



Flammability Testing Commissioned by 3M for Graphic Films (See worksheets for test result information)

This document has been produced in response to end-user requests for fire test information for graphic films. It is not intended as a guide or an interpretation of regulatory requirements. It is the end-user's responsibility to determine the regulations which govern their chosen application.

Where a test procedure requires the film to be applied to a substrate, generally aluminium or steel has been chosen as the most commonly used inert substrate. However, it is the end-user's responsibility to determine the suitability of any results for their chosen substrate application. 3M accepts no responsibility for any losses and/or damages whatsoever and howsoever caused and whether of a pecuniary or a non-pecuniary nature or for any personal injury and/or death caused to any agent, employee, sub-contractor of the end-user or any Third Party as a result of the end-user failing to comply with its responsibility to determine the suitability of their chosen substrate.

For applications on rail rolling stock
The standards most often requested are:

Railway Group Standard GM/RT 2130 Issue 3 December 2010 (supersedes GM/RT 2120)

BS6853: 1999 Code of practice for fire precautions in the design and construction of passenger carrying trains, the tests including:-

BS 476: Part 7: 1997 Method for Classification of the Surface Spread of Flame of Products.

BS 476: Part 6: 1989 Method of test for Fire Propagation for Products

BS6853 Annex B: Determination of weighted summation of toxic fume, R

BS6853 Annex D.8.4 Methods for measuring Smoke Density

NF X 70-100 Analysis of pyrolysis and combustion gases – Tube furnace method

London Underground Standard 1-085 Issue A3 Fire Safety Performance of Materials.

BS EN45545-2 Railway Applications. Fire Protection on Railway Vehicles, Part 2 Requirements for fire behaviour of materials & components. Status: Current, Draft published April 2010 for public comment. Publication of this European Standard planned for 2012.

For internal applications to buildings

The standard most often requested is Class 0 to Building Regulations. The definition of a Class 0 material from the Building Regulations 2010, Fire Spread is as follows: Class 0 can be achieved if the product achieves a Class 1 result to BS476 Part 7 Surface Spread of Flame and which also achieves a Fire Propagation Index (I) of not more than 12, and i1 of not more than 6 as defined in BS 476: Part 6: Method of test for Fire Propagation for Products.

Notes:

- 1) 3M confirms that VHR films have the same face film and adhesive as their non-VHR equivalents and would, therefore, achieve the same results in flammability testing.
- 2) Full descriptions of the substrates used for each test can be found in the appropriate box.

Date Issued: 4th June 2013



FIRE TESTING COMMISSIONED BY 3M UNITED KINGDOM PLC

This information is the property of 3M United Kingdom PLC. It should not be shared with a third party without the express permission of 3M United Kingdom PLC.

Film No.	Film Description	Substrate	Substrate Finish	Report No. & URL Link	Test	Date of Test/ Revalidation	Result	BS6853:1999	
								Table 2 Interior Vertical	Table 5 Exterior Vertical
VHR100	3M™ Scotchcal™ Graphic Film Series VHR100	Steel 1.6mm	NA	L18766	BS476 Part 6	11-Apr-99	$I_{max} = 0.2$ $i_1 = 0.00$	N/A	Fully compliant for Category II vehicles
		Steel 1.6mm	NA	L18315	BS476 Part 7	04-Dec-98	Class 1		
		Aluminium	NA	FT99/015/1	BS6853 D.8.4	15-Jun-99	Ao (on) = 2.34 Ao (off) = 2.96		
		N/A	NA	LIMS 10702	NFX70-100	28-Jul-99	R = 0.10		
VHR160	3M™ Controllac™ Graphic Marking Film Series VHR160	Steel 2mm	Nexa Autocolour Paint	154919	BS476 Part 6	19-Sep-06	$I_{max} = 0.1$ $i_1 = 0.0$	Fully compliant for Category II vehicles	Fully compliant for Category 1b and II vehicles
		Steel 2mm	Nexa Autocolour Paint	228583	BS476 Part 7	09-Mar-06	Class 1		
		Steel 2mm	Nexa Autocolour Paint	229997	BS6853 Annex B.2	15-May-06	R = 2.439		
		Steel 2mm	Nexa Autocolour Paint	229998	BS6853 D.8.4	18-May-06	Ao (on) = 3.70 Ao (off) = 4.54		
VHR180	3M™ Controllac™ Graphic Marking Film Series VHR180	Steel 1.6mm	NA	L18765	BS476 Part 6	10Apr99	$I_{max} = 0.3$ $i_1 = 0.0$	Fully compliant for Category 1a, 1b and II vehicles	Fully compliant for Category 1a, 1b and II vehicles
		Steel 1.6mm	NA	L16502	BS476 Part 7	6May97	Class 1		
VHR180/8993	3M™ Controllac™ Graphic Marking Film Series VHR180 laminated with 3M™ Scotchgard™ Graphic & Surface Protection Film Series 8993	Aluminium 3mm	3M™ Scotchkote™ Dicol 170 Paint	ICLH132176	BS476 Part 6	09-Apr-13	$I_{max} = 1.5$ $i_1 = 0.0$	Fully compliant for Category 1b and II vehicles	Fully compliant for Category 1a, 1b and II vehicles
				303659	BS476 Part 7	20-Jan-11	Class 1		
				ICLH132174	BS 6853: Annex B.2	09-Apr-13	R = 0.067		
				ICLH132175	BS6853: D.8.4	09-Apr-13	Ao (on) = 4.06 Ao (off) = 4.82		
VHR180/8993	3M™ Controllac™ Graphic Marking Film Series VHR180 laminated with 3M™ Scotchgard™ Graphic & Surface Protection Film Series 8993	Aluminium 3mm	PPG Paint, Deltron/DCU2050	286670	BS476 Part 7	07-May-13	Class 1	N/A	Fully compliant for Category 1a, 1b and II vehicles
					BS 6853: Annex B.2	07-May-13	R = 1.377		
					BS6853: D.8.4	07-May-13	Ao (on) = 3.54 Ao (off) = 4.28		
VHR3650	3M™ Scotchcal™ Film Series VHR3650 coated with 1920 & 1955 Clearcoats	Steel 1.6mm	NA	182617	BS476 Part 7	29-Apr-10	Class 1	N/A	Fully compliant for Category II vehicles
6645C	3M™ Controllac™ Removable Graphic Film with Comply™ Adhesive 6645C, clear coated with Gloss Clear 1920	Aluminium 3mm	PPG Paint Spec FB13	222816	BS 476 Part 7	26-May-05	Class 1	Fully compliant for Category 1a, 1b and II vehicles	Fully compliant for Category 1a, 1b and II vehicles
		Aluminium 3mm	PPG Paint Spec FB13	222818	BS6853 Annex B.2	06-Jun-05	R = 0.185		
		Aluminium 3mm	PPG Paint Spec FB13	222817	BS6853 D8.4	25-May-05	Ao (on) = 1.98 Ao (off) = 2.48		
		Aluminium 3mm	PPG Paint Spec FB13	00378	ISO 5660-1	27-May-05	MAHRE value of 47.56 kW/m ²		
6645C/8995	3M™ Controllac™ Removable Graphic Film with Comply™ Adhesive 6645C, laminated with 3M™ Scotchgard™ Graphic and Surface Protection Film 8995	Aluminium 3mm	Interpon D1036	276375	BS476 Part 6	05-Jan-12	$I_{max} = 0.6$ $i_1 = 0.6$	Fully compliant for Category 1a, 1b and II vehicles	NA
		Aluminium 3mm	Interpon D1036		BS476 Part 7	05-Jan-12	Class 1		
		Aluminium 3mm	Interpon D1036		BS 6853: Annex B.2	05-Jan-12	R = 0.06		
		Aluminium 3mm	Interpon D1036		BS6853: D.8.4	05-Jan-12	Ao (on) = 0.98 Ao (off) = 1.31		
VCC15484/8995	3M™ Controllac™ Graphic Film with Comply™ Adhesive VCC15484, laminated with 3M™ Scotchgard™ Graphic and Surface Protection Film 8995	Aluminium 3mm	PPG Paint Spec FB13	318235	BS476 Part 6	25-May-12	$I_{max} = 2.0$ $i_1 = 0.0$	Fully compliant for Category 1a, 1b and II vehicles	NA
		Aluminium 3mm	PPG Paint Spec FB13	318101	BS476 Part 7	23-May-12	Class 1		
		Aluminium 3mm	PPG Paint Spec FB13	318237	BS 6853: Annex B.2	25-May-12	R = 0.31		
		Aluminium 3mm	PPG Paint Spec FB13	318236	BS6853: D.8.4	25-May-12	Ao (on) = 1.58 Ao (off) = 1.93		
8640/1920	3M™ Controllac™ Graphic Film 8640 ES screen printed using 3M™ Screen Print Gloss Clear 1920DR	Aluminium 1.5mm	NA	301159	BS476 Part 6	12-May-00	$I_{max} = 1.4$ $i_1 = 0.0$	Fully compliant for use on Category II vehicles	Fully compliant for use on Category 1b and II vehicles
		Aluminium 1.5mm	NA	301031	BS476 Part 7	02-May-00	Class 1		
		Aluminium 1.5mm	NA	301032	BS 6853 D.8.4	10-May-00	Ao (on) = 4.83 Ao (off) = 5.46		
		N/A	NA	301033	NFX70-100	18-Apr-00	R = 2.37		
8991	Scotchgard™ Graphic and Surface Protection Film Series 8991	Glass 6mm	NA	214852	BS476 Part 6	24-Oct-03	$I_{max} = 0.0$ $i_1 = 0.0$	Fully compliant for Category 1a, 1b and II vehicles	Fully compliant for Category 1a, 1b and II vehicles
		Glass 6mm	NA	214851	BS 476 Par 7	06-Oct-03	Class 1		
		Glass 6mm	NA	217506	BS6853 B2	20-Apr-04	R = 0.088		
		Glass 6mm	NA	214854	BS6853: D: 8.4	05-Nov-03	Ao (on) = 0.93 Ao (off) = 1.11		
Safety S40	3M™ Safety and Security Window Film Safety S40 (Formerly known as Scotchshield™ Glass Protection Film SH4CLARL)	Glass 6mm	NA	300819	BS 476 Part 6	03-Feb-00	$I_{max} = 0.2$ $i_1 = 0.0$	Fully compliant for Category 1a, 1b and II vehicles	Fully compliant for Category 1a, 1b and II vehicles
		Glass 6mm	NA	301089	BS 476 Part 7	26-Apr-00	Class 1		
		Glass 6mm	NA	300820	BS 6853	09-Feb-00	Ao (on) = 0.73 Ao (off) = 0.81		
		N/A	NA	300823	NFX70-100	14-Feb-00	R = 0.16		
Ultra 400	3M™ Safety and Security Window Film Ultra 400 (formerly known as Scotchshield™ Glass Protection Film S35 NEAR400)	Glass 6mm	NA	211697	BS 476 Part 6	05-Mar-03	$I_{max} = 0.3$ $i_1 = 0.00$	Fully compliant for Category 1a, 1b and II vehicles	Fully compliant for Category 1a, 1b and II vehicles
		Glass 6mm	NA	211698	BS 476 Part 7	03-Mar-03	Class 1		
		Glass 6mm	NA	211752	BS 6853 B.2	12-Mar-03	R = 0.39		
		Glass 6mm	NA	211753	BS6853 D.8.4	12-Mar-03	Ao (on) = 1.493 Ao (off) = 1.619		



FIRE TESTING COMMISSIONED BY 3M UNITED KINGDOM PLC

This information is the property of 3M United Kingdom PLC. It should not be shared with a third party without the express permission of 3M United Kingdom PLC.

Film No.	Film Description	Substrate	Substrate Finish	Report No. and URL Link	Test	Date of Test/ Revalidation	Result	Classification to Building Regs.
40	3M™ Scotchcal™ Graphic Film Series 40	Aluminium 2mm	NA	168537	BS476 Part 6	13-Nov-07	$I_{max} = 0.1$ $i_1 = 0.00$	Class 0
		Aluminium 2mm	NA	168538	BS476 Part 7	08-Nov-07	Class 1	
100	3M™ Scotchcal™ Graphic™ Film Series 100	Steel 1.6mm	NA	L18766	BS476 Part 6	11-Apr-99	$I_{max} = 0.2$ $i_1 = 0.00$	Class 0
		Steel 1.6mm	NA	L18315	BS476 Part 7	04-Dec-98	Class 1	
IJ160	3M™ Controltac™ Graphic Marking Film Series IJ160 with Gloss Clear 1920	Steel 2mm	Nexa Autocolour paint	154919	BS476 Part 6	19-Sep-06	$I_{max} = 0.1$ $i_1 = 0.0$	Class 0
		Steel 2mm	Nexa Autocolour paint	228583	BS476 Part 7	09-Mar-06	Class 1	
		Steel 2mm	Nexa Autocolour paint	229997	BS6853 Annex B.2	15-May-06	R = 2.439	
		Steel 2mm	Nexa Autocolour paint	229998	BS6853 D.8.4	18-May-06	Ao (on) = 3.70 Ao (off) = 4.54	
180	3M™ Controltac™ Graphic Marking Film Series 180	Steel 1.5mm	NA	L18765	BS476 Part 6	10-Apr-99	$I_{max} = 0.3$ $i_1 = 0.0$	Class 0
		Steel 1.5mm	NA	L16502	BS476 Part 7	06-May-97	Class 1	
180/639	3M™ Controltac™ Graphic Marking Film Series 180 laminated with 3M™ Scotchcal™ Graffiti Resistant Film Series 639	Aluminium 1.5mm	ICI Autocolour	123709	BS476 Part 6	08-Mar-02	$I_{max} = 6.4$ $i_1 = 0.2$	Class 0
		Aluminium 1.5mm	ICI Autocolour	122347	BS476 Part 7	04-Dec-01	Class 1	
		Aluminium 1.5mm	ICI Autocolour	123710	BS6853 B.2	08-Mar-02	R = 0.25	
		Aluminium 1.5mm	ICI Autocolour	302863	BS6853 D.8.4	13-Mar-02	Ao (on) = 3.15 Ao (off) = 3.47	
3545C/8908	3M™ Controltac™ Non-PVC Film with Comply™ Adhesive 3545C overlaminated with 3M™ Scotchcal™ Lustre Overlaminates 8908	Aluminium 1.7mm	NA	198520	BS476 Part 6	03-Nov-10	$I_{max} = 2.7$ $i_1 = 0.0$	Class 0
		Aluminium 1.7mm	NA	198521	BS476 Part 7	03-Nov-10	Class 1	
		N/A	NA	198523	BS6853 B.2	22-Nov-10	R = 0.16	
		Aluminium 1.7mm	NA	198522	BS6853 D.8.4	26-Nov-10	Ao (on) = 0.770 Ao (off) = 0.985	
8150	3M™ Scotchcal™ Clear View Graphic Film 8150	Glass 6mm	NA	272864	BS476 Part 6	16-Aug-11	$I_{max} = 0$ $i_1 = 0$	Class 0
		Glass 6mm	NA	272863	BS476 Part 7	22-Aug-11	Class 1Y	
		Glass 6mm	NA	ICL/H11/884	BS 6853 Annex B.2	16-Aug-11	R = 0.46	
		Glass 6mm	N/A	ICL/H11/885	BS 6852 Annex D.8.4	16-Aug-11	Ao (on) = 3.06 Ao (off) = 3.38	
8640/1920	3M™ Controltac™ Graphic Film 8640 ES screen printed using 3M™ Screen Print Gloss Clear 1920DR	Aluminium 1.6mm	NA	301159	BS476 Part 6	12-May-00	$I_{max} = 1.4$ $i_1 = 0.0$	Class 0
		Aluminium 1.6mm	NA	301031	BS476 Part 7	02-May-00	Class 1	
		Aluminium 1.6mm	NA	301032	BS 6853 Annex D.8.4	10-May-00	Ao (on) = 4.83 Ao (off) = 5.46	
		N/A	NA	301033	NFX70-100	18-Apr-00	R = 2.37	
IJ8624/8524	3M™ Scotchcal™ Graphic Film for Textured Surfaces IJ8624 overlaminated with 3M™ Scotchcal™ Lustre Overlaminates for textured Surfaces 8524	Aluminium 3mm	NA	305583	BS476 Part 6	16-Mar-11	$I_{max} = 0.90$ $i_1 = 0.0$	Class 0
		Aluminium 3mm	NA	305584	BS476 Part 7	16-Mar-11	Class 1	
8991	Scotchgard™ Graphic and Surface Protection Film Series 8991	Glass 6mm	NA	214852	BS476 Part 6	24-Oct-03	$I_{max} = 0.0$ $i_1 = 0.0$	Class 0
		Glass 6mm	NA	214851	BS 476 Part 7	06-Oct-03	Class 1	
		Glass 6mm	NA	217506	BS6853 Annex B2	20-Apr-04	R = 0.088	
		Glass 6mm	NA	214854	BS6853: D: 8.4	05-Nov-03	Ao (on) = 0.93 Ao (off) = 1.11	
DI-NOC	3M™ Di-Noc Film Group 1 Construction (See next worksheet for DI-NOC product references)	Aluminium 3mm	NA	308044	BS476 Part 6	02-Jun-11	$I_{max} = 0.0$ $i_1 = 0.0$	Class 0
		Aluminium 3mm	NA	308045	BS476 Part 7	02-Jun-11	Class 1	
7725SE-324	3M™ Scotchcal™ Special Effects Film Series 7725SE-324 Frosted Crystal	6mm Glass Panel	NA	302121	BS476 Part 6	11-Jun-01	$I_{max} = 0.0$ $i_1 = 0.0$	Class 0
		6mm Glass Panel	NA	302122	BS476 Part 7	11-May-01	Class 1	
		6mm Glass Panel	NA	302124	NFX70-100	11-Jun-01	R = 1.30	
		6mm Glass Panel	NA	302123	BS6853 D.8.4	01-Jan-99	Ao (on) = 2.07 Ao (off) = 2.23	



3M™ DI-NOC™ Architectural Finishes - Pattern Groups for fire test purposes

Group 1

UK test results for this pattern group are shown on the Buildings worksheet

CA-419	FA-7037	FW-1035	FW-1808	FW-501	FW-652	LE-010	PC-491	SE-684	WG-1050	WG-1814	WG-416	WG-7031	WG-865
CA-421	FA-7038	FW-1036	FW-1809	FW-502	FW-655	LE-015	PC-672	SE-685	WG-1051	WG-1815	WG-417	WG-7032	WG-866
CA-424	FA-7039	FW-1037	FW-1810	FW-521	FW-656	LE-017	PC-673	SE-824	WG-1052	WG-1816	WG-467	WG-7033	WG-867
CA-1170	FA-7040	FW-1038	FW-1811	FW-522	FW-677	LE-018	PC-751	SE-825	WG-1053	WG-1817	WG-477	WG-7034	WG-871
FA-1093	FE-1091	FW-1039H	FW-1812	FW-575	FW-7001	LE-1104	PC-754	SE-826	WG-1054	WG-1818	WG-478	WG-7035	WG-872
FA-1094	FE-1092	FW-1040H	FW-231	FW-576	FW-7002	LE-1105	PC-756	SE-827	WG-1055	WG-108	WG-624	WG-705	WG-877
FA-1095	FE-1100	FW-1113	FW-232	FW-577	FW-7003	LE-1106	PC-758	SE-828	WG-1056	WG-109	WG-628	WG-706	WG-878
FA-1096	FE-1101	FW-1114	FW-233	FW-606H	FW-7004	LE-1107	PC-785	SE-829	WG-1057	WG-143	WG-629	WG-707	WG-879
FA-1097	FE-299	FW-1121H	FW-234	FW-607H	FW-7005	LE-1171	PC-1180	SE-893	WG-1058	WG-144	WG-657	WG-709	WG-880
FA-1098	FE-301	FW-1122	FW-235	FW-608H	FW-7006	LE-1172	PC-1181	SE-896	WG-1059	WG-145	WG-658	WG-763	WG-940
FA-1099	FE-801	FW-1123	FW-236	FW-609H	FW-7007	LE-1173	PG-188	ST-440	WG-1060	WG-156	WG-659	WG-763GN	WG-941
FA-1102	FE-802	FW-1124	FW-237	FW-612	FW-7008	LE-128	PG-189	ST-442	WG-1061	WG-157	WG-660	WG-765	WG-942
FA-1103	FE-804	FW-1125	FW-238	FW-616	FW-7009	LE-129	PG-190	ST-523	WG-1062	WG-159	WG-662	WG-765GN	WG-943
FA-1149	FE-805	FW-1126	FW-239	FW-617	FW-7010	LE-137	PG-193	ST-526	WG-1063	WG-664	WG-663	WG-766	WG-944
FA-1150	FE-813	FW-1127	FW-240	FW-618	FW-7011	LE-367	PG-194	ST-553	WG-1064	WG-693	WG-767	WG-946	WG-960
FA-1151	FW-1016	FW-1128	FW-322	FW-619	FW-7012	LE-517	PG-195	ST-555	WG-1065	WG-242	WG-821	WG-947	WG-962
FA-1152	FW-1017	FW-1129	FW-324	FW-7015	FW-7013	LE-593	PG-197	ST-556	WG-1066	WG-243	WG-694	WG-831	WG-964
FA-1153	FW-1018	FW-1130H	FW-326	FW-7016	FW-7014	LE-700	PG-1182	ST-557	WG-1067	WG-244	WG-695	WG-832	WG-965
FA-1162	FW-1019	FW-1131	FW-327	FW-625	LW-1080	LE-701	PT-344	ST-736	WG-1068	WG-245	WG-696	WG-833	
FA-1165	FW-1020	FW-1132	FW-328	FW-627	LW-1081	LE-702	PT-345	ST-737	WG-1069	WG-246	WG-697	WG-835	
FA-1167	FW-1021	FW-1133	FW-329	FW-638H	FW-7017	LE-703	PT-346	ST-1195	WG-1070	WG-247	WG-698	WG-836	
FA-1819	FW-1022	FW-1134	FW-330	FW-639H	FW-7018	LE-778	PT-347	WG-101	WG-1071	WG-248	WG-699	WG-837	
FA-1820	FW-1023	FW-1135	FW-331	FW-640	FW-788	LE-779	PT-735	WG-102	WG-1072	WG-249	WG-7019	WG-839	
FA-1821	FW-1024	FW-1136H	FW-332	FW-641	FW-789	LE-782	PX-1088	WG-103	WG-1140	WG-250	WG-7020	WG-840	
FA-1822	FW-1025	FW-1137	FW-333	FW-642	FW-791	LE-783	PX-1089	WG-115	WG-1141	WG-251	WG-7021	WG-841	
FA-565	FW-1026	FW-1138	FW-334	FW-643	FW-795	RT-1112	PX-1090	WG-1041	WG-1142	WG-254	WG-7022	WG-845	
FA-591	FW-1027	FW-1139H	FW-335	FW-644	FW-799	SE-1086	RS-487	WG-1042	WG-1143	WG-256	WG-7023	WG-846	
FA-592	FW-1028	FW-1331	FW-336	FW-645	FW-886	LZ-461	RS-488	WG-1043	WG-1144	WG-372	WG-7024	WG-854	
FA-601	FW-1029	FW-1801	FW-337	FW-646	FW-887	LZ-462	WG-1047	WG-1044	WG-1145H	WG-373	WG-7025	WG-855	
FA-602	FW-1030	FW-1803	FW-338	FW-647	FW-888	LZ-480	WG-1048	WG-1045	WG-1146	WG-364GN	WG-7026	WG-856	
FA-671	FW-1031	FW-1804	FW-339	FW-648	FW-889	LZ-587	SE-1087	WG-1046	WG-1147	WG-376	WG-7027	WG-857	
FA-688	FW-1032	FW-1805	FW-340	FW-649	GE-445	ME-434	SE-567	WG-166	WG-1148	WG-408	WG-7028	WG-860	
FA-690	FW-1033	FW-1806	FW-341	FW-650	GE-822	ME-435	SE-568	WG-222	WG-1196	WG-410	WG-7029	WG-862	
FA-7036	FW-1034	FW-1807	FW-342	FW-651	GE-906	PC-224	SE-570	WG-1049	WG-1813	WG-411	WG-7030	WG-863	

