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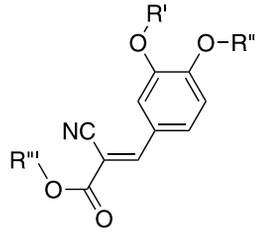
Chiguard® GA403

A Broad Spectrum and Highly Effective UV Blocker

Chiguard® GA403



CAS No. : Proprietary

Introduction

Chiguard® GA403 (GA403) is a novel UV blocker derived from vanillin. It has a remarkably high absorption in the UV-A wavelength region, as shown in Figure 1. Therefore, at 1500 ppm loading in a 1 mm thick PET film, GA403 can block out UV light up to 405 nm, as shown in Figure 2, which indicates that GA403 will have a low impact on the initial color.

The most important property of GA403 is its insolubility in common food ingredients, and it has passed a PET migration test in 10% ethanol, 3% acetic acid, and vegetable oil. The results are shown in Table 1. Meanwhile, GA403 is applying the U.S. food contact substance (FCS) notification.

However, the low solubility of GA403 does not affect its high compatibility with most commodity plastics like PET, PC, PA, PMMA, and PE. GA403 has extraordinary heat stability as shown in Figure 3, which allows it to be used in plastics that are processed at over 300 °C, such as PET, PC, and PA. Chiguard® 380W is recommended for use with GA403 to create a high-efficiency and broad-coverage UV blocking system.

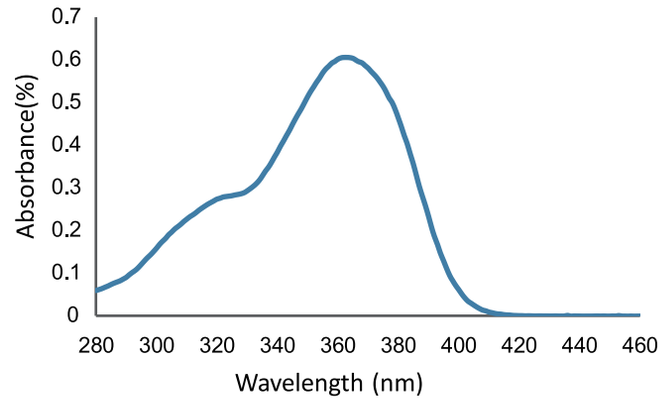
Recommended Applications

1. PET, PC, PMMA, PA, PE
2. UV / Blue light filter
3. Solar Window film
4. Transparent containers of UV-sensitive substances

Physical Data

Appearance	:	Yellow crystalline powder
TGA (10% loss)	:	350 °C min.
Bulk density	:	0.387 g/cm^3
Extinction Coefficient (ε)	:	ca. 4.45x10^4 @ λmax. 363 nm ca. 3.41x10^4 @ 380 nm
Melting point	:	200 - 206 °C

Figure 1. UV-VIS Absorbance spectrum



Concentration: 10 ppm in tetrahydrofuran (THF)

Figure 2. Transmittance spectrum

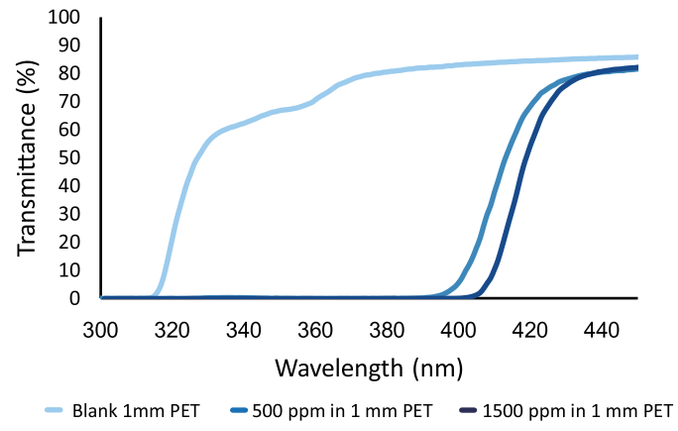
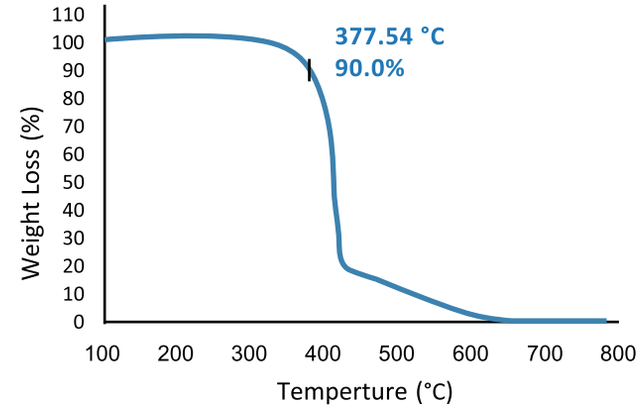


Table 1. Migration Test Results

Food Simulant \ GA403 form	GA403 in film in Simulant*
10% Ethanol	Not detectable** (ND)
3% Acetic Acid	ND
Vegetable oil	ND

* Tests were conducted in a food simulant at 60 °C for 10 days. The results were analyzed by HPLC-UV
** Detection limit: 50 ppb

Figure 3. Thermogravimetric Analysis (TGA)



Conditions:
1. Under Air
2. Heat from 110 °C to 850 °C at 20 °C/min
3. Hold for 5 mins at 850 °C

Strengths of Chiguard® GA403

1. High UV absorption efficiency
2. Excellent thermal stability
3. Low color contribution
4. Non-migration in PET
5. Derived from natural resource