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For attention: Mr Duncan Goldsmith

13 January 2010

Dear Sir

EVALUATION OF THE TOXICITY OF THE GASES RELEASED UPON THE COMBUSTION OF "ENVIRODUCT" AIR-CONDITIONING DUCTING MATERIAL

1. SAMPLE DESCRIPTION

The "Enviroduct" air-conditioning ducting system consists of 20 mm thick panels consisted of a poly-isocyanurate foam core with a heavy foil facing on either side. The system is intended for use in the construction of air-conditioning ducting in buildings. It was required to evaluate the toxicity of the gases released upon the combustion of this material.

2. TEST METHODS AND RESULTS

2.1 Toxicity of combustion gases (NES 713)

One gram of the sample (a representative portion) was burned 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. 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 for the “Enviroduct” sample:

Gas detected	Conc. of gas per 100 g of material consumed (ppm)	Toxicity Index
Carbon Dioxide	90 000	0.9
Carbon Monoxide	4 000	1.0
Nitrous Oxides	500	2.0
Hydrogen Cyanide	100	0.66

Total Toxicity Index: 4.56

3. DISCUSSION OF RESULTS

The toxicity levels of the combustion gases released by the sample are regarded as within acceptable limits.

4. CONCLUSION

While there are no standards particularly related to the toxicity of gases released upon combustion for the building and construction industry in South Africa, the standards applicable to the mining industry requires that a product have a toxicity index of less than 5.0 to be considered for underground applications. While the product tested is not earmarked for underground application at this stage, given this guideline, the gases released upon the combustion of “Enviroduct” can be viewed as favourable in terms of toxicity.

Yours faithfully

A square box containing a handwritten signature in black ink. The signature is stylized and appears to be 'K van Dyk'.

K van Dyk
Fire Technology & Consulting Services T/a **FIRELAB**