Validation of Real Life Silicone Array Efficiency Gains

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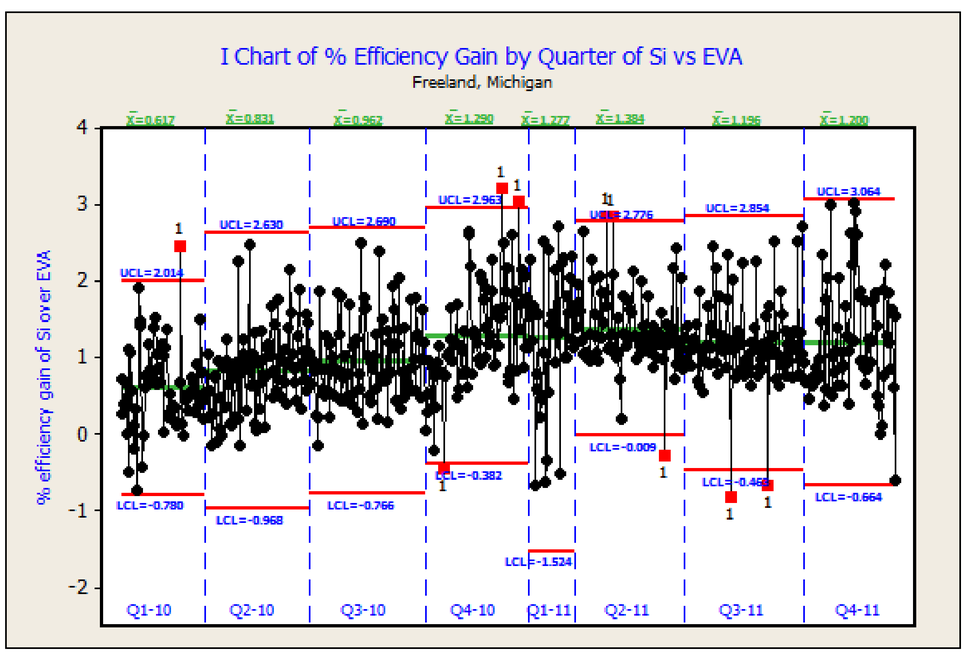
Dow Corning Corporation Installed Array Field Studies

Dow Corning SSAC in Freeland, Michigan

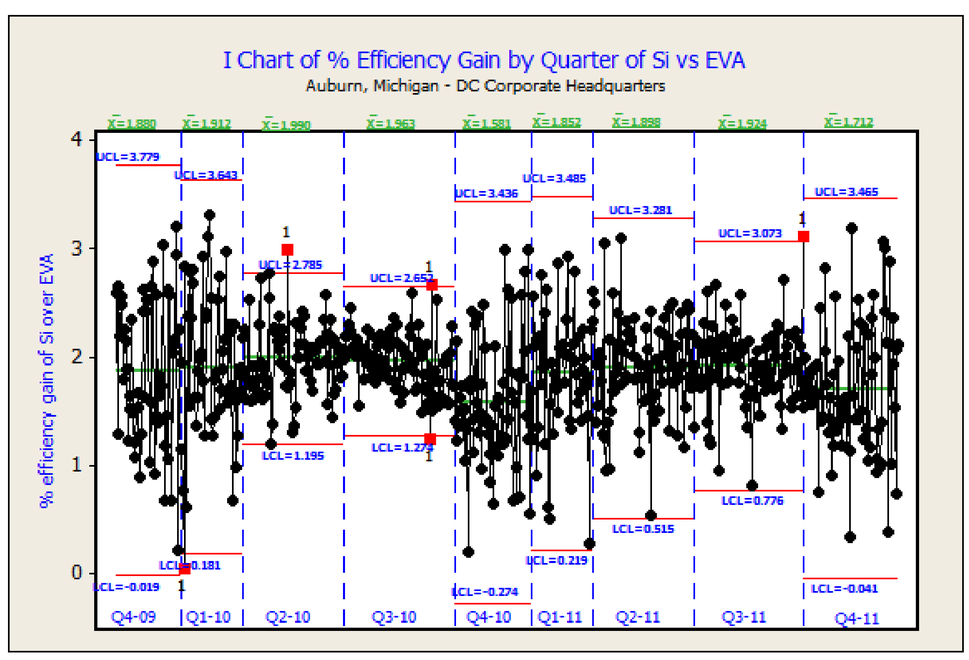
10 kWp - Multi-crystalline (5 kWp Si & 5kWp EVA)

Dow Corning in Auburn, Michigan

30 kWp - Mono-crystalline (15 kWp Si & 15kWp EVA)



1.1% average efficiency gain since Q4-2009



1.9% average efficiency gain since Q4-2009

Field study results are able to be validated in the lab utilizing a sun simulator certified below 400nm, previously not possible due to instrumentation that filtered out the UV spectrum. The inherent properties of silicone allow the cells to utilize light below 400nm independent of cell type or size.

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on
Solar Simulator Performance Measurement
Dow Corning Corporation
Freeland, MI 48623, USA

The spectral irradiance curves are shown in Figures 1 and 2. The diagrams also include a comparison between spectral irradiances of the Xenon flash lamp and the AM 1.5 reference spectral irradiance distribution (IEC 60904-3 Ed. 2). The results of spectral match classification are summarised in Table 2. They prove that **Class A** requirements of IEC 60904-9 are fulfilled.

Flasher setting No.	Irradiance level [W/m²]	Power setting		Spectral irradiance evaluation: Wavelength range [nm]	Spectral match	Class
1 / 1	1000	85.0%		400-500	1.03	A
				500-600	0.92	A
				600-700	0.95	A
				700-800	0.99	A
				800-900	1.05	A
				900-1100	1.10	A
1 / 1	500	85.0%		400-500	0.99	A
				500-600	0.89	A
				600-700	0.92	A
				700-800	0.96	A
				800-900	1.17	A
				900-1100	1.14	A

Table 2: Results of spectral match calculation, pulsed solar simulator PSS10

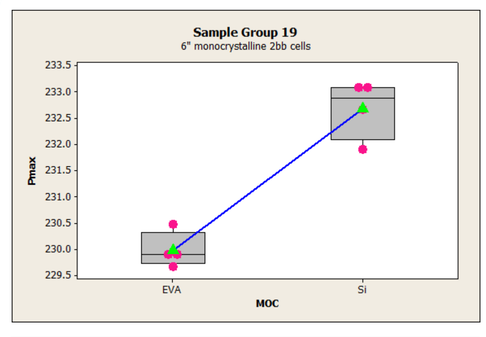
Although this evaluation is not within the scope of IEC 60904-9 Ed. 2, Table 3 shows the results of a comparison of the measured spectra to the AM 1.5 reference spectral irradiance distribution extended to the wavelength interval 300-1100 nm.

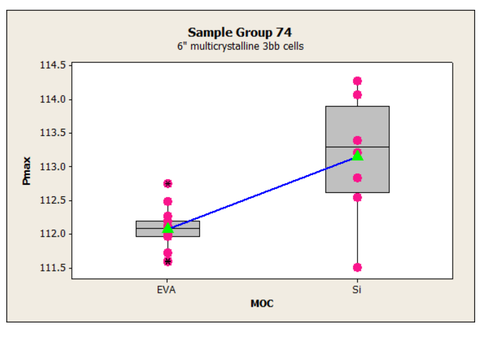
Flasher setting No.	Irradiance level [W/m²]	Power setting		Spectral irradiance evaluation: Wavelength range [nm]	Spectral match	Class
1 / 1	1000	85.0%		300-400	1.14	A
				400-500	1.02	A
				500-600	0.92	A
				600-700	0.94	A
				700-800	0.97	A
				800-900	1.05	A
				900-1100	1.09	A
1 / 1	500	85.0%		300-400	1.07	A
				400-500	0.99	A
				500-600	0.89	A
				600-700	0.92	A
				700-800	0.96	A
				800-900	1.17	A
				900-1100	1.13	A

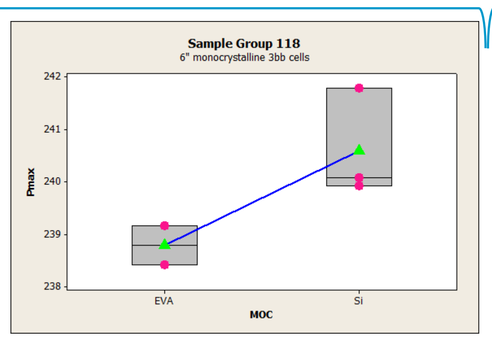
Table 3: Results of spectral match calculation for an extended wavelength interval

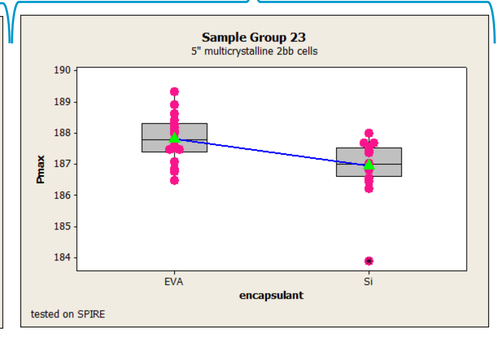
Panels Tested Between 300-1100 nm

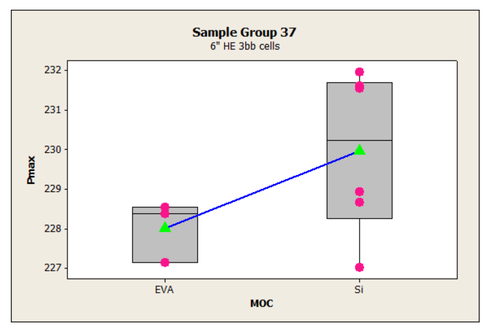
Panels Tested Between 400-1100 nm

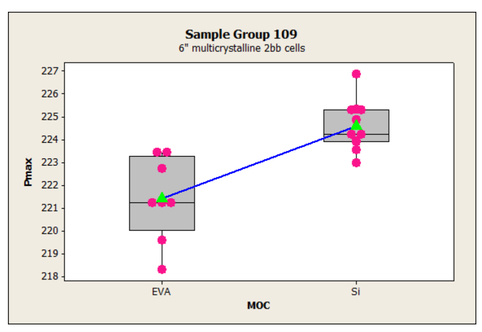


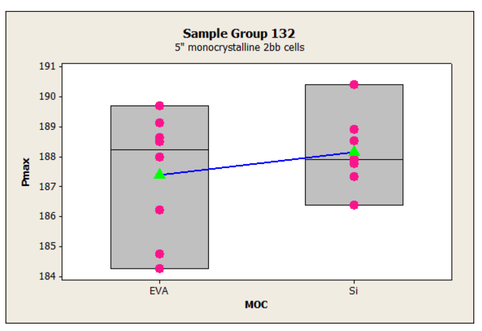


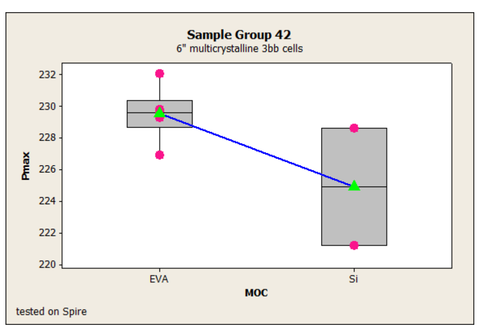


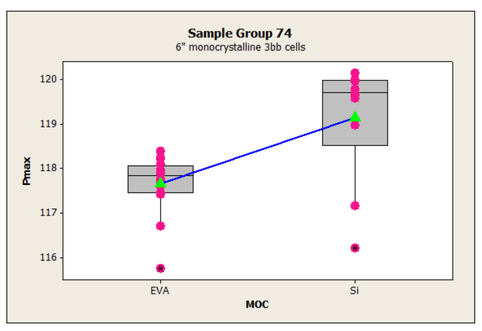


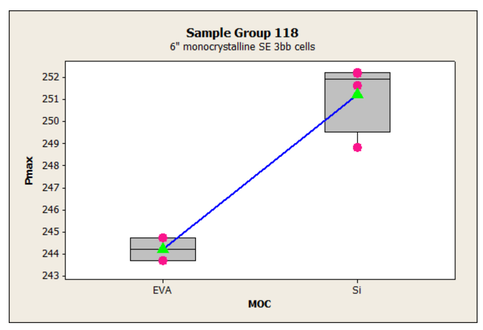


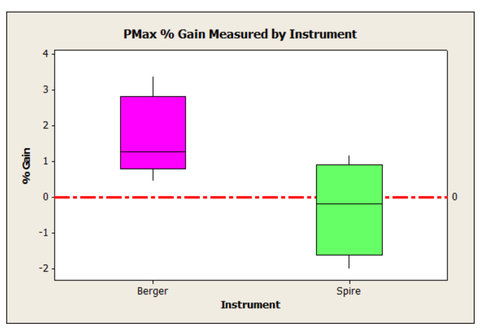


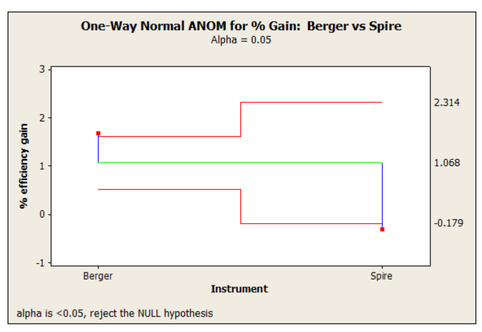












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