Chiguard® GA403

PRODUCT DATASHEET

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Introduction

Chiguard® GA403 is a UV blocker derived from vanillin, a renewable natural resource. GA 403 has a remarkably high absorption in the UV-A wavelength region, as shown in Figure 1. Therefore, at merely 750 ppm loading in 1 mm thick PET, GA403 can block out all UV-A light up to 400 nm, as shown in Figure 2. In fact, GA403 is 5 times more effective in blocking UV-A light at 400 nm than Chiguard® 326, a commonly used UV blocker, which indicates that GA403 will have a low impact on the initial color.

The most important property of GA403 is that it is basically insoluble in common food ingredients such as acetic acid, ethanol, cooking oil, and water. Due to this, GA403 has passed the EFSA food contact migration test as shown in Table 1. However, the low solubility of GA403 does not affect its high compatibility with most commodity plastics like PET, PC, PA, PMMA, and PP. GA403 has an extraordinary heat stability as shown in Figure 3, which allows it to be used in plastics that are processed at high temperatures, such as PC and PA. Chiguard® 380W is recommended for use with GA403 if UV-B region blockage is also required.

Applications

Chiguard® GA403 is recommended to use in the following applications :

- Sports drink bottles
- Solar window film
- Multi-layer food packaging
- Cooking oil bottles
- Shrink wrap film

Registration Status

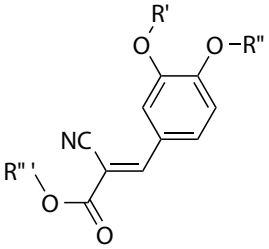
TSCA	:	On-going
REACH	:	Registered
FDA	:	On-going
EFSA	:	On-going

Solubility (g in 100 ml solvent @20 °C)

Dichloromethane	:	<1
Tetrahydrofuran	:	<1
Acetonitrile	:	<1
Toluene	:	<1

Chemical Informaion

Structure



CAS No. : Proprietary

Physical Data

Appearance	:	Yellow crystalline powder
TGA (10% loss)	:	350 °C min.
Melting point	:	200-206 °C
Bulk density	:	0.453 g/cm^3
ε value	:	6.55x10^4 M^{-1}cm^{-1}

Figure 1. Absorbance Spectrum

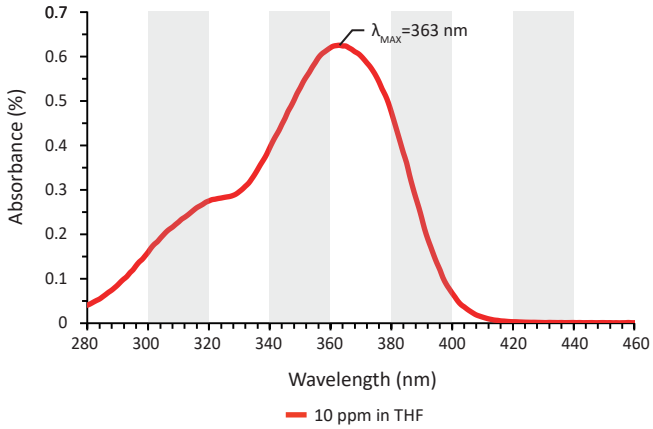


Figure 2. Transmittance Spectrum

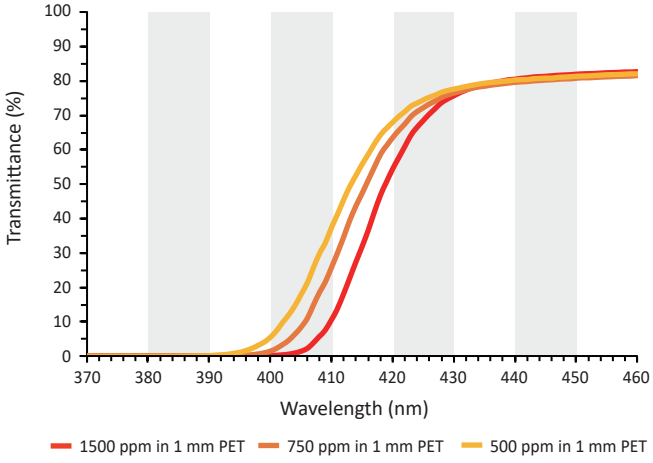
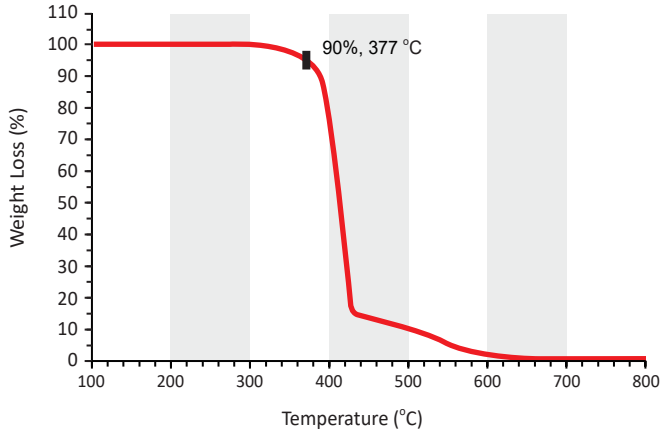


Figure 3. Thermogravimetric Analysis (TGA) Diagram*



* Condition:
1) Air
2) Heat from 110 °C to 850 °C at 20 °C/min
3) Hold for 5 mins at 850 °C

Table 1. Migration Test Results

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

* Test condition is set in food simulant under 60 °C for 10 days, and the results are analyzed by HPLC-UV

** Detection limit : 50 ppb