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INTUMESCENT PAINT PERFORMANCE TEST – MICON “INTUSAYF WB”





Building Products & Services Programme

**INTUMESCENT PAINT PERFORMANCE TEST – MICON
“INTUSAYF WB”**

Contract No:

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INTUMESCENT PAINT PERFORMANCE TEST – MICON “INTUSAYF WB”

1. USE OF THIS REPORT

The use of this report is subject to the attached “General Contract Conditions” which forms an integral part of this report.

2. DESCRIPTION OF TEST MATERIAL

The material supplied for testing was a water based intumescent paint with a white colour indentified as Micon “Intusayf WB”.

3. TEST METHODS AND RESULTS

3.1 Fire insulation properties (AAC Spec 164/23 clause 4.2)

The intumescent and fire insulation properties of the coating were determined by exposing the coated side of a 150 x 150 mm steel plate (coated according to the manufacturer’s instructions with the test material) to the effects of a gas burner with a flame temperature of 1 100 °C. The temperature on the upper side of the steel plate was measured by a thermocouple brazed to the plate.

The following result was obtained:

Time (minutes)	Temperature (°C)
0	24
2	219
4	221
6	218
8	215
10	212
12	210
14	209
16	208
18	208
20	207

This result met the requirements of the AAC Specification which states that the maximum temperature on the upper surface of the steel plate must not exceed 250 °C after two minutes of the test or exceed 220 °C after a further 15 minutes.

3.2 Resistance to cracking (AAC Spec. 164.23 clause 4.4)

The coating was applied to a 20 mm diameter PVC cable and allowed to age for 48 hours. When the coated cable was bent over a 200 mm mandrel, no cracking was observed. This complies with the requirements of the specification.

3.3 Stability of Char

The carbonaceous char that developed during the insulation test was exposed to an airstream with a velocity of 5 m/s without dislodging. When re-tested, similar results to those recorded in 3.1 were obtained. This complies with the specification requirements.

3.4 Toxicity Test (AAC Spec. 164/23 clause 4.6)

The insulation test was performed in a chamber with a volume of 1 m³. the concentrations of certain specified gases were determined by means of colorimetric (Dräger) tubes. These concentrations were then used to calculate the quantities of gases given off by burning 100 g of material in a cubic metre of air, knowing the specific gravity of the material and the thickness of the material applied.

The toxicity index is calculated from the summation of the ratios of these concentrations to the concentrations causing fatality to man after a 30 minute exposure time.

Gases to be determined and their fatality limits are:

Gas	Conc. (ppm)	Gas	Conc. (ppm)
Carbon Dioxide	100000	Nitrous Oxides	250
Carbon Monoxide	4000	Hydrogen Cyanide	150
Formaldehyde	500	Acrylonitrile	400
Hydrogen Fluoride	100	Ammonia	750
Hydrogen Chloride	500	Sulphur Dioxide	400
Hydrogen Bromide	150	Hydrogen Sulphide	750
Phenol	250	Phosgene	25

The following results were obtained:

Gas detected	Conc. For 100 g of material burned (ppm)	Toxicity Index
Carbon Dioxide	90 000	0.9
Carbon Monoxide	2 500	0.625
Nitrous Oxides	750	3

Total Toxicity Index : 4.525

This result complies with the requirements of the specification which requires that the toxicity index be less than 5.0.

3.5 SABS 0177 Part 3 test

In addition to the above tests which form part of the AAC specification, a SABS 0177 Part 3 test was performed on the coating in order to assess its flame spread, heat contribution and smoke evolution properties. Based on these a Surface Fire Index was calculated and a classification awarded.

Micon “Intusayf WB” was applied to a non-combustible backing to a dry thickness of 250 microns. A light green topcoat as also applied which adds another 20 to 30 microns to the overall dry thickness.

The following results were obtained:

- Spread of Flame Index : 0
- Heat Contributed Index : 0
- Smoke Emitted Index : 0.12

Therefore the Surface Fire Index of the material is 0.12/3 – 0.04.

The table with the maximum allowable values of the various indices for the different classifications are given below:

Class	Spread of Flame Index	Heat Contributed Index	Smoke Emission Index	Surface Fire Index
1	0.1	0.1	0.2	0.1
2	0.7	0.8	1.0	0.6
3	1.5	1.7	2.0	1.2
4	3.5	3.8	4.0	2.9
5	5.5	5.8	6.0	4.5

From the table it can therefore be seen that Micon “Intusayf” applied to a dry thickness of 250 μm is classified as a Class 1 finishing material.

4. DISCUSSION OF RESULTS

From the above tests it can be seen that Micon “Intusayf WB” satisfied the requirements of AAC Specification number 164/23 on all of the aspects evaluated.

Furthermore the results of the SABS 0177 Part 3 test indicate that the material does not support flame spread when applied to a thickness of 250 microns.





GENERAL CONTRACT CONDITIONS

1. **PURPOSE**

The purpose of the investigation must be fully disclosed to the CSIR. The client will use the results of the investigation only for the purpose disclosed to the CSIR, unless otherwise agreed.
2. **RISK RELATING TO MATERIALS, APPARTUS, OR EQUIPMENT**

Materials, apparatus or equipment delivered by or on behalf of the client to the CSIR pursuant to the contract, shall be accepted, retained and used at the owner's risk.
3. **PUBLICATION OF REPORTS**
 - (a) The contents of any interim reports issued are confidential and may not be published by the CSIR or the client, and the results of any discussions with CSIR personnel relating to this investigation may not be communicated to the press or technical journals or be given publicity in any other manner until the final report has been issued.
 - (b) The final report will be the property of the client and may be published by him provided that:
 - (i) the CSIR be acknowledged in the publication;
 - (ii) it is published in full, or where only extracts or a summary of an abridgment are published, the CSIR's written approval of the extracts, summary or abridged report be obtained prior to publication; and
 - (iii) the CSIR be indemnified against any claim for damages which may result from publication.
4. **CONFIDENTIALITY**

The CSIR will not publish any results without the client's consent. The CSIR is, however, entitled to use technical information obtained from the investigation, but undertakes in doing so not to identify the sponsor or the subject of this investigation.
5. **ADVERTISING**

No reference may be made to CSIR or any of its strategic units or employees in advertisements or for sale or publicity purposes without the CSIR's prior written consent.
6. **OWNERSHIP OF INTELLECTUAL PROPERTY**

In terms of Act No. 46 of 1988 all intellectual property developed by CSIR during the course of the investigation vests in the CSIR unless otherwise agreed in writing.
7. **DOMICILIUM CITANDI ET EXECUTANDI**

The parties hereto respectively choose as their *domiciliuim citandi et exectutandi* for all purposes of, and in connection with, this contract, the addresses stated in the letter of proposal.
8. **WAIVER**

Failure of either party hereto at any time to demand performance of any provision of the contract shall not affect that party's rights to require full performance thereof at any time thereafter and a waiver by either party of a breach by the other of any such provision shall not be taken to a waiver of any subsequent or similar breach, or as nullifying by the effectiveness of such provision.
9. **NOTICES**

Any notice to be given hereunder shall be given in writing and may be given either personally or may be sent by post or telex or telefax and addressed to the relevant party at its *domicilium* or to such other address as shall be notified in writing by any of the parties to the other. Any notice given by post shall be deemed to have been served on the expiry of 7 (seven) working days after the same is posted by registered post by (land or airmail). Any notice delivered personally or sent by telex or telefax shall be deemed to have been served at the time of delivery or sending.

Any notice to be given shall be given to the client at his principal place of business and to the CSIR, Scientia (BOUTEK) at Meiring Naude Road, Pretoria.
10. **AMENDMENTS**

No amendment to this contract or the proposal shall be of any force or effect unless reduced to writing and signed by both parties.
11. **VALUE ADDED TAX**

It is hereby expressly recorded that any Value Added Tax (VAR) payable in respect of the services rendered in terms of this contract shall be for the account of the client and shall be included in the final payment payable in terms of this contract.

12. LIMITATION OF LIABILITY

While every care is taken to ensure the accuracy of any work performed by the CSIR under this contract, the CSIR does not warrant the merchantability or commercial viability of the research results. Neither the CSIR nor its employees shall be liable in any way whatsoever to the client or to any other person whatsoever for any negligence, error or omission in carrying out the work or for any erroneous statement, whether in fact or opinion, contained in any report issued pursuant to the work performed.

13. GOVERNING LAW AND JURISDICTION

13.1 The contract between the parties shall be governed by and interpreted in all respects in accordance with the laws of the Republic of South Africa. The parties hereby consent to the jurisdiction of any competent Magistrate's Court for the adjudication of any claim based on this contract.

13.2 Notwithstanding the provision of 13.1, in the event of the parties failing to reach agreement in regard to the interpretation of, or the carrying into effect of, or any of the parties' rights and obligation arising from, or the termination of or arising from the termination of, or the rectification of, this agreement within 14 (fourteen) days of the dispute arising, then either party may, by notice in writing to the party, refer the dispute for determination by arbitration in South Africa under the provision of the Arbitration Act, Act No. 42 of 1965, as amended.

The arbitrator shall be, if the matter in dispute is principally

- a legal matter, a practising attorney of not less than 15 (fifteen) years standing or a practising advocate of not less than 10 (ten) year standing;
- an accounting matter, a practising chartered accountant of not less than 10 (ten) year standing;
- any other matter, any independent person agreed to between parties.

Should the parties fail to agree on an arbitrator within 14 (fourteen) days after the arbitration has been demanded then the arbitrator shall be nominated by the (current) serving President of the Law Society of the Transvaal.

14. PAYMENT OF ACCOUNT

All amounts due in terms of this contact shall be payable on the due date indicated in the proposal or within 30 (thirty) days of the date of issue of an invoice where that is required. Any amount not paid on the due date shall bear interest at a rate of 2% (two per cent) above the prime overdraft rate charged by Volkskas Bank Limited to its preferred corporate clients, calculated and compounded daily as from the due date until date of payment.

15. VALIDITY

All proposals are valid for 30 (thirty) days from date of issue, unless otherwise indicated, and unless accepted within that period, will lapse automatically.

16. TERMINATION

This contract may be terminated forthwith by either party in the event of the other being liquidated or being placed under judicial management.

In the event of any party to this contract being in breach of any of the terms of the contract, the other may by written notice require the party which is in breach to remedy the breach, and if it has not been done so within 7 (seven) days of receipt of such notice, or if the breach is incapable of being remedied, the other party may, in writing, terminate the contract without prejudice to its right to claim damages.