



The Textile and Flexible Plastics group of SAE has recently conducted a round robin laboratory test to generate performance targets and tolerances for a new Lot of polystyrene (PS) weathering reference materials. The data tables on the following page present these values determined from a recent Round Robin on PS chips used as weathering reference materials in **SAE J2527** ("Performance Based Standard for Accelerated Exposure of Automotive Exterior Materials Using A Controlled Irradiance Xenon-Arc Apparatus") and **SAE J2412** ("Accelerated Exposure of Automotive Interior Trim Components Using a Controlled Irradiance Xenon-Arc Apparatus").

A round robin test was conducted in 2006 to determine performance limits for Lot 8, the previous lot of polystyrene weathering reference materials. Supplies from this lot are critically low and thus a new lot (Lot 9) of the PS chips was produced. A preliminary study indicated that this new Lot would be suitable for use, so a full study was conducted to determine if the new lot provides repeatable & reproducible results, and what control limits should be established for the PS yellowing values, referred to as Delta b (Δb^*).

Data was collected by 15 different laboratory testers. Control limits for PS Lot 9 were determined by taking mean values for each radiant dosage and allowing approximately two standard deviations high and two standard deviations low. The control limits were adjusted slightly from two standard deviations for linearity. Three sets of data are provided in accordance with the specifications in the standard: SAE J2527 with Daylight filters, SAE J2527 with Extended-UV filters, and SAE J2412 with Extended-UV filters. Unlike previous Lots, it was decided not to define an upper and lower limit after just one day of testing, given the inherent variability in that short test period. The data from the round robin study generated broader tolerances for Lot 9 PS than for Lot 8. One reason for this is that the J2527 Daylight limits are based on a very small statistical sample, and thus should be considered only as guidelines and not requirements.

Improved weathering test technology/controls and standards have led to a de-emphasis of PS reference materials, which are now used primarily to ensure that something isn't grossly wrong with weathering tester setup. Most North American original equipment manufacturers (OEM's) have stopped requiring PS references and the polystyrene validation is optional in the latest published revisions of SAE J2412 and SAE J2527. That said, based on the data collected during the study, these limits seemed to be appropriate as "guard rails" for those laboratories that wish to continue this optional reference procedure.

For additional information or questions regarding this information, please contact me at 800 208 3129, +1 651 225 6959 or e-mail at klosman@ifai.com. For further information on this Round Robin of Polystyrene CHIPS Lot 9, please contact Shawn Meeks at 570 603 0432, 570 603 0433 (fax), or email shawn@testfabrics.com, info@testfabrics.com.

Sincerely,

Kristy Osman, Managing Director, Automotive Materials Association

SAE J2527 - Polystyrene Lot 9 Reference Material Specifications (Sept 2017)

Radiant Dosage (kJ/m ² ·nm @340 nm)	95% Tolerance Interval for Reflectance Δb*, SAE J1960 and J2527 Table C1 Spectra Extended UV Filter			95% Tolerance Interval for Reflectance Δb*, SAE J2527 Table C2 Spectra Daylight Filter		
	Low	Target	High	Low	Target	High
31.6						
63.2	0.40	1.20	2.00	0.50	1.00	1.50
94.8	0.69	1.57	2.45	0.71	1.29	1.86
126.4	0.99	1.94	2.89	0.93	1.57	2.21
158.0	1.28	2.31	3.34	1.14	1.86	2.57
189.6	1.57	2.68	3.79	1.36	2.14	2.93
221.2	1.86	3.05	4.23	1.57	2.43	3.29
252.8	2.16	3.42	4.68	1.79	2.71	3.64
284.4	2.45	3.79	5.13	2.00	3.00	4.00
316.0	2.74	4.16	5.57	2.21	3.29	4.36
347.6	3.04	4.53	6.02	2.43	3.57	4.71
379.2	3.33	4.90	6.46	2.64	3.86	5.07
410.8	3.62	5.27	6.91	2.86	4.14	5.43
442.4	3.91	5.64	7.36	3.07	4.43	5.79
474.0	4.21	6.01	7.80	3.29	4.71	6.14
505.6	4.50	6.38	8.25	3.50	5.00	6.50

SAE J2412 - Polystyrene Lot 9 Reference Material Specifications (Sept 2017)

Radiant Dosage (kJ/m ² ·nm @ 340 nm)	95% Tolerance Interval for Reflectance Δb*, SAE J1885 and J2412 Extended UV Filter		
	Low	Target	High
37.6			
75.2	1.30	2.40	3.50
112.8	1.78	3.03	4.29
150.4	2.26	3.66	5.07
188.0	2.74	4.30	5.86
225.6	3.21	4.93	6.64
263.2	3.69	5.56	7.43
300.8	4.17	6.19	8.21
338.4	4.65	6.83	9.00
376.0	5.13	7.46	9.79
413.6	5.61	8.09	10.57
451.2	6.09	8.72	11.36
488.8	6.56	9.35	12.14
526.4	7.04	9.99	12.93
564.0	7.52	10.62	13.71
601.6	8.00	11.25	14.50

Note: A very special “Thank you” goes out to Mr. Tom Loseth from Lear Corporation / Eagle Ottawa for his time in performing the statistical analysis for this Round Robin evaluation. Another special thanks are due to ALL those who participated in this study. Most of all, thanks for all the patience shown by ALL those involved in seeing this project to its completion.

Testfabrics, Inc.

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CERTIFICATE OF CONFORMITY

Product Code: *CHIP*

Description: *Polystyrene Reference Plastic Standard Chips for use with Xenon Arc Weatherometer*

Product Lot Number: 2

Product Certification

It is to certify that above mentioned product has been evaluated according to the standards and conform to the specifications for manufacturing and performance outlined in:



SAE J2527, SAE J2412, SAE J1960 and SAE J1885” found to be in compliance with the specifications outlined by IFAI/Automotive Materials Association Standard Reference Material.



Other Domestic, International and Corporate Test Methods where specified.

Our Assurance

Test Materials supplied by Testfabrics, Inc. are tested by Testfabrics in house lab as well as approved ISO Certified Labs. Each production Lot is tested under strict performance testing to ensure that products fit the specifications.

Trackable Lot Numbers

Testfabrics products are marked with identifiable lot numbers. This lot number is the key identification of the product, if you have any questions please advise us the lot number.

A handwritten signature in blue ink, appearing to read 'Thomas A. Klaas'.

Thomas A. Klaas,
Technical Director

Testfabrics, Inc. | 415 Delaware Ave, West Pittston, PA 18643 USA
Tel: +1 (570) 603 0432 | Fax: +1 (570) 603 0433 | Email: info@testfabrics.com
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