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*Encl.: 1*

## Test Report

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### Macroplast UK 8160

Henkel KGaA  
HenkelStrasse 67  
D-40191 Düsseldorf  
Germany

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**Danish Institute of Fire and Security Technology**



The results relate only to the items tested.  
The test report should only be reproduced in extenso  
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*The present test report supersedes DIFT's test report  
dated 2004-02-25 under the above file number*

## 1 SPONSOR

Henkel KGaA  
HenkelStrasse 67  
D-40191 Düsseldorf  
Germany

## 2 PRODUCT

Adhesive (2K) designated Macroplast UK 8160 with hardener UK 5400.

## 3 NAME OF MANUFACTURER

The sponsor is the manufacturer.

## 4 LICENSE/APPROVAL

None issued yet.

## 5 TEST METHOD

The test was performed in accordance with annex to IMO Resolution A.653(16):  
"Recommendation on improved fire test procedures for surface flammability of bulkhead ceiling  
and deck finish materials".

Furthermore the test was carried out in accordance with the requirements of the Russian  
Maritime Register of Shipping, St. Petersburg, cf. Certificate of Accreditation of Testing Labo-  
ratory No. 97.002.009 valid until 16th September 2005.





## 6 SAMPLE

The sample was picked during the resistance to fire test of the construction: Floating Floor A60, Danish Institute of Fire and Security Technology (DIFT) file No. PG11259, test date 2003-09-19;

DIFT sampled the following:

One bucket of Macroplast UK 8160. The bucket had two individual chambers, one containing 7.5 Kg of resin UK 8160, the other 1.5 Kg of hardener UK 5400.

DIFT prepared five test specimens by mixing the two components in ratio 5:1, and applied 250 g/m<sup>2</sup> to five steel sheets with the dimensions 795 X153 X 2 mm.

### Material specification (stated by the sponsor)

Two component solvent free polyurethane adhesive.

Further material specification was given by the sponsor and has been filed at DIFT under the above file number.

## 7 CONDITIONING

The specimens were conditioned in accordance with IMO Res.A.653 (16).

## 8 TEST RESULTS

Date of test: 2004-02-24.

Pilot flame: Non-impinging.

The test results are shown in full detail in enclosure 1.

### Derived fire characteristics

Test No.	1	2	3	Average
CFE (kW/m <sup>2</sup> )	40.0	34.5	35.2	36.6
Q <sub>sb</sub> (MJ/m <sup>2</sup> )	4.5	4.4	4.3	4.4
Q <sub>t</sub> (MJ)	0.1	0.1	0.0	0.1
q <sub>p</sub> (kW)	0.5	0.7	0.5	0.6

CFE : Critical flux at extinguishment

Q<sub>sb</sub> : Heat for sustained burning

Q<sub>t</sub> : Total heat release

q<sub>p</sub> : Peak heat release rate



## 9 CONCLUSION

The investigated sample of Macroplast UK 8160 with hardener UK 5400 applied with 250 g/m<sup>2</sup> (wet) on 2 mm steel sheets, fulfils the surface flammability criteria listed in IMO Resolution A.653 (16) for bulkhead, wall and ceiling linings as well as "IMO FTPC Part 5" and is therefore considered to meet the requirement for low flame spread in compliance with regulations II-2/3.8, II-2/34 and II-2/49 of the International Convention for the Safety of Life at Sea, 1974, as amended.

## 10 STATEMENT

As the Macroplast UK 8160 with hardener UK 5400, as applied, has a total heat release ( $Q_t$ ) of not more than 0.2 MJ and a peak heat release rate ( $q_p$ ) of not more than 1.0 kW, it is considered to comply with the requirements for smoke and toxicity, set out in "IMO FTPC, Part 2" without further testing, cf. IMO Resolution MSC. 61(67), Annex 2, "Products which may be installed without testing and/or approval", § 2 "Materials not generating excessive quantities of smoke nor toxic products in fire", paragraph 2.2.

### Note

The test results relate only to the behaviour of the test specimens of a product under the particular conditions of the test; they are not intended to be the sole criterion for assessing the potential fire hazard of the product in use.

## 11 COPY

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SURFACE FLAMMABILITY OF BULKHEAD, CEILING AND DECK FINISH MATERIALS.  
 TEST METHOD: IMO Res. A.653(16)

Material: Macroplast UK 8160 on 2 mm steelsheets

Sponsor: Henkel KGaA

Amount of adhesive: 250 g/m<sup>2</sup>

Date of test: 2004-02-24

Pilot flame: Non-impinging

Test results

j	Wj	tj			tjsr	tjsd	Qj			Qjsr	Qjsd
[mm]	[kW/m <sup>2</sup> ]	s			av.	st.dev.	kJ/m <sup>2</sup>			av.	st.dev.
specimen	1	2	3	1	2	3	av.	st.dev.	1	2	3
50	50.50	86	92	87	88	3	4343.0	4646.0	4393.5	4460.8	162.3
100	49.53	86	92	87	88	3	4259.6	4556.8	4309.1	4375.2	159.2
150	46.90	95	94	92	94	2	4455.5	4408.6	4314.8	4393.0	71.6
200	42.75	123	104	102	110	12	5258.2	4446.0	4360.5	4688.2	495.5
250	37.20	-	133	127	130	4	-	4947.6	4724.4	4836.0	157.8
300	30.56	-	-	-	-	-	-	-	-	-	-
350	23.90	-	-	-	-	-	-	-	-	-	-
400	18.19	-	-	-	-	-	-	-	-	-	-
450	13.40	-	-	-	-	-	-	-	-	-	-
500	9.33	-	-	-	-	-	-	-	-	-	-
550	6.20	-	-	-	-	-	-	-	-	-	-
600	4.19	-	-	-	-	-	-	-	-	-	-
650	3.00	-	-	-	-	-	-	-	-	-	-
700	2.21	-	-	-	-	-	-	-	-	-	-
750	1.40	-	-	-	-	-	-	-	-	-	-
							1	2	3	av.	st.dev.
Ignition time					ti [s]		73.0	73.0	66.0	70.7	4.0
Heat for ignition					Qi [MJ/m <sup>2</sup> ]		4.5	4.4	4.3	4.4	0.1
Extinguishment time					te [s]		214.0	172.0	157.0	181.0	29.5
Max. flame spread distance					l [mm]		225.0	270.0	265.0	253.3	24.7
Crit.flux at exting.					CFE [kW/m <sup>2</sup> ]		39.98	34.54	35.21	36.58	3.0
Heat for sust. burning					Qsb [MJ/m <sup>2</sup> ]		4.5	4.4	4.3	4.4	0.1
Peak heat release rate					qp [kW]		0.5	0.7	0.5	0.6	0.1
Total heat release					Qt [MJ]		0.1	0.1	0.0	0.1	0.0
Heat release per unit area					Qa [MJ/m <sup>2</sup> ]		1.8	1.4	1.1	1.4	0.3

Surface flammability criteria

Bulkhead, wall and ceiling linings				Floor coverings / Prim. deck coverings			
CFE (kW/m <sup>2</sup> )	Qsb (MJ/m <sup>2</sup> )	Qt (MJ)	Qp (kW)	CFE (kW/m <sup>2</sup> )	Qsb (MJ/m <sup>2</sup> )	Qt (MJ)	Qp (kW)
≥ 20.0	≥ 1.5	≤ 0.7	≤ 4.0	≥ 7.0	≥ 0.25	≤ 2.0/1.5	≤ 10.0