



Superior Colorants for the Plastics Industry.

April 27, 2006

Therm -A- Guard
Division of Universal Thermography, Inc.

Re: Weather Testing of of Therm-A- Guard Wildlife Protection
Grade HDPE Plaque

Xenon Arc weathering has been completed on the grey HDPE plaque supplied by Tuthill. A total of 10,000 hours exposure was done according to ASTM G-155 test method, which represents roughly 10 years Florida outdoor exposure. Results, as have been periodically supplied, have ranged from 0.2 dE total color difference to approximately 0.6 dE total color difference. This represents no significant change from the 0 hour standard; as a general rule, any total color difference of less than 1.0 dE is less than can be detected by the average human eye. There was also no appreciable crazing or chalking on the surface of the plaque. In short, no significant change in the color of physical appearance of the part occurred during exposure.

Please feel free to contact me with any questions.

Thank you.

Milton Bain, Jr.

Milton Bain
R&D Chemist
Polymer Color Services

TS04-357: Polymer Color Weathering Performance of HDPE Sample

Polymer Color - HDPE Sample, all exposed intervals											
L* a* b* Values After Exposure in General Spray Xenon # K @63°C											
Sample ID#	Initial	1000hr	2000hr	3000hr	4000hr	5000hr	6000hr	7000hr	8000hr	9000hr	10,000hr
	L*	L*	L*	L*	L*	L*	L*	L*	L*	L*	L*
Grey PE	77.5	77.4	77.6	77.6	77.8	77.8	77.7	77.8	77.2	77.6	77.5
	a*	a*	a*	a*	a*	a*	a*	a*	a*	a*	a*
Grey PE	-1.3	-1.2	-1.2	-1.2	-1.1	-1.1	-1.1	-1.1	-1.2	-1.3	-0.8
	b*	b*	b*	b*	b*	b*	b*	b*	b*	b*	b*
Grey PE	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	1.4	1.3	1.3
Total Operation Hours	0	1004	1989	3018	4040	5059	6034	7033	8040	90006	10012
Total kj/m ²	0	1211	2412	3672	4920	6164	7342	8554	9776	10998	12220
Completion Date	9/21/04	11/9/04	12/27/04	3/2/05	4/18/05	5/31/05	7/11/05	8/22/05	12/20/2005	2/1/2005	3/20/2006

Xenon # K : General Purpose Spray @63°C - serial # CB-2459-F50 - Black panel temperature = 63°C Light;
 Irradiance, W/m² = 0.35 Light; Wet bulb depression = 10°C Light; Conditioning water = 40°C Light,
CAM # 7/ ASTM G155/ Cycle 1
Cycle: 102 minutes light, 16 minutes light and water
Filters: Borosilicate/borosilicate

DCI SF-600 Plus Spectrophotometer - Color : ID# PEF-CO4; serial #13549, D65, 10deg, %R Large Area View SCI UV 400

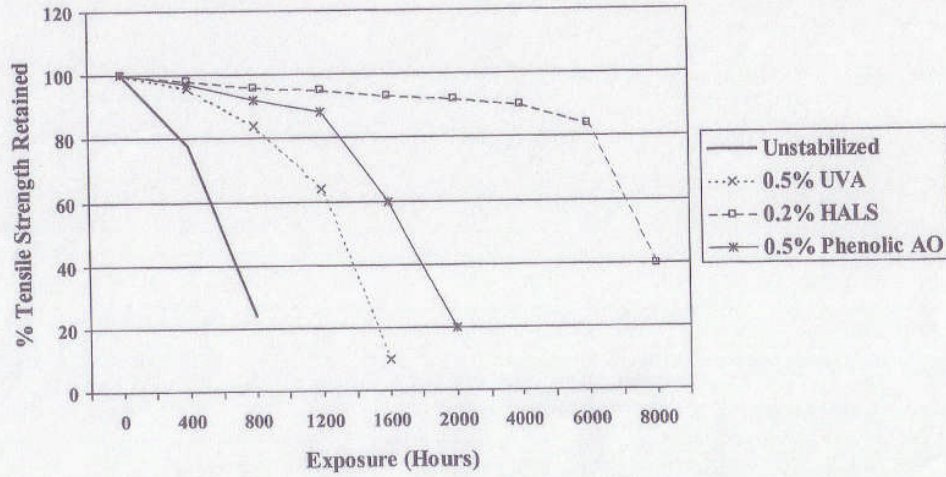
TS04-357: Polymer Color Weathering Performance of HDPE Sample

Polymer Color - HDPE Sample, all exposed intervals										
Delta E Values After Exposure in General Spray Xenon # K @63°C										
Sample ID#	1000hr	2000hr	3000hr	4000hr	5000hr	6000hr	7000hr	8000hr	9000hr	10,000hr
	DE	DE	DE	DE	DE	DE	DE	DE	DE	DE
Grey PE	0.2	0.2	0.2	0.3	0.4	0.3	0.4	0.59	0.44	0.53
Total Operation Hours	1004	1989	3018	4040	5059	6034	7033	8012	9023	10052
Total kj/m ²	1211	2412	3672	4920	6164	7342	8554	9776	10998	12220
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DCI SF-600 Plus Spectrophotomer - Color : ID# PEF-CO4; serial #13549, D65, 10deg, %R Large Area View SCI UV 400

UV Stability - Polypropylene



Source: Plastics Additives Handbook, 5th Ed. "Stabilization of Selected Plastics, PP"; p. 249 (2000) - Unfilled PP films

Therm-A-Guard's Contain .75% HALS UV Stabilizer
(Nearly 4 times the amount in the above result table)



Superior Colorants for the Plastics Industry.

July 12, 2004

Enrique Yaffar
ChemiCorp, Inc.
5805 Blue Lagoon Drive
Suite 447
Miami, FL 33126

Enrique;

I have received the analysis results on the plaques you forwarded from Tuthill. Our supplier did an analysis to quantify the presences of the UV protection package. Our supplier ran two separate tests to verify results. The target was 0.75% additive in the final plaque, and the results were 0.70% and 0.72%. These results are well withing the variance of the test, and indicate that the target amount is indeed present in the samples.

Please feel free to contact me with any questions.

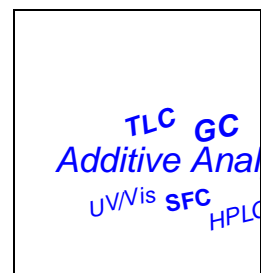
Thank you.

Milton Bain
R&D Chemist
Polymer Color Services



Ciba

Additive Analysis Laboratory Report



Request Number: TSR04-251
Charge Number: PPT-TS04-251
References: 2006

Requester: D. Pietzak
Analyst: B. Jackson
Date: 7/06/04

Background: Polymer Color has gained new business with Tinuvin 783. They would like to confirm the level of Tinuvin 783 (Chimassorb 944 and Tinuvin 622) in a plaque sample. The total level of the components is expected at approximately 0.75 wt.%.

Results:

Component	Level in Concentrate (wt.%)	
	A	B
Chimassorb 944	0.36	0.36
Tinuvin 622	0.34	0.36
Tinuvin 783 (Total)	0.70	0.72

The additives were identified based on retention time comparison only and results were calculated using an external standard technique.