

Laboratory Report: Adhesion

Date: 10/10/2014

Project #: 75

Test costs: _____

Project name: Alpolic Testing

Location: _____

Customer: Mitsubishi Plastic Composites America, Inc

Date samples received: _____

Description of samples received and adhesion testing:

(according to ASTM C-794 Test Method for Adhesion in Peel of Elastomeric Joint Sealants and CQP 033 Bead Adhesion Testing - CQP = Corporate Quality Procedure)

8" squares of the following Alpolic Colors

„SHB Blue“ GH32SHB8 (Polyester Painted finish Valspar)

„MBU Blue“ 4mm4MBU8 (FEVE Painted finish Valspar)

„MOD“ silver color (PVDF Painted finish Valspar)

Back side (Wash Coat Valspar – back of MBU)

„Stainless Steel“ 4mmFRHL8 (brushed stainless)

„Zinc“ 4mmFR8AZZ8 (Quartz Zinc)

„Copper“ 4mm8C128

Sikasil® SG 10 White lot 3001039062

Sikasil® SG 15 Black lot 3001076604

Sikasil® N Plus White lot 3001085130

Sikasil® WS 290 Aluminum lot 3001084911

Sikasil® WS 295 Black lot 3001089615

Sikasil® WS 305CN S-6 Gray lot 3000989868

Primer 2100

Method: Peel adhesion panels are prepared following ASTM C-794 Adhesion in Peel Procedure, one inch peel panels were prepared on a cleaned surface (via Isopropyl alcohol/water mixture and two cloth cleaning method), and a cleaned and primed surface of each substrate. Primer was allowed to dry one hour. Note that all substrates should always be cleaned before application. The sealant was allowed to cure for one week at standard laboratory conditions (75°F / 50% RH.). Tensile Properties were determined via Instron. Samples were then exposed to water immersion for one week

For CQP 033, the surfaces were cleaned with an Isopropyl alcohol wipe by the “two cloth method”. A clean, dry, lint free cloth was wetted with the IPA and wiped vigorously over the substrate to remove contaminants. Immediately wipe the cleaned area with the second clean, dry, lint free cloth before the solvent has evaporated. This will allow dirt and contaminants suspended in the solvent, to be lifted and removed. Allow the solvent on the substrate to dry for one hour before proceeding with the adhesion test. Additional sample substrates were primed with Primer 2100 and allowed to dry for a minimum of 10 minutes. The sealant was allowed to cure for one week at standard laboratory conditions (75°F / 50% RH.). After cure, the beads are undercut several times with a sharp instrument like a razor blade, while being pulled at approximately 90 degree angle. The amount of cohesive bonding to the substrate is noted

For CQP 034, the CQP 033 beads are exposed to a sequence of various high temperature extremes and water immersion.

Initial cure is 7 days at standard laboratory conditions (75°F / 50% RH.).

Beads are then subjected to 90F/ 95%RH for 7 days.

Beads are then immersed into a 104F water bath for 7 days.

Finally, the beads are subjected to 158F oven for 7 days.

At the end of entire sequence, the beads are undercut as above noting the amount of cohesive or adhesive failure using the „adhesion code“ chart at the bottom of the data.



Brief Report Summary:

SHB Blue GH32SHB8 (Polyester Painted finish Valspar)

Sikasil® SG 10 IPA wipe - No Primer necessary
Sikasil® SG 15 IPA wipe - No Primer necessary
Sikasil® N Plus IPA wipe - No Primer necessary
Sikasil® WS 290 IPA wipe - No Primer necessary
Sikasil® WS 295 IPA wipe - No Primer necessary
Sikasil® WS 305CN IPA wipe - No Primer necessary

MBU Blue 4mm4MBU8 (FEVE Painted finish Valspar)

Sikasil® SG 10 IPA wipe - No Primer necessary
Sikasil® SG 15 IPA wipe - No Primer necessary
Sikasil® N Plus Primer 2100 required
Sikasil® WS 290 Primer 2100 recommended for water exposure
Sikasil® WS 295 IPA wipe - No Primer necessary
Sikasil® WS 305CN IPA wipe - No Primer necessary

MOD silver color (PVDF Painted finish Valspar)

Sikasil® SG 10 IPA wipe - No Primer necessary
Sikasil® SG 15 IPA wipe - No Primer necessary
Sikasil® N Plus Primer 2100 required
Sikasil® WS 290 IPA wipe - No Primer necessary
Sikasil® WS 295 IPA wipe - No Primer necessary
Sikasil® WS 305CN IPA wipe - No Primer necessary

Back side (Wash Coat Valspar – back of MBU)

Sikasil® SG 10 IPA wipe - No Primer necessary
Sikasil® SG 15 IPA wipe - No Primer necessary
Sikasil® N Plus Primer 2100 required
Sikasil® WS 290 IPA wipe - No Primer necessary
Sikasil® WS 295 IPA wipe - No Primer necessary
Sikasil® WS 305CN IPA wipe - No Primer necessary

Stainless Steel 4mmFRHL8 (brushed stainless)

Sikasil® SG 10 IPA wipe - No Primer necessary
Sikasil® SG 15 IPA wipe - No Primer necessary
Sikasil® N Plus Primer 2100 required
Sikasil® WS 290 IPA wipe - No Primer necessary
Sikasil® WS 295 IPA wipe - No Primer necessary
Sikasil® WS 305CN IPA wipe - No Primer necessary

Zinc 4mmFR8AZZ8 (Quartz Zinc)

Sikasil® SG 10 IPA wipe - No Primer necessary
Sikasil® SG 15 IPA wipe - No Primer necessary
Sikasil® N Plus IPA wipe - No Primer necessary
Sikasil® WS 290 IPA wipe - No Primer necessary
Sikasil® WS 295 IPA wipe - No Primer necessary
Sikasil® WS 305CN IPA wipe - No Primer necessary

Copper 4mm8C128

Sikasil® SG 10 Primer 2100 recommended for water exposure
Sikasil® SG 15 IPA wipe - No Primer necessary
Sikasil® N Plus Primer 2100 recommended for water exposure
Sikasil® WS 290 IPA wipe - No Primer necessary
Sikasil® WS 295 IPA wipe - No Primer necessary
Sikasil® WS 305CN IPA wipe - No Primer necessary



RESULTS:

Paint	Sealant	surface prep	one week RT			one week water		CQP 034
			ASTM C-794		CQP 033	ASTM C-794		CQP 033
			PLI	Adhesion		PLI	Adhesion	
SHB Blue GH325SHB8	SG 10	IPA	19	1	1	45	1	1
		P 2100	21	1	1	39	1	1
	SG-15	IPA	41	1	1	59	1	1
		P 2100	40	1	1	55	1	1
	N Plus	IPA	38	1	1	35	1	1
		P 2100	40	1	1	36	1	1
	WS 290	IPA	34	1	1	45	1	1
		P 2100	35	1	1	41	1	1
	WS 295	IPA	50	1	1	67	1	1
		P 2100	48	1	1	55	1	1
	WS 305CN	IPA	36	1	1	45	1	1
		P 2100	35	1	1	40	1	1
MBU Blue 4mm4MBU8	SG 10	IPA	21	1	1	45	1	1
		P 2100	21	1	1	35	1	1
	SG-15	IPA	44	1	1	45	1	1
		P 2100	40	1	1	39	1	1
	N Plus	IPA	5	5	5	5	5	5
		P 2100	39	1	1	44	1	1
	WS 290	IPA	31	2	2	5	5	5
		P 2100	30	1	1	35	1	1
	WS 295	IPA	45	1	1	56	1	1
		P 2100	45	1	1	55	1	1
	WS 305CN	IPA	39	1	1	43	1	1
		P 2100	40	1	1	40	1	1
"MOD" silver	SG 10	IPA	19	1	1	44	1	1
		P 2100	20	1	1	39	1	1
	SG-15	IPA	47	1	1	60	1	1
		P 2100	45	1	1	58	1	1
	N Plus	IPA	5	5	5	5	5	5
		P 2100	40	1	1	48	1	1
	WS 290	IPA	28	1	1	63	1	1
		P 2100	34	1	1	59	1	1
	WS 295	IPA	44	1	1	60	1	1
		P 2100	41	1	1	58	1	1
	WS 305CN	IPA	34	1	1	39	1	1
		P 2100	30	1	1	44	1	1
(Back white)	SG 10	IPA	22	1	1	47	1	1
		P 2100	21	1	1	44	1	1
	SG-15	IPA	49	1	1	62	1	1
		P 2100	44	1	1	59	1	1
	N Plus	IPA	5	5	3	5	5	5
		P 2100	44	1	1	48	1	1
	WS 290	IPA	30	1	1	55	1	1
		P 2100	31	1	1	42	1	1
	WS 295	IPA	44	1	1	63	1	1
		P 2100	44	1	1	48	1	1
	WS 305CN	IPA	50	1	1	46	1	1
		P 2100	49	1	1	49	1	1



Paint	Sealant	surface prep	one week RT			one week water		CQP 034
			ASTM C-794		CQP 033	ASTM C-794		CQP 033
			PLI	Adhesion		PLI	Adhesion	
"Stainless Steel" 4mmFRHL8	SG 10	IPA	21	1	1	48	1	1
		P 2100	22	1	1	47	1	1
	SG-15	IPA	42	1	1	43	1	1
		P 2100	40	1	1	47	1	1
	N Plus	IPA	42	1	1	5	5	5
		P 2100	42	1	1	48	1	1
	WS 290	IPA	34	2	1	53	1	1
		P 2100	35	1	1	50	1	1
	WS 295	IPA	46	1	1	49	1	1
		P 2100	44	1	1	50	1	1
	WS 305CN	IPA	38	1	1	38	1	1
		P 2100	39	1	1	44	1	1
Zinc 4mmFR8AZZ8	SG 10	None	17	1	1	43	1	1
		P 2100	20	1	1	44	1	1
	SG-15	None	44	1	1	50	1	1
		P 2100	41	1	1	48	1	1
	N Plus	None	38	1	1	39	1	1
		P 2100	40	1	1	41	1	1
	WS 290	None	32	1	1	55	1	1
		P 2100	35	1	1	50	1	1
	WS 295	None	47	1	1	51	2	1
		P 2100	44	1	1	44	1	1
	WS 305CN	None	35	1	1	43	1	1
		P 2100	40	1	1	48	1	1
Copper 4mm8C128	SG 10	IPA	17	1	1	38	4	2
		P 2100	24	1	1	35	1	1
	SG-15	IPA	43	1	1	58	1	1
		P 2100	40	1	1	49	1	1
	N Plus	IPA	37	1	1	37	3	3
		P 2100	40	1	1	44	1	1
	WS 290	IPA	30	1	1	68	1	1
		P 2100	38	1	1	58	1	1
	WS 295	IPA	51	2	1	59	1	1
		P 2100	48	1	1	54	1	1
	WS 305CN	IPA	37	1	1	44	1	1
		P 2100	41	1	1	46	1	1

ASTM C-920; requires 5 PLI peel strength and 75% CF minimum (Adhesion code 2 or lower)
AAMA 802.3 Type I and II; require 5 PLI peel strength and 90% CF minimum (Adhesion code 1)
AAMA 805.2; requires 12.5 PLI peel strength and 90% CF minimum (Adhesion code 1)
Standard cure: 70F / 50% RH

Additional Remarks:

Adhesion code
1 = > 95% cohesive failure
2 = > 75% cohesive failure
3 = > 25% cohesive failure
4 = < 25% cohesive failure
5 = 0% cohesive failure or 100% adhesive failure

Approved by:



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