Greener, Safer

and superior

Chemicals

Waterborne

Chiguard® WB Series

UV Absorbers & HALS

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Water-borne coatings have received huge demand as society and governments put more pressure on environmental protection such as VOC limit. Various new water-borne resins have been developed to meet the market demand. Likewise, water-borne UVAs have become available with a broader range of products.

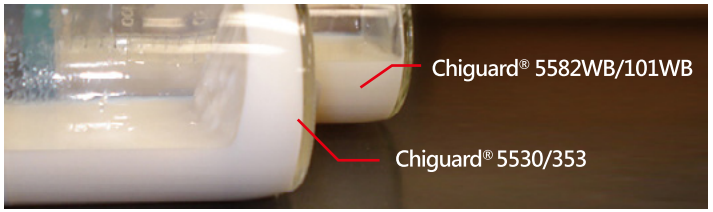
Chiguard® 5530 is the first water-borne UVA as it is easily emulsified. However, it fails in poor storage stability with 2K PUD systems as shown in Figure 1 where precipitation was observed in PUD in the front jar. Chiguard® 5530 also shows low stability against rain washing.

Two new emulsified liquid UVAs, Chiguard® 5582WB, Chiguard® 5400WB and one water-borne HALS Chiguard® 101WB are introduced here. These three products feature improved resin compatibility and coatings storage stability across all water-borne systems, including leading edge 2K PUD systems. The Chiguard® water-borne series easily mix into formulas (Figure 2) without any pre-emulsification like Chiguard® 5530. These products remain stable and in solution unlike water-borne UVAs from previous generation (Figure 1).

All three water-borne UVAs enjoy high stability against rain washing which makes exterior coatings more durable (Figure 3). Other advantages include: high initial gloss, high inter-miscibility among three water-borne UVAs and high miscibility with a wide range of water-borne resins.

These three water-borne UVAs are made by using a proprietary three-dimensional emulsifying technologies. Their properties are described in Table 1. The selection of these water-borne UVAs will allow for a wide range of exterior coatings applications and will meet or exceed the most stringent water-borne coating requirements.

Figure 1. Chiguard® 5530/353 at 1% resin solids caused the PUD precipitation



Chiguard® 5530
Mixture of α-3-(3-(2H-benzotriazol-2-yl)-5-tert-butyl-4-hydroxyphenyl)propionyl-ω-hydroxypoly(oxyethylene) and α-3-(3-(2H-benzotriazol-2-yl)-5-tert-butyl-4-hydroxyhenyl)propionyl-ω-3-(3-(2H-benzotriazol-2-yl)-5-tert-butyl-4-hydroxyphenyl)propionyloxypoly(oxyethylene)
CAS : 104810-48-2 & 104810-47-1

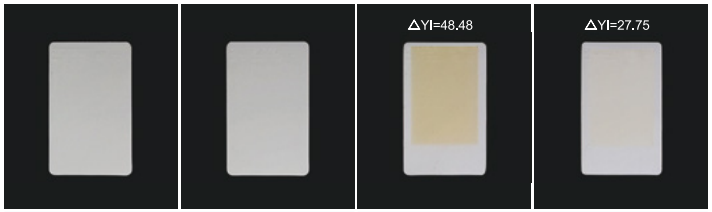
Chiguard® 353
Reaction mass of bis(1,2,2,6,6-pentamethyl-4-piperidyl) sebacate and methyl 1,2,2,6,6-pentamethyl-4-piperidyl sebacate
CAS : 41556-26-7 & 82919-37-7

Table 1. Properties of Chiguard® water-borne series

Chiguard®	5582WB	5400WB	101WB
Appearance	White milky emulsion	Pale yellow milky emulsion	White milky emulsion
Active content	30%	30%	30%
Solid content	31 - 34%	31 - 34%	31 - 34%
Particle size(LD_{50})	< 200 nm	< 200 nm	< 200 nm
pH	6 - 8	6 - 8	6 - 8
Storage temperature	10 - 40 °C	10 - 40 °C	10 - 40 °C
Package	20 kg net/ Plastic pail	20 kg net/ Plastic pail	20 kg net/ Plastic pail
Total VOC	< 1,000 ppm	< 1,000 ppm	< 1,000 ppm

Figure 2. A homogeneous solution of Chiguard® 5582WB in water was achieved simply by gentle stirring

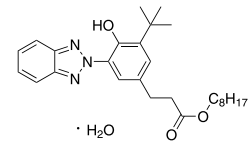
Figure 3. Accelerated weathering test on water-borne coating on ABS plates showed the effectiveness of water-borne UVAs (ASTM G-154)



* 5582WB & 101WB at 1% resin solids were added to water-borne PU

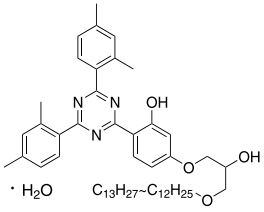
Chiguard® 5582WB

Premier water-borne UVA suitable for most exterior applications.
CAS No. 127519-17-9



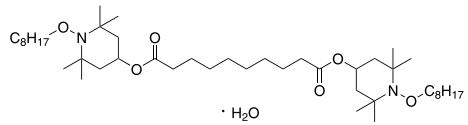
Chiguard® 5400WB

For special purpose coatings that require protection against contact of acid catalyst, acidic residues, acid rain…etc.
CAS No. 153519-44-9



Chiguard® 101WB

Water-borne light stabilizer (HALS), synergist for UVA.
CAS No. 129757-67-1



Recommended applications :

In general, Chiguard® water-borne series can be applied to any water-borne coating to enhance to exterior durability of the coating. Below are those water-borne coating applications, where the enhancements were successfully achieved:

1. Automotive refinish coating
2. Plastics coating on polycarbonate, ABS…etc.
3. Textile coating for exterior durability on water-repellent, color retainsion…etc.
4. Metal coating for roofing and frame.
5. Wood coating

Internal weathering data for above coating applications are available upon request!