

Figure 4. Solvent Extraction
Test of UVAs

< 5%

Chiguard® R-455

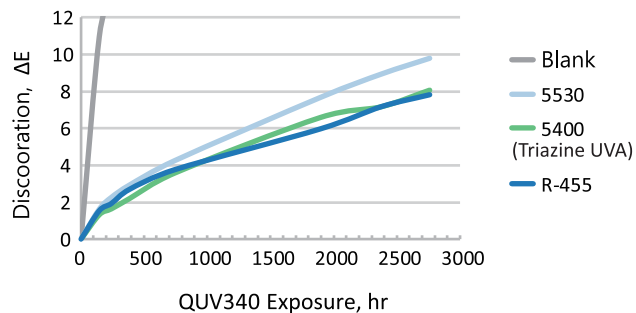
> 99%

Chiguard® 5582

Conditions:

- Dichloromethane, reflux 1hr
- Melamine baking enamel, 25um, UVA= 1%
- Curing: 150 °C, 30mins

Figure 5. Performance comparison
of UVAs



Conditions:

- Aliphatic 2K PU, white base coat, clear top coat (UVA/HALS)
- Curing: 80 °C, 20mins
- UVA= 1%, HALS= Chiguard® 353= 1%
- ASTM-G154

Greener, safer,
and
more effective
Chemistry

chitec

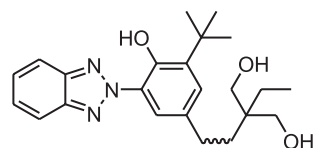
www.chitec.com

16F., No. 51, Sec. 2, Keelung Rd.,
Taipei City 110, Taiwan
sales@chitec.com
+886-2-2700-6678



Chiguard® R-455
A copolymerizable UV absorbing diol

Chiguard® R-455



CAS No. : Proprietary



Introduction

Chiguard® R-455 (R-455) is a novel benzotriazole UV absorber (UVA) that contains a propane diol group. It can react with various hardeners such as isocyanates, melamine resins, and siloxanes.

When used with polyurethane elastomers, R-455 reacts with isocyanates to form covalent bonds and becomes part of the polymer main chain. This completely solves the UVA migration issue that has plagued polyurethane manufacturers for many years. In Figure 1, 2% R-455 MDI-based TPU achieves a yellowing resistance level that is as good as aliphatic TPU after 168 hr QUV340 exposure. When a high-performance UV stabilization system is required, R-455 shows an excellent synergetic effect when combined with CG 1152, a reactive N-OR HALS, and CG 106, an oligomeric HALS, as shown in Figure 2.

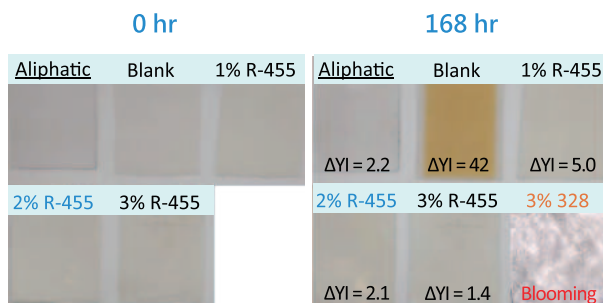
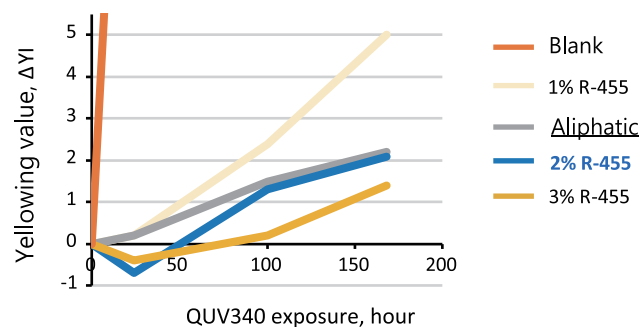
When used in a melamine baking enamel (Figure 4), R-455 has an excellent solvent extraction resistance with an extraction rate <5%, while more than 99% of the additive-type UVA was extracted.

Under ASTM-G154 accelerated aging tests, R-455 shows a performance as good as triazine-type UVA, as shown in Figure 5.

Recommended Applications

1. PUD resin synthesis
2. 2K-PU coating
3. Melamine baking enamel
4. Siloxane resin
5. TPU film/spinning, E-TPU
6. Medical/food contact application

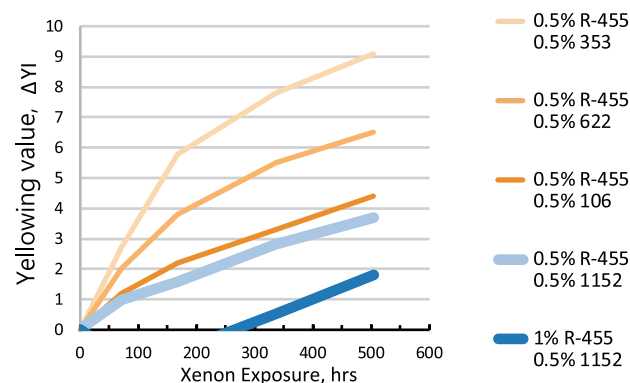
Figure 1. R-455 Aromatic TPU VS. Aliphatic TPU



Conditions:

- PEBA3000/1, 4-BDO/MDI, 90A, 2mm
- UVA 1-3%, w/o HALS
- ASTM-G154

Figure 2. Synergetic Effect of R-455 and HALS



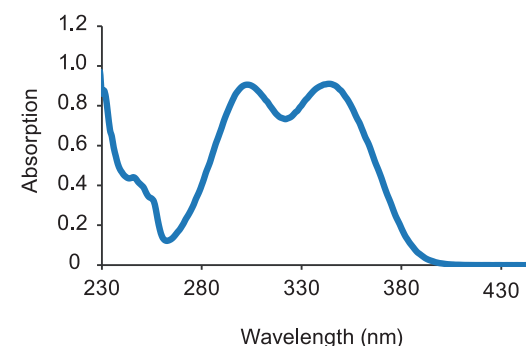
TPU System: PTMEG/BG, NCO/OH=0.99, AO=0.3%, 2mm

Conditions: ASTM-G155

*Chiguard® 1152: CAS NO. = 191743-75-6

**Chiguard® 106: CAS NO. = 82451-48-7

Figure 3. Absorbance spectrum



Conc. : 20 ppm (in Dichloromethane)

Physical Data

Appearance	: Light Yellow powder
Assay	: 98% min.
TGA (10% loss)	: 295 °C
Density	: 0.308 g/cm ³
Melting point	: 115 °C min.
Hydroxyl value	: 242

Solubility (g in 100 ml solvent @25 °C)

1-Methoxy-2-propanol(PM)	: > 10
Methanol	: 10
Xylene	: 1.5

Strengths of Chiguard® R-455

1. Low initial color
2. With OH reactive functional group
3. Long-term weathering resistance
4. Migration resistance
5. Solvent extraction resistance
6. High heat resistance