

Babcock & Wilcox



of R. E. Ryan / M. L. Ruthrauff

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GO 5280-1

From M. L. RUTHRAUFF - MANAGER, CORPORATE SAFETY AND HEALTH

File No.
or Ref.

Subj. COMPANY USE OF ASBESTOS

Date
SEPTEMBER 14, 1976

The attached summarizes recent asbestos monitoring undertaken at various Company locations. These results tend to confirm the validity of our current Asbestos Handling Guide (Safety & Health Procedure 1001.1).

We continue to encourage the elimination of asbestos material fabrication, cutting, and working within shop areas. Wherever possible, the purchase of exact size and shape asbestos material should be made.

It is important to note that the sampling times used for our asbestos study are generally limited to evaluations of asbestos fiber exposure down to a minimum of .5 to 1 fiber per c.c. Should the asbestos standard exposure limits be lowered to the proposed .5 fiber per c.c., it will be necessary to obtain additional studies. Longer sampling periods were not used since operations involving asbestos exposure are frequently of short duration, and we have not attempted to design contrived procedures to monitor extended periods of time.

It is important to also note the deterioration of asbestos material when used in such a way as to be exposed to high temperatures. A program of replacement and renewal of such materials should be established at each location.

Please call upon the Corporate Safety and Health office when you have questions regarding the continuing use of asbestos materials.

A handwritten signature in cursive script, reading "M. L. Ruthrauff".
M. L. RUTHRAUFF

MLR/sfb
Attachment

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To INDUSTRIAL HYGIENE - ASBESTOS FILE

GO 6060-2

From S. E. SINGLETON - CORPORATE SAFETY AND HEALTH

File No.
or Ref.

Subj. SUMMARY AND CONCLUSIONS OF ASBESTOS SAMPLING

Date
SEPTEMBER 8, 1976

GENERAL

The attached table summarizes asbestos sampling to date. A survey was conducted to determine the various forms and uses of asbestos materials within the Company. Representative air samples were then collected during typical operations by using MSA Gravimetric Dust Sampling equipment and open-face AA filter cassettes supplied by Clayton Environmental Consultants. The Clayton laboratory then analyzed the samples using the standard NIOSH method.

ANALYTICAL METHOD

The Clayton laboratory uses Phase Contrast Illumination Microscopy as specified by NIOSH. A given sample is transformed into a transparent gel and a pie-shaped wedge is cut from it. Using 400 power magnification a minimum of 20 microscope fields and a maximum of 100 fields are scrutinized, depending upon the detection of at least 100 fibers. However, 100 fields is not exceeded even if fewer than 100 fibers are viewed.

Results are reported as asbestiform fibers because the method does not allow for strict identification that the fibers being counted are actually asbestos. That can only be determined from separate analysis of bulk samples. To qualify as asbestiform, fibers must be greater than 5 micrometers in length and have an aspect ratio of 3 to 1 or greater.

Where no asbestiform fibers are seen in 100 microscope fields, that is reported as < 2900 fibers per total filter. The resulting concentration is shown with < symbol and a value dictated by volume. Where one asbestiform fiber is seen in 100 fields, that is reported as 2900 fibers per total filter. The resulting concentration value is likewise dictated by the volume sampled.

DISCUSSION OF RESULTS

The table footnotes show the two current Threshold Limit Values and the proposed value. The ceiling value, according to NIOSH, is the peak allowable concentration as determined by a minimum sampling time of fifteen minutes. OSHA's current standard includes no mention of this minimum sampling time. The Time-Weighted Average exposure limits are for an 8-hour work day. These can either be determined by sampling for 8 hours, or sampling for a representative time period and calculating based upon the length of time the exposure to asbestos is present. The last column of the table contains footnote codes which relate the test results to these exposure limits.

If the proposed TLV ($\frac{1}{2}$ fiber per cc of air, 8-hour TWA) is adopted, then many of the samples collected represent conditions of possible "overexposure". All of the test results shown in the table are for representative sampling times. The footnotes also refer to certain key samples for which the 8-hour time weighted average exposures were calculated and compared with the TLV's.

ASBESTOS PRODUCTS

The asbestos products used in the sampling were the following:

1. Treated and untreated cloth
2. Pre-cut gaskets and gasket materials
3. Rope and ribbon packing materials
4. Millboard
5. Coated weld rods
6. Gloves

Interviews with 2 asbestos product manufacturers revealed the following:

1. Untreated cloth products should bear a health hazard label.
2. Treated fabrics have greater abrasion resistance, as much as 79% greater than untreated.
3. Treated fabrics exhibit as much as 75% reduction of airborne fibers in tests comparing them to untreated.
4. ASTM grade classifications for asbestos textiles are as follows:

<u>Grade</u>	<u>Asbestos Content by Weight</u>	<u>Temp. Limit</u>
Commercial	75% to 80%	400°F.
Underwriters	80% to 85%	450°F.
A	85% to 90%	550°F.
AA	90% to 95%	600°F.
AAA	95% to 99%	750°F.
AAAA	99% to 100%	900°F.

Where asbestos content is less than 100%, binder materials such as cotton, neoprene, brass wire, etc., are woven with the asbestos to give it strength. Fiber-capturing applications such as wet-brushing, resin-bonding, etc., are designed to be effective at least to the above temperature limits for general performance of the cloth. When these limits are exceeded, the binders and the "health" treatments are burned out. The resulting material has little mechanical strength and readily frees fibers into the air. Some typical B&W service temperatures are as follows:

1. Opposite surface of steel under preheat = 500°F.
2. Chimney effect of heated air (from drums, nozzles, etc.) = 700°F.
3. Direct flame impingement from a natural gas preheat torch = 2000°F.

No "health" treatments are rendered to millboard products and so performing any kind of mechanical work (sawing, cutting, breaking, etc.) on millboard will release fibers.

RECOMMENDATIONS

1. Substitute materials should be sought and used wherever possible.
2. Where asbestos fabrics are used, they should be purchased as wet-brushed or resin-treated and whichever ASTM grade suits the applications.
3. Treated fabrics should either be purchased in needed sizes, or be cut to size with scissors or a sharp knife (not ripped or otherwise "violently" separated).
4. Places where cloth is cut should be cleaned daily to control any possible build-up of asbestos debris.
5. Cloth should be discarded when it has been in service long enough for the cotton binder and wet-brushing treatment to be burned away. The cloth thus has little or no strength and "dusts" easily. The time required for the cloth to become unsuitable depends upon the type of service, particularly the temperature.
6. Asbestos millboard should be purchased in needed sizes and not be cut or sheared to size after purchase.
7. Periodic asbestos-in-air sampling should continue and include area sampling as well as day-long, personal sampling.

Note: See Corporate Safety and Health Procedure No. 1001.1 for additional information and clarification.


S. E. SINGLETON

SES/sfb
Attachment

ASBESTOS SAMPLING

Sample Number	Nature of Sample	Description of Sample	Asbestiform Fibers Per CC of Air	
09-2	Asbestos Cloth	Cut a piece of untreated cloth from a roll with a knife and folded it	0.72	3b
03-2	"	In front of cloth roll stand after another employee cut a piece of untreated cloth from a roll with a knife	<0.36	a
03-3	"	Cut a piece of wet-brushed cloth from a sheet with scissors	<0.36	a
06-3	"	Cut a piece of wet-brushed cloth from a sheet with scissors and also tore it	0.45	b
02-3	"	Cut a piece of wet-brushed cloth from a sheet with scissors and knife	<0.48	a
22-3	"	Used asbestos cloth under pre-heat, shaken	43.0	1d
02-2	"	Used cloth with burn marks, folded and patted	3.9	2c
10-2	Asbestos Gasket Material	Cut a piece of gasket material with knife & then tore it	<0.64	3a
14-3	"	Scraped a piece of gasket material with knife	0.72	3b
18-3	"	Cut a piece of gasket material with knife	<0.7	3a
23-3	"	Cut a piece of gasket material with knife	<0.7	3a
17-3	"	Cut a piece of gasket material with knife	<0.7	3a
21-3	Asbestos Rope Packing	Cut a piece of rope packing material with knife	<0.7	3a
13-3	Asbestos Gloves	Personnel sample working while wearing new pair of untreated gloves	0.13	b
01-2	"	Handling a bundle of new, untreated gloves	<1.5	3a
09-4	Asbestos Mill-board	Cut $\frac{1}{2}$ " millboard with sabre saw	0.24	b
20-4	"	Cut $\frac{1}{8}$ " millboard with scissors	<0.24	a
06-5	"	Scoring and breaking strips of $\frac{1}{4}$ " millboard	0.83	3

ASBESTOS SAMPLING

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Sample Number	Nature of Sample	Description of Sample	Asbestiform Fibers Per CC of Air	
19-4	Asbestos Gaskets	Handling assorted pre-cut packing gaskets, some showing a resin-type treatment	0.87	3
15-4	Asbestos Rope	Handling/cutting rope and ribbon packing material, some showing	2.00	2c
04-2	Mfg. of Asbestos Coated Weld Rod	Pouring and weighing semi-dry materials for #7010 weld wire coat	1.5	3
12-3	"	Pug mill unloading and cleaning damp mixture of materials	<0.36	a
11-3	"	Dumping bags of dry material into pug mill	1.1	3b
05-3	"	Mixed, semi-dry materials being placed into die of slug press, slugs removed, cleaned, and bagged.	0.36	a
16-3	"	Slug press operation	<0.48	a
08-2	"	Extruder line, moved around to various work stations	0.29	b
10-3	"	End of extruder where A.C. check and adjustments are made	0.41	b
07-3	"	Inspection/packing station at end of production line, after dryer	<0.10	a
01-1	Welding with Asbestos-Coated Weld Rod	Removing & replacing weld rods from shipping can	<0.72	3a
02-1	"	Weld being made - cassette taped to shoulder, behind hood	0.13	b
07-1	"	Weld being made - cassette taped to shoulder, behind hood	<0.15	a
10-1	"	Weld being made - cassette held near weld, but not in smoke	<0.72	3a
08-1	"	Weld being made - cassette held near weld, but not in smoke	0.36	b
04-1	"	Weld being made - cassette held near weld, but not in smoke	0.72	3b
06-1	"	Weld being made - cassette held 5 feet above & to the side	<0.83	3a
05-1	"	Weld being made - cassette held directly in weld smoke	<2.9	2ac

SES/9-9-76

TABLE FOOTNOTES

1. Present OSHA ceiling value of 10 fibers per cc of air
 2. Present OSHA, 8-hour TWA, TLV of 2 fibers per cc of air
 3. Proposed OSHA, 8-hour TWA, TLV of $\frac{1}{2}$ fiber per cc of air
- (a) "No" asbestiform fibers detected - see Analytical Method
 - (b) "One" asbestiform fiber detected - see Analytical Method
 - (c) Does not exceed present standard when 8-hour TWA is calculated
 - (d) Sample exceeds ceiling value when 8-hour TWA is calculated