



BUREAU VERITAS

Centre European
Des Techniques de la Construction
Division Essais et Mesures
Tests and Measurements Division

Test Report No. DME 7 92 539

TEST CLAIMANT: Machinery Sales Noumea MSN
BP 3989 – OUEMO – Magenta
Noumea – New Caledonia
South West Pacific

Date of Claimant: 23 November 1992
Reference: fax Jim Della-Bonna

TEST CARRIED OUT ON: INSULTEC PAINT

SAMPLES: Received: On the November 10, 1992
Registered No 699

TYPE OF TESTS: Tests on roof covering for waterproofing.

DATE OF TESTS: From January 6th to March 26th, 1993

Bureau Veritas, established in 1828, is the largest building controller in Europe. The following test report is issued from it's Test and Measures Division.

At this point, it must be kept in mind that all buildings subject to a loan from any private or government banking institute must be covered by a 10 year construction warranty, that against any faulty workmanship, faulty materials, or materials which do not stand up to a very strict quality control and again inaccurate engineering calculations.

As soon as a total estimate has been carried out on and the tender adjudicated, the company must register the total cost of the building and an insurance policy for a ten year cover must be paid. Bureau Veritas then controls the structure from the foundations to the paint finish and until the final handing over to the owner.

Not a single item in the construction must be unknown to Bureau Veritas. Builders are required to show that all merchandise used is ratified by the European Standards Body.

SAMPLES USED: INSULTEC METAL PRIMER

1- PREPARATION OF TEST SURFACES

1-1 SURFACES

- Cement mortar finely finished following a standard No P 84-402
- Fibro cement prepared in conformity with standard NF T 30-800
- Fibro cement prepared as for NF T 30-800 but rendered alkaline by a process of standard NF T 30-803
- Galvanized steel, new and cleaned with scouring solvent, then washed with a solution of concentrated soda to obtain a p11 of 13.
- Sheet of vinyl to obtain a single coat of paint.

1-2 APPLICATION OF THE MATERIAL

1-2.1 Primary undercoat

Surfaces : cement mortar, fibro cement, sheet vinyl

Brush on a coat of metal primer diluted with 50% water

Mass of product applied per sq metre = 11 sq feet

Mortar	Fibro cement	Vinyl
560 gm.	340 gm	315gm

Drying time: 24 hours at 23⁰C +/- 2⁰C and 50% +/- 5% relative humidity.

1-2.2 INSULTEC paint

On all the above test surfaces

First coat of Insultec applied by brush

Mass of paint applied per sq m = 625gm, or 11 sq ft = 1lb 6 oz.

Drying time: 24 hours at 23⁰C +/- 2⁰C and 50% +/- 5% relative humidity

Brush application of a second coat of Insultec Paint

Mass of paint applied per sq m = 625gm, or 11 sq ft = 1lb 6 oz.

1-3 CONSERVATION PRIOR TO TESTS

After treatment, the test bars are kept away from dust for a month at 23⁰C +/- 2⁰C temperature and in a relative humidity of 50% +/-5%

2- WATER PENETRATION FOLLOWING CONVENTIONAL CODES: NFT 30-801

Test explanation

3 tubes of a diameter of 40mm (about 1.5") are sealed onto the Insultec paint which has been previously applied on a non alkaline fibro cement and a 4th tube is sealed on a piece of plate glass.

These have, at their ends, a reduction of 8mm (about 5/16th) in diameter, and a line is traced at 10cm (about 4") from the base.

The water level is checked and corrected every 24 hours during 8 days with the help of a drop glass.

The loss of water mass then corrected is weighed and gives the water absorption content of the surface in gm/dm² per day.

Results:

Water absorption g / dm ² /day	TEST1	TEST 2	TEST3	AVERAGE
	0.5	0.5	0.4	0.5
0.35 g / 1 ¾ sq. in	0.0175 OZ	0.0175 OZ	0.014 OZ	0.0175 OZ

3 - WATER VAPOUR PENETRATION TEST: NF T 30-018

Test explanation

3 samples of Insultec paint, having a diameter of 50mm are sealed inside aluminium cells, having a sump of 35.7mm +- 0.1mm.

With the help of a pipette, 20ml of saturated solution of ammonium chloride are introduced into the sump. The aluminium cells are then placed into a dryer for calcium chloride at 23°C +/- 2°C and 50% +/- 5% relative humidity

Every 24 hours, the loss of weight is registered

The water vapour penetration through the material becomes a constant, with a 5% error. It is expressed in g / m² / 24 hours.

Results:

Water absorption g / dm ² /day	TEST1	TEST 2	TEST3	AVERAGE
	11	12	9	11
Per 11 sq. ft / 24 hrs	3/8 th OZ	7/16 th OZ	1/4 th OZ	3/8 th OZ

4- TEST FOR ENDURANCE UNDER NORMAL CLIMATIC CONDITIONS:

Test carried out under the method of 75 automatic cycles in 12 hours.

- **Cement mortar surface**

At the conclusion of the cycles the product showed no apparent dust, no sign of coming away from the surface, no cracking, no change of colour and no trace of bubbles.

5- ADHERENCE TEST: NF30-062

On cement mortar base

Patches of 50mm diameter

The stress and tearing point are shown on the table below.

Test Number	Applied stress in Mpa	Average	Type of rupture looked for
	5 –1 <u>Before climatic cycles, test average</u>		
1	1.5		
2	1.8		
3	1.7		
4	1.8	1.6	Rupture of adhesion (coming unstuck at the base)
5	1.7		
6	1.5		
7	1.4		
8	1.6		
	5 –2 <u>After climatic cycles, test average</u>		
1	1.4		Test 1 to 6
2	1.3		Un-sticking at base
3	1.3		
4	1.4	1.5	
5	1.8		Tests 7 and 8
6	1.2		Un-sticking at base and later coming of with the material.
7	1.7		
8	2.1		

6 - STANDARD TEST OF PERFORMANCE TO HUMIDITY AND HEAT NF T 30-802

Surface used: Fibro cement
Alkaline fibro cement

After 3 weeks exposure at 40°C +/- 2 °C and 95% relative humidity, the tested material showed no dust, no loss of adhesion, no cracking, no change or colour, nor bubbling.

7 - ADHERENCE TEST: NF T 30-062

Surface used: Fibro cement
Alkaline fibro cement

Patches of 50mm diameter

Test Number	Applied stress in Mpa	Type of rupture looked for
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7 -1 Before exposing to humidity and heat

7 - 1.1 Test Samples: Fibro cement

1	0.6	Bonding break of the base
2	0.7	
3	0.6	
4	0.6	0.6 Average
5	0.7	
6	0.5	
7	0.6	

7 - 1.2 Test Samples: Alkaline fibro-cement

1	0.7	Bonding break of the base
2	0.7	
3	0.6	
4	0.7	0.7 Average
5	0.8	
6	0.7	
7	0.5	
8	0.7	

7 -2 After climatic cycle's test

7 - 2.1 Test Samples: Fibro cement

1	1.8	
2	1.6	Bonding break of the base
3	1.7	and partly un-sticking of the base
4	1.7	1.7 Average
5	1.8	
6	1.6	
7	1.4	
8	1.6	

7 - 2.2 Test Samples: Alkaline fibro-cement

1	0.7	Bonding break from the base
2	0.8	
3	0.7	
4	0.7	0.8 Average
5	0.8	
6	0.8	
7	0.8	
8	0.8	

8 - STANDARD TEST OF PERFORMANCE TO SALINATED FOG

Test sample : galvanized sheet steel (NEW)

Preparation according to standard NF x 41-002

After 500 hours of exposure to salinated fog, the material showed no effect of dusting, un-sticking, racking, change of colour, bubbling nor traces of rusting of the surface on which the surface is applied.

9 - ADHERENCE TEST NF T 30-062

The stress and type of separation are indicate in the table below :

Test Number	Applied Stress in Mpa	Type of rupture looked for
9 – 1 <u>Before 500 hours exposure to salinated fog</u>		
1	0.9	Un-sticking of the applied material and its base
2	1.0	
3	1.1	1.0 Average
4	1.1	
5	0.8	
6	1.0	
7	1.1	
9 – 2 <u>After 500 hours exposure to salinated fog</u>		
1	0.9	Un-sticking of the applied material and its base
2	1.0	
3	1.1	1.0 Average
4	1.1	
5	0.8	
6	1.0	
7	1.1	

10 - RESISTANCE TEST FOR BREAK FOLLOWING FALL OF A MASS: NFT30-039

Procedure of the test

Base of the test: galvanized sheet steel (new)

A weight of 1000gms (2lb 2oz) with polished and rounded ends, having a diameter of 23mm +/- 1mm is dropped through a guide tube from varying heights and without initial velocity.

The cracking or un-sticking of the material is observed at the point of impact from a given height.

Results:

Thickness of the material in mm – minimum: 0.4 / maximum:0.6

M = 2lb 2oz

H = 0.5m

No of impacts: 5 – no cracking, no un-sticking,

11 - ABRASIVE RESISTANCE TEST

This test is carried out according to standard NF T 30-015 (Dec 1991) on 3 test samples made of galvanized steel sheeting covered with Insultec paint.

Number of abrasions: 100

Results:

Test Number	TEST 1	TEST 2	TEST 3	AVERAGE
Loss of weight in mg	21	22	22	22
	7/1000 th oz	8/1000 th oz	8/1000 th oz	8/1000 th oz

12 - COMPARISON TEST

The measures carried out are those taken on samples previously used for testing

Product Identification	METAL PRIMER	INSULTEC
Volumetric mass at 23°C (g/cm ³) (73.5° F oz/cu in)	0.947 ½ oz / cu in	1.240 2/3 oz / cu in
Extracted dry at 105°C (220 °F)	24.8%	56%
Quantity of ashes at 450 °C (840 °C)	11.7%	19.2%
Quantity of ashes at 900 °C	11.6%	19.4%

Viscosity at 23 °C (73.5 °F)

Brookfield apparatus	Type	T2	T6
Speed in revolutions / minutes		Viscosity	
5.0		0.2	46
10.0		0.2	26
20.0		0.2	15
50.0		0.2	7
pH indicator at 73.5 °F / 23 °C			7.5



Gennevillers the 7th April 1993

Technician chargé des essais



Dominique HEITZLER