

28 November, 2005

Astec Paints Australasia Pty Ltd
262 Marion Road
NETLEY SA 5037

Attention: Mr Mark Waters

REPORT 05MAAD12331 – Part 1

CLIENT REFERENCE: Request

TITLE: Astec SRI Test

SAMPLE IDENTIFICATION: Astec Energy Star EC-100 TSM

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 Astec Energy Star EC-100 TSM 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.

- ❖ Astec Energy Star EC-100 TSM
- ❖ Astec Energy Star colours

2. PROCEDURE

The sample data supplied was 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/m² 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 Astec Energy Star EC-100 TSM white base of 0.87.

3. RESULTS

- ❖ Low Wind Conditions

The results of the calculations of the Astec Energy Star EC-100 TSM 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	112.14	315	42	108
8068 C/B Heritage Red	40.87	354	81	178
8069 Red Iron Oxide	42.86	353	80	176
8070 Terracotta	47.40	348	78	172
8071 Clay Tone	53.16	348	75	166
8072 Warm Clay	70.54	338	65	149
8073 Tuscany	79.49	333	60	140
8074 C/B Ironbark	44.99	352	79	174
8075 Pioneer	29.41	360	87	189
8076 Regal Brown	42.33	353	80	177
8077Yallara Brown	40.21	355	82	179
8078 C/B Weathered Copper	43.00	353	80	176
8079 Charcoal	34.66	358	85	184
8080 C/B Slate Grey	44.59	352	79	174
8082 Nimbus	38.22	356	83	181

<u>Colour</u>	<u>SRI (low)</u>	<u>Surface Temp (K)</u>	<u>Surface Temp (°C)</u>	<u>Surface Temp (°F)</u>
8083 C/B Beige	63.44	342	69	156
8084 Merino	82.68	331	58	137
8085 Off White	91.61	326	53	128
8086 Sandalwood	94.41	325	52	125
8087 C/B Smooth Cream	96.95	324	51	123
8088 Mocca	67.94	339	66	152
8089 Stone	83.51	331	58	136
8098 Carraige Green	23.93	363	90	195
8099 Bruns Green	25.62	362	89	193
8100 Mist Green	49.54	349	76	170
8101 C/B Rivergum	50.21	349	76	169
8102 Olive Green	43.40	353	80	176
8103 Blue Grass	38.89	355	82	180
8104 Botanic	28.23	361	88	190
8105 French Green	62.89	342	69	157
8108 C/B Mountain Blue	25.10	363	90	193
8081 C/B Birch Grey	74.25	336	63	145
8094 Quarry	70.95	338	65	149
8095 Mid Biscuit	84.35	330	57	135
8097 Light Latte	86.30	329	56	134
8106 C/B Saltbush	65.48	341	68	154
8107 Cobalt	35.98	357	84	183
8110 Pewter	72.18	337	64	147
8111 Autumn	72.46	337	64	147
8112 Chino	72.05	337	64	148
8091 Broken White	100.90	321	48	119
8092 Neutral White	96.95	324	51	123
8093 Pale Buscuit	92.59	326	53	127
8096 Light Cream	97.23	323	50	123
8109 Gull Grey	82.68	331	58	137

❖ Medium Wind Conditions

The results of the calculations of the Astec Energy Star EC-100 TSM sample under medium wind conditions were as follows.

Colour	<u>SRI</u> (medium)	<u>Surface Temp (K)</u>	<u>Surface Temp (°C)</u>	<u>Surface Temp (°F)</u>
White Base	112.24	313	40	104
8068 C/B Heritage Red	41.51	340	67	152
8069 Red Iron Oxide	43.49	339	66	151
8070 Terracotta	47.99	335	64	148
8071 Clay Tone	53.71	335	62	144
8072 Warm Clay	70.96	329	56	132
8073 Tuscany	79.84	325	52	126
8074 C/B Ironbark	45.60	338	65	149
8075 Pioneer	30.13	344	71	160
8076 Regal Brown	42.96	339	66	151
8077Yallara Brown	40.85	340	67	152
8078 C/B Weathered Copper	43.62	339	66	151
8079 Charcoal	35.34	342	69	156
8080 C/B Slate Grey	45.20	338	65	150
8082 Nimbus	38.88	341	68	154
8083 C/B Beige	63.91	331	58	137
8084 Merino	83.00	324	51	124
8085 Off White	91.86	321	48	118
8086 Sandalwood	94.65	320	47	116
8087 C/B Smooth Cream	97.16	319	46	114
8088 Mocca	68.37	330	57	134
8089 Stone	83.83	324	51	123
8098 Carraige Green	24.69	346	73	164
8099 Bruns Green	26.37	345	72	162
8100 Mist Green	50.11	336	63	146
8101 C/B Rivergum	50.77	336	63	146
8102 Olive Green	44.02	339	66	150
8103 Blue Grass	39.54	340	67	153
8104 Botanic	28.96	344	71	161
8105 French Green	63.37	331	58	137
8108 C/B Mountain Blue	25.86	346	73	163

<u>Colour</u>	<u>SRI</u> <u>(medium)</u>	<u>Surface Temp (K)</u>	<u>Surface Temp (°C)</u>	<u>Surface Temp (°F)</u>
8081 C/B Birch Grey	74.64	327	54	130
8094 Quarry	71.36	328	55	132
8095 Mid Biscuit	84.66	323	50	123
8097 Light Latte	86.59	323	50	122
8106 C/B Saltbush	65.94	330	57	135
8107 Cobalt	36.65	342	69	155
8110 Pewter	72.59	328	55	131
8111 Autumn	72.86	328	55	131
8112 Chino	72.45	328	55	131
8091 Broken White	101.08	317	44	112
8092 Neutral White	97.16	319	46	114
8093 Pale Buscuit	92.84	320	47	117
8096 Light Cream	97.44	319	46	114
8109 Gull Grey	83.00	324	51	124

❖ High Wind Conditions

The results of the calculations of the Astec Energy Star EC-100 TSM sample under high wind conditions were as follows.

Colour	<u>SRI</u> <u>(high)</u>	<u>Surface Temp</u> <u>(K)</u>	<u>Surface Temp</u> <u>(°C)</u>	<u>Surface Temp</u> <u>(°F)</u>
White Base	112.32	311	38	101
8068 C/B Heritage Red	42.08	326	53	127
8069 Red Iron Oxide	44.05	325	52	325
8070 Terracotta	48.52	323	51	124
8071 Clay Tone	54.20	323	50	122
8072 Warm Clay	71.33	320	47	116
8073 Tuscany	80.15	318	45	113
8074 C/B Ironbark	46.15	325	52	125
8075 Pioneer	30.78	328	55	131
8076 Regal Brown	43.52	325	52	126
8077Yallara Brown	41.43	326	53	127
8078 C/B Weathered Copper	44.18	325	52	126
8079 Charcoal	35.96	327	54	129
8080 C/B Slate Grey	45.75	325	52	125
8082 Nimbus	39.47	326	53	128
8083 C/B Beige	64.33	321	48	118
8084 Merino	83.30	317	44	111
8085 Off White	92.09	315	42	108
8086 Sandalwood	94.86	315	42	107
8087 C/B Smooth Cream	97.35	314	41	106
8088 Mocca	68.77	320	47	117
8089 Stone	84.12	317	44	111
8098 Carraige Green	25.38	329	56	133
8099 Bruns Green	27.05	329	56	132
8100 Mist Green	50.63	324	51	123
8101 C/B Rivergum	51.29	324	51	123
8102 Olive Green	44.57	325	52	126
8103 Blue Grass	40.13	326	53	127
8104 Botanic	29.62	328	55	131
8105 French Green	63.80	321	48	119
8108 C/B Mountain Blue	26.53	329	56	133

<u>Colour</u>	<u>SRI</u> <u>(high)</u>	<u>Surface Temp</u> <u>(K)</u>	<u>Surface Temp</u> <u>(°C)</u>	<u>Surface Temp</u> <u>(°F)</u>
8081 C/B Birch Grey	74.99	319	46	114
8094 Quarry	71.74	319	46	116
8095 Mid Biscuit	84.94	317	44	111
8097 Light Latte	86.86	316	43	110
8106 C/B Saltbush	66.35	321	48	118
8107 Cobalt	37.26	327	54	128
8110 Pewter	72.95	319	46	115
8111 Autumn	73.22	319	46	115
8112 Chino	72.82	319	46	115
8091 Broken White	101.25	314	41	105
8092 Neutral White	97.35	314	41	106
8093 Pale Buscuit	93.06	315	42	108
8096 Light Cream	97.63	314	41	106
8109 Gull Grey	83.30	317	44	111