

**Bell Laboratories**

subject: ASBESTOS STUDIES IN THE BELL SYSTEM

given October 31, 1978 at the
Bell System course "Toxicology
and Industrial Hygiene"

date:

from: Roy Deitchman

LLA 001940

NOTES:

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**MINERAL FORMS OF INDUSTRIALLY
USED ASBESTOS:**

CHRYSOTILE

ANTHOPHYLLITE

AMOSITE

CROCIDOLITE

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ASBESTOS BULK ANALYSIS METHODS

X-RAY DIFFRACTION

OPTICAL

- LIGHT MICROSCOPY
- DISPERSION STAINING

LLA 001942

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ASBESTOS AIR SAMPLING ANALYSIS METHODS

LIGHT MICROSCOPY

SCANNING ELECTRON MICROSCOPY -- WITH EDXA

TRANSMISSION ELECTRON MICROSCOPY -- WITH EDXA

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2.0 FIBERS/CC 2,000,000 FIBERS/m³

ASSUME 10m³ OF AIR BREATHED IN AN
EIGHT HOUR SHIFT

THEREFORE, AT 2.0 FIBERS/CC, 20,000,000
FIBERS POTENTIALLY REACH THE LUNG.

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THEORETICAL MINIMUM DETECTABLE FIBER CONCENTRATIONS BY OPTICAL MICROSCOPY

SAMPLING PERIOD * (MINUTES)	MINIMUM DETECTABLE CONC. (FIBERS > 5 μ m/gg)
15	0.04
30	0.02
60	0.01
120	0.005
240	0.003
480	0.001

* SAMPLE FLOW RATE OF 2.0 LITERS/MINUTE

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FIBER COUNT/MASS RELATIONSHIPS

ANALYSIS METHOD	AVERAGE CONC.	UNITS OF MEASURE
TOTAL FIBERS BY ELECTRON MICROSCOPY	4.82	FIBERS/cc
ASBESTOS MASS BY ELECTRON MICROSCOPY	3.980	mg/m ³
FIBERS >5µm BY OPTICAL MICROSCOPY	1.51	FIBERS/cc

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APPROXIMATE RELATIONSHIPS:

1 mg $\approx$ 1,200 TOTAL FIBERS BY ELECTRON MICROSCOPY

1 mg $\approx$ 400 FIBERS $> 5\mu$ in LENGTH BY OPTICAL MICROSCOPY

NOTES:

ASBESTOS MEASUREMENTS AT FLATIRON BUILDING,

JUNE 21, 1977

A. SAMPLES COLLECTED IN THE MORNING DURING CABLE DROPPING OPERATIONS.

LOCATION	SAMPLE DURATION (MINUTES)	CONCENTRATION (FIBERS/CC)
PERSONAL SAMPLE -	92	3.75
PERSONAL SAMPLE -	93	0.54
PERSONAL SAMPLE -	94	5.32

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NOTES:

ASBESTOS MEASUREMENTS AT FLATIRON BUILDING.

JUNE 21, 1977

D. SAMPLES COLLECTED IN THE AFTERNOON DURING CABLE SECURING OPERATIONS.

LOCATION	SAMPLE DURATION (MINUTES)	CONCENTRATION (FIBERS/CC)
PERSONAL SAMPLE -	49	0.02
BASEMENT IN UTILITY CLOSET	126	0.03
PERSONAL SAMPLE -	78	0.12
AREA SAMPLE - SUB-BASEMENT	135	<0.01

LLA 001950

NOTES:

**BULK ANALYSIS OF MINERAL PHASES PRESENT FROM SPRAY INSULATION
SAMPLES TAKEN AT YANKEE STADIUM, BRONX, NEW YORK.^a
OCTOBER 17, 1977**

LOCATION OF SAMPLE:	CEILING OVER ROOM B200	CEILING OVER ROOM B173
MINERAL PHASES PRESENT		
CALCITE	50%	45%
GYPNUM	25%	25%
RUTILE SYN.	ND ^x	10%
α QUARTZ (FREE SILICA)	<5%	5%
CHRYSOPILE (ASBESTOS)	ND	10%
ANHYDRITE	15%	ND

^a ANALYSIS PERFORMED BY ES LABORATORIES, MARLTON, NEW JERSEY

X (ND) = NONE DETECTED

LLA 001951

NOTES:

**AIRBORNE ASBESTOS LEVELS MEASURED AT YANKEE STADIUM, BRONX, NEW YORK.
OCTOBER 17, 1977**

<u>LOCATION</u>	<u>DURATION</u> (MINUTES)	<u>CONCENTRATION</u> (FIBERS/CC)
AREA SAMPLE - ROOM B173 (NY TEL SUPPLY ROOM)	53	0.01
AREA SAMPLE - HALLWAY OUTSIDE ROOM B173	95	0.01
AREA SAMPLE OUTSIDE AMBIENT (YANKEE DUGOUT)	40	0.01
OSHA STANDARD.	480	2.00

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ASBESTOS SAMPLES COLLECTED IN A GARAGE DURING BRAKE WORK OPERATIONS USING A VACUUM CLEANER

DESCRIPTION	SAMPLE DURATION (MINUTES)	CONCENTRATION (FIBERS/CC)	ANALYTICAL METHOD
PERSONAL SAMPLE -- WHILE PERFORMING BRAKE CHANGE	110	0.05	LM
PERSONAL SAMPLE -- WHILE INSPECTING BRAKES	15	BDL (0.02)	TEM
PERSONAL SAMPLE -- WHILE INSPECTING BRAKES	15	0.20	LM
PERSONAL SAMPLE -- WHILE INSPECTING BRAKES	15	BDL (0.10)	TEM
BACKGROUND SAMPLE -- IN GARAGE	05	0.12	LM
BACKGROUND SAMPLE -- IN GARAGE	05	BDL (0.005)	TEM

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CRITERIA FOR VACUUM CLEANERS USED FOR MOTOR VEHICLE BRAKE WORK

- 1. HIGH EFFICIENCY (HEPA) FILTER SYSTEM**
- 2. IMPERVIOUS PLASTIC DISPOSAL BAGS**
- 3. HEAVY DUTY MOTOR WITH MINIMUM FLOW
RATE OF 100 cfm**
- 4. ADEQUATE SEALS AND GASKETS**
- 5. PROPER ACCESSORIES**
- 6. OPTIONAL BRAKE ASSEMBLY CLEANER**

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