



Department of purchases and logistics
Testing and measuring laboratory
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Test report n° 07.1090 A

M classification in accordance with standard NF P92-507, and F classification in accordance with standard NF F 16-101, complemented by STM-S-001 index C, for the product 3M S70

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Approved by the technical manager : Jérôme Lefebvre Tel: 01 587 89005

Approval date: **November 20, 2007**

This report comprises 8 pages, including 4 appendix pages

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N°1-1523

M classification in accordance with standard NF P 92-507 (February 2004), and F classification in accordance with standard NF 16-101 (October 1998), complemented by STM-S-001 index C (October 2006), for the product 3M S70

Product: *Self-adhesive transparent film S70*

Origin: *3M (Switzerland) S.A.*

Client	: M. Zbinden
Order reference number	: CO ERT 2745 / 2406
Order date	: 10/10/07
Account charged	: -

Distribution:	
M. Zbinden	3M (Switzerland) SA Building and Commercial Services Eggstrasse 93 8803 Rüslikon SWITZERLAND
Archival	LEM + PPC

Specific reference codes: SC 07-080 PPC

Tests performed by: Patrick Massé
Franck Guichard
Florence Chaîneau
David Herrati

A	Change of the client's corporate name and address
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B

Date of the 1 st version: November 14, 2007
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Nullifies and replaces: 07.1090

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1 Subject

M classification in accordance with standard NF P92-507 (February 2004), and F classification in accordance with standard NF F 16-101 (October 1998), complemented by STM-S-001 index C (October 2006), for the product 3M S70

2 Summary and conclusions

In accordance with the standards listed above, the **product 3M S70** is classified as:

M1	F1
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Note: In asserting compliance, or the lack thereof, with the standards and/or specifications listed above, the uncertainty linked with the results is not explicitly taken into consideration. The rules of assertion of compliance and classification are listed in an internal Laboratory document, to be consulted on request.

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3 Product submitted for testing

Product name	: S70
Nature of the product	: PET
Use	: Self-adhesive transparent film
Manufacturing process	: Unspecified
Origin	: 3M (Switzerland) S.A.

4 Detailed conditions of the submitted sample

The retrieval of the test tubes is the responsibility of the client.

The client provided:

- 8 rectangular test tubes measuring 400 mm x 300 mm of transparent film glued to tempered glass
- 4 square test tubes measuring 70 mm x 70 mm of transparent film glued to tempered glass.
- 4 test tubes measuring 400 mm x 35 mm of transparent film glued to tempered glass
- 16 test tubes measuring 76 mm x 76 mm used to measure the opacity of the fumes
- 1 rectangular plate measuring 300 mm x 400 mm for measuring the toxicity of the fumes

Markings on the samples placed by the client: "S70"

5 Observed discrepancies

None.

6 Details of test conditions

No prior aging.

7 Reference information and documents

The M classification is defined in the standard NF P92-507 (February 2004). The F classification is defined in the standard NF F 16-101 (October 1998) complemented by STM-S-001 index C (October 2006).

8 Detailed results

Detailed results are provided in Appendixes 1 to 4.

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EPIRADIATEUR TEST**Appendix 1**

Tests performed by : CREPIM Date of tests : 22/10/07
 Product name : S70
 Standards used : NF P 92-501 (December 1995)
 Number of test tubes : 4
 Equipment : *The M classification is determined using a test chamber which complies with the standard NF P 92-501*
 Test tube dimensions : 400 mm x 300 mm, 5 mm thick.

Test results:

Test tube	1		2		3		4	
Thickness (mm)	5		5		5		5	
Dimensions (mm)	400 X 300		400 X 300		400 X 300		400 X 300	
Initial mass (g)	-		-		-		-	
Loss of mass (%)	-		-		-		-	
∑h	na		na		na		na	
ΔT	na		na		na		na	
t1(s)	t2(s)	na	na	na	na	na	na	na
td1(s)	td2(s)	na	na	na	na	na	na	na
e1(s)	e2(s)	na	na	na	na	na	na	na
q	0		0		0		0	

na: non applicable

$$\text{Where } q = \frac{\sum h \times 100}{t_i \times \sqrt{\Delta T}}$$

∑h: Sum of the maximum lengths (in cm) reached by the flames throughout each 30 second period:

- exceeding the upper edge of the epiradiateur for the lower side
- and exceeding the zero marking line for the upper side

ΔT: Total duration of the presence of flames, exceeding either the upper limit of the flat part of the radiant surface for the lower side.

t1: Length required for burning, for the lower side of the test tube

t2: Length required for burning, for the upper side of the test tube

td1: Time at the end of which the flame extends beyond the limits of the upper edge of the flat plane of the radiant surface of the epiradiateur for the lower side

td2: Time at the end of which the flame extends beyond the zero marking line for the upper side

e1: Time at the end of which the flame no longer extends beyond the limits of the upper edge of the radiant surface of the epiradiateur or the time of the flame's extinction in the event where it extends beyond the above limit for the lower side

e2: Time at the end of which the flame no longer extends beyond the zero marking line, or the time of the flame's extinction in the event where it extends beyond the above marking on the upper side

Observations:

No burning, no drops

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COMBUSTION GAS*

Appendix 2

Test performed by : Patrick Massé, Florence Chaineau and David Herrati Date of tests : from 18/10/07 to 29/10/07

Product name : S70

Standards used : NF X 70-100-1 (April 2006) and NF X 70-100-2 (April 2006).

Equipment : *Thermal degradation of the material and analysis of the emitted gases are performed using equipment which complies with the standards listed above.*
Carbon monoxide and dioxide analysis performed using infrared.
Chloride, bromide, sulfate and cyanide analysis performed using ion chromatography.
Fluoride analysis performed using UV-visible spectrophotometry.

Test conditions.....: • test temperature..... : 600 °C
 • mass of the test tubes..... : 1.0 g
 • air flow : 2 L.min⁻¹
 • mode..... : inhalation
 • duration..... : 20 minutes

Results:

Gases emitted, in mg per g of material

				average	100 Ci / CCi	
CO	:	203	198	188	196	11.2
CO ₂	:	601	589	660	617	0.7
HCl	:	NQ	NQ	NQ	0.0	0.0
HBr	:	NQ	NQ	NQ	0.0	0.0
HF	:	NQ	NQ	NQ	0.0	0.0
HCN	:	NQ	NQ	NQ	0.0	0.0
SO ₂	:	NQ	NQ	NQ	0.0	0.0

NQ = Non Quantifiable.

ITC= 11.9

Observations / events:

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FUME OPACITY*

Appendix 3

Test performed by : David Herrati Date of tests.....: 30/10/07

Product name : S70

Standards used : NF X 10-702-1 (November 1995) and NF X 10-702-2 (September 1994).

Equipment : *The opacity of the fumes is determined using equipment which complies with the standards listed above.*

Test tube dimensions : 76.0 mm x 76.0 mm and 0.1 mm thick.

Means of exposure.....: With pilot flames Without pilot flames

Number of test tubes tested : 3 "with flames" and 1 "without flames"

Results:

NF F 16-101	TESTS DISMISSED	TESTS ADMITTED			AVERAGE
D1	0	26	15	12	18
D2	0	25	19	15	20
D3	0	27	24	17	23
D4	1	30	31	20	27
D ⁵	2	34	40	24	33
D10	7	69	72	57	66
D20	20	110	93	82	95
Dm	20	110	93	82	95
	at 20 min	at 20 min	at 20 min	at 20 min	-
Dmc	16	97	83	72	-
VOF4	1	93	73	55	74

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DETERMINATION OF CLASSIFICATION IN ACCORDANCE WITH NF F 16-101

Appendix 4

M classification:

- q₁ : 0
- q₂ : 0
- q₃ : 0
- q₄ : 0

TESTS	CLASSIFICATION CRITERIA	CLASSIFICATION
NF P 92-501	q average < 2.5	M1
	q average < 15	M2
	q average < 50	M3
NF P 92-504	Material which cannot be classified in the above categories	M4

If rupture occurs without true burning of the material (shrinkable materials glued on a support and having a volumetric mass less than 200 kg/m³ and a thickness greater than 5 mm), the classification criteria become:

TESTS	CLASSIFICATION CRITERIA			
NF P 92-505	No inflammation of the swab			Inflammation of the swab
NF P 92-504	No drops	Drops, not flame	Drops or debris, aflame	M4
No persistence > 2 s	M1	M1	M1	
Persistence ≤ 5 s	M2	M2	M2	
Persistence < 5 s without spreading	M3	M3	M3	
V _p < 2 mm/s	M4			

F classification:

Calculation of the fume index I F = $\frac{D_m}{100} + \frac{VOF4}{30} + \frac{ITC}{2}$

Result of the fume index I F = $\frac{95}{100} + \frac{74}{30} + \frac{11.9}{2} = 9$

F classification criteria	
Class	Value of I F
F0	< 5
F1	≤ 20
F2	≤ 40
F3	≤ 80
F4	≤ 120
F5	> 120

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