

Technical Assessment Envirograf® HW01 and HW02 coating manufactured by Intumescent Systems Ltd

Report no.	2013-Efectis-R0392
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1. INTRODUCTION

Scandinavian Trading Ltd has asked Efectis Nederland to perform a technical assessment for the Envirograf® HW01 and HW02 coating manufactured by Intumescent Systems Ltd. For this technical assessment Efectis Nederland has reviewed the results of a number of fire tests that were performed with HW01 or HW02 coating. Products are also known as HW01F respectively HW02E.

The technical assessment is based upon the following reports:

- Danish Institute of Fire and Security Technology test report PGA10050, dated 11-11-2011;
- Danish Institute of Fire and Security Technology classification of fire protection ability report PCA10037, dated 27-02-2012;
- Efectis Nederland test report 2006-Efectis-R0832, dated December 2006;
- Efectis Nederland classification of fire resistance report 2006-Efectis-R0833[Rev.1], dated June 2013;
- Efectis Nederland classification of reaction to fire report 2008-Efectis-R0678, dated September 2008;

Chapter 2 gives a summary of the fire test and classification reports mentioned above. Chapter 3 reviews the field of application for the reviewed reports. Chapter 4 gives a summary of the additional info which was briefly reviewed. Chapter 5 contains the conclusion of this technical assessment.

In the attachment of this report additional documentation, such as a technical and material safety data sheet, have been incorporated. This documentation has been provided by Scandinavian Trading Ltd, Efectis Nederland has assessed these documents for accurateness.

1.1 INFORMATION ON REVISIONS

This is the first version of this report.

2. SUMMARY OF REPORTS

2.1 DBI TEST REPORT PGA10050

This report describes the results of a fire protection ability test performed according to EN 14135:2004 on a covering of 15 mm pinewood profiles with intumescent coating type HW02 and ES/RFC/TC/C mounted with tongue and groove.

The test specimen had external dimensions 2660 x 2400 x 25 mm (l x w x t) and had the following construction (from unexposed to exposed side):

- Timber battens, dimensions 10 x 100 mm, c.t.c. distance 600 mm, located at horizontal joints board;
- Chipboard, thickness 19 mm and nominal density 650 kg/m³, fixed by use of screws, 5 x 30 mm with c.t.c. distance of 600 mm;
- Pinewood profiles, 1800 x 95 x 15 mm (l x w x t), profiles mounted with tongue (6 mm) and groove (7 mm) joints, fixed by screws 3 x 15 mm with c.t.c. distance 600 mm;
- Pinewood profiles were coated with two layers of HW02 (8 m²/liter, thickness 75 µm dry film per coat) and one coat of ES/RFC/TC/C clear sealant varnish (12 m²/liter, thickness 50 µm dry film per coat). The ES/RFC/TC/C is a water based top coat.

In the report a summary is given of the test results according to EN 14135:

- No charring of the chipboard during the 10 minutes test;
- The average temperature rise measured on the unexposed side of profiles did not exceed 250 °C during the test;
- The maximum temperature rise measured on the unexposed side of profiles did not exceed 270 °C during the test.

Based on the test results the test specimen was classified as K₁10 or K₂10 according to EN 13501-2:2007+A1:2009, as is documented in the DBI report PCA10037.

2.2 EFECTIS NEDERLAND TEST REPORT 2006-EFECTIS-R0832

This reports describes the results of a fire resistance test with the reduced fire curve according to EN 1364-1:1999 of a non-load bearing external fire-rated timber wall. The fire side of the construction was coated with HW01 and HW02 coating, manufactured by Environmental Seals.

The test specimen had the following construction (from non-exposed to exposed side):

- one layer of 12.5 mm plasterboard (horizontal), fixed with steel nails Ø 2.8 x 50 mm;
- a timber framework, outer dimensions 3950 x 2990 mm (w x h), stud dimensions 75 x 50 (w x t) with a c.t.c. distance of approx. 500 mm. The spaces between the studs were filled with Rockwool insulation, thickness 40 mm and density 35 kg/m³;
- one layer of 12 mm chipboard, fixed with steel nails Ø 3 x 40 mm, c.t.c. 250 mm;
- chipboard was covered with glass fibre, aluminium reinforced, membrane paper, thickness 0.1 mm, hold in place with battens 50 x 23 mm, fixed by screws 40 x 4 mm;
- Finished with Norwegian spruce shiplap timber, dimensions 150 x 20 mm (w x t), fixed per batten by two nails Ø 2.8 x 50 mm each. The shiplap timber was coated with two layers (0.125 l/m²) HW01, first three planks near the bottom coated with HW02 (0.125 l/m²).

In the report a summary is given of the test results according to EN 1364-1:1999:

Criterion	Duration from start of the fire test until criterion was reached according to EN 1364-1:1999	
	Time	Result
- Integrity (E)	66 minutes	Criterion not reached
- Thermal insulation (I)	66 minutes	Criterion not reached
- Heat radiation (W)	66 minutes	Criterion not reached

Based on the test results the specimen was classified as EI60 and EW60 for the reduced fire curve according to EN 13501-2:2003, as is documented in the Efectis Nederland classification report 2006-Efectis-R0833[Rev.1].

2.3 EFFECTIS NEDERLAND CLASSIFICATION OF REACTION TO FIRE REPORT 2008-EFFECTIS-R0678

This reports lists the results from previous reaction to fire tests and documents the classification of standard particle board (12 mm and 18 mm) and standard MDF board (12 mm) coated with Envirograf® HW01 coating according to EN 13501-1:2002.

The product combination consisted of 12mm and 18 mm thick standard particle board and 12 mm thick standard MDF board, all coated with one layer of the Envirograf® HW01 coating, 8 m²/liter. For the EN 13823 tests the product combination was mounted with a 35 mm deep air gap, by using soft wood battens, onto 12 mm standard wood fibre based board.

Based on the test results the product combination was classified as B-s1, d0 according to EN 13501-1:2002.

3. FIELD OF DIRECT APPLICATION

3.1 FIRE PROTECTION ABILITY

The classification K₁10 or K₂10 according to EN 13501-2:2007+A1:2009 for the covering '15 mm pinewood profiles with intumescent coating type HW02 and ES/RFC/TC/C mounted with tongue and groove' is only valid for the following end use conditions:

- For 15 mm profiles with maximum width and length of 95 x 1800 mm;
- For profiles with thickness of 15 mm;
- On substrates with a density above 300 kg/m³ if K₁10 is required;
- On all substrates if K₂10 is required;
- With closer spacing between the fixings than used in the test specimen;
- Increase in height above 10 mm of the air gap (the cavity) behind the covering;
- Horizontal, vertical and sloped application of the covering.

3.2 RESISTANCE TO FIRE

The classification EI60_{o,i} and EW60_{o,i} according to EN 13501-2:2003 for an 'external fire-rated timber wall coated with HW01 and HW02 coating' is only valid for a construction which is the same in detail as the tested structure and which complies with the following conditions:

- the Spruce shiplap timber at the external side of the construction is coated with two layers (0.125 l/m²) of product 42 (HW01) coloured or (HW02) clear;
- filled with Rockwool insulation with a thickness 40 mm and a density of 35 kg/m³;
- the maximum allowed height of the wall construction is 4.00 m between the supporting beams;
- The width of the construction is not limited.

3.3 REACTION TO FIRE

The classification B s1, d0 according to EN 13501-1:2002 for the product combination 'standard particle board (12 mm and 18 mm) and standard MDF board (12 mm) coated with Envirograf® HW01 coating' is only valid for the following end use applications: as a wall or ceiling coating product with the following product parameters:

- Substrates: Standard particle board and standard MDF board;
- Thickness: minimum of 12 mm;
- Coating (wet): one coat, approximately 8 m² per liter.

The classification is valid for the following substrates and air gaps: mounted as described, with an air gap, on a wooden substrate or any non-combustible (A1 or A2) substrate.

4. ADDITIONAL INFO

4.1 TECHNICAL DATA SHEET

The technical data sheet refer to the correct fire test report from Efectis Nederland. The two other test reports mentioned on the technical data sheet were not subject of this technical assessment. Values for characteristic parameter mentioned on technical data sheet match the values mentioned in the material safety data sheet.

4.2 MATERIAL SAFETY DATA SHEET AND LIST OF COMPONENTS

Efectis Nederland has reviewed the list of components which was provided by Intumescent Systems Ltd. Efectis Nederland has verified that the percentages on the list of components correspond with the values displayed on the material safety data sheet. On request of Intumescent Systems Ltd, Efectis Nederland has obscured the percentages by mass of the individual components.

4.3 ISO9001 CERTIFICATION

The ISO 9001 certificate for Intumescent Systems Ltd was provided and is valid until 2020.

5. CONCLUSION

Efectis Nederland has written this report, with reference 2013-Efectis-R0392, on behalf of Scandinavian Trading Ltd. Efectis Nederland has performed a technical assessment of fire test results for Envirograf® HW01 and HW02 coatings.

Based on the reviewed documents, Efectis Nederland expects the HW01 and HW02 coating, manufactured by Intumescent Systems Ltd, to have the following fire related characteristics:

- Fire protection ability K₁10 or K₂10
- Reaction to Fire B-s1, d0
- Fire resistance EI60-ef and EW60-ef

The above conclusion is valid under the assumption, that:

- The coating is applied as described in the test reports PGA10050, 2006-Efectis-R0832 and 2008-Efectis-R0678.

Efectis Nederland has assessed the following documents for accurateness:

- Technical Data sheets for HW01 en HW02 coating;
- Material Safety Data sheets for HW01 en HW02 coating (including a list of components);
- List of components;
- ISO9001 certification for Intumescent Systems Ltd.



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APPENDIX A: TECHNICAL DATA SHEET

A.1 TECHNICAL DATA SHEET HW01 COATING

TDS042-01-06-2009



Issue 1

ENVIROGRAF®

Technical Data Sheet

Product 42

HW01

Description:

The HW01 is a white water based intumescent paint for the use over HWAP, and under HW04.

This product can be applied over existing paint systems or wood stains to improve the fire protection of the substrate.

Material Specification:

Colour:	White, other colours available on request.
Form:	White liquid.
Odour:	Low odour.
pH as supplied:	Approximately 8.0
Bulk density:	1.3 to 1.4g/cm ³
Water solubility:	Miscible.

Test Details:

	<u>Integrity</u>	<u>Insulation</u>
Efectis 2006-Efectis-R0832	66 Minutes	66 Minutes
Trada – RF 96012	44 Minutes	44 Minutes

The above tests are using HWAP in conjunction with Intumescent paints.

A.2 TECHNICAL DATA SHEET HW02 COATING

TDS042-02-06-2009

Issue 1



ENVIROGRAF®

Technical Data Sheet

Product 42

HW02

Description:

The HW02 is a (Milky) clear water based intumescent paint for the use over HWAP, and under HW03.

This product can be applied over existing paint systems or wood stains to improve the fire protection of the substrate.

Material Specification:

Colour:	White (dries to clear coat).
Form:	Liquid.
Odour:	Mild.
pH as supplied:	6 – 6.5
Boiling point/range:	~ 100°C.
Freezing point/range:	~ 0°C.
Bulk density:	1.20 to 1.24g/cm ³ .
Water solubility:	Miscible.

Test Details:

	<u>Integrity</u>	<u>Insulation</u>
Efectis 2006-Efectis-R0832	66 Minutes	66 Minutes
Chiltern IF98078	58 Minutes	58 Minutes

The above tests are using HWAP in conjunction with Intumescent paints.

APPENDIX B: MATERIAL SAFETY DATA SHEET

B.1 MATERIAL SAFETY DATA SHEET HW01 COATING

SAFETY DATA SHEET

HW01 Coating

SDS Compliant with Regulation (EC) No 1907/2006 - N° 453/2010

(1) IDENTIFICATION OF THE SUBSTANCE / PREPARATION AND THE COMPANY / UNDERTAKING

Product name	HW01 Coating		
Supplier	Intumescent Systems Ltd Barfreston Nr Dover Kent CT15 7JG England	Telephone:	(01304) 842555
		Fax:	(01304) 842666
	Website: www.envirograf.com		
	Email: sales@envirograf.com		
Emergency telephone number	Contact National Poison Centre via Hospital or General Practitioner		
Product use	Coatings: Waterborne paint		

(2) HAZARDS IDENTIFICATION

Health effects:

Skin	May cause slight irritation on prolonged / repeated contact.
Eyes	May cause some irritation.
Inhalation	No hazard under normal conditions of use.
Ingestion	Low toxicity.
Physical/chemical effects	Not applicable.

(3) COMPOSITION / INFORMATION ON INGREDIENTS

Chemical characterization	Aqueous (emulsion) polymer system.
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(4) FIRST AID MEASURES

Skin contact	Remove contaminated clothing and wash contaminated skin with soap and water.
Eye contact	Wash with water for several minutes. If irritation persists seek medical advice.
Inhalation	Remove the casualty to fresh air.
Ingestion	Rinse out mouth with water and if conscious drink plenty of water. Seek medical attention.

(5) FIRE-FIGHTING MEASURES

Extinguishing media	Foam, carbon dioxide, powder, and water spray.
Extinguishing media which must not be used for safety reasons	None known.
Special exposure hazards	None known.
Special protective equipment for fire-fighters	Chemical protection suit / gloves / boots and self contained breathing apparatus.

(6) ACCIDENTAL RELEASE MEASURES

Personal precautions	Use personal protection equipment.
Environmental precautions	Do not dispose of into surface water or sanitary sewer system.
Methods for cleaning up	Scrape up excess and dispose of at an approved site.

(7) HANDLING AND STORAGE

Handling precautions	Not applicable.
Storage conditions	Store in closed containers between + 5°C and + 30°C in dry conditions. Avoid extremes of temperature.

(8) EXPOSURE CONTROLS / PERSONAL PROTECTION

Control parameters	Not applicable.
Engineering measures	Not applicable.
Personal protection equipment:	
Respiratory protection	Not applicable.
Hand protection	Gloves.
Eye protection	Goggles.
Skin and body protection	Not applicable.

(9) PHYSICAL AND CHEMICAL PROPERTIES

Colour	White, other colours available on request.
Form	White liquid.
Odour	Low odour.
pH as supplied	Approximately 8.0.
Boiling point/range	Not determined.
Melting point/range	Not applicable.
Flash point	Not applicable.

Flammability (solid, gas)	Not applicable.
Autoignition temperature	Not applicable.
Explosive properties	Not applicable.
Oxidizing properties	Not applicable.
Vapour pressure	Not applicable.
Bulk density	1.3 to 1.4g/cm ³
Solubility:	
Water solubility	Miscible.
Partition coefficient (n-octanol/water)	Not applicable.
Other data	

(10) STABILITY AND REACTIVITY

Stability	Stable under normal conditions.
Conditions to avoid	Avoid extremes of temperature especially frost and freezing conditions.
Materials to avoid	None, under normal conditions of use.
Hazardous decomposition products	No decomposition if stored and applied as directed.

(11) TOXICOLOGICAL INFORMATION

Not applicable.

(12) ECOLOGICAL INFORMATION

Not applicable.

(13) DISPOSAL CONSIDERATIONS

Dispose of in accordance with local regulations at approved sites.

(14) TRANSPORT INFORMATION

UK road/rail	Not applicable. None hazardous.
IMDG	Not applicable. None hazardous.
ICAO	Not applicable. None hazardous.
ADR	Not applicable. None hazardous.

(15) REGULATORY INFORMATION

Supply classification:

Hazard symbol(s) None.

Risk phrases None.

Safety phrases None.

(16) OTHER INFORMATION

Recommended use Coating with fire retardant / intumescent properties.

Further information Consult technical data sheet.

The information contained in this safety data sheet is given in good faith. It is accurate to the best of our knowledge and belief and represents the most up to date information. The information given in this data sheet does not constitute or replace the user's own assessment of workplace risk as required by other health and safety legislation.

B.2 MATERIAL SAFETY DATA SHEET HW02 COATING

SAFETY DATA SHEET

HW02E

SDS Compliant with Regulation (EC) No 1907/2006 - N° 453/2010

SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

Product name and/or code	HW02E		
Supplier/Manufacturer	Intumescent Systems Ltd Barrestone Nr Dover Kent CT15 7JG England	Telephone: Fax:	(01304) 842555 (01304) 842666
	Website: www.envirograf.com Email: sales@envirograf.com		
Emergency telephone number	Contact National Poison Centre via Hospital or General Practitioner		
Product use	Coatings: Waterborne paint		

SECTION 2: HAZARDS IDENTIFICATION

Health effects: Main hazard:	No Labelling required in accordance with EU Guideline 199/45/EC.
Skin	May cause mild irritation with repeated contact for individuals with sensitive skin.
Eyes	May cause irritation.
Risk phrases	This product is not classified according to EU legislation.
Safety phrases	S2 – Keep out of the reach of children S23 – Do not breathe vapour/spray.

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

Chemical characterization	Aqueous dispersion of a polymer with non hazardous fire retardant and intumescent additives.
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Chemical Name	CAS No.	EINECS Number	%	Classification
Benzyl alcohol	100-51-6	202-859-9	< 3	Xn.R20/R22
1-Methoxy-2-propanol ; monopropylene glycol methyl ether	107-98-2	203-539-1	7%	R10

SECTION 4: FIRST AID MEASURES

Skin contact	Remove contaminated clothing and wash contaminated skin thoroughly with water. Obtain medical attention if symptoms develop.
Eye contact	Wash immediately with copious amounts of water. Seek medical attention if irritation persists.

Inhalation	Remove the casualty to fresh air. Obtain medical attention if difficulties persist.
Ingestion	If ingested in large amounts then seek medical attention – show the physician this data sheet.

SECTION 5: FIREFIGHTING MEASURES

Extinguishing media	Select extinguishing agent appropriate for other materials involved.
Extinguishing media which must not be used for safety reasons	None known.
Special exposure hazards	None known.
Special protective equipment for fire-fighters	Wear appropriate protective clothing and suitable breathing apparatus.

SECTION 6: ACCIDENTAL RELEASE MEASURES

Personal precautions	Wear appropriate protective clothing and ensure standard good working industrial practice.
Environmental precautions	Try to prevent the material entering drains or watercourses. Advise Authorities if spillage has entered watercourse or sewer or has contaminated soil or vegetation. Dilute as much as possible with water and notify authorities immediately.
Spillages	Contain and absorb using earth, sand, cloth or other inert absorbent material.

SECTION 7: HANDLING AND STORAGE

Handling precautions	Wear appropriate protective clothing. Adequate ventilation should be provided if there is risk of mist or aerosol formation.
Storage conditions	Store in closed containers between + 5°C and + 30°C in dry conditions. Avoid extremes of temperature. Protect from freezing. Normal ventilation is adequate.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

Occupational Exposure Standards

monopropylene glycol methyl ether (CAS no. 107-98-2, EINECS no. 203-539-1) ~ 1.5%

EU Directive 2000/39/EC OEL TLV-TWA (8 hours): 375mg/m³ – 100ppm (2000)

EU Directive 2000/39/EC OEL TLV-STEL (short term): 568mg/m³ – 150ppm (2000)

Personal protection equipment:

Respiratory protection	Not normally required, use in case of insufficient exhaust ventilation or prolonged exposure.
Hand protection	Wear impermeable nitrile or rubber gloves.
Eye protection	Wear safety goggles.
Skin and body protection	Wear suitable overalls. Wash off any splashes immediately. No eating drinking or smoking in the work place. Practice good personal hygiene.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Colour	White (dries to clear coat).
Form	Liquid.
Odour	Mild.
pH as supplied	6 – 6.5
Boiling point/range	~ 100°C.
Freezing point/range	~ 0°C.
Flash point	Not applicable.
Flammability (solid, gas)	Not applicable.
Autoignition temperature	Not applicable.
Explosive properties	Not applicable.
Vapour pressure	Not applicable.
Bulk density	1.20 to 1.24g/cm ³ .
Solubility:	
Water solubility	Miscible.
Partition coefficient (n-octanol/water)	Not determined.
Other data	

SECTION 10: STABILITY AND REACTIVITY

Stability	Stable under normal conditions.
Materials and Conditions to avoid	No hazardous reactions when stored and handled to prescribed instructions.
Hazardous decomposition products	No decomposition if stored and applied as directed. Thermal decomposition may generate oxides of carbon and phosphorus.

SECTION 11: TOXICOLOGICAL INFORMATION

Mono-propylene glycol methyl ether	(CAS no. 107-98-2, EINECS no. 203-539-1) ~ 1.5%
Acute Toxicity:	LD50-oral, rat >5000 mg/kg LC50-inhalation, rat (4h) = 15.000ppm
Reproduction toxicity:	Negative.

SECTION 12: ECOLOGICAL INFORMATION

Information on components:	Do not allow product to enter soil, waterways or waste water.
Mono-propylene glycol methyl ether	(CAS no. 107-98-2, EINECS no. 203-539-1) ~ 1.5%
	Fish: LC50, 96h; ~28.000mg/l Daphnia: EC50, 48 h; ~23.300mg/l Algae: EC50, 168 h; >1000mg/l Biodegradation in activated domestic sewage: <80% after 28days. The potential to accumulate in biota and pass through the food chain is low. (Calculated log Pow is less than 3)

SECTION 13: DISPOSAL CONSIDERATIONS

Product	Recommended disposal of this product is in accordance with local regulations at approved sites. Incineration is suitable.
Uncleaned packaging	Contaminated packaging should be emptied as far as possible and after cleansing may be reused. Packaging that cannot be cleaned should be disposed of as product waste.

SECTION 14: TRANSPORT INFORMATION

UN Class	This product is not classified as dangerous goods under the United Nations Transport Recommendations.
UN Packing group	No special requirements.
ADR	Not regulated for transport.
RID	Not regulated for transport.
IMDG	Not regulated for transport.
IATA	Not regulated for transport.
Further information:	Dispatch by post permitted.

SECTION 15: REGULATORY INFORMATION

Labelling / Supply classification	No classification required according to directive 67/548/EEC, Directive 1999/45/EC and further amendments and adaptations.
National regulations	Water Hazard Class (Ger.): 2 (according to VwVwS, 17.05.1999)

SECTION 16: OTHER INFORMATION

Recommended use	Coating with fire retardant / intumescent properties.
Further information	Consult technical data sheet.
R-Phrase from section 2	R10 – Flammable. R20 – Harmful by inhalation R22 – Harmful if swallowed. R36 – Irritating to eyes. R38 – Irritating to skin.

The information contained in this safety data sheet is given in good faith. It is accurate to the best of our knowledge and belief and represents the most up to date information. The information given in this data sheet does not constitute or replace the user's own assessment of workplace risk as required by other health and safety legislation. The information given in this safety data sheet is meant to be a description of the safety requirements for our product. It is not to be considered a guarantee of the product's properties.

APPENDIX C: LIST OF COMPONENTS



Intumescent Systems Ltd

MANUFACTURERS OF
Envirograf®
PASSIVE FIRE PREVENTION PRODUCTS
Protecting Property – Protecting Lives



Components HW-series

	amount	CAS Number
HW01F		
tetramethylol acetylene diurea		5395-50-6
isothiazolone		26530-20-1
isothiazolone		55965-84-9
Chlorinated Paraffin, long chained		CAS 85535-84-8
Mono ethylene Glycol		107-21-1
Melamine		108-78-1
Pentaerythritol		115-77-5
APP		68333-7-9-9
Water		N/A
Titanium dioxide		13463-67-7
Veova modified Vinyl acetate		None
	100%	

	amount	CAS Number
HW02E		
Benzyl Alcohol		100-51-6
1-Methoxy-2-propanol		107-98-2
Ammonium Polyphosphate		68333-7-9-9
Pentaerythritol		115-77-5
Polymer		None
Dicyandiamide phosphosphate		None
	100%	



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Registered in England No. 02139649 VAT Reg. No. 530 6664 45



APPENDIX D: ISO 9001 CERTIFICATE INTUMESCENT SYSTEM LTD

