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Interoffice Memorandum

TO (Name and Location)	DATE
O. W. Schnellenberger	12-16-82
FROM (Name and Location)	REFERENCE NO.
N. A. Flaten/J. H. Pritchard BJ	NAF-29/JHP-13-82

MX-322 RIBBON BLENDER CLEANING MONITORING RESULTS

SUMMARY

Filled Resins personnel were monitored for exposure to asbestos and antimony trioxide (Sb_2O_3) when cleaning the MX-322 ribbon blender. The clean-up procedure includes purging the vessel with 3M lbs of PBT prior to the actual cleaning. Personnel were monitored when the ribbon blender was cleaned with and without the PBT purge to determine if the purge was reducing exposures.

The results showed that the PBT purge did not reduce exposures and that all exposures were below the OSHA and Celanese limits. The highest exposures for asbestos were 5 fibers/cc and 2.3 fibers/cc STEL with and without the PBT purge. The OSHA permissible exposure limit for asbestos is 10 fibers/cc STEL. The highest exposure for Sb_2O_3 were 0.094 mg/m^3 and 0.84 mg/m^3 8 hr. TWA with and without the PBT purge. The OSHA limit for Sb_2O_3 is 0.5 mg/m^3 8 hr. TWA and the Celanese 8 hr. TWA limit is 0.15 mg/m^3. Since exposures were not reduced by the PBT purge, the PBT purge could be eliminated.

The exposure data and the clean-up procedure were reviewed with the SHE Department. It was determined that the cleaning of the ribbon blender by gently sweeping with long handled brooms from outside the blender is acceptable. However, vacuuming is still the method of choice and should be used whenver possible. Also, the results show that when asbestos is handled according to the present Bishop Plant Policy for the Safe Handling and Disposal of Asbestos (Section VII-4), exposures are well below levels that can result in a health hazard. Personnel should continue to follow the Bishop Plant policy.

Please review the data with the personnel involved and post the data on your bulletin board.

DISCUSSION

Between certain production runs, the MX-322 ribbon blender in Filled Resins must be cleaned of SEO material to prevent contamination of non-SEO formulations. SEO blends contain both asbestos and Sb_2O_3. The clean-up procedure calls for 3,000 lbs. of PBT to be purged through the vessel before it is opened up and cleaned. It was unknown how effective the PBT purge is for reducing exposures to asbestos and Sb_2O_3. This monitoring was to determine if the PBT purge could be

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eliminated to help reduce costs without increasing exposure to these compounds.

Personnel were monitored during the clean-up procedure with and without the PBT purge. The asbestos and Sb_2O_3 samples were collected and analyzed according to NIOSH method P&CAM 239 and S2. The results show that exposures with and without the purge are below OSHA and Celanese limits and that exposures are not reduced by the PBT purge.

On the first part of this survey, the baseline level of exposure to asbestos and Sb_2O_3 during the normal clean-up procedure was established. The MX-322 ribbon blender clean-up was monitored twice. Both times, 3M lbs. of PBT were purged through the vessel prior to cleaning. The STEL exposures to asbestos ranged from <0.05 to 5.0 fibers/cc while the 8 hr. TWA exposures to Sb_2O_3 were 0.077 and 0.094 mg/m^3. (Table I)

On the second part of this survey, exposure levels were monitored twice when no PBT purge was used. The asbestos STEl exposures ranged from <0.05 to 2.3 fibers/cc and the Sb_2O_3 8 hr. TWA exposures ranged from <0.001 to 0.084 mg/m^3. (Table II)

The OSHA STEL for asbestos is 10 fibers/cc. The OSHA limit for Sb_2O_3 is 0.5 mg/m^3 for an 8 hr. TWA. Celanese has established an exposure limit for Sb_2O_3 of 0.15 mg/m^3 for an 8 hr. TWA.[1] Neither OSHA nor Celanese specifies a STEL for Sb_2O_3. Samples were taken only while personnel were cleaning the blender (STEL type samples). Therefore, to make comparisons to the 8 hr. TWA limits, the 8 hr. TWA exposures were calculated from the short term sample data and the assumption that employees were not exposed to Sb_2O_3 during the rest of the shift. Current monitoring shows this to be a valid assumption because all monitoring results were <0.07 mg/m^3 for an 8 hr. TWA.[2]

The range of exposure levels to asbestos and Sb_2O_3 were the same whether or not the PBT purge was used. In either case, exposures did not exceed OSHA or Celanese limits. The results indicate the PBT purge could be eliminated from the clean-up procedure without increasing exposures to asbestos and Sb_2O_3.

The monitoring results and ribbon blender cleaning procedure was reviewed with the SHE Department. Monitoring results indicate that gentle sweeping with long handled brooms from outside the blender is acceptable. However, it is recommended that vacuuming is still the method of choice and should be used whenver possible. It was also concluded that when asbestos is handled according to the present Bishop Plant Policy for the Safe Handling and Disposal of Asbestos (Section VII-4), exposures are well below levels that can result in a potential health hazard.[3] In particular, the policy states that:

A. All asbestos contaminated areas shall be cleaned by vacuuming into the SEO Dust Collection System.

B. High pressure air will not be used for cleaning floors, walls, beams or equipment, etc. in areas where asbestos materials are used.

C. Where vacuum outlets to the SEO Dust Collection System are not accessible, loose asbestos shall be cleaned up by vacuuming using an approved portable vacuum cleaner or thoroughly dampening the dust prior to sweeping.

D. During any clean-up operation, employees shall wear respiratory protective equipment, disposable coveralls, and shoe covers.

It should be noted that all operators and operator helpers were wearing dust masks, disposable coveralls and gloves. Therefore, the actual concentrations of exposure to these compounds were less than what is shown in Tables I and II.

The ribbon blender cleaning procedure will be monitored periodically to ensure that exposures to asbestos and Sb_2O_3 do not exceed permissible exposure limits.

CONCLUSIONS AND RECOMMENDATIONS

1. None of the exposures exceed the OSHA or Celanese permissible exposure limits for asbestos and Sb_2O_3.

2. The PBT purge step does not help to reduce exposures to asbestos and Sb_2O_3.

3. When asbestos is handled according to the present Bishop Plant Policy for the Safe Handling and Disposal of Asbestos (Section VII-4), exposures are well below levels that can result in a potential health hazard.

4. Personnel should continue to follow the Plant Policy. In particular, as stated in the policy:

   a. All asbestos contaminated areas shall be cleaned by vacuuming into the SEO Dust Collection System.

   b. High pressure air will not be used for cleaning floors, walls, beams or equipment, etc. in areas where asbestos materials are used.

   c. Where vacuum outlets to the SEO Dust Collection System are not accessible, loose asbestos shall be cleaned up by vacuuming using an approved portable vacuum cleaner or thoroughly dampening the dust prior to sweeping.

   d. During any clean-up operation, employees shall wear respiratory protective equipment, disposable coveralls, and shoe covers.

5. Monitoring results indicate that gentle sweeping with long-handled brooms from outside the blender is acceptable. However, it is recommended that vacuuming is still the method of choice and should be used when possible.

6. The ribbon blender cleaning will periodically be monitored to ensure that exposures to asbestos and Sb_2O_3 do not exceed permissible exposure limits.

REFERENCES

[1] Barrett, C. D., Celaneses Policy on Handling Carcinogens, November 15, 1982. (CDB-241-82).

[2] Monitoring results to be issued when the study is complete.

[3] Ille, G., unpublished letter, September 20, 1982.

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Central Files (3) CCCTC
Uniterms: Asbestos
Antimony
Monitoring
Filled Resins
Environmental
Bishop
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TABLE I

MONITORING RESULTS WHEN PBT PURGE WAS USED

DATE	SX#	NAME/SS#	DURATION (Min.)	NUISANCE[1] DUST (Mg/M^3)	ANTIMONY[2] TRIOXIDE (Mg/M^3) STEL	ANTIMONY[2] TRIOXIDE (Mg/M^3) CALC. TWA[4]	ASBESTOS[3] (FIBERS/CC)	COMMENTS AND PROTECTIVE EQUIPMENT USED
4-17-82	003109	Robert Zavala 462-11-2053	30	--	--	--	3	Cleaned the MX-322 Ribbon Blender and Ms-931 8th Floor Dump Chute. Wore Disposable coveralls, gloves, and dust mask. 3000 lbs. of PBT was used as purge prior to cleaning.
4-17-82	003111	Robert Zavala 462-11-2053	50	9.80	0.74	0.077	--	
4-17-82	003110	Richard Thallman 454-58-4085	32	--	--	--	5	
4-17-82	003112	Richard Thallman 454-58-4085	48	5.21	0.94	0.094	--	
7-12-82	003163	Mike Vos	19	0.53	--	--	--	Cleaned the MX-322 Ribbon Blender. Wore disposable coveralls, gloves, and dust mask. 3000 lbs. of PBT was used as purge prior to cleaning.
7-12-82	003165	Steve Davis 459-82-5687	24	--	--	--	0.36	
7-12-82	003233	Steve Davis 459-82-5687	34	--	--	--	<0.05	
	OSHA or ACGIH Permissible Exposure Limits			10 mg/m³ 8 hr. TWA	0.5 mg/m³ 8 hr. TWA 0.15 mg/m³ 8 hr. TWA (Celanese)		10 fibers/ cc STEL	

[1] The samples were collected on a 0.5μ porosity PVC Filter and analyzed gravimetrically.
[2] The samples were collected on a 0.8μ porosity mixed cellulose Ester Membrane Filter and analyzed by NIOSH Method #2.
[3] The samples were collected and analyzed according to NIOSH Method No. P&CAM 239. Analysis performed by NATLSCO.
[4] The 8 hr. TWA's were calculated using the STEL data and the assumption that employee's were not exposed to Antimony Trioxide during the rest of the shift.

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TABLE II

MONITORING RESULTS WHEN NO PBT PURGE WAS USED

DATE	SX#	NAME/SS#	DURATION (Min.)	NUISANCE[1] DUST (Mg/M^3)	ANTIMONY[2] TRIOXIDE (Mg/M^3) STEL	ANTIMONY[2] TRIOXIDE (Mg/M^3) CALC. TWA[4]	ASBESTOS[3] (FIBERS/CC)	COMMENTS AND PROTECTIVE EQUIPMENT USED
9-7-82	003171	Elias Martinez 459-52-4001	20	--	0.81	0.084	--	Cleaned the MX-322 Ribbon Blender. Wore disposable coveralls, gloves, and dust mask. No PBT purge was used.
9-7-82	003172	Ram Vasquez 458-04-9573	36	--	0.033	0.002	--	
9-7-82	003175	Ram Vasquez 458-04-9573	34	--	--	--	2.3	Same as above.
9-7-82	003173	Eusebio Garcia 450-15-8276	37	--	--	--	0.14	Same as above.
9-7-82	003176	Eusebio Garcia 450-15-8276	33	--	1.1	0.076	--	Same as above.
9-7-82	003174	Robert Zavala 462-11-2053	35	--	--	--	<0.05	Same as above.
10-20-82	003207	Steve Davis 459-82-5687	30	--	0.58	0.036	--	Cleaned the MX-322 Ribbon Blender. Wore disposable coveralls, dust mask, and gloves. No PBT purge was used.
10-20-82	003208	George Hernandez 467-96-1746	24	--	<0.012	<0.001	--	
		OSHA or ACGIH Permissible Exposure Limits		10 mg/m^3 8 hr. TWA	0.5 mg/m^3 8 hr. TWA 0.15 mg/m^3 8 hr. TWA (Celanese)		10 fibers/ cc STEL	

[1] The samples were collected on a 0.5u porosity PVC Filter and analyzed gravimetrically.
[2] The samples were collected on a 0.8μ porosity mixed cellulose Ester Membrane Filter and analyzed by NIOSH Method S2.
[3] The samples were collected and analyzed according to NIOSH Method No. P&CAM 239. Analysis performed by NATLSCO.
[4] The 8 hr. TWA's were calculated using the STEL data and the assumption that employee's were not exposed to Antimony Trioxide during the rest of the shift.

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