162-LF is a highly concentrated AA scavenger, with typical dosing levels as low as 0.05% to 0.15%.





### **Re-heating**

The use of IR absorbers can noticeably shorten preform reheat time. Significant processing cost savings can be obtained with CESA® reheat solutions such as increased productivity and lower energy consumption.

CESA® FEA0050110-LF in liquid carrier and CESA® NEA0050153-MN as microgranule in PET carrier are both cost-efficient solutions at very low dosage.

### **Slip agents**

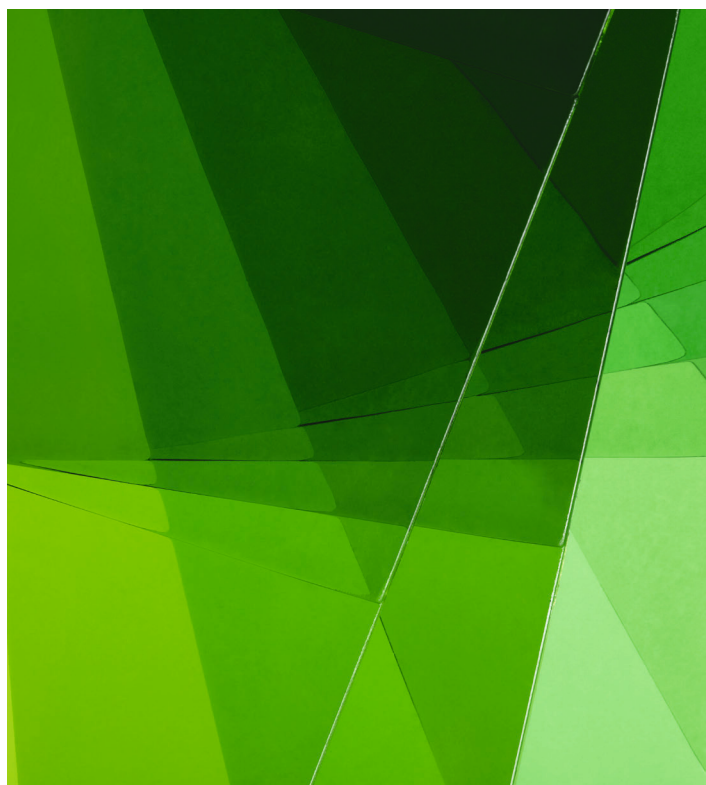
CESA®-slip agents reduce the adhesion of preforms, facilitating mold release, reducing damage and increasing packaging density.

The very low dosing rate, the liquid carrier and process efficiency make CESA®-slip FEA0050133-LF and CESA®-slip FEA0050179-LF a valuable solution for converters.

CESA®-slip NEA0050289, in PET carrier, helps to reduce friction between preform and improve blowing properties of the bottles.







### Special effects

Clariant is synonymous with color innovation and is the ideal partner in predicting future market trends. If your objective is to create innovative and distinctive packaging, our CESA® range of additives and RENOL® range of pigment preparations will open the door to a wide range of special effects, such as satin-finish, mother-of-pearl, opalescent and ice-effect surfaces.

#### RENOL® White NT01050140-MN

This innovative masterbatch produces a realistic ice-effect on the finished product, thanks to its special mixture of additives, creating a package that will get noticed. The recommended dosage ranges between 1 and 3%, depending on the desired extent of the effect.



### Anti Yellow

Clariant develop a specific product, able to mask the undertone of r-PET.

The product is HIFORMER® VIOLET FE41050152-LF, to be used at 0.02-0.04% according to the color of r-PET.

The product is available also in granule and microgranule version.

# Physical forms **FOR ANY APPLICATION**

RENOL<sup>®</sup>-ne, RENOL<sup>®</sup>-ne/C, RENOL<sup>®</sup>-nt and CESA<sup>®</sup>-combi are available in three different forms:

- STD: standard granulometry (2.0 x 2.5 mm), ideal for most applications.
- MC: microgranules (1.5 x 2.0 mm), suitable for low dosages (0.05% - 0.15% w/w)
- LG: large granulometry (2.5 x 4.0 mm), recommended for film applications.

All the components used in the production of the above-mentioned masterbatches are carefully selected to guarantee excellent results in terms of coloration and additivation. Their high level of purity and excellent thermal stability ensures color consistency at typical polyester processing temperatures.







In addition to offering the greatest range of products on the market, Clariant can claim many years of partnership with the most important and technologically advanced manufacturers of dosing systems.





# Clariant DOSING SYSTEMS

Our Technical Assistance Service can assist you to identify the most suitable system for your application and technology, in order to ensure the proper and efficient use of RENOL<sup>®</sup>, CESA<sup>®</sup> and HIFORMER<sup>®</sup> masterbatches.



To optimize your use of liquid pigment preparations, Clariant has developed HIFORMER<sup>®</sup> MDS-HG1, an easy-to-use dosing system that ensures excellent color replication at very low dosages.

The system consists of the following components:

- User's interface: 7" touch-screen; signal tower with visual and acoustic signals for functioning and eventual alarms remote monitoring
- Unique size stepper motor without gearbox
- Several types and sizes of pump heads for maximum flexibility: peristaltic, gear, screw
- Data recording on USB drive
- Digital load cell for material quantity monitoring, no-flow alarm, closed-loop dosing control (loss-in-weight "gravimetric" mode)
- Use of 20kg Clariant pails in all available layouts (plastic/metal, with/without PE in-liner)

The use of the premixer (optional) ensures proper mixing of the polyester pellets and HIFORMER<sup>®</sup>-fe liquid and is recommended for deep or opaque colors.

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