

FILE NAME: Mine Safety Appliances (MSA)

DATE: 1945

DOC#: MSA013

DOCUMENT DESCRIPTION: Excerpt from MSA Booklet on Dust and Fumes in Industry

MSA

LIBRARY
INSURANCE SOCIETY
OF NEW YORK
INCORPORATED

FEB 16 1945

Dusts and Fumes in Industry

(Sources, Effects and Control)



File
W851
D94
WRE

Published by

Mine Safety Appliances Company

BRADDOCK, THOMAS AND MEADE STREETS

PITTSBURGH (8) PENNSYLVANIA

me as that
ck, metals,
, or wood.
ltra-micro-
ee that the
fraction of
inch). The
ocesses are
anic dusts,

are formed
d sublima-
n industry
ich typical
is usually
contrast to
ple errone-
materials,

inants en-
ver various
esses which
or pulver-
dusts are
but organic

ten metals
ed in indus-
greatly in-
o fumes of
s from the

It is to be borne in mind that metals may produce both dusts and fumes, according to the nature of the operation and the state of the materials when processed. For example, among the heavy metals such as lead, dust may be of equal or greater etiologic importance with fumes — other mineral dusts and metallic dusts also are considered of etiological importance, as the following outline will show:

I. Organic dusts:

1. Non-living organic dusts:

- (a) Toxic and/or irritant dusts; "(Various organic compounds such as trinitrotoluene, mercury fulminate, tetryl)."
- (b) allergy-producing dusts (woods, pollens, and the like).

2. Living organic dusts:

- (a) bacteria
- (b) fungi

II. Inorganic dusts: (mineral dusts)

- (a) toxic and/or irritant dusts; (mainly the dusts from heavy metals and their salts, such as arsenic, lead, manganese.)
- (b) fibrosis-producing dusts, (examples are free silica and asbestos).
- (c) non-fibrosis-producing dusts; (the so-called inert dusts, such as alundum, corundum, emery, limestone, magnesite, marble, plaster-of-paris, and polisher's rouge).*

The most important of the non-metallic, inorganic mineral dusts is free silica, which produces silicosis, if breathed in sufficient quantities over a long period of time. Free silica dust and

* This classification is in accordance with the present state of knowledge. Future studies and experience will probably show some of the so-called inert or nuisance dusts to be harmful.

ich produce
dusts — sili-
h as various
can produce
of minerals
mixtures of
as gypsum,
against the
ons of free
als present
f free silica.

the etiology
exposure to
posure and
rely means
alth hazard;
etermined by
the amount
d standards
mes. Many
ead hazard,
being made
contention
ng environ-

mes in the
ed for such
ance of air
the patho-
ught about
ds and ma-
instance, of
in, namely
. No dusts,
gical condi-

tions from skin absorption, and it is doubtful that any kind of true fume is absorbed by the skin.

From the etiologic point of view, particularly with reference to pathologic effects, the following outline shows how different types of substances (among the dusts and fumes) act on various systems in the body to produce pathological effects:

1. *General systemic poisoning:*
Examples: Arsenic, lead, manganese, mercury.
2. *Substances acting on the circulatory system:*
Examples: Arsenic, lead, mercury, vanadium.
3. *Substances acting on the respiratory system:*
Examples: Asbestos, free silica.
4. *Substances acting on the gastro-intestinal system:*
Examples: Antimony, cadmium, lead, mercury, zinc.
5. *Substances acting on the skeleton and joints:*
Examples: Lead, mercury, mesothorium, phosphorus, radium.
6. *Substances acting on organs of special sense:*
Examples: Arsenic, lead, manganese, mercury.
7. *Substances acting as fetal poisons:*
Examples: Lead, mercury.
8. *Substances acting on the genito-urinary system:*
Examples: Arsenic, lead, mercury, vanadium.
9. *Substances acting on the brain and nervous system:*
Examples: Arsenic, lead, manganese.

GENERAL DIAGNOSTIC METHODS

The accurate diagnosis of pathological conditions arising from the inhalation of industrial dusts and fumes has tremendous economic significance and also it is of medicolegal importance. Moreover, it is impossible to understand how proper and effica-