Home Office

ADMINISTRATIVE DEPARTMENT OF CIVIL PROTECTION
AND FIRE PREVENTION SERVICES

RESEARCH AND PRACTICE CENTRE

CHEMICAL LABORATORY

TEST CERTIFICATE
N° RFV/066

File N° 3303/122/98

issued in accordance with the decree from the Home Office dated 6 March 1992 on "Technical and procedural standards for the classification of reaction to fire and approval of varnishing products applied to wood materials" (published in the Italian Official Gazette N° 66 of 19/03/92).

In view of the investigations made according to standard CNVVF/UNI 9796

it is certified that the	**FIRE RETARDANT VARNISHING PRODUCT**
made by:	**VERNICI EGIDIO MILESI S.p.A.** **Via Olona 37 - 20017 RHO (Milan)**
called:	**EM FF1 TRANSPARENT** **FIRE-RETARDANT POLYURETHANE CYCLE**
has been given the	**CLASS OF REACTION TO FIRE: 1 (ONE)**

This certificate only applies to the sample tested.

Date

The Director
(Gioacchino GIOMI)

CSE Chemical Laboratory

TEST REPORT N° RFV/066 FILE N° 3303/122/98

FIRE RETARDANT VARNISHING PRODUCT MARKETED AS “EM FF1 TRANSPARENT FIRE-RETARDANT POLYURETHANE CYCLE”

NAT. FIRE DEPT. COUNCIL / UNI 9796 STANDARD - TESTING METHOD: NFDC / UNI 8457

Description: - Medium-density wood fibre panel (M.D.F.)

Position: - Vertical with no additional fire resistence

Applied resolutions: - ///

Preparation: - UNI 9796 - Section 6.3.1

Specimen N°	Afterburning time		Afterglow time		Damaged area		Dripping	
	sec.	level	sec.	level	sec.	level	detected	level
1	0	1	0	1	43	1	None	1
2	0	1	0	1	42	1	”	1
3	0	1	0	1	42	1	”	1
4	0	1	0	1	43	1	”	1
5	0	1	0	1	41	1	”	1
6	0	1	0	1	43	1	”	1
7	0	1	0	1	43	1	”	1
8	0	1	0	1	42	1	”	1
9	0	1	0	1	43	1	”	1
10	0	1	0	1	43	1	”	1

PARAMETERS	Attributed level
Afterburning time	1
Afterglow time	1
Damaged area	1
Dripping	1

CATEGORY
I

REMARKS:

DATE: 3 February 1999

Fire Prevention Inspector
Cristina D’ANGELO

Fire Prevention Chief Inspector
Sergio SCHIAROLI

CSE Chemical Laboratory

TEST REPORT N° RFV/066 **FILE N° 3303/122/98**

FIRE RETARDANT VARNISHING PRODUCT MARKETED AS “EM FF1 TRANSPARENT FIRE-RETARDANT POLYURETHANE CYCLE”

NAT. FIRE DEPT. COUNCIL / UNI 9796 STANDARD - TESTING METHOD: NFDC / UNI 9174

Description: - Medium-density wood fibre panel (M.D.F.)

Position: - Partition with no additional fire-resistance

Applied resolutions: - ///

Preparation: - UNI 9796 - Section 6.3.2

Time (sec) from flame front for covering the distance of 50 mm between two consecutive points

mm.	Specimen N° 1	2	3
50	11	10	11
100	37	21	23
150	22	20	31
200	34	31	31
250	41	38	37
300	52	49	50
350	77	75	72
400	149	137	152
450	151	148	148
500	203	195	211
550	210	208	215
600	264	271	277
650	281	292	296
700	...	...	...
750			
800			
Afterglow time (sec)	>360	>360	>360
Damaged area (mm)	650	650	650

Average speed (mm/s) for the flame front to spread between two consecutive points

mm.	Specimen N° 1	2	3
50			
100			
150	2,27	2,5	1,61
200	1,47	1,61	1,61
250	1,22	1,32	1,35
300	0,96	1,02	1
350	0,65	0,67	0,69
400	0,34	0,36	0,33
450	0,33	0,34	0,34
500	0,25	0,26	0,24
550	0,24	0,24	0,23
600	0,19	0,18	0,18
650	0,18	0,17	0,17
700	...	...	...
750			
800			
Average speed (mm/min)	44,18	47,29	42,27
Dripping	Parts detached	Parts detached	Parts detached

PARAMETERS	LEVELS Specimen 1	Specimen 2	Specimen 3	Attributed level	CATEGORY
Spreading speed of fire front	3	3	3	3	IV
Damaged area	3	3	3	3	
Afterglow time	3	3	3	3	
Dripping	1	1	1	1	

REMARKS:

DATE: 3 February 1999

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TEST REPORT N° RFV/066 **FILE N° 3303/122/98**

FIRE RETARDANT VARNISHING PRODUCT MARKETED AS “EM FF1 TRANSPARENT FIRE-RETARDANT POLYURETHANE CYCLE”

NAT. FIRE DEPT. COUNCIL / UNI 9796 STANDARD - TESTING METHOD: NFDC / UNI 8457

Description: - Fire-retardant varnishing product applied to a medium-density wood fibre panel (M.D.F.)
Position : - Vertical with no additional fire resistance
Applied resolution: - ///
Preparation: - UNI 9796 - Section 6.3.1

Specimen N°	Afterburning time		Afterglow time		Damaged area		Dripping	
	sec.	level	sec.	level	sec.	level	detected	level
1	1	1	0	1	55	1	None	1
2	0	1	0	1	54	1	”	1
3	0	1	0	1	55	1	”	1
4	1	1	0	1	55	1	”	1
5	0	1	0	1	56	1	”	1
6	2	1	0	1	56	1	”	1
7	0	1	0	1	54	1	”	1
8	0	1	0	1	55	1	”	1
9	1	1	0	1	55	1	”	1
10	0	1	0	1	54	1	”	1

PARAMETERS	Attributed level
Afterburning time	1
Afterglow time	1
Damaged area	1
Dripping	1

CATEGORY
I

REMARKS:

DATE: 3 February 1999

Fire Prevention Inspector
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TEST REPORT N° RFV/066 **FILE N° 3303/122/98**

FIRE RETARDANT VARNISHING PRODUCT MARKETED AS “EM FF1 TRANSPARENT FIRE-RETARDANT POLYURETHANE CYCLE”

NAT. FIRE DEPT. COUNCIL / UNI 9796 STANDARD - TESTING METHOD: NFDC / UNI 9174

Description: - Fire retardant varnishing product applied to a medium-density wood fibre panel (M.D.F.)

Position: - Partition with no additional fire resistance

Applied resolutions: - ///

Preparation: - UNI 9796 - Section 6.3.2

Time (sec) from flame front for covering the distance of 50 mm between two consecutive points

mm.	Specimen N° 1	2	3
50	12	20	10
100	119	10	11
150	147	371	197
200	.....	.....	360
250			.....
300			
350			
400			
450			
500			
550			
600			
650			
700			
750			
800			

Average speed (mm/s) for the flame front to spread between two consecutive points

mm.	Specimen N° 1	2	3
50			
100			
150	0,34	0,13	0,25
200	.....	.....	0,14
250			.....
300			
350			
400			
450			
500			
550			
600			
650			
700	...	...	...
750			
800			

Afterglow time (sec)	0	0	0	Average speed (mm/min)	20,40	7,80	11,70
Damaged area (mm)	150	150	200	Dripping	None	None	None

PARAMETERS	LEVELS Specimen 1	Specimen 2	Specimen 3	Attributed level	CATEGORY
Spreading speed of fire front	2	2	2	2	IV
Damaged area	1	1	1	1	
Afterglow time	1	1	1	1	
Dripping	1	1	1	1	

REMARKS:

DATE: 3 February 1999

Fire Prevention Inspector
Cristina D’ANGELO

Fire Prevention Chief Inspector
Sergio SCHIAROLI

TECHNICAL SHEET
EM FF1 TRANSPARENT FIRE-RETARDANT POLYURETHANE CYCLE

MANUFACTURER: VERNICI EGIDIO MILESI S.p.A.	Regd. Address: Via Petitti 16 - 20149 Milan Offices and factory: Via Olona 37 - 20017 RHO (Milan) Tel: 029326181 - Fax: 02932618300
FIRE-RETARDANT PRODUCT	
Marketed as:	EM FF1 TRANSPARENT FIRE-RETARDANT POLYURETHANE CYCLE The cycle consists of: EM 2330 Swelling transparent primer EM 2332 Transparent fire-retardant finish EM C60 100% polyisocyanic catalyst (2nd component for both) EM 722 Dilating Polyurethane Thinner
Description:	<u>EM 2330 and EM 2332</u>: Liquid high viscosity products with a milky appearance <u>EM C60</u>: Transparent liquid product <u>EM 722</u> Transparent liquid product
Properties of the components:	<u>EM 2330 Swelling transparent primer</u>: A product based on saturated polyester resin, organic solvents, wetting and anti-settling agents, silicon anti-foaming additives. The composition of the swelling agents is as follows: chloropolyphosphate, thermolabile azoic compound, polyfunctional alcohol, ammonia polyphosphate and chloroparaffin. <u>EM 2332 Transparent fire-retardant finish</u>: A product based on saturated polyester resin, silicon resin, organic solvents, wetting and anti-settling agents, silicon anti-foaming and anti-scratch additives, matting silica. The composition of the fire-retardant agents is: zinc borate and chlorophosphate <u>EM C60 100% polyisocyanic catalyst</u>: Isocyanic resin in a solution of organic solvents <u>EM 722 Dilating Polyurethane Thinner</u>: Blend of largely ketonic-based organic solvents.

TECHNICAL SHEET
EM FF1 TRANSPARENT FIRE-RETARDANT
POLYURETHANE CYCLE (cont.)

APPLICATION SYSTEM OF THE FIRE-RETARDANT VARNISHING PRODUCT	
How to prepare the wood base:	Sandpapering of new wood
How to apply the varnishing cycle:	By spray. Two coats of EM 2330 swelling primer. First coat: EM 2330 100% catalysed with EM C60 and 50% diluted with EM722. At least 12 hours later and after sandpapering, a second coat of EM 2330 100% catalysed with EM C60 and 25% diluted with EM 722. By spray. At least 24 hours after applying the second primer coat and after sandpapering, application of the third coat (completing the cycle) with EM 2332 fire-retardant finish 100% catalysed with EM C60 and 20% diluted with EM 722 polyurethane thinner.
Quantity of wet product to be applied per square metre, for each component and for each layer:	First coat of EM 2330 swelling primer (catalysed with EM C60 and diluted with EM 722 as described) 180 g/m^2 Second coat of EM 2330 swelling primer (catalysed with EM C60 and diluted with EM 722 as described) 150 g/m^2 Third coat of EM 2332 fire-retardant finish (catalysed with EM C60 and diluted with EM 722 as described) 150 g/m^2 For a total of 480 g/m^2
Maintenance	If the coat of paint remains in good condition, maintenance will be unnecessary. Clean with neutral or mild detergents if necessary.
Other useful information for correctly using the fire-retardant product:	Both the primer and the top coat should be well stirred before use. Fully mix the components with the catalyst before adding thinner. If the product has not been catalysed it cannot be applied.

TEST BASE

Medium-density wood fibre panel (MDF), not fire-retardant (according to UNI 9177).
The volume weight of the base is between 650 and 800 kg/m^3 (according to UNI 9177).
The base has a uniform thickness of 4 +/- 0.2 mm.

Rho, 19/11/1998

Vernici Egidio Milesi S.p.A.
Via Olona n.37
20017 RHO (Milano) - ITALY

Giovanni Milesi