

2 November, 2005

Astec Paints Australasia Pty Ltd  
262 Marion Road  
NETLEY SA 5037

Attention: Mr Mark Waters

**REPORT 05MAAD09735-Part 7**  
**Reissue #1 - 1/11/05 – Data Corrections**

CLIENT REFERENCE: Request

TITLE: Astec SRI Test

SAMPLE IDENTIFICATION: Astec Energy Star Metal-Flex GLS/LS S.M.

WORK REQUESTED: Determine Solar Reflectance Index according to ASTM E 1980-01

INVESTIGATING OFFICER(S): Natalie Powell

Monty Luke  
Laboratory Manager  
Materials Services

## 1. INTRODUCTION

Mark Waters of Astec Paints Pty Ltd supplied reflectance and emittance data of Energy Star Metal-Flex GLS/LS S.M. samples of various colours to the Amdel Materials Services Laboratory. It was requested that Amdel should carry out calculations to determine the Solar Reflectance Index according to ASTM E1980 – 01. The samples supplied for evaluation were identified as follows.

- ❖ Energy Star Tile Shield
- ❖ Energy Star colours

## 2. PROCEDURE

The sample data supplied were inserted into the American Cool Roof Rating Council ASTM E 1980-01 calculator and the results reported for three convective coefficients corresponding to low, medium and high wind conditions. Standard solar conditions of Solar Flux = 1000W/m<sup>2</sup> Ambient Air Temp = 310K (37°C), Ambient Sky Temp = 300K (27°C) and no conductive heat transfer were used for all calculations. Each sample used the Emittance value for Energy Star Metal-Flex GLS/LS S.M. white base of 0.90.

## 3. RESULTS

- ❖ Low Wind Conditions

The results of the calculations of the Energy Star Metal-Flex GLS/LS S.M. sample under low wind conditions were as follows.

<u>Colour</u>	<u>SRI (low)</u>	<u>Surface Temp (K)</u>	<u>Surface Temp (°C)</u>	<u>Surface Temp (°F)</u>
White Base	112.55	315	42	107
8068 C/B Heritage Red	41.47	354	81	178
8069 Red Iron Oxide	43.45	353	80	176
8070 Terracotta	47.95	350	77	171
8071 Clay Tone	53.68	347	74	166
8072 Warm Clay	70.94	338	65	149
8073 Tuscany	79.84	333	60	140
8074 C/B Ironbark	45.56	352	79	174
8075 Pioneer	30.08	360	87	189
8076 Regal Brown	42.92	353	80	176
8077 Yallara Brown	40.81	354	81	178
9078 C/B Weathered Copper	43.58	353	80	175

<u>Colour</u>	<u>SRI (low)</u>	<u>Surface Temp (K)</u>	<u>Surface Temp (°C)</u>	<u>Surface Temp (°F)</u>
8079 Charcoal	35.30	357	84	184
8080 C/B Slate Grey	45.17	352	79	174
8082 Nimbus	38.84	355	82	180
8083 C/B Beige	63.89	342	69	156
8084 Merino	83.00	331	58	137
8085 Off White	91.87	326	53	128
8086 Sandalwood	94.66	325	52	125
8087 C/B Smooth Cream	97.18	323	50	123
8088 Mocca	68.36	339	66	151
8089 Stone	83.83	331	58	136
8098 Carraige Green	24.63	363	90	194
8099 Bruns Green	26.32	362	89	192
8100 Mist Green	50.08	349	76	169
8101 C/B Rivergum	50.74	349	76	168
8102 Olive Green	43.98	352	79	175
8103 Blue Grass	39.49	355	82	179
8104 Botanic	28.91	361	88	190
8105 French Green	63.35	342	69	156
8108 C/B Mountain Blue	25.80	362	89	193
8081 C/B Birch Grey	74.63	336	63	145
8094 Quarry	71.35	338	65	148
8095 Mid Biscuit	84.66	330	37	135
8097 Light Latte	86.60	329	56	133
8106 C/B Saltbush	65.92	341	68	154
8107 Cobalt	36.61	356	83	182
8110 Pewter	72.58	337	64	147
8111 Autumn	72.85	337	64	147
8112 Chino	72.44	337	64	147
8091 Broken White	101.10	321	48	119
8092 Neutral White	97.18	323	50	123

<u>Colour</u>	<u>SRI (low)</u>	<u>Surface Temp (K)</u>	<u>Surface Temp (°C)</u>	<u>Surface Temp (°F)</u>
8093 Pale Biscuit	92.85	326	53	127
8096 Light Cream	97.46	323	50	122
809 Gull Grey	83.00	331	58	137

❖ Medium Wind Conditions

The results of the calculations of the Energy Star Metal-Flex GLS/LS S.M. sample under medium wind conditions were as follows.

<u>Colour</u>	<u>SRI (medium)</u>	<u>Surface Temp (K)</u>	<u>Surface Temp (°C)</u>	<u>Surface Temp (°F)</u>
White Base	112.61	313	40	104
8068 C/B Heritage Red	41.91	340	67	152
8069 Red Iron Oxide	43.88	339	66	150
8070 Terracotta	48.36	337	64	147
8071 Clay Tone	54.06	335	62	143
8072 Warm Clay	71.23	328	55	132
8073 Tuscany	80.08	325	52	126
8074 C/B Ironbark	45.99	338	65	149
8075 Pioneer	30.58	344	71	159
8076 Regal Brown	43.36	339	66	151
8077 Yallara Brown	41.26	340	67	152
9078 C/B Weathered Copper	44.01	339	66	150
8079 Charcoal	35.77	342	69	156
8080 C/B Slate Grey	45.59	338	65	149
8082 Nimbus	39.30	341	68	154
8083 C/B Beige	64.22	331	58	137
8084 Merino	83.23	324	51	124
8085 Off White	92.05	321	48	118
8086 Sandalwood	94.82	320	47	116
8087 C/B Smooth Cream	97.32	319	46	114
8088 Mocca	68.66	329	56	134

<u>Colour</u>	<u>SRI (medium)</u>	<u>Surface Temp (K)</u>	<u>Surface Temp (°C)</u>	<u>Surface Temp (°F)</u>
8089 Stone	84.05	324	51	123
8098 Carraige Green	25.17	346	73	163
8099 Bruns Green	26.84	345	72	162
8100 Mist Green	50.48	336	63	146
8101 C/B Rivergum	51.14	336	63	145
8102 Olive Green	44.41	339	66	150
8103 Blue Grass	39.95	340	67	153
8104 Botanic	29.42	344	71	160
8105 French Green	63.68	331	58	137
8108 C/B Mountain Blue	26.32	345	72	162
8081 C/B Birch Grey	74.90	327	54	129
8094 Quarry	71.64	328	55	132
8095 Mid Biscuit	84.88	323	50	123
8097 Light Latte	86.80	323	50	121
8106 C/B Saltbush	66.24	330	57	135
8107 Cobalt	37.08	341	68	155
8110 Pewter	72.86	328	55	131
8111 Autumn	73.13	328	55	131
8112 Chino	72.72	328	55	131
8091 Broken White	101.23	317	44	112
8092 Neutral White	97.32	319	46	114
8093 Pale Buscuit	93.02	320	47	117
8096 Light Cream	97.60	319	46	114
809 Gull Grey	83.23	324	51	124

## ❖ High Wind Conditions

The results of the calculations of the Energy Star Metal-Flex GLS/LS S.M. sample under high wind conditions were as follows.

<u>Colour</u>	<u>SRI (High)</u>	<u>Surface Temp (K)</u>	<u>Surface Temp (°C)</u>	<u>Surface Temp (°F)</u>
White Base	112.67	311	38	101
8068 C/B Heritage Red	42.32	326	53	127
8069 Red Iron Oxide	44.28	325	52	126
8070 Terracotta	48.73	324	51	124
8071 Clay Tone	54.40	323	50	122
8072 Warm Clay	71.50	320	47	116
8073 Tuscany	80.30	318	45	113
8074 C/B Ironbark	46.37	325	52	125
8075 Pioneer	31.04	328	55	131
8076 Regal Brown	43.75	325	52	126
8077 Yallara Brown	41.66	326	53	127
9078 C/B Weathered Copper	44.41	325	52	126
8079 Charcoal	36.20	327	54	129
8080 C/B Slate Grey	45.98	325	52	125
8082 Nimbus	39.71	326	53	128
8083 C/B Beige	64.51	321	48	118
8084 Merino	83.43	317	44	111
8085 Off White	92.21	315	42	108
8086 Sandalwood	94.97	315	42	107
8087 C/B Smooth Cream	97.46	314	41	106
8088 Mocca	68.94	320	47	117
8089 Stone	84.25	317	44	111
8098 Carraige Green	25.65	329	56	133
8099 Bruns Green	27.31	329	56	132
8100 Mist Green	50.84	324	51	123
8101 C/B Rivergum	51.50	324	51	123

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<u>Colour</u>	<u>SRI (High)</u>	<u>Surface Temp (K)</u>	<u>Surface Temp (°C)</u>	<u>Surface Temp (°F)</u>
8102 Olive Green	44.80	325	52	126
8103 Blue Grass	40.36	326	53	127
8104 Botanic	29.88	328	55	131
8105 French Green	63.98	321	48	118
8108 C/B Mountain Blue	26.80	329	56	132
8081 C/B Birch Grey	75.14	319	46	114
8094 Quarry	71.90	319	46	116
8095 Mid Biscuit	85.07	317	44	111
8097 Light Latte	86.99	316	43	110
8106 C/B Saltbush	66.52	321	48	118
8107 Cobalt	37.50	327	54	128
8110 Pewter	73.12	319	46	115
8111 Autumn	73.39	319	46	115
8112 Chino	72.98	319	46	115
8091 Broken White	101.34	313	40	105
8092 Neutral White	97.46	314	41	106
8093 Pale Buscuit	93.18	315	42	108
8096 Light Cream	97.74	314	41	106
809 Gull Grey	83.43	317	44	111