

10-13-69  
10-13-69

WC 216  
Baker's  
Conclusions

## Asbestos

Hooker H-1, H-2 4-1  
diaphragms supplied by Rubberoid  
Johns Manville 7-M supposedly same as 2/1 4-1, H-2  
but it isn't used for all gulping  
Rubberoid 4-D mixing in cement just  
F. Stasberger 9-25-69

specification probably has Ray Pascoli

PLAINTIFF'S EXHIBIT

DOW-1384

9-25-69 From plant store room

Johns M - 85% Magnesia Cement

Queens Corning SC10 Cement

No 450 Cement

✓ Pabco Coldtemp Pipe Insulation

✓ Kaylo 1 1/4 Nom 25 Sec. Cement Oweudorning just — yes

✓ Felt

✓ Asbestos Sheet 4' x 8'

None Yes

✓ Corrugate

None yes

✓ Let use sheet

None yes

Sent to Barrie Baker - end September, 1969

~~Thermobestos~~ (

15T0007490

412262

# Asbestos Sheet (Thin)

## Composition and Texture

~80% Fibrous asbestos (chrysotile); fibers vary widely in size and shape, from fiber bundles 0.2 mm diameter and 1 to 5 mm long to single strongly curved "single" fibers only 2 to 10  $\mu$ m in diameter and from 20 to 1000  $\mu$ m long. Large fiber bundles splitting into many loose fibers are common.

~15% Granular asbestos (antigorite) as near-equant grains from 10 to 100  $\mu$ m in diameter; probably occurs as part of asbestos raw material rather than a fabrication-added phase.

~5% Binder, subcrystalline, pale brown, translucent; likely an organic glue of some sort to hold the mat of asbestos together but still give some flexibility.

Safety Comments: The sheet is quite friable but should be relatively safe of inhalation danger if handled gently and cut with shears or a knife. Any grinding, shaving, or sanding operations should be done with the operator wearing a dust mask.



412263

1647000151

B.H. Brier  
3 Oct. 1969

# Asbestos Sheet, 4x8

## Composition and Texture

~60%

Cement, individual crystals  $\frac{1}{2}$  to 2  $\mu$ m in diameter, in crystal aggregates. Thin layer of cement strongly adheres to most asbestos fibers.

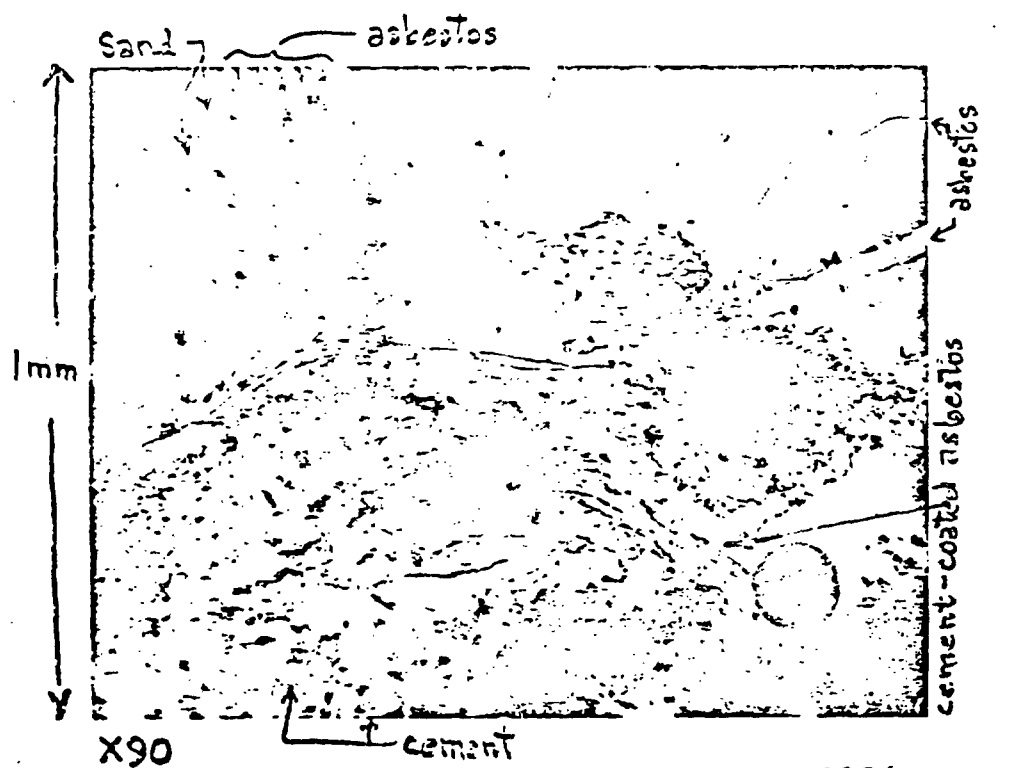
~30%

Asbestos (chrysotile) in flexible fiber bundles from 10 to 50  $\mu$ m in diameter and up to 2mm long. Fiber bundles split with difficulty to small diameters (5-15  $\mu$ m) due to good cement coating.

~10%

Fine sand or crushed rock filler, chiefly quartz and feldspar, generally less than 0.1mm in diameter.

Safety Comments: Asbestos is very well sealed into matrix making these panels relatively <sup>very</sup> safe from asbestos inhalation. For operations of sawing, sanding, filing etc. a dust mask should be worn.



IST0007492

412264

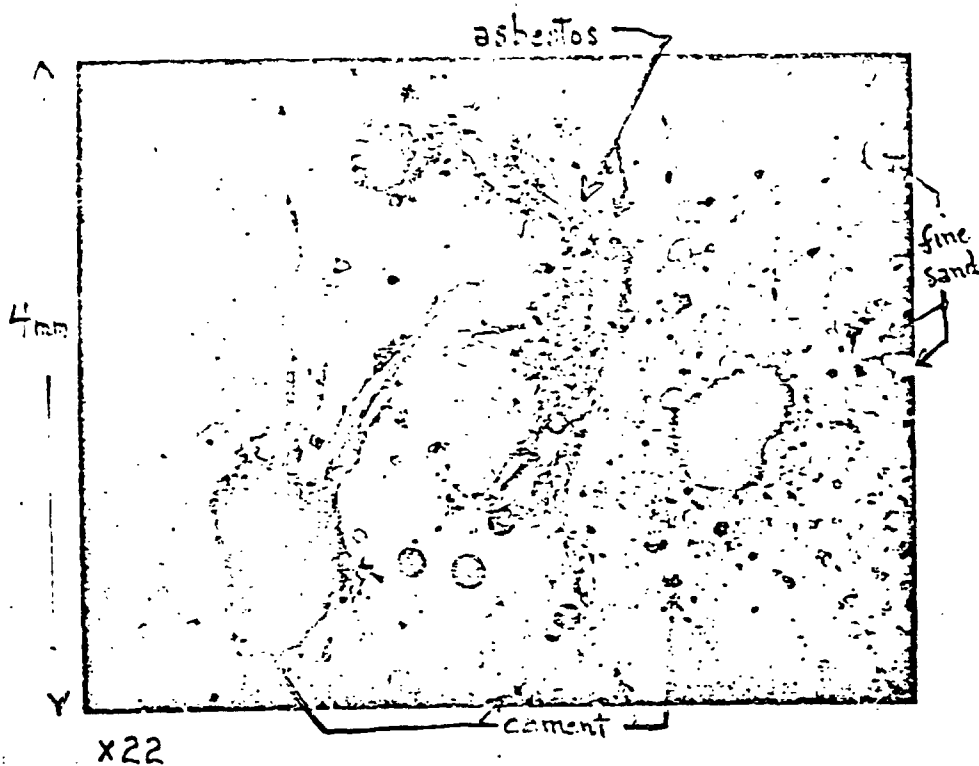
B.H. Bieler  
3 Oct. 1969

# Corrugated Asbestos Wallboard

## Composition and Texture

- ~40% Microcrystalline cement aggregates, individual crystal size ~1-3  $\mu\text{m}$ , aggregates of crystals from 50  $\mu\text{m}$  diameter.
- ~30% Fine sand filler, composed of quartz crystal grains and some feldspar grains (i.e. crushed rock or fine sand).
- ~30% Asbestos (chrysotile) in flexible fibers from 5-10  $\mu\text{m}$  in diameter (as "unravalled" from larger fiber bundles) to 0.1 mm to 0.5 mm; length from 20  $\mu\text{m}$  to 10 mm. When torn loose from bulk only sparsely coated with cement grains.

Safety Comments: Asbestos is well enough sealed into matrix to make these panels safe from asbestos inhalation if no rubbing or abrasion of the surface is done. For operations of sawing, sanding, filing, etc. a dust mask should be worn, as the fibers are rather easily released from the matrix.



ST0007493

B.H. Zieler  
3 Oct. 1969

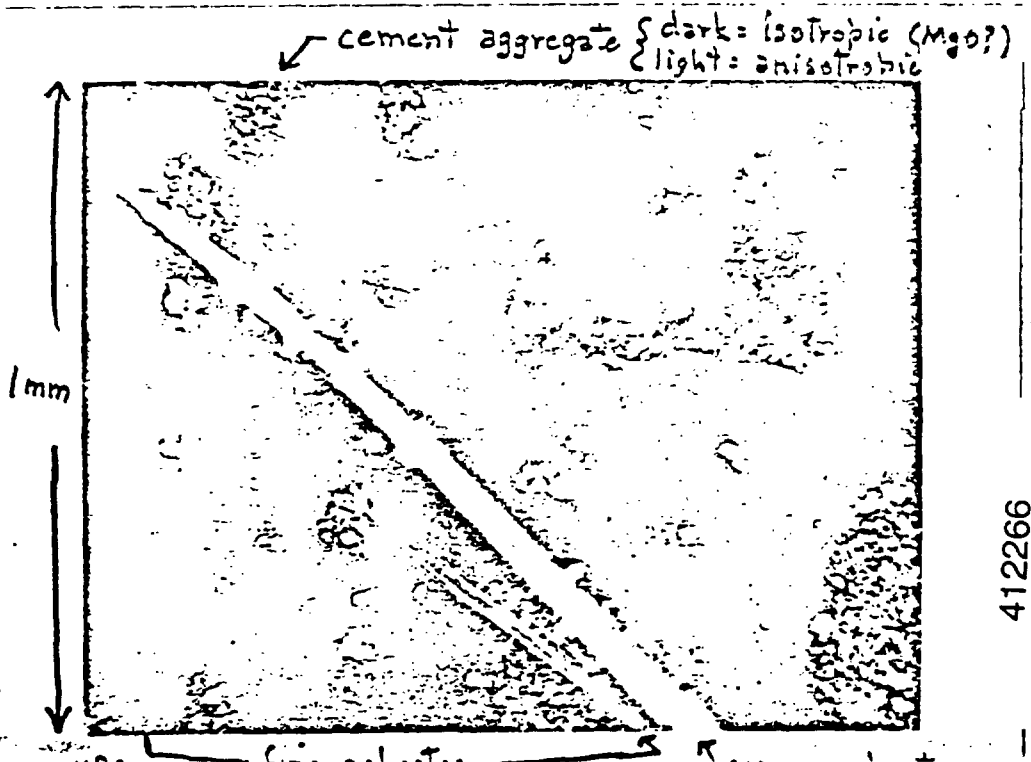
412265

# Pabco Caltemp Pipe Insulation

## Composition and Texture

- ~ 80% Cement, composed of about  $\frac{1}{2}$  near isotropic grains which likely are MgO and  $\frac{1}{2}$  yellowish-brown anisotropic crystalline material which may be a cement like portland, or gypsum plaster. The brownish color may be due to an organic binder as well.
- ~ 20% Asbestos (chrysotile) in brittle fibers from 1  $\mu$ m in diameter to fiber bundles up to 50  $\mu$ m in diameter and from 50  $\mu$ m to 3 mm long; loosely held in the cement aggregate structure, no cement coats the exposed fibers.

Safety Comments - The brittle nature of this asbestos with its ability to be broken down into very small sizes and its ease of separation from the porous matrix "cement" creates a serious safety hazard. Dust masks should be worn by all who install or remove this insulation. If the outer skin on this insulation is not secure "knocking" or vibration of insulated pipes could cause fine needles of asbestos to be liberated into the air.



46470001S

B.H. Bieler  
7 Oct. 1969

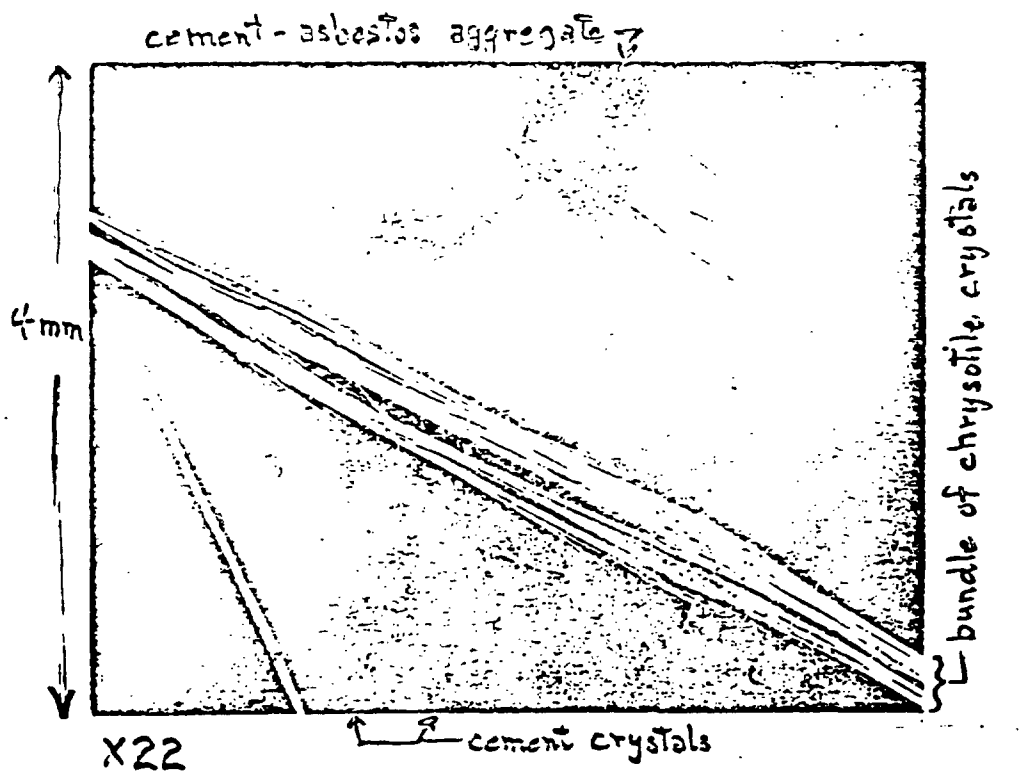
Kalo 1 1/4 Nom.

### Composition and Texture

~60% Cement, composed of small, equant crystals of varying birefringence (no MgO?); individual crystals vary from 1/2 to 25  $\mu$ m in diameter.

~40% Asbestos, long thin slightly flexible crystals (from 1 x 30  $\mu$ m to 25 x 500  $\mu$ m) and crystal bundles up to 0.1 x 2 cm in size. Crystals break free of cement easily and in general are not coated with cement grains. Crystals are chrysotile.

Safety Comments; nearly 1/2 of volume is asbestos; the material is very easily friable and many small needle-like chrysotile fiber crystals would be very dangerous to inhale. When working with this material in the dry state a dust mask should be worn.



ST0007495

B. Bieler  
7 Oct. 1969

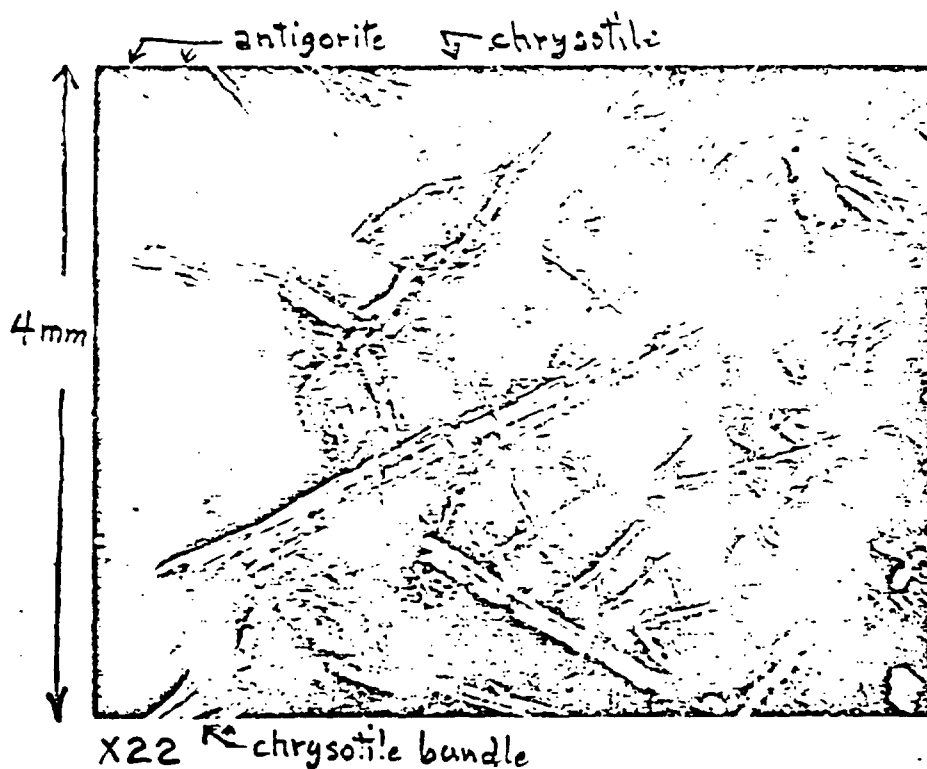
412267

# #1 Asbestos

## Composition and Texture

100% Asbestos: about  $\frac{1}{5}$  small equant antigorite crystals from 3 to 10  $\mu$ m in diameter, about  $\frac{4}{5}$  elongate chrysotile fiber crystals from "single" crystals  $5 \times 5 \mu$ m to large fiber aggregates  $0.2 \times 5$  cm. Large aggregates are very flexible. Although  $\frac{2}{3}$  of the fiber aggregates are relatively large,  $\frac{1}{3}$  are small enough to be easily airborne in dry air.

Safety Comments: All asbestos, part of which is easily friable into very small particles which are easily airborne. A dust mask should be worn (or hood protection given) when working with the dry material in air. It would probably be safe to handle when damp if no dust mask were available.



ST0007496

B. Bieler  
7 Oct. 1969

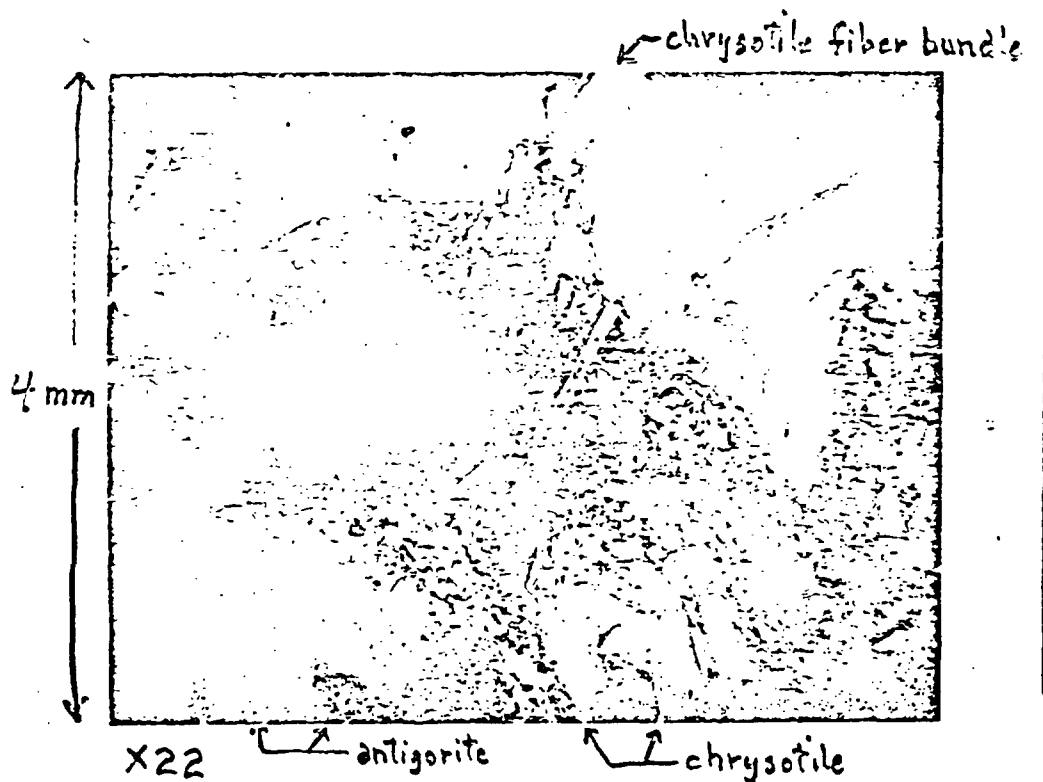
412268

## #2 Asbestos

### Composition and Texture

100% Asbestos: about 1/4 is antigorite type with small equant grains intergrown with chrysotile (about 3/4). The antigorite grains are 1 to 5  $\mu$ m in diameter the chrysotile fibers are as small as  $5 \times 100 \mu$ m and fiber aggregates are up to  $200 \times 1000 \mu$ m ( $0.2 \times 1$  mm) and are slightly flexible.

Safety Comments - All asbestos which is easily friable into very small particles which are easily airborne. A dust mask should be worn (or hood protection given) when working with the dry material in air. This would probably be safe to handle when damp or under water.



ST0007497

T.B. Bieler  
7 Oct. 1969

412269

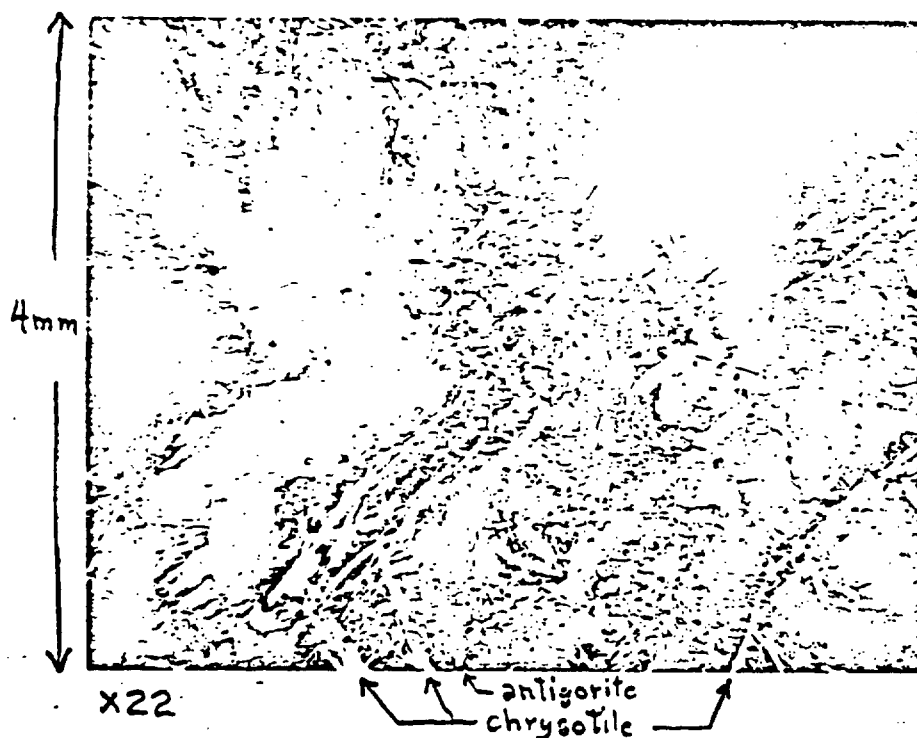
## 4D Asbestos

### Composition and Texture

100%

Asbestos: about  $\frac{1}{3}$  is antigorite type, with roughly equant grains from  $1 \times 1 \mu\text{m}$  to  $10 \times 10 \mu\text{m}$  which is texturally intergrown but separable from the about  $\frac{2}{3}$  chrysotile as flexible elongate fibrous crystals from  $1 \times 20 \mu\text{m}$  to  $200 \times 1000 \mu\text{m}$ ; clusters of crystals. Moderate abrasion liberates small hair-like crystals with ease.

Safety Comments: All Asbestos, which is easily friable into small particles which are easily airborne. A dust mask should be worn when working with this material in air; would probably be safe to handle when very damp or under water.



ST0007498

B. Bieler  
1 Oct. 1969

412270

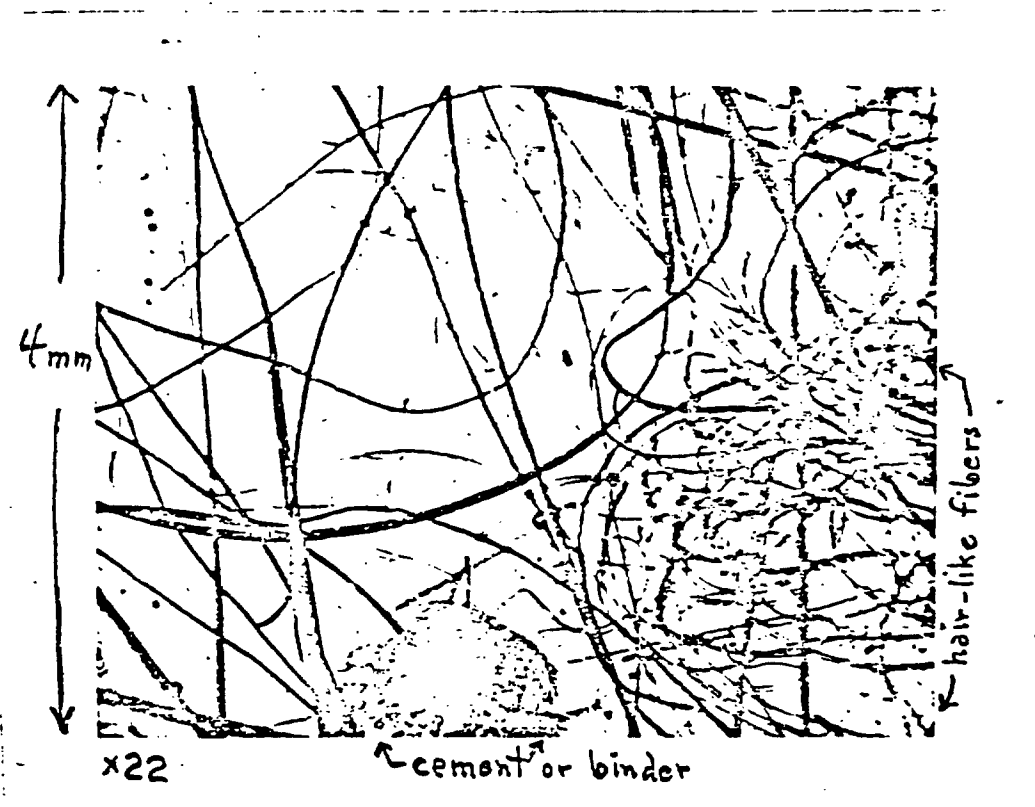
Felt

### Composition and Texture

95% Hair-like organic fibers, from 30 to 70  $\mu$ m in diameter and from 2 to 5 cm long. Birefringent, so appear white to black in photo below.

5% Binder, appears to contain a brownish cement and fine cellulose fibers.

Safety Comments: no hazardous materials evident.



ST0007499

B. Bieler  
- Oct. 1969

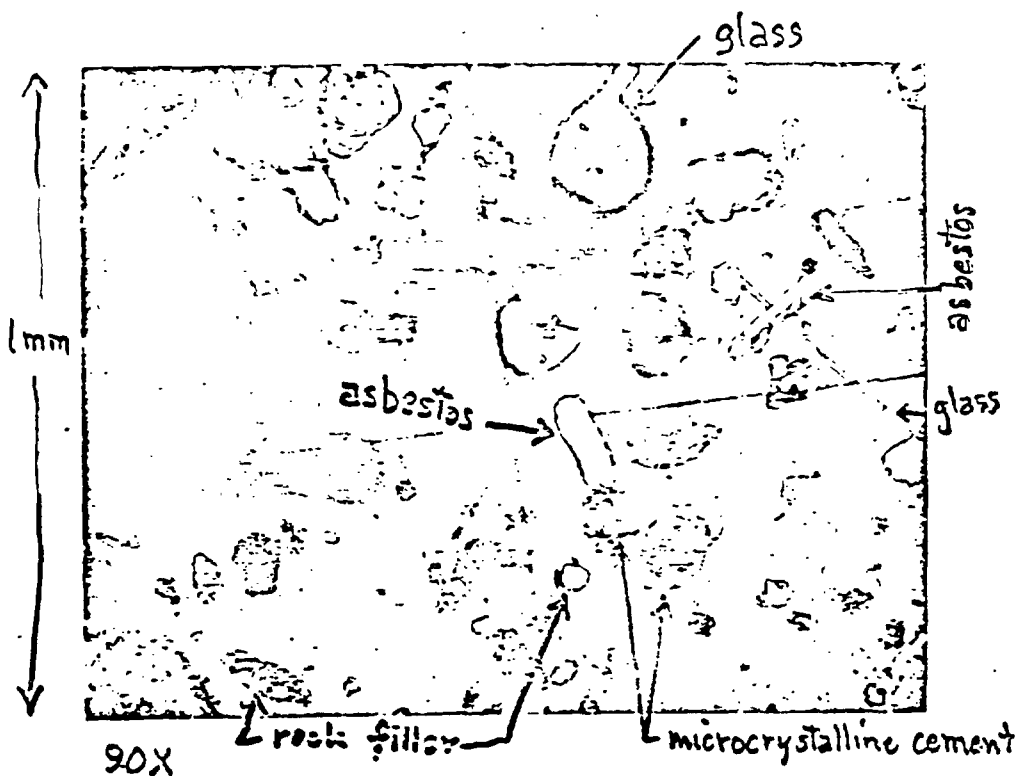
412271

# #450 Cement

## Composition & Texture:

- ~ 80% microcrystalline aggregates of brownish silicate, probably portland-type cement; individual crystals are 1-3  $\mu\text{m}$  in diameter.
- ~ 10% shards of glass with some quartz and feldspar (i.e. broken glass and rock flour used as a filler); grain size ~ 100  $\mu\text{m}$ .
- ~ 10% short asbestos fibers (chrysotile), most not more than 100  $\mu\text{m}$  long and 5-20  $\mu\text{m}$  in diameter.

Safety Comments - only by grinding this cement very fine is asbestos released, and then the relative amount is small. Dust mask probably not necessary unless dusting conditions are severe.



ST0007500

412272

B. N. Bieler  
2 Oct. 1969

# Owens-Corning SC10 Cement

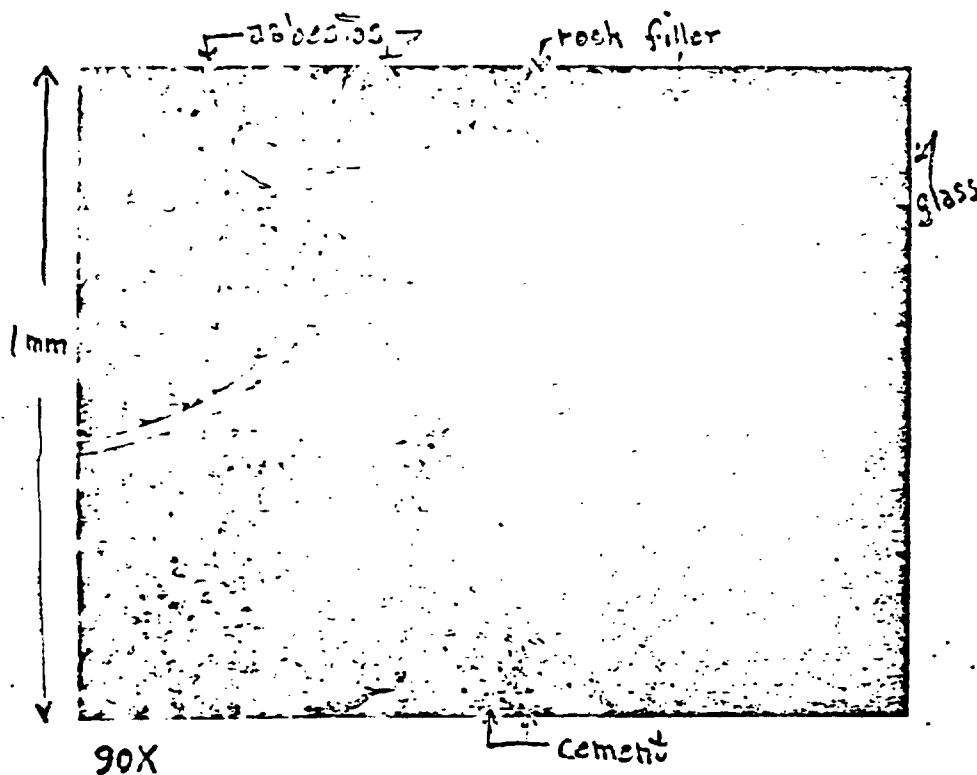
## Composition and Texture

~ 90% microcrystalline cement aggregates; individual crystals are  $\frac{1}{2}$  to 2  $\mu\text{m}$  in diameter.

~ 5% rock filler, quartz and feldspar grains; grain size 50-100  $\mu\text{m}$ .

~ 5% long fibers, some are brownish glass about 10  $\mu\text{m}$  in diameter and 2-10 mm long, some are chrysotile of similar dimensions but up to 50  $\mu\text{m}$  in diameter (no short, brittle chrysotile was seen).

Safety Comments: The asbestos fiber is low in volume, very flexible, and rather long. Essentially no asbestos hazard with this material.



ST0007501

412273

B.H. Bieler  
2 Oct. 1969

## 7-M Asbestos

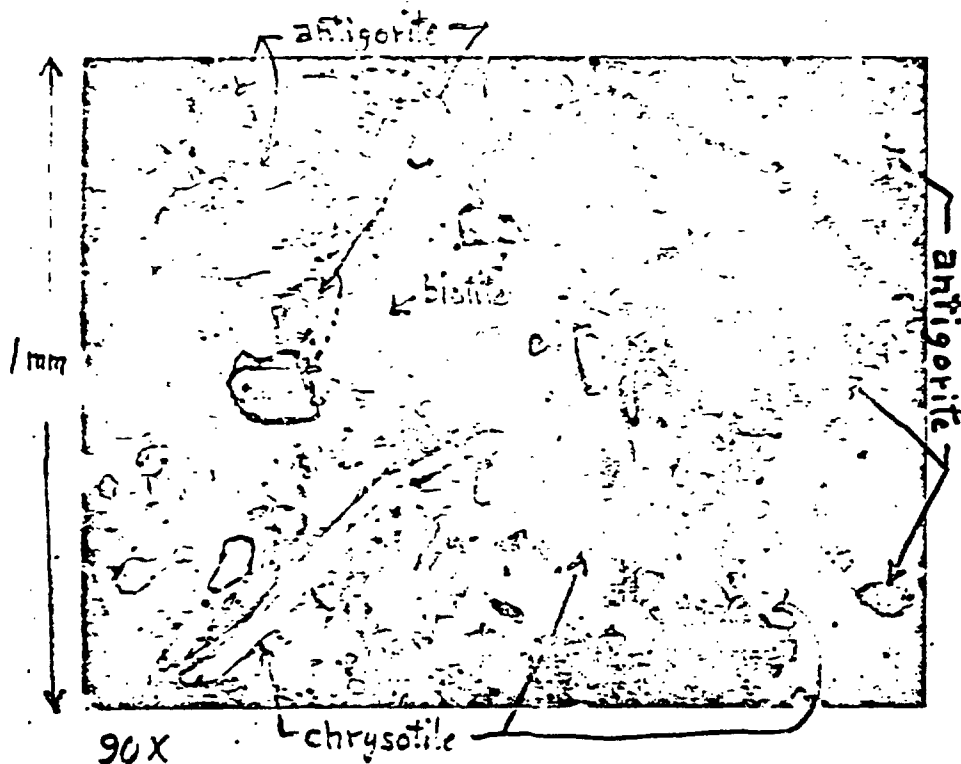
### Composition and Texture

~ 60% --- Fibrous asbestos (chrysotile) in flexible elongate crystals and crystal aggregates from  $\frac{1}{2} \times 10 \mu\text{m}$  to  $0.1 \times 3 \text{ mm}$ .

~ 40% --- Granular asbestos (antigorite) in equant to elongate crystal masses from  $5 \mu\text{m}$  to  $100 \mu\text{m}$  in diameter.

Trace ---- Black mica (biotite) as an impurity mineral, in rounded flakes about  $0.1 \text{ mm}$  in diameter.

Safety Comments : Since this is pure asbestos a serious hazard exists. A dust mask should be worn or some dust-reducing air hooding provided when working with this material.



ST0007502

412274

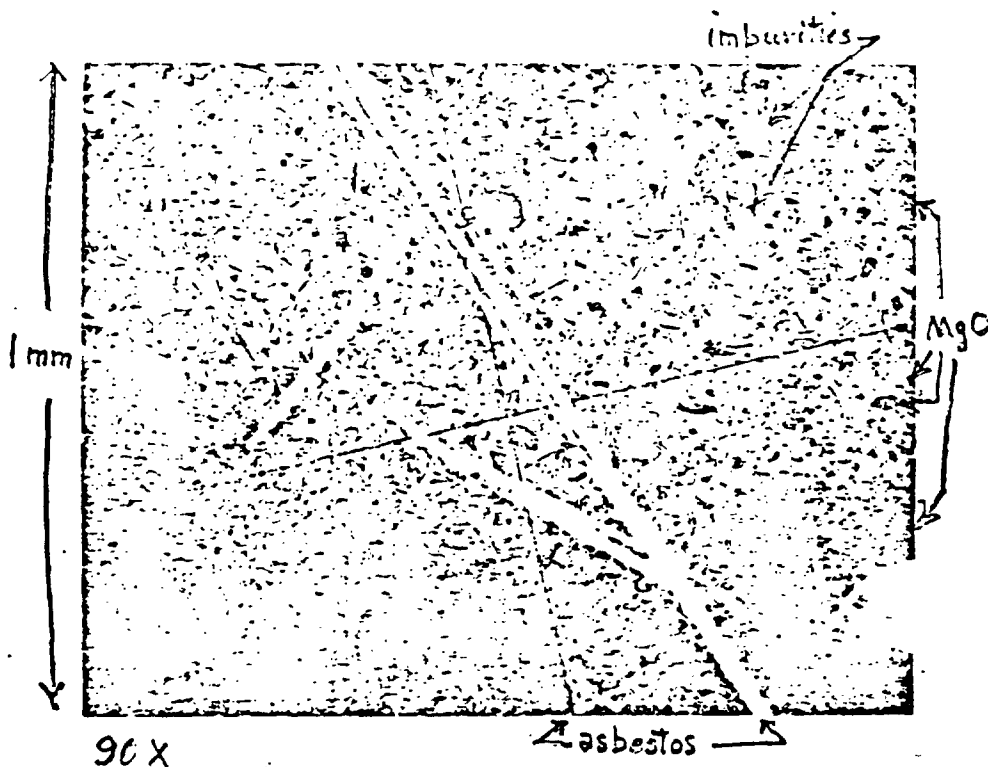
B.H. Bieler  
2 Oct. 1969

# Johns-Manville 85% MgO Cement

## Composition and Texture

- ~80% Periclase ( $MgO$ ) in very small crystals about  $\frac{1}{2}$  to 2  $\mu m$  in diameter. Themselves in aggregates ranging from 10  $\mu m$  to several mm.
- 5% Crystalline cement grains and magnesium silicate impurities; range in diameter from 1  $\mu m$  to 50  $\mu m$ .
- 15% Fibrous asbestos (chrysotile), in very long crystals and crystal aggregates. Crystals not flexible, some as small as  $\frac{1}{2} \times 5 \mu m$ , some as large as 160  $\mu m$  in diameter by 10 mm long, easily broken to smaller sizes and easily split from the mass of cement.

Safety Comments: The brittle nature of this asbestos and its ease of liberation from the  $MgO$  make it extremely hazardous. Suggest workers wear dust masks when handling dry powder or cutting or shaping cured cement.



ST0007503

412275

B. H. Bieler  
2 Oct. 1969