Kritilen White® Masterbatches for PET milk bottles

TECHNICAL INFORMATION

KRITILEN® masterbatches for white PET milk bottles are concentrates of colorants in a PET carrier. They offer a convenient way of incorporating colorants in PET bottles, without dust contamination and with good dispersion which is essential for maximum coloring strength and performance.

MARKET DATA

Milk is a valuable and popular food in Europe, where across the continent seven out of ten Europeans drink it regularly. Milk packaging though is a challenging venture because the product is very sensitive and easily destroyed by light, microbes and air. Quite a few packaging solutions have been used for this sensitive product, such as multilayer HDPE bottles and carton packs for ESL (Extended Self Life) or UHT (Ultra High Temperature) milk, in order to decrease the production cost.

In warm climate countries like Spain, UHT milk is preferred due to high costs of refrigerated transportation and "inefficient cooling cabinets". UHT is less popular in Northern Europe and Scandinavia, particularly in Denmark, Finland, Norway, Sweden, the United Kingdom and Ireland. It is also less popular in Greece, where fresh pasteurized milk is the most popular type of milk. In Greece though, ESL and UHT milk gain more and more market share.

A recent development in milk packaging is the use of mono-layer PET bottles, which has helped the dairy producers presenting innovative, appealing and environmentally-friendly packaging. The combination of PET and UHT technology has provided longer shelf life.

PET has significant advantages when compared with alternative milk bottling materials. It offers better protection from odors than HDPE. Special PET grades and additives allowed the production of a lighter, resilient and more cost effective than the traditional 1-litre HDPE bottle for UHT milk. Nevertheless, this was not possible to be accomplished until recently, because no functional light barriers existed for mono-layer PET. Light causes photo-oxidation of riboflavins (B2 and B12 vitamins) and secondary auto-oxidation of milk fats. As a result, the nutritional value and the organoleptic properties (odor and taste) of the milk would deteriorate. It must be noted that even slight changes in odor and taste are not acceptable by the consumers.

Recent studies have proved that the most harmful wavelengths are between 380nm and 550nm, but for optimum conservation, it is also important to hold light penetration between 500nm and 700nm below 2%.

PRODUCTS

Plastika Kritis offers a special product line for the coloration of PET white milk bottles, consisting of the following masterbatches:

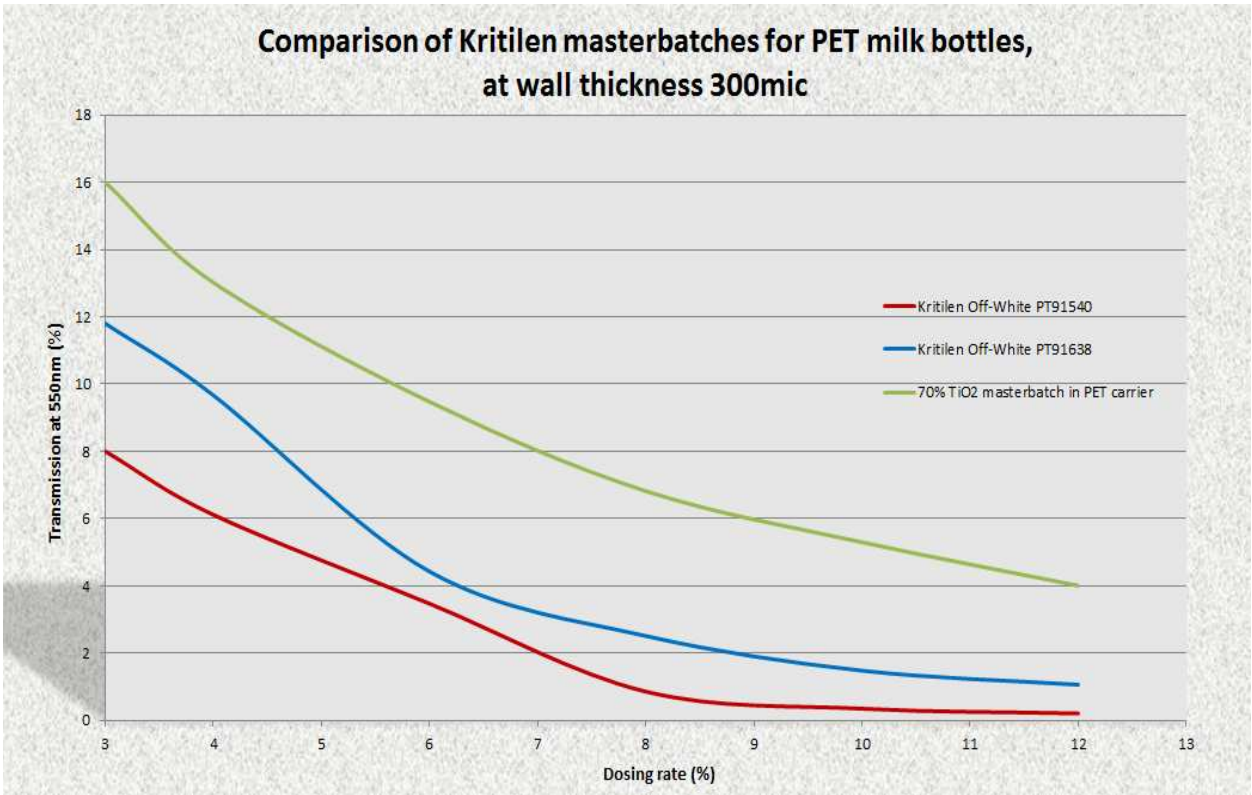
a) KRITILEN® OFF-WHITE PT91540: This masterbatch provides the necessary light barrier according to the requirements mentioned above, for UHT mono-layer milk bottles at an addition rate of 7%-8% (see Graph 1 below). These addition rates assure that the light transmittance at 550nm is below 2% and, thus riboflavins and milk fats are protected. KRITILEN® OFF-WHITE PT91540 is also recommended to be used for ESL PET milk bottles at an addition rate of 3%-4%.

   With KRITILEN® OFF-WHITE PT91540, finest aesthetics and the optimum mechanical strength of PET, along with processing efficiency in preform and bottle production, are now a trouble-free combination.

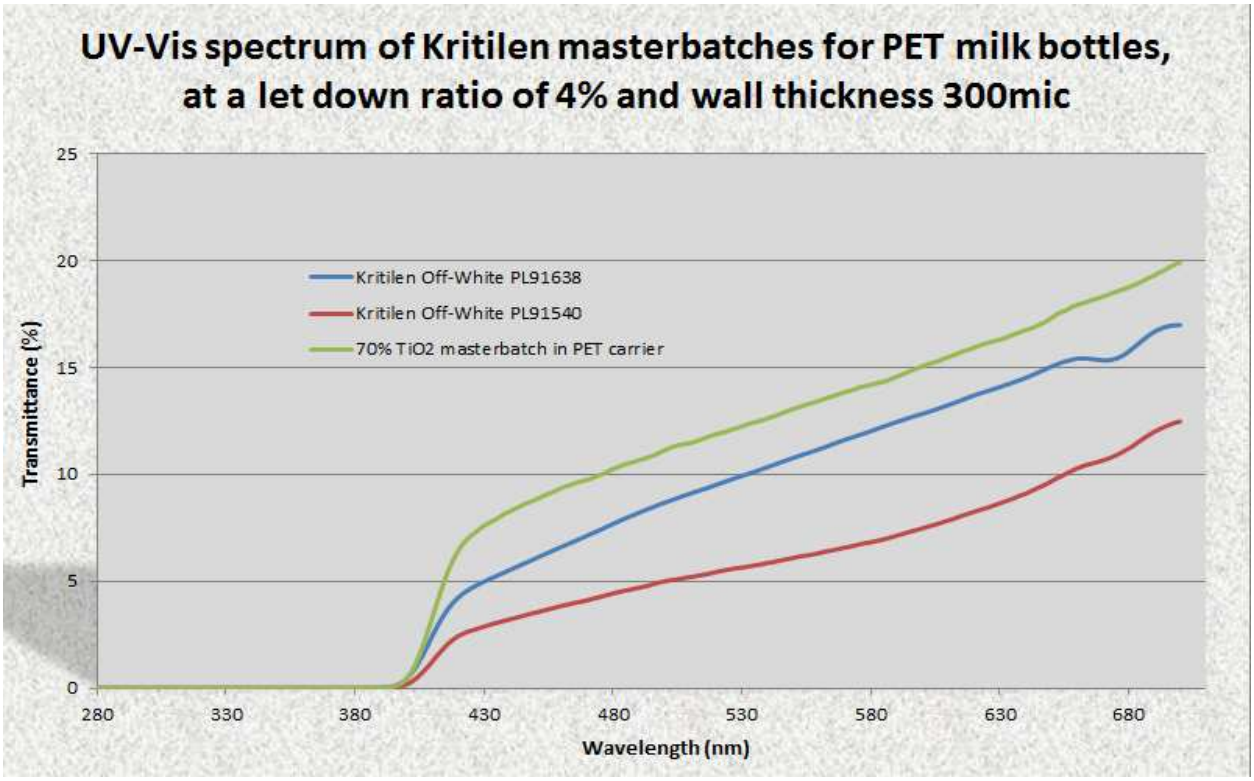
b) KRITILEN® OFF-WHITE PT91638: It is a masterbatch that can be used for both UHT (at addition rates 9%-10%) and ESP (at addition rates 5%-6%) PET milk bottles. It imparts a slightly different undertone than KRITILEN PT91540 to milk bottles.

Due to their special design, these KRITILEN® masterbatches perform much better when used for the coloration of white PET bottle versus a typical 70% TiO_2 masterbatch based on a PET carrier (see Graphs 1, 2 and 3 below), at the same addition rate.

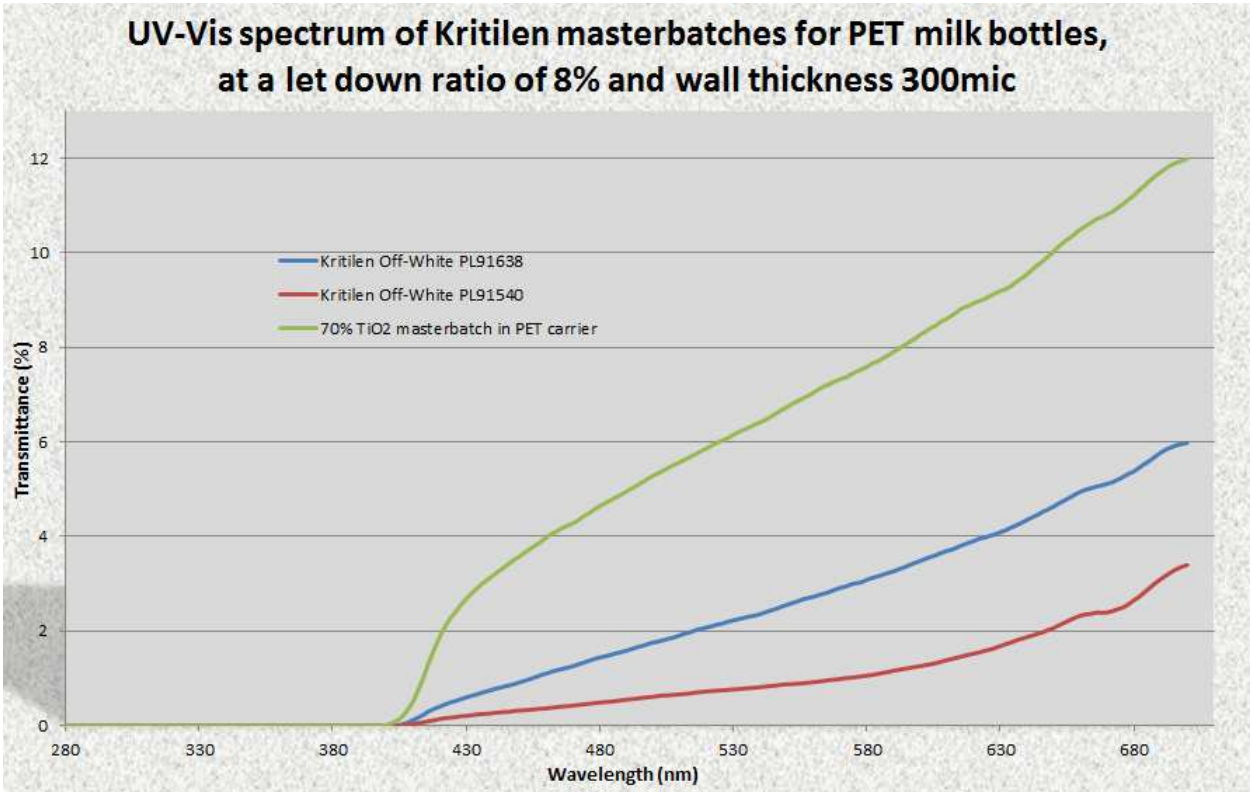
All above products comply to EU Resolution AP(89)1 and Directive 94/62/EC.



Graph 1: Transmittance curves at 550nm at wall thickness of 300mic—Comparison of PET based Kritilen® masterbatches versus a 70% TiO2 PET based masterbatch



Graph 2: Transmittance curves at 280-700nm at a let down ratio of 4% and wall thickness of 300mic—Comparison of PET based Kritilen® masterbatches versus a 70% TiO2 PET based masterbatch



Graph 3: Transmittance curves at 280-700nm at a let down ratio of 8% and wall thickness of 300mic—Comparison of PET based Kritilen® masterbatches versus a 70% TiO2 PET based masterbatch

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