



FIRELAB

TITLE : Report on the small-scale fire properties of the **Vent Block Sealer** when tested in accordance with the **DEFSTAN (NES 713)** and **SANS 10177 – Part 9** test protocols

REQUESTED BY : **Chryso SAF (Pty) Ltd**
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TABLE OF CONTENTS

LIST OF FIGURES AND TABLES.....	1
1. SAMPLE DESCRIPTION	2
2. TEST PROCEDURES.....	3
2.1. TOXICITY: DEFSTAN (NES 713)	3
2.1.1. TEST EQUIPMENT.....	3
2.2. BASIC FIRE PROPERTIES: SANS 10177 – PART 9:2006	4
2.2.1. TEST EQUIPMENT.....	4
3. TEST RESULTS	5
3.1. TOXICITY: DEFSTAN (NES 713)	5
3.2. BASIC FIRE PROPERTIES: SANS 10177 – PART 9:2006	6
4. DISCUSSION OF RESULTS.....	7
4.1. TOXICITY: DEFSTAN (NES 713)	7
4.2. BASIC FIRE PROPERTIES: SANS 10177 – PART 9:2006	7
5. CONCLUSION	8
ANNEXURE “A”	9
ANNEXURE “B”	10

LIST OF FIGURES AND TABLES

Figure 1.1: Identification of the specimen received for testing.....	2
Table 2.1.1: Noxious gases with its lethal limits after 30 minutes of exposure	3
Table 3.1.1: Toxicity test results	5
Table 3.2.1: SANS 10177 – 9 test results	6

1. SAMPLE DESCRIPTION

A **Vent Block Sealer** applied to a non-combustible board was delivered to **FIRELAB**. The material, intended for underground use, was tested for both basic fire properties and toxicity of combustion products.

The specimen submitted for testing was identified as follows:

Product name:	Vent Block Sealer
Manufacturer:	Chryso South Africa
Manufacturing Date:	September
Product Code:	PF 002339A
Thickness:	1 to 2 mm
Composition:	Styrene acrylic copolymer

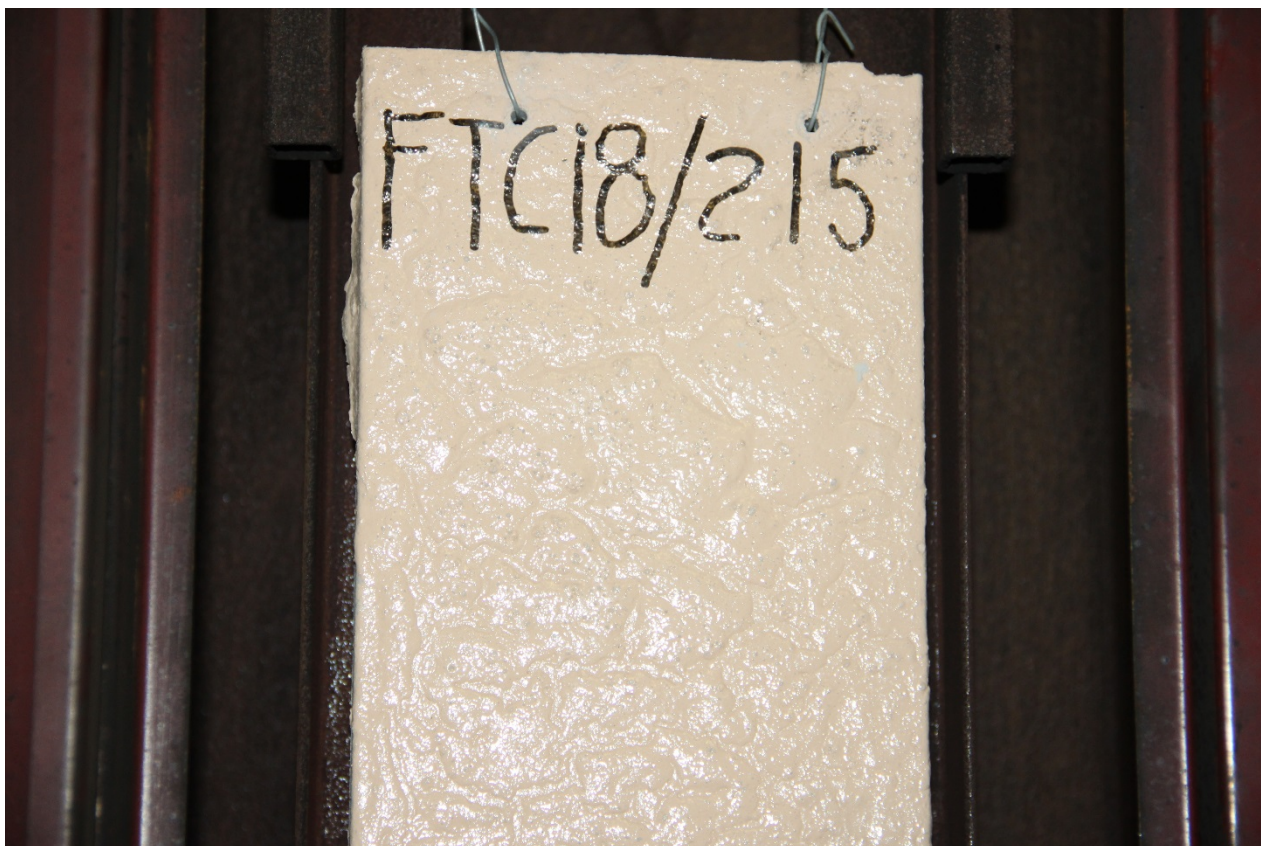


Figure 1.1: Identification of the specimen received for testing

Annexure "A": Company information

Annexure "B": Product information and Safety Data Sheet

2. TEST PROCEDURES

2.1. TOXICITY: DEFSTAN (NES 713)




One gram ($1\text{ g} \pm 5\text{ mg}$) of the material was burned in a chamber with a volume of 1 m^3 . 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 should a 100 g of material burned in a cubic meter (1 m^3) of air.

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	Chemical Formula	Conc. (ppm)	Gas	Chemical Formula	Conc. (ppm)
Carbon Dioxide	CO ₂	100 000	Nitrous Oxides	N ₂ O	250
Carbon Monoxide	CO	4 000	Hydrogen Cyanide	HCN	150
Formaldehyde	CH ₂ O	500	Acrylonitrile	C ₃ H ₃ N	400
Hydrogen Fluoride	HF	100	Ammonia	NH ₃	750
Hydrogen Chloride	HCl	500	Sulphur Dioxide	SO ₂	400
Hydrogen Bromide	HBr	150	Hydrogen Sulphide	H ₂ S	750
Phenol	C ₆ H ₅ OH	250	Phosgene	COCl ₂	25

Table 2.1.1: Noxious gases with its lethal limits after 30 minutes of exposure

2.1.1. TEST EQUIPMENT

-  Dräger tubes (various as per test protocol)
-  Dräger pump
-  Toxicity Test facility

2.2. BASIC FIRE PROPERTIES: SANS 10177 – PART 9:2006





A specimen of 1 500 mm long by 150 mm wide was secured in the test frame. The frame was suspended in a 300 mm x 300 mm x 2.1 m high metal chimney along its length approximately 65 mm above the Bunsen burner.

A Bunsen burner with a flame length of 200 mm and a temperature of $\pm 1\,000\text{ }^{\circ}\text{C}$ was applied at an angle of 45° , 100 mm below the bottom edge of the specimen for a period of 10 minutes.

The temperature near the top of the chimney was recorded with a single K-type thermocouple. This temperature was used to determine the heat contribution of the test specimen in comparison to the plot obtained from a “blank” run.

Other observations related to the presence of flaming droplets, the propensity to self-extinguish upon removal of the burner and rate of flame spread along the height of the specimen were also noted.

2.2.1. TEST EQUIPMENT

-  Temperature recorder – Multi-meter
-  Stopwatch
-  Type K thermocouple
-  **SANS 10177 – 9** Test facility chimney

3. TEST RESULTS

3.1. TOXICITY: DEFSTAN (NES 713)

The results from the toxicity test conducted on 10 October 2018 are seen in Table 3.1.1 below, the average Ambient Temperature during test was 26.5 °C.

Chryso SAF – Vent Block Sealer			
Gas detected	Chemical Formula	Conc./100 g (ppm)	Toxicity Index
Carbon Dioxide	CO ₂	120 000	1.200
Carbon Monoxide	CO	3 000	0.750
Hydrogen Chloride	HCl	-	-
Nitrous Oxides	N ₂ O	-	-
Hydrogen Cyanide	HCN	-	-
Sulphur Dioxide	SO ₂	-	-
Acrylonitrile	C ₃ H ₃ N	-	-
Total Toxicity Index			1.950

Table 3.1.1: Toxicity test results

3.2. BASIC FIRE PROPERTIES: SANS 10177 – PART 9:2006

Observations made during the **SANS 10177 – 9** test conducted on 10 October 2018 are shown in Table 3.2.1.

Chryso SAF – Vent Block Sealer	
Observations during SANS 10177 – Part 9 Test	
Time to Ignition/Flaming (mm:ss)	00:04
Specimen burning after removal of burner at 12 seconds	No
Specimen burning after removal of burner at 24 seconds	No
Length of flame spread	120 mm
Length of heat damage	270 mm
Heat Contribution over 10-minute period	0.64 °C/min
Maximum temperature in chimney above calibration temperature	6.4 °C
Note: Calibration temperature 11.0 °C; ambient temperature 26.4 °C	

Table 3.2.1: **SANS 10177 – 9** test results

4. DISCUSSION OF RESULTS

4.1. TOXICITY: DEFSTAN (NES 713)

The toxicity level (Total Toxicity Index) of the combustion gases released by the specimen is **1.950**.

4.2. BASIC FIRE PROPERTIES: SANS 10177 – PART 9:2006

The specimen ignited at approximately 4 seconds and slowly propagate up to approximately 120 mm. The flaming on the specimen self-extinguished before the end of the test period (10 minutes).

No molten or flaming droplets were observed during the test.

When the Bunsen burner was removed at the end of the test period, no visible glowing was observed

5. CONCLUSION

The **Vent Block Sealer** when applied to a non-combustible board, supplied by **Chryso SAF**, achieved a toxicity index rating of **1.950** during the **DEFSTAN (NES 713)** Toxicity test and did not propagate flame during the **SANS 10177 – Part 9** test.

- Notes:**
- » The Toxicity Index must be considered in conjunction with the material, the application of the material and the associated risk assessment that must be carried out by each mine. The use of material in large continued applications would present a higher risk than a material used in a confined application. The Toxicity Index will also vary depending on the ventilation requirements (dilution) applicable at each mine.
 - » The material is combustible and therefore use and storage should be managed in accordance with the relevant safety requirements that may be applicable at the respective mines.




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Compiled by: **E.M. Nel**




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Approved by: **J.S. Strydom**

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- Company Information -		 FIRELAB
Company Name:	CHRYSO SOUTH AFRICA	
Company Trading Name:	CHRYSO SAF (Pty) Ltd.	
Company Registration Nr.:	1995 / 005321 / 07	
Company VAT Nr.:	4500 158 441.	
Core Business Activities:	CONCRETE ADDITIVES TO CONSTRUCTION INDUSTRY	
Postal Address:	POST NET. SUITE 59 PRIVATE BAG XI EAST RAND 1462	
Physical Address:	26 MALCOLM MOODIE CRESENT JET PARK 1469	
Company contact number:	011 395 9700	
Direct Contact Details		
Technical (name):	FRANS BAKSELEKOWICZ	
Cell phone number:	062 620 1574	
Email address:	FRANSB@CHRYSOSA.CO.ZA	
Financial (name):	VELASHNIE PADAYACHEE	
Cell phone number:	011 395 9700	
Email address:	VELASHNIE@CHRYSOSA.CO.ZA	
- Test & Sample Information -		
Test Required:	FIRE & TOXICITY TEST	
Sample/Product name:	JENT BLOCK SEALER	
Intended Use:	SEALING VENTILATION WALL 4/6.	
Sample/Product Description:	1 X 1.5 W 1.0 - 2.0mm JENT BLOCK SEALER.	
<i>(Short description of sample or product submitted for testing, and type of material to be tested)</i>	THIN SPRAY APPLIED TO VENTILATION WALLS TO SEAL AND INCREASE DENSITY OF HOLLOW BLOCK WALLS IN COAL MINES.	

ANNEXURE "B"

- SANS 10177 - Part 9 & NES 713 (TOX) - - Product Description -		 FIRELAB
Product description:		
Product name:	VENT BLOCK SEALER	
Product Manufacturer:	CHRYSO . SOUTH AFRICA .	
Manufacturer Date:	SEPT.	
Product Code No.:	PF 002339A.	
Batch No.:	SAMPLE .	
Proposed Usage:	VENTILATION LEAKAGE SEALER .	
Generic Identification:	NA .	
Physical description:		
Actual Mass (g/m ²):	SG . 1.12 .	
Thickness (mm):	1.0 - 2.0 mm .	
Width (mm):	-	
Length (mm):	-	
Product composition:		
Layer 1:		
Layer 2:		
Layer 3:		
Layer 4:		
Layer 5:		
Additional Information - MSDS:		

Technical data sheet

CHRYSO[®] Vent Block Sealer

Underground ventilation sealer

Description

CHRYSO[®] Vent Block Sealer is an underground ventilation sealer for hollow block walls.

CHRYSO[®] Vent Block Sealer acts as a styrene acrylic copolymer sealant for ventilation walls and air crossings.

Advantages

- Ready-to-use
- Easily application
- Colour tinted to easily identify full coverage
- Bonds well and bridges cracks up to 1mm.
- Improves the density of building blocks and bricks
- Gives wall stronger tensile strength
- Tough plastic like membrane
- Able to absorb flexibility
- Hardens rapidly into an effective ventilation stop.
- Non-flammable
- Reduces leakage efficiency

Application guidelines

Use

- Concrete bricks/blocks
- Clay bricks

Application

- The optimum dosage of CHRYSO[®] Vent Block Sealer can only be established after using trial tests
- The surface should be cleaned with a broom, to remove any excessive dust residues.
- If CHRYSO[®] Vent Sealer should become lumpy or skinned, it should first be stirred in it's original container
- Apply CHRYSO[®] Vent Block Sealer by spray/brush directly onto a ventilated-type wall surface.
- More than one coat can be applied, if the leakage factor is high.

Physical and chemical properties

- Physical state: liquid
- Colour: cream to amber
- Solids, by weight: 47%
- pH: 9.0
- Specific gravity: 1.12
- Soluble: Yes

- The average drying time of CHRYSO[®] Vent Block Sealer is 2 hours.

- Clean application equipment well with water after use.

Coverage

- > 1mm

Precautions

- Do not expose to skin for long periods of time as product may not wash off easily.

Storage

- Store at room temperature in closed containers
- Avoid storing in direct sunlight and temperatures above 40° C
- Protect from frost
- Shelf life of 6 months, if stored correctly

Packaging

- 25t jerry cans

The Test Report and results only relate to the product(s) and/or sample(s) submitted for testing as identified in Section 1 and Annexures and do not apply to any similar product(s) or sample(s) that has not been tested. This Test Report is only valid for 5 years or until there is a change to the product composition, manufacturing process or previously approved supplier(s).



Revision number: 1
Date: 2018/08/13

Technical data sheet

CHRYSO[®] Vent Block Sealer

Underground ventilation sealer

Health and safety

- ☒ non-hazardous and non-toxic to skin
- ☒ For more information, please refer to the material safety data sheet.

Disclaimer: The information contained in this document is given to the best of CHRYSO's knowledge and is the result of extensive testing. However, this document will not under any circumstances be considered as a warranty involving CHRYSO's liability in case of misuse. Tests should be carried out before any use of the product to ensure that the methods and conditions of use of the product are satisfactory. CHRYSO specialists are at the disposal of the users in order to help them with any problems encountered.

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Page: 2/2

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SAFETY DATA SHEET (REGULATION (EC) n° 1907/2006 - REACH)
Version : N°2 (10/08/2018)
CHRYSO SOUTHERN AFRICA (PTY)

Date : 10/08/2018 Page 1/7
Revision : N°1 (10/08/2018)

Vent Block Sealer - PF002339A



SAFETY DATA SHEET

(REACH regulation (EC) n° 1907/2006 - n° 2015/830)

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

1.1. Product identifier

Product name : Vent Block Sealer
Product code : PF002339A.

1.2. Relevant identified uses of the substance or mixture and uses advised against

Concrete and mortar admixture.

1.3. Details of the supplier of the safety data sheet

Registered company name : CHRYSO SOUTHERN AFRICA (PTY).
Address : 26 Malcolm Moodie Crescent, Jet Park Ext.30, 1469..Boksburg.South Africa.
Telephone : 27 11 395 97 00. Fax : 27 11 397 66 44.
fds.chryso@chryso.com
www.chryso.com

1.4. Emergency telephone number : -0800 333 444.

Association/Organisation : .

SECTION 2 : HAZARDS IDENTIFICATION

2.1. Classification of the substance or mixture

In compliance with EC regulation No. 1272/2008 and its amendments.

Skin sensitisation, Category 1 (Skin Sens. 1, H317).

This mixture does not present a physical hazard. Refer to the recommendations regarding the other products present on the site.

This mixture does not present an environmental hazard. No known or foreseeable environmental damage under standard conditions of use.

2.2. Label elements

In compliance with EC regulation No. 1272/2008 and its amendments.

Hazard pictograms :



GHS07

Signal Word :

WARNING

Product identifiers :

EC 204-798-3

613-167-00-5

TRISOBUTYLPHOSPHATE

MIXTURE OF: 5-CHLORO-2-METHYL-4-ISOTHIAZOLIN-3-ONE [EC NO. 247-500-7] AND
2-METHYL-2HISOTHIAZOL-3-ONE [EC NO. 220-239-6] (3:1)

Hazard statements :

H317

May cause an allergic skin reaction.

Precautionary statements - Prevention :

P261

Avoid breathing vapours/spray.

P280

Wear protective gloves/protective clothing/eye protection/face protection.

Precautionary statements - Response :

P333 + P313

If skin irritation or rash occurs: Get medical advice/attention.

Other information :

2.3. Other hazards

The mixture contains substances classified as 'Substances of Very High Concern' (SVHC) \geq 0.1% published by the European Chemicals Agency (ECHA) under article 57 of REACH: <http://echa.europa.eu/fr/candidate-list-table>

The mixture fulfils neither the PBT nor the vPvB criteria for mixtures in accordance with annexe XIII of the REACH regulations EC 1907/2006.

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