



# FCA PF-10770

## Pressure Sensitive Adhesive – Cellular and Fibrous Materials Automotive Spec Testing

Technical Bulletin

August, 2016

3M tested the following adhesive tapes to the Automotive OEM Spec: FCA PF-10770 Pressure Sensitive Adhesive – Cellular and Fibrous Materials. The results of the testing are provided in the following information. Adhesives not listed on this document have not been tested to this spec.

3M™ Reinforced Adhesive Transfer Tape L1+RT (3.2 mil)

3M™ Double Coated PolyEster Tape L1+DCP (3.5 mil)

3M™ Double Coated PolyEster Tape L2+DCP (4.8 mil)

3M™ Adhesive Transfer Tape L2+T5 (5.0 mil)

3M™ Adhesive Transfer Tape L3+T5 (5.0 mil)

Test	Test Condition / Environment
180° Peel Adhesion on ABS 300mm / 12 inch per min	Table 2 – Initial, 2 hour dwell @ Room Temp
	Table 2 – Aging, 168 hours @ 79°C / 175°F
	Table 2 – Aging, 8 hours @ 93°C / 200°F
	Table 2 – Water Immersion for 24 hours @ Room Temp
	Table 2 – Environmental Cycle (5 cycles) 24 hours @ 79°C / 175°F 24 hours @ 24 hours @ -29°C / -20°F

Flexible Composites (Table 2) = when one or more of the substrates is flexible; thin bond adhesives are primarily used for flexible bonds.

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Adhesive		PU Ester	PU Ether	XLPE Foam	Microcellular Urethane Foam	EPDM Foam	Nitrile Foam	Neoprene Foam	EPDM Rubber	Neoprene Rubber	Santoprene™ Rubber	Butyl Rubber
L1 + RT	2 hours @ Room Temp	P	P	P	P	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Heat Age	P	P	P	P	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Heat	P	P	P	P	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Immersion	P	P	P	P	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Cycle	P	P	P	P	N/A	N/A	N/A	N/A	N/A	N/A	N/A
L1 + DCP	2 hours @ Room Temp	P	P	P	P	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Heat Age	P	P	P	P	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Heat	P	P	P	P	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Immersion	P	P	P	P	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Cycle	P	P	P	P	N/A	N/A	N/A	N/A	N/A	N/A	N/A
L2 + DCP	2 hours @ Room Temp	P	P	P	P	P	P	P	N/A	N/A	N/A	N/A
	Heat Age	P	P	P	P	P	F	P	N/A	N/A	N/A	N/A
	Heat	P	P	P	P	P	P	P	N/A	N/A	N/A	N/A
	Immersion	P	P	P	P	P	P	P	N/A	N/A	N/A	N/A
	Cycle	P	P	P	P	P	F	P	N/A	N/A	N/A	N/A
L2 + T5	2 hours @ Room Temp	P	P	P	P	P	P	P	N/A	N/A	N/A	N/A
	Heat Aged	P	P	P	P	P	P	P	N/A	N/A	N/A	N/A
	Heat	P	P	P	P	P	P	P	N/A	N/A	N/A	N/A
	Immersion	P	P	P	P	P	P	P	N/A	N/A	N/A	N/A
	Cycle	P	P	P	P	P	P	P	N/A	N/A	N/A	N/A
L3 + T5	2 hours @ Room Temp	P	P	P	P	P	P	P	P	P	P	P
	Heat Aged	P	P	P	P	P	P	P	F	P	P	F
	Heat	P	P	P	P	P	P	P	F	P	P	F
	Immersion	P	P	P	P	P	P	P	F	P	P	P
	Cycle	P	P	P	P	P	P	P	P	P	P	P

P = Pass, F = Fail, N/A = Not Tested

# FCA PF-10770: Pressure Sensitive Adhesive – Cellular and Fibrous Materials

## Automotive Spec Testing

### L1 + RT Adhesive

Table 2 – 2 hours @ Room Temp

	Substrate	Substrate	AVG Peel N/m	AVG Peel oz/in	Observation	Requirement 90 N/m / 8.23 oz/in or foam tear
L1+RT Adhesive	PU Ester Foam	ABS	568	51.91	Clean Peel	Pass
	PU Ether Foam		523	47.80	Clean Peel	Pass
	XLPE Foam		243	22.21	Foam Tear	Pass
	Microcellular Urethane Foam		392	35.83	Clean Peel	Pass

Table 2 – 2 hours @ Room Temp

	Substrate	Substrate	AVG Peel N/m	AVG Peel oz/in	Observation	Requirement 90 N/m / 8.23 oz/in or foam tear
L1+RT Adhesive	PU Ester Foam	ABS	814	74.40	Clean Peel	Pass
	PU Ether Foam		577	52.74	Clean Peel	Pass
	XLPE Foam		206	18.83	Foam Tear	Pass
	Microcellular Urethane Foam		487	44.51	Clean Peel	Pass

Table 2 – 8 hours @ 93°C / 200°F

	Substrate	Substrate	AVG Peel N/m	AVG Peel oz/in	Observation	Requirement 330 N/m 30.16 oz/in or foam tear
L1+RT Adhesive	PU Ester Foam	ABS	592	54.11	Clean Peel	Pass
	PU Ether Foam		448	40.95	Clean Peel	Pass
	XLPE Foam		182	16.63	Foam Tear	Pass
	Microcellular Urethane Foam		474	43.32	Cohesive	Pass

Table 2 – Water Immersion for 24 hours @ Room Temp

	Substrate	Substrate	AVG Peel N/m	AVG Peel oz/in	Observation	Requirement 330 N/m / 30.16 oz/in or foam tear
L1+RT Adhesive	PU Ester Foam	ABS	620	56.67	Cohesive	Pass
	PU Ether Foam		588	53.74	Clean Peel	Pass
	XLPE Foam		255	23.31	Foam Tear	Pass
	Microcellular Urethane Foam		520	47.53	Cohesive	Pass

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## L1 + RT Adhesive (Cont.)

Table 2 – Environmental Cycle						
	Substrate	Substrate	AVG Peel N/m	AVG Peel oz/in	Observation	Requirement 330 N/m / 30.16 oz/in or foam tear
L1+RT Adhesive	PU Ester Foam	ABS	695	63.52	Clean Peel	Pass
	PU Ether Foam		561	51.27	Clean Peel	Pass
	XLPE Foam		250	22.85	Foam Tear	Pass
	Microcellular Urethane Foam		504	46.06	Cohesive	Pass

## L1 + DCP Adhesive

Table 2 – 2 hours @ Room Temp						
	Substrate	Substrate	AVG Peel N/m	AVG Peel oz/in	Observation	Requirement 90 N/m / 8.23 oz/in or foam tear
L1+DCP Adhesive	PU Ester Foam	ABS	557	50.91	Clean Peel	Pass
	PU Ether Foam		420	38.39	Clean Peel	Pass
	XLPE Foam		219	20.02	Foam Tear	Pass
	Microcellular Urethane Foam		393	35.92	Clean Peel	Pass

Table 2 – 168 hours @ 79°C / 175°F						
	Substrate	Substrate	AVG Peel N/m	AVG Peel oz/in	Observation	Requirement 330 N/m / 30.16 oz/in or foam tear
L1+DCP Adhesive	PU Ester Foam	ABS	551	50.36	Clean Peel	Pass
	PU Ether Foam		532	48.62	Clean Peel	Pass
	XLPE Foam		214	19.56	Foam Tear	Pass
	Microcellular Urethane Foam		484	44.24	Clean Peel	Pass

Table 2 – 8 hours @ 93°C / 200°F						
	Substrate	Substrate	AVG Peel N/m	AVG Peel oz/in	Observation	Requirement 330 N/m / 30.16 oz/in or foam tear
L1+DCP Adhesive	PU Ester Foam	ABS	330	30.16	Clean Peel	Pass
	PU Ether Foam		408	37.29	Clean Peel	Pass
	XLPE Foam		220	20.11	Foam Tear	Pass
	Microcellular Urethane Foam		475	43.41	Clean Peel	Pass

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## L1 + DCP Adhesive (Cont.)

Table 2 –Water Immersion for 24 hours @ Room Temp						
	Substrate	Substrate	AVG Peel N/m	AVG Peel oz/in	Observation	Requirement 330 N/m / 30.16 oz/in or foam tear
L1+DCP Adhesive	PU Ester Foam	ABS	477	43.60	Clean Peel	Pass
	PU Ether Foam		560	51.18	Clean Peel	Pass
	XLPE Foam		217	19.83	Foam Tear	Pass
	Microcellular Urethane Foam		387	35.37	Cohesive	Pass

Table 2 – Environmental Cycle						
	Substrate	Substrate	AVG Peel N/m	AVG Peel oz/in	Observation	Requirement 330 N/m / 30.16 oz/in or foam tear
L1+DCP Adhesive	PU Ester Foam	ABS	596	54.47	Clean Peel	Pass
	PU Ether Foam		497	45.42	Clean Peel	Pass
	XLPE Foam		233	21.30	Foam Tear	Pass
	Microcellular Urethane Foam		508	46.43	Cohesive	Pass

## L2 + DCP Adhesive

Table 2 – 2 hours @ Room Temp						
	Substrate	Substrate	AVG Peel N/m	AVG Peel oz/in	Observation	Requirement 90 N/m / 8.23 oz/in or foam tear
L2+DCP Adhesive	PU Ester Foam	ABS	692	63.25	Clean Peel	Pass
	PU Ether Foam		658	60.14	Foam Tear	Pass
	XLPE Foam		207	18.92	Foam Tear	Pass
	Microcellular Urethane Foam		419	38.30	Clean Peel	Pass
	EPDM Foam		169	15.45	Foam Tear	Pass
	Nitrile Foam		570	52.10	Clean Peel	Pass
	Neoprene Foam		594	54.29	Clean Peel	Pass

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## L2+ DCP Adhesive (Cont.)

Table 2 – 168 hours @ 79°C / 175°F						
	Substrate	Substrate	AVG Peel N/m	AVG Peel oz/in	Observation	Requirement 330 N/m / 30.16 oz/in or foam tear
L2+DCP Adhesive	PU Ester Foam	ABS	959	87.65	Foam Tear	Pass
	PU Ether Foam		606	55.39	Clean Peel	Pass
	XLPE Foam		199	18.19	Foam Tear	Pass
	Microcellular Urethane Foam		688	62.88	Foam Tear	Pass
	EPDM Foam		235	21.48	Foam Tear	Pass
	Nitrile Foam		159	14.53	Clean Peel	Fail
	Neoprene Foam		626	57.22	Foam Tear	Pass

Table 2 – 8 hours @ 93°C / 200°F						
	Substrate	Substrate	AVG Peel N/m	AVG Peel oz/in	Observation	Requirement 330 N/m / 30.16 oz/in or foam tear
L2+DCP Adhesive	PU Ester Foam	ABS	587	53.65	Clean Peel	Pass
	PU Ether Foam		676	61.79	Foam Tear	Pass
	XLPE Foam		190	17.37	Foam Tear	Pass
	Microcellular Urethane Foam		621	56.76	Foam Tear	Pass
	EPDM Foam		226	20.66	Foam Tear	Pass
	Nitrile Foam		497	45.42	Clean Peel	Pass
	Neoprene Foam		360	32.90	Cohesive	Pass

Table 2 – Water Immersion for 24 hours @ Room Temp						
	Substrate	Substrate	AVG Peel N/m	AVG Peel oz/in	Observation	Requirement 330 N/m / 30.16 oz/in or foam tear
L2+DCP Adhesive	PU Ester Foam	ABS	566	51.73	Clean Peel	Pass
	PU Ether Foam		592	54.11	Foam Tear	Pass
	XLPE Foam		236	21.57	Foam Tear	Pass
	Microcellular Urethane Foam		602	55.02	Foam Tear	Pass
	EPDM Foam		226	20.66	Foam Tear	Pass
	Nitrile Foam		534	48.81	Cohesive	Pass
	Neoprene Foam		861	78.69	Clean Peel	Pass

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## L2 + DCP Adhesive (Cont.)

Table 2 – Environmental Cycle						
	Substrate	Substrate	AVG Peel N/m	AVG Peel oz/in	Observation	Requirement 330 N/m / 30.16 oz/in or foam tear
L2+DCP Adhesive	PU Ester Foam	ABS	915	83.63	Clean Peel	Pass
	PU Ether Foam		602	55.02	Foam Tear	Pass
	XLPE Foam		216	19.74	Foam Tear	Pass
	Microcellular Urethane Foam		635	58.04	Foam Tear	Pass
	EPDM Foam		265	24.22	Foam Tear	Pass
	Nitrile Foam		65	5.94	Cohesive	Fail
	Neoprene Foam		529	48.35	Clean Peel	Pass

## L2 + T5 Adhesive

Table 2 – 2 hours @ Room Temp						
	Substrate	Substrate	AVG Peel N/m	AVG Peel oz/in	Observation	Requirement 90 N/m / 8.23oz/in or foam tear
L2+T5 Adhesive	PU Ester Foam	ABS	903	82.53	Foam Tear	Pass
	PU Ether Foam		607	55.48	Foam Tear	Pass
	XLPE Foam		220	20.11	Foam Tear	Pass
	Microcellular Urethane Foam		504	46.06	Clean Peel	Pass
	EPDM Foam		205	18.74	Foam Tear	Pass
	Nitrile Foam		645	58.95	Clean Peel	Pass
	Neoprene Foam		625	57.12	Clean Peel	Pass

Table 2 – 168 hours @ 79°C / 175°F						
	Substrate	Substrate	AVG Peel N/m	AVG Peel oz/in	Observation	Requirement 330 N/m / 30.16 oz/in or foam tear
L2+T5 Adhesive	PU Ester Foam	ABS	939	85.82	Foam Tear	Pass
	PU Ether Foam		595	54.38	Foam Tear	Pass
	XLPE Foam		168	15.35	Foam Tear	Pass
	Microcellular Urethane Foam		1080	98.71	Foam Tear	Pass
	EPDM Foam		218	19.92	Foam Tear	Pass
	Nitrile Foam		480	43.87	Foam Tear	Pass
	Neoprene Foam		1400	127.96	Foam Tear	Pass

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## L2 + T5 Adhesive (Cont.)

Table 2 – 8 hours @ 93°C / 200°F						
	Substrate	Substrate	AVG Peel N/m	AVG Peel oz/in	Observation	Requirement 330 N/m / 30.16 oz/in or foam tear
L2+T5 Adhesive	PU Ester Foam	ABS	985	90.03	Foam Tear	Pass
	PU Ether Foam		581	53.10	Foam Tear	Pass
	XLPE Foam		168	15.35	Foam Tear	Pass
	Microcellular Urethane Foam		772	70.56	Foam Tear	Pass
	EPDM Foam		197	18.00	Foam Tear	Pass
	Nitrile Foam		568	51.91	Clean Peel	Pass
	Neoprene Foam		496	45.33	Clean Peel	Pass

Table 2 – Water Immersion for 24 hours @ Room Temp						
	Substrate	Substrate	AVG Peel N/m	AVG Peel oz/in	Observation	Requirement 330 N/m / 30.16 oz/in or foam tear
L2+T5 Adhesive	PU Ester Foam	ABS	930	85.00	Foam Tear	Pass
	PU Ether Foam		619	56.58	Foam Tear	Pass
	XLPE Foam		238	21.75	Foam Tear	Pass
	Microcellular Urethane Foam		683	62.43	Clean Peel	Pass
	EPDM Foam		208	19.01	Foam Tear	Pass
	Nitrile Foam		927	84.73	Clean Peel	Pass
	Neoprene Foam		1070	97.80	Foam Tear	Pass

Table 2 – Environmental Cycle						
	Substrate	Substrate	AVG Peel N/m	AVG Peel oz/in	Observation	Requirement 330 N/m / 30.16 oz/in or foam tear
L2+T5 Adhesive	PU Ester Foam	ABS	957	87.47	Foam Tear	Pass
	PU Ether Foam		628	57.40	Foam Tear	Pass
	XLPE Foam		253	23.12	Foam Tear	Pass
	Microcellular Urethane Foam		987	90.21	Foam Tear	Pass
	EPDM Foam		263	24.04	Foam Tear	Pass
	Nitrile Foam		362	33.09	Clean Peel	Pass
	Neoprene Foam		736	67.27	Cohesive	Pass



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## L3 + T5 Adhesive

Table 2 – 2 hours @ Room Temp

	Substrate	Substrate	AVG Peel N/m	AVG Peel oz/in	Observation	Requirement 330 N/m / 30.16 oz/in or foam tear
L3+T5 Adhesive	PU Ester Foam	ABS	856	78.24	Foam Tear	Pass
	PU Ether Foam		565	51.64	Foam Tear	Pass
	XLPE Foam		210	19.19	Foam Tear	Pass
	Microcellular Urethane Foam		662	60.51	Foam Tear	Pass
	EPDM Foam		211	19.28	Foam Tear	Pass
	Nitrile Foam		549	50.18	Cohesive	Pass
	Neoprene Foam		1110	101.45	Foam Tear	Pass
	EPDM Rubber		194	17.73	Clean Peel	Fail
	Neoprene Rubber		735	67.18	Clean Peel	Pass
	Santoprene™ Rubber		476	43.51	Clean Peel	Pass
	Butyl Rubber		282	25.77	Clean Peel	Fail

Table 2- 168 hours @ 79°C / 175°F

	Substrate	Substrate	AVG Peel N/m	AVG Peel oz/in	Observation	Requirement 330 N/m / 30.16 oz/in or foam tear
L3+T5 Adhesive	PU Ester Foam	ABS	946	86.46	Foam Tear	Pass
	PU Ether Foam		590	53.93	Foam Tear	Pass
	XLPE Foam		204	18.64	Foam Tear	Pass
	Microcellular Urethane Foam		754	68.92	Foam Tear	Pass
	EPDM Foam		249	22.76	Foam Tear	Pass
	Nitrile Foam		1230	112.42	Clean Peel	Pass
	Neoprene Foam		1670	152.64	Foam Tear	Pass
	EPDM Rubber		93	8.50	Clean Peel	Fail
	Neoprene Rubber		726	66.36	Clean Peel	Pass
	Santoprene™ Rubber		622	56.85	Clean Peel	Pass
	Butyl Rubber		296	27.05	Clean Peel	Fail

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## L3 + T5 Adhesive (Cont.)

Table 2 – 8 hours @ 93°C / 200°F						
	Substrate	Substrate	AVG Peel N/m	AVG Peel oz/in	Observation	Requirement 90 N/m / 8.23 oz/in or foam tear
L3+T5 Adhesive	PU Ester Foam	ABS	830	75.86	Foam Tear	Pass
	PU Ether Foam		599	54.75	Clean Peel	Pass
	XLPE Foam		223	20.38	Foam Tear	Pass
	Microcellular Urethane Foam		462	42.23	Clean Peel	Pass
	EPDM Foam		213	19.47	Foam Tear	Pass
	Nitrile Foam		558	51.00	Clean Peel	Pass
	Neoprene Foam		642	58.67	Clean Peel	Pass
	EPDM Rubber		243	22.21	Clean Peel	Pass
	Neoprene Rubber		541	49.45	Clean Peel	Pass
	Santoprene Rubber		149	13.62	Clean Peel	Pass
	Butyl Rubber		216	19.74	Clean Peel	Pass

Table 2 – Water Immersion for 24 hours @ Room Temp						
	Substrate	Substrate	AVG Peel N/m	AVG Peel oz/in	Observation	Requirement 330 N/m / 30.16 oz/in or foam tear
L3+T5 Adhesive	PU Ester Foam	ABS	853	77.96	Foam Tear	Pass
	PU Ether Foam		632	57.76	Foam Tear	Pass
	XLPE Foam		212	19.38	Foam Tear	Pass
	Microcellular Urethane Foam		637	58.22	Clean Peel	Pass
	EPDM Foam		200	18.28	Foam Tear	Pass
	Nitrile Foam		858	78.42	Clean Peel	Pass
	Neoprene Foam		1060	96.88	Foam Tear	Pass
	EPDM Rubber		274	25.04	Clean Peel	Fail
	Neoprene Rubber		1170	106.94	Clean Peel	Pass
	Santoprene™ Rubber		603	55.11	Clean Peel	Pass
	Butyl Rubber		665	60.78	Clean Peel	Pass

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## L3 + T5 Adhesive (Cont.)

Table 2 – Environmental Cycle						
	Substrate	Substrate	AVG Peel N/m	AVG Peel Oz/in	Observation	Requirement 330 N/m / 30.16 oz/in or foam tear
L3+T5 Adhesive	PU Ester Foam	ABS	938	85.73	Foam Tear	Pass
	PU Ether Foam		599	54.75	Foam Tear	Pass
	XLPE Foam		187	17.09	Foam Tear	Pass
	Microcellular Urethane Foam		721	65.90	Foam Tear	Pass
	EPDM Foam		267	24.40	Foam Tear	Pass
	Nitrile Foam		932	85.18	Clean Peel	Pass
	Neoprene Foam		1110	101.45	Foam Tear	Pass
	EPDM Rubber		158	14.44	Clean Peel	Fail
	Neoprene Rubber		770	70.38	Clean Peel	Pass
	Santoprene™ Rubber		605	55.30	Clean Peel	Pass
	Butyl Rubber		359	32.81	Clean Peel	Pass

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## Technical Information

The technical information, recommendations and other statements contained in this document are based upon tests or experience that 3M believes are reliable, but the accuracy or completeness of such information is not guaranteed.

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# 3M

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