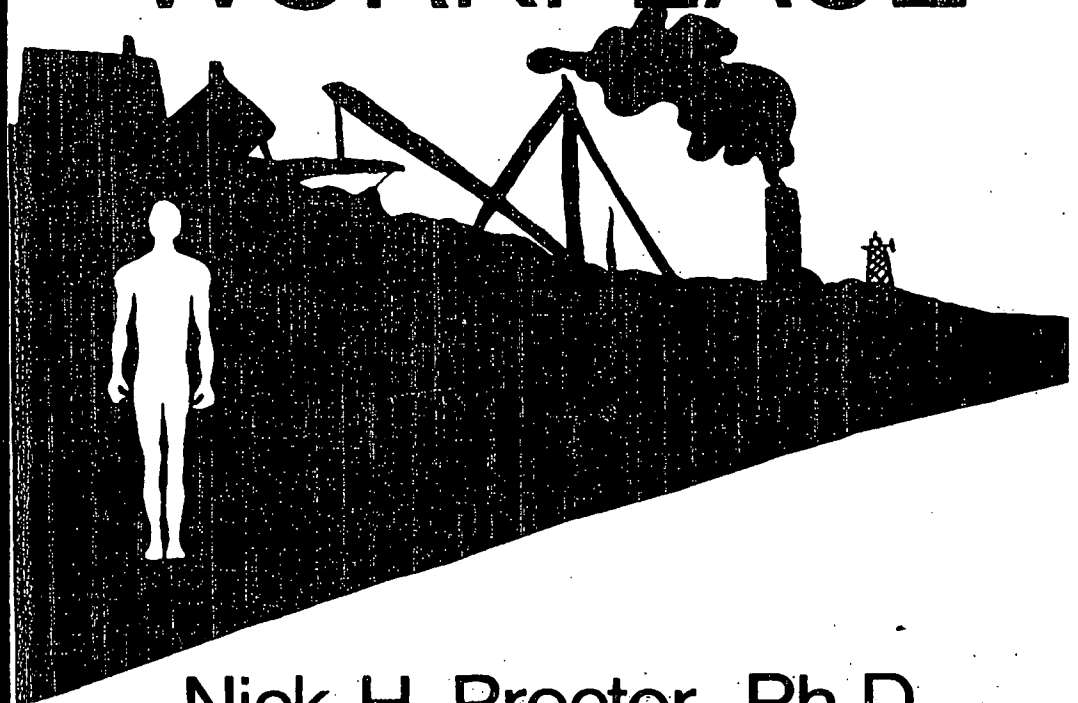


of the
WORKPLACE



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Chemical Hazards of the Workplace

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Table 2-1. Occupational Health Surveillance Charts.
Examples of Medical and Industrial Hygiene Considerations in an Aluminum Corporation

<i>Airborne Contaminant</i>	<i>Principal Use or Source of Emission</i>	<i>Health Effects</i>	<i>Medical Surveillance</i>	<i>1977 TLV</i>	<i>Air Sampling</i>	<i>Respiratory Protection or Other Controls</i>
Acetone	Solvent; present in fast drying paints or lacquers	Irritation of respiratory tract and mucous membranes; narcosis; dermatitis	Interval history	1000 ppm	Charcoal tubes Detector tubes	Air-purifying respirator with cartridge for organic vapors Rubber gloves
Alumina	Potrooms; materials handling areas; kilns; refractories	Lung overload; no fibrosis	Interval history	10 mg/m ³ (1977 addition)	Gelman VM-1 membrane filter; nuclepore 0.45 micron filter	Air-purifying respirator with filter for nuisance dust
Ammonia	Spent pot relinings; cryolite recovery and pot repair; dross reclamation; cleaners; pretreatment of printed packaging Catalyst	Irritation of respiratory tract and mucous membranes	Chest x-ray Lung function	25 ppm	Detector tubes Impinged in acid	Air-purifying respirator with cartridge for ammonia
Antimony Pentachloride		Gastrointestinal and heart disorders; respiratory irritation	EKG Chest x-ray Lung function	0.5 mg/m ³	Millipore AA filter	Air-purifying respirator with filter for nuisance dust Stibine may be generated under reducing conditions
Asbestos	Insulation; coverings; lagging materials; marinite; molten metal control; brake linings	Fibrosis of lung; bronchogenic carcinoma; mesothelioma; cancer of stomach, colon, and rectum	Chest x-ray Lung function Sputum cytology (OSHA requirement — annual medical surveillance)	5 fibers/ml > 5μ in length (OSHA standard is 2 fibers/ml > 5μ)	Millipore AA filter (OSHA requirement — semiannual sampling)	Dependent upon concentration Positive pressure respirator Power filtered respirator Filter respirator Vacuum sweeping Local exhaust ventilation
Bauxite (may contain silica)	Materials handling	Lung overload	Chest x-ray Lung function	10 mg/m ³ (nuisance dust)	Gelman VM-1 filter	Air-purifying respirator with filter for nuisance dust

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ASBESTOS

1977 TLV 5 fibers/cc
 > 5 μ in length
 OSHA Standard 2 fibers/cc
 > 5 μ in length

Synonyms: Asbestos is a generic term applied to a number of hydrated mineral silicates, including chrysotile, amosite, crocidolite, tremolite, and anthophyllite

Physical Form: Fibers of various sizes, colors, and textures

Uses: Thermal and electrical insulation; fire smothering blankets and safety garments; filler for plastics; cement

Exposure: Inhalation

Toxicology: Asbestos causes asbestosis, cancer of the lungs and digestive tract, and mesothelioma.

Asbestosis is a lung disorder characterized by a diffuse interstitial fibrosis, at times including pleural changes of fibrosis and calcification.¹ Chest x-rays reveal a granular change, chiefly in the lower lung fields; as the condition progresses, the heart outline becomes shaggy, and irregular patches of mottled shadowing may be seen.² Asbestos bodies may be found in the sputum, and the

patient exhibits restrictive pulmonary function.¹ Accompanying clinical changes may include fine rales, finger clubbing, dyspnea, dry cough, and cyanosis.¹

The onset of asbestosis probably depends upon the asbestos dust concentration, the fiber morphology, and the length of exposure.³ Asbestosis is a progressive disease which may develop fully in seven to nine years and may cause death as early as 13 years after the first exposure.³ Usually, the pneumoconiosis becomes evident 20 to 40 years after the first exposure to asbestos.³ Once established, the asbestosis progresses even after the exposures have ceased.³ In its severe forms, death results from the inability of the body to obtain requisite oxygen or from the failure of the heart to pump blood through the scarred lungs.¹

Bronchogenic carcinoma and mesothelioma of the pleura and peritoneum are causally associated with asbestos exposures; excesses of cancer of the stomach, colon, and rectum have also been observed.³ Among 632 asbestos workers observed from 1943 to 1967, there were 99 excess deaths (above that expected on the basis of the U.S. white male population) for three types of malignancies—bronchogenic (63), gastrointestinal (26), and all other sites combined (10).⁴ Concerning mesothelioma, 80 per cent of the cases studied in South Africa and the United Kingdom were shown to have had an occupational or paraoccupational association with asbestos fibers.⁴ In the U.S., 14 deaths were reported among 532 asbestos insulation workers studied from 1943 to 1968, compared with no deaths, expected in the same number of similar individuals in the general population.⁴

Neoplasm, such as mesothelioma, may occur without radiologic evidence of asbestosis at exposure levels lower than those required for prevention of radiologically evident asbestosis.⁴ Mesothelioma can occur after a short intensive exposure; cases of mesothelioma in children under 19 years of age indicate the latent time period for development of mesothelioma may be shorter than first estimated.⁴ Mesothelioma tumors have yet to be successfully cured by any types of treatment, including chemotherapy, radiation, or surgery; death usually results within a year of diagnosis.¹ Information is in-

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sufficient at this time to set an exposure stan-
dard (other than zero) which could assure
prevention of mesothelioma in all workers,
since the disease may occur following a very
limited exposure 20 to 30 years earlier.¹

Cigarette smoking is strongly implicated as
a cocarcinogen among asbestos workers.²
The incidence of bronchogenic carcinoma
among nonsmoking asbestos workers is not
significantly greater than that of nonasbestos
workers, while asbestos workers who smoke
have a much higher incidence.² Calculations
suggest that cigarette smoking asbestos
workers have approximately eight times the
risk of developing lung cancer compared with
other smokers.¹

The TLV was established to protect against
asbestosis and reduce to an acceptably low
risk the development of neoplasms.⁵

Diagnosis: Signs and symptoms include
localized pleural thickenings, which may be-
come radiopaque through calcification; re-
strictive pulmonary function; rales, dyspnea,
cyanosis, dry cough, and finger clubbing.

Differential Diagnosis: Differentiate from
other diseases which are associated with dif-
fuse infiltration of the lungs: Hamman-Rich
syndrome, Löfller's syndrome, fungus infec-
tions, sarcoidosis, scleroderma, and other
rare types of diffuse interstitial fibrosis.

Differential diagnosis of pleural mesotheli-
oma should include inflammatory pleurisy,
primary lung cancer, and the presence of met-
astatic disease from a primary tumor else-
where in the body.¹²

Special Tests: Radiography, tuberculin skin
test, and sputum culture should be per-
formed.

Treatment: None is specific.

Medical Control: Preplacement and annual
physical examination, with emphasis on the
pulmonary, cardiovascular, and gastrointes-
tinal systems; chest roentgenograms; lung
function tests to include FVC and FEV (1
sec.); sputum cytology.

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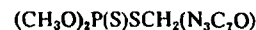
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AZINPHOSMETHYL



1977 TLV 0.2 mg/m³

Synonyms: O,O-Dimethyl S(4-oxo-1,2,3-
-benzotriazin-3(4H)-ylmethyl) phosphoro-

STANDARDS MEMORANDUM

.0036

TO: ALL DESIGNERS AND DETAILERS +LIST
FROM : G A HIDER
RE: BRAKE MATERIALS

IN ORDER TO REPLACE ALL PRESENT ASBESTOS BRAKE MATERIALS
WITH NON-ASBESTOS MATERIALS THE FOLLOWING WILL BE ADOPTED:

SCAN PAC 230AF REPLACES SCAN PAC 230 AND JOHNS MANVILLE 230
SCAN PAC 232AF REPLACES SCAN PAC 232, SCAN PAC 242, AND
JOHNS MANVILLE 232

REDCO "RNAW" REPLACES EBONY, SCAN PAC RBW, GREY ROCK#98
AND GREY ROCK#2010

ENGINEERING:

FOR ALL NEW APPLICATIONS (UNTIL STANDARDS BOOK CAN BE
UPDATED) SPECIFY THE NEW MATERIALS ON THE DRAWING RELYING
ON THE DESCRIPTION IN THE STANDARDS BOOK III page M29-M31
OF THE MATERIALS THE NEW MATERIALS ARE REPLACING.

INDUSTRIAL ENGINEERING:

ON OLD DRAWINGS CALLING FOR THE ASBESTOS MATERIALS
MANUFACTURING SHOULD USE THE NEW MATERIALS AS SOON AS
POSSIBLE AND ASK FOR A MINOR CHANGE ON THE DRAWING.

PRODUCTION-QUALITY CONTROL:

PRODUCTION SHOULD MAKE A SCRAP VERSUS USE UP
DETERMINATION DEPENDING ON QUANTITIES ON HAND.

SAFETY COMMITTEE:

IF ASBESTOS MATERIALS ARE CONTINUED TO BE USED IN THE USE
UP MODE, PERSONNEL MUST USE A FACE MASK WHEN MACHINING
THEM.

PURCHASING:

PURCHASING SHOULD SCREEN ALL ORDERS MAKING SURE THAT NO
ASBESTOS MATERIALS ARE ORDERED IN THE FUTURE.

9/23/86

cc:

T. UHL / D.S. DEZIO / L.R. GIBSON / R.G. SWINK
A.E. BUTTERFIELD / J.R. SOBER
D.G. LACAVA
M.D. LIEBI / T.E. STROHMEYER
H.W. BOWMAN