S420-420

JOHNS-MANVILLE RESEARCH AND ENGINEERING CENTER

Report No. 404-105

Date March 30, 1972

Title: THERMOBESTOS AND MARINITE - Fiber and Dust Release on Cutting

Requested by: S. Speil

SUMMARY

MARINITE, MOLTEN METAL MARINITE, Regular THERMOBESTOS, and laboratory heat treated THERMOBESTOS (chrysotile converted into amorphous form) were evaluated for fiber and dust release during cutting. The MARINITE blocks were cut with a rotary carbide-tipped saw. The THERMOBESTOS blocks were cut with a bandsaw. While cutting, the airborne particulates were collected by a Millipore filter equipped personal sampler attached to the operators collar. The cutting methods are believed typical of field cutting.

The MOLTEN METAL MARINITE released three times more airborne total dust and fiber than MARINITE 36.

The heat treated THERMOBESTOS released significantly less airborne total dust and fiber than regular THERMOBESTOS. Further evaluation is recommended to ascertain [illegible]s. The physical properties should also be tested for probable degradation since it cut and broke apart easier.

Contents: Summary, Material, Test Procedure, Results and Conclusions

Reported by R. M. Haller

R. M. Haller
Materials Evaluation Section

pmp

cc: E. M. Fenner - Denver
G. L. Swallow - Denver
H. E. Konrad - NY
C. Sheckler - NY

F. L. Pundsack (S)
S. Speil
J. H. Zettel
Att: W. K. Hesse
J. P. Leineweber
G. P. Reimschussel
R. H. Neisel
R. M. Haller
K. L. Kinder (2)
Library (2)

Published by AsbestosClaims.Law
asbestosclaims.law/library/25552/1

JOHNS-MANVILLE RESEARCH
AND ENGINEERING CENTER

MATERIAL

Two blocks of THERMOBESTOS measuring 2 x 12 x 36-in. were received from Manville plant utilizing the following formula:

Material	Per Cent
CELITE 256	22.4
CELITE 392	24.1
Hydrated Lime	46.6
4 K 30 Chrysotile	6.9

This is the formula for homogenized fiber.

Two blocks of MARINITE were received from Billerica plant with the following measurements and formulas:

	MARINITE 36	Molten Metal MARINITE
1. Dimensions, in.	1/2 x 14 x 48	1 x 14 x 40-5/8
2. Formula, per cent		
a. Amosite	33.3	40
b. CELITE	33.3	30
c. Hydrated Lime	33.3	30

One of the THERMOBESTOS blocks was heat-treated as follows in order to convert the asbestos to the amorphous form:

1. Preheat two furnaces to 400C (752F) and 685C (1265F).
2. Heat block at 400C for 5-hr followed by immediate insertion into 685C furnace for 1-hr.
3. Asbestos was not fully converted, therefore, the block was heated at 400C for 3-hr followed by 685C for 25-min.
4. After the 685C exposure the block was immediately placed at room temperature.

The X-ray examination (No. 4248-51-10) confirmed that the asbestos had all converted to the amorphous form.

TEST PROCEDURE

The MARINITE blocks were cut along the 14-in. side. The 3/8-in. wide cuts were executed at a speed of 20 and 15-sec per 14-in. cut for the MARINITE 36 and MOLTEN METAL MARINITE (MMM) respectively. The MMM was softer, therefore, it cut easier. A portable electric rotary hand saw (6000 rpm, 2.0 HP) was employed with a 7-in. carbide-tipped blade (eight teeth, 1/8-in. wide). The cutting was

Published by AsbestosClaims.Law
asbestosclaims.law/library/25552/2

executed in the fire test room with the outside wall fan on. The material was at room condition. Approximately equal lengths of cut were made with collection times for the sampler of 20 and 16-min for MARINITE 36 and MOLTEN METAL MARINITE, respectively.

The THERMOBESTOS blocks were cut with a bandsaw (No. 552) at a blade speed of 3300 ft/min (six teeth/in., 1/16-in. blade width). The bandsaw exhaust system was on. One-half inch wide cuts were made in the THERMOBESTOS along the 12-in. side at a rate of 15-sec per cut. The material was at standard condition. Approximately equal lengths of cut were made with collection times of 30 and 22-min for the regular and heat treated THERMOBESTOS, respectively.

As the above cutting was in progress for each of the four blocks, the operator was wearing a Millipore filter personal sampler on his collar.

RESULTS AND CONCLUSIONS

The data generated by E. J. Bulava is as follows:

Product	MARINITE 36	MMM	THERMOBESTOS	
			Regular	Heat Treated
Total dust, mg/m^3	11.5	37.2	6.7	Not Measurable
Greater than 5 u fiber count, f/cc	126	315 +	4.4	0.8
Collection time - min	20	16	30	22

The increased dust and fiber for the MARINITES is expected when compared to the THERMOBESTOS since no exhaust system was in the immediate vicinity. The MMM dust and fiber release is about three times the MARINITE 36 release. This is reasonable to expect since approximately three times more material was cut from the MMM. Therefore, it can be concluded that with normal cutting conditions the MOLTEN METAL MARINITE will produce about three times more dust and fiber than MARINITE 36.

The heat treated THERMOBESTOS yielded appreciably less dust and fiber than the regular THERMOBESTOS although it did cut and break apart much easier. It appears possible to expect THERMOBESTOS with its asbestos converted to the amorphous form to produce significantly less dust and fiber. It is suggested that more testing be executed to ascertain this and to also evaluate the possibility of adverse effects on the physical properties (namely flexure and hardness).

Published by AsbestosClaims.Law
asbestosclaims.law/library/25552/3