

ADVP & R										Design Verification PLAN AND REPORT										DVP NUMBER:			DEPT:		
COMPONENT/ASSEMBLY: Weather Striping					P/N:					UPG NO:					PLAN DATE: 3/19/2009			PLAN ORIGINATOR: John McGovern							
MY: Various					APPLICATIONS: Dynamic Weather Strip					ODD BOX SUPPLIER: JYCO Sealing Technologies					CONCURRENCE:			MANAGER APPVL: Benoit Singher							
										SOURCE:					REPORT DATE: 3/31/2009 Rev 5			REPORTING ENGR:							
*** TEST REPORT ***																									
ITEM NO	TASK DESCRIPTION	PROCEDURE OR STANDARD	ACCEPTANCE CRITERIA	TARGET REQUIREMENTS	TASK RESPONSIB	TEST STAGE	SAMPLE		TIMING/SUPP		SAMPLES TESTED			ACTUAL RESULTS	NOTES										
							QTY	TYPE	START	COMPL	QTY	TYPE	PHASE												
1	Hazardous Materials	CS-9003																							
2	Material Testing - TPV (PP-EPDM) JyFlex	SAE J2558 TPV (BP1230, C24, DA27, EL400, SGC920, TMA1, TS05)	JyFlex																						
2.1	Compression Set Plied Slab 22 hours @70 C -BP1230	ISO 815 Type A	40 % max	40%	TPV	ED,DV,PV,CC	3	E	17-Feb-09	2-Mar-09	Lot# 5908174001	E	E	38.1, 37.6, 39.3, 38.4%	Lot # 5308174001										
2.2	Hardness Shore A -DA 27 15 sec	ISO 868	Shore A 45 +/-5(15 second delay)	40-50	TPV	ED,DV,PV,CC	3	E	17-Feb-09	2-Mar-09	Lot# 5908174001	E	E	48,50,44, 49	Lot # 5308174001										
2.30	Specific Gravity - SGC 920	ASTM D 792	0.95-0.99 Max	0.968	TPV	ED,DV,PV,CC	3	E	17-Feb-09	2-Mar-09	Lot# 5908174001	E	E	.956, .987, .977, .965	Lot # 5308174001										
2.4	Tensile strength @ 100% Elongation - TMA0.4	ISO 37 Type 1 Dumbbell	0.4 Mpa Min	0.6 Mpa	TPV	ED,DV,PV,CC	3	E	17-Feb-09	2-Mar-09	Lot# 5908174001	E	E	0.6,0.7,0.7, 0.7,	Lot # 5308174001										
2.5	Tensile strength - TS05	ISO 37 Type 1 Dumbbell	3.5 Mpa Min	5.1 Mpa	TPV	ED,DV,PV,CC	3	E	17-Feb-09	2-Mar-09	Lot# 5908174001	E	E	4.9,4.5,4.7, 4.8	Lot # 5308174001										
2.6	100% Modulus Mpa	ASTM D 412	Mpa 0.4 Min 2.3 Max	1.6	TPV	ED,DV,PV,CC	3	E	17-Feb-09	2-Mar-09	Lot# 5908174001	E	E	2.1, 1.6, 1.8, 1.9	Lot # 5308174001										
3	Material Testing - TPV (PP-EPDM)		TPV-187A-BK																						
3.1	Shore A Durometer 5 Second Delay	ASTM D2240	82-92 Shore A	82-92 Shore A	TPV	DV,PV,CC	1	E	10-Aug-08	2-Sep-08	Sample Lot	E	E	89	Lot # OR080725										
3.2	Tensile Strength, Mpa, min	ASTM D412	12 MPa min	Certified to Spec	TPV	DV,PV,CC	1	E	10-Aug-08	2-Sep-08	Sample Lot	E	E	Pass	Lot # OR080725										
3.3	Elongation, % min	ASTM D412	500 min	500 Min	TPV	DV,PV,CC	1	E	10-Aug-08	2-Sep-08	Sample Lot	E	E	Pass	Lot # OR080725										
3.4	100% Modulus, Mpa	ASTM D412	6.1 Mpa Min	6.1 Mpa Min	TPV	DV,PV,CC	1	E	10-Aug-08	2-Sep-08	Sample Lot	E	E	Pass	Lot # OR080725										
3.5	Tear Strength, %	ISO-34	45 Min	Certified to Spec	TPV	DV,PV,CC	1	E	10-Aug-08	2-Sep-08	Sample Lot	E	E	Pass	Lot # OR080725										
3.6	Compression Set, Max % @ 22 hours 70 Deg C	ISO-815	55 % Max	55% Max	TPV	DV,PV,CC	1	E	10-Aug-08	2-Sep-08	Sample Lot	E	E	54.00%	Lot # OR080725										
3.7	Compression Set, Max % @ 70 hours 125 Deg C	ISO-815	75 % Max	75%	TPV	DV,PV,CC	1	E	10-Aug-08	2-Sep-08	Sample Lot	E	E	75.00%	Lot # OR080725										
3.8	Specific Gravity	ASTM D792	0.95-0.99	0.95	TPV	DV,PV,CC	1	E	10-Aug-08	2-Sep-08	Sample Lot	E	E	0.98	Lot # OR080725										
4	Coextruded Top Layer	SAE J2558 TPV (DD42, PA2V, SGC1050,)	X123-42W242																						
4.1	Specific Gravity	ISO 1183	1.00-1.10	1.05	TPV	ED,DV,PV,CC	1	D	24-Jul-08	29-Aug-08	Lot data	E	E	105 SG	Lot #PJG7654										
4.2	Shore D hardness	ISO 868, 15s	39-45	40	TPV	ED,DV,PV,CC	1	D	24-Jul-08	29-Aug-08	Lot data	E	E	43Shore D	Lot #PJG7654										
4.3	Tensile Strength, Mpa	ISO 37 Type 1	7.0 Min	9.0 Max	TPV	ED,DV,PV,CC	1	D	24-Jul-08	29-Aug-08	Lot data	E	E	8.80	Lot #PJG7654										
4.4	Elongation @ Yield	ISO 37, Type 1	10 min	35	TPV	ED,DV,PV,CC	1	D	24-Jul-08	29-Aug-08	Lot data	E	E	39.00%	Lot #PJG7654										
4.5	Staining Resistance	ISO 3865 Migratory	No Stain	No Stain	TPV	ED,DV,PV,CC	1	D	24-Jul-08	29-Aug-08	Lot data	E	E	No Stain	Lot #PJG7654										

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4.6	U.V. Resistance	SAE J1960 1250 kJ	Delta E of 3.0 or less 585Kj 1500Kj 2031 Kj 2500Kj	Less than 3.0	TPV	ED,DV,PV,CC	1	D	24-Jul-08	29-Aug-08	Lot data	E	E	1.64	Lot #PJG7654										
4.7	Coating thickness			20 to 35micron					10-Mar-09	10-Mar-09	ER production run			26.4 to 31.9 micron	Tested at the plant										
5	General: Weather striping spec (Assembly)	SAE J1960, SAE J1885, SAE J1756, FMVSS302	Per Spec	No deviation unless specified on Catia drawing or comments	JYCO	ED,DV,PV,CC	1	E	9-Jan	4-Feb	Sample Lots	E	E	Pass											
5.1	Regulated substances and recyclability																								
5.2	Hot / Cold Cycle for Bloom		No discoloration or bloom after subjecting part to 2 environmental cycles of A. 48 hours at -40C B. 120 hours at 100C	No bloom or leaching of material	JYCO	ED,DV,PV,CC	3	E	3-Jan-09	23-Feb-09	3	E	E	No evidence of any appearance change	DTL Test Report #4015125										
5.3	Exterior Xenon Light Exposure 2400 kJ/sq m	SAE J1960	Delta E <3.0 or AATCC reading of 4	Less than 3.0	JYCO	ED,DV,PV,CC	3	E	20-Jun	9-Sep	3	E	E		Testing performed by DTL										
5.4	Shrinkage	Dual Extrusion	Shrinkage shall not exceed 0.5%	Less than 0.5%	JYCO	ED,DV,PV,CC	3	E	16-Mar-09	17-Mar-09	3	E	E	Pass	JTL#09-053										
5.5	Sealing Bulb/Lip to Retainer Adhesion		The assembly shall not separate at the closed cell dense joint line.	No failure at material seperation	JYCO	ED,DV,PV,CC	3	E	11-Mar-09	11-Mar-09	2	E	E	Pass no tear at joint line	JTL# 09-048										
5.6	Compression Set		Approval by engineering	65% Target	JYCO	ED,DV,PV,CC	3	E	5-Mar-09	18-Mar-09	3	E	E		JTL# 09-055										
5.7	Flame Resistance	FMVSS302	100mm / Minimum Max burn rate	30mm/minute	JYCO	ED,DV,PV,CC	3	E	16-Mar-09	16-Mar-09	3	E	E	Pass 28mm/min	JTL# 09-052										
5.8	Compression Load Deflection (CLD)		4.5N +/-2N per 100mm	4.5N +/-2N per 100mm	JYCO	ED,DV,PV,CC	3	E	11-Mar-09	11-Mar-09	PER production run	E	E	Pass 3.3N	Tested in the plant										
5.9	I/E Test (Insertion)		< 40N 2.8mm flange per 100mm sample	< 40N 100mm sample	JYCO	ED,DV,PV,CC	3	E	11-Mar-09	11-Mar-09	PER production run	E	E	Pass 39N	Tested in the plant										
5.10	I/E Test (Extraction)		>28N on a 2.8mm flange per 100mm sample	>28N with 2.8mm flange per 100mm	JYCO	ED,DV,PV,CC	1	E	11-Mar-09	11-Mar-09	PER production run	E	E	Pass 37N	Tested in the plant										
5.11	Freeze Release		Requirement per Model	<15N	JYCO	ED,DV,PV,CC	3	E	28-Jan-09	23-Feb-09	3	E	E	Pass No Bond	DTL Test Report #4015125 0% water absorption										
5.12	Adhesion Transfer		No transfer to seal surface. Adhesion 13.3 N.m maximum	13.3N Max	JYCO	ED,DV,PV,CC	3	E	28-Jan-09	23-Feb-09	Sample Lots	E	E	Molding did not adhere or transfer itself to the painted panel	DTL Test Report #4015125 Painted Panel C700 No C Immersion DIW Ecoat: ED6100H Primer: PCV70118 Basecoat: NHU90394 White Clearcoat: CSRC8002										
6	Additional Testing																								

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							QTY	TYPE	START	COMPL	QTY	TYPE	PHASE											
6.1	Outdoor Weathering of Exterior Materials	SAE J1976 ASTM G 147-02	Delta E <3.0 or AATCC reading of 4 Procedure A Exposure at 5 degree south Evaluation ASTM D 714-02 : Method for evaluating degree of blistering of paints ASTM D660-93 (2005) Method for evaluating degree checking of exterior parts ASTM E1331-96 (2003) Test method for reflectance factor and color spectrophotometry using hemispherical geometry ASTM D17929-96 (2003) Practice for visual appraisal of color and color difference of diffusely-illuminated opaque materials ASTM D661-93 (2005) Method for evaluating degree cracking of exterior paints	Less than 3.0	Atlas/JYCO	ED,DV,PV,CC	3	E	27-Jan-08	4-Aug-08	5 parts (1 TPV Primary)	E	E	Color change 8DC Cracks 0 Blisters 0 Checking 0 Delta E 0.37 L -0.25 a 0.19 b 0.20 C -0.27 H -0.06	Atlas Test Report # FS23223 data from 18 month exposure of 24 months Radiant Energy total: 9,134 MJ/m sq; 218,296 Langleys UV: 426 MJ/m sq (295-385mm)									
7	Vehicle Tests																							
7.1	Temperature Cycling			No wave present after thermal cycling	JYCO	ED,DV,PV,CC	3	E	118/2009	25-Feb-09	Sample Lots	E	E	No wave at 23 C, Under humid, -20, 70 C	Slam Test									
7.2	NVH / BSR (A to B comparison with Part cycled thru durability and with previous part)		Digital Sound recording track this is to be done after 4 post shaker test	No degradation no BSR concerns	OEM	ED,DV,PV,CC	1	E			Sample Lots	E	E	Pass	no change to design, incremental verification under item 8.0									
7.3	Door Slam		35,000 cycles ambient, 7,500 hot cycle, 7,500 cold cycle @ 4ft/s, 20 cycles at ambient @ 8ft/s	no failure	OEM	ED,DV,PV,CC	1	E	3-Jan-09	4-Feb-09	Sample Lots	E	E	Pass	Slight wear of coextruded top layer after 100K slams, no cracking Passing results									
7.4	(Water Test)- Use an A -to- B Comparison		30 min soak and 5 min static test	no failure	OEM	ED,DV	1	E			Sample Lots	E	E	Pass	no change to design, incremental verification under 8.1									
7.5	Freeze Test		No ice freeze to panel	Max 15N	OEM	DV,PV,CC	1	E	3-Jan-09	4-Feb-09	3	E	E	Pass	Painted Panel C700 No C Immersion DIW Ecoat: ED6100H Primer: PCV70118 Basecoat: NHU90394 White Clearcoat: CSRC8002									
7.6	Durability Test	Parts on durability vehicles	Good part retention on the flange at all times.	no failure	OEM	ED,DV,PV,CC	1	E	3-Jan-09	4-Feb-09	Sample Lots	E	E	Pass	no change to design, coating thickness increased, so previous vehicle durability test sufficient									
8	Post PPAP DVP testing		BSR	Evaluate condition with build variations	no failure	OEM	ED,DV,PV,CC	PER Vehicles	E	31-Jan-09	18-Mar-09	PER Vehicles	E	E	Pass	NC-4 track / Test track								
8.1		Water Test	Plant off line water booth - regular production test. No leaks	no failure	OEM	ED,DV,PV,CC	PER Vehicles	E	31-Jan-09	18-Mar-09	PER Vehicles	E	E	No leaks on all vehicles tested										
8.2		Overnight Evaluation	Evaluate Retention and appearance	Parts remain on flange, no puckering	OEM	ED,DV,PV,CC	PER Vehicles	E	31-Jan-09	18-Mar-09	PER Vehicles	E	E	Pass										
8.3		Appearance	Review parts with Audit Team	Record and retain boundary samples	OEM	ED,DV,PV,CC	PER Vehicles	E	31-Jan-09	18-Mar-09	PER Vehicles	E	E	Pass										
8.4		Packaging Review	Evaluate packaging effects on part	Give feedback to Jyco	OEM	ED,DV,PV,CC	PER Vehicles	E	31-Jan-09	18-Mar-09	PER Vehicles	E	E	Pass	no change to container, shipping since 7/25/08, no issues									
8.5	Thermal Audit		Extreme temperature (Hot/Cold)	No adverse changes affecting performance/Appearance	OEM	ED,DV,PV,CC	PER Vehicles	E	31-Jan-09	18-Mar-09		E	E	Pass										
PROCEDURE DESCRIPTION		ACCEPTANCE CRITERIA	TARGET REQUIREMENTS	TEST STAGE	SAMPLE TYPE	SAMPLES TESTED	ACTUAL RESULTS	NOTES																
SPECIFY THE GOVERNING TEST PROCEDURE OR PROVIDE A BRIEF DESCRIPTION OF EACH TEST		SPECIFY CYCLES, MILES, VOLTS, MINIMUM VALUES, NO FAILURES ETC.	STATE REQUIRED RELIABILITY OR NO FAILURE	ED = ENGR. DEV. DV = DESIGN VER. PV = PROD. VALID. CC = CONT. CONFORM.	A = PROTO.(COBBLE) B = PROTO.(TOOLED) C = PROGRAM LEVEL D = INITIAL PRODUCT. E= VOLUME PRODUCT.	LIST QUANTITY TESTED, SAMPLE TYPE AND DESIGN PHASE E.G. I,II, ETC.	RESULTS PER TARGET PF RELIABILITY, CONFIDENCE: R90/C90, ETC.	DESCRIBE ANY ELABORATE OR UNIQUE CRITERIA, RESULTS, ETC.																

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