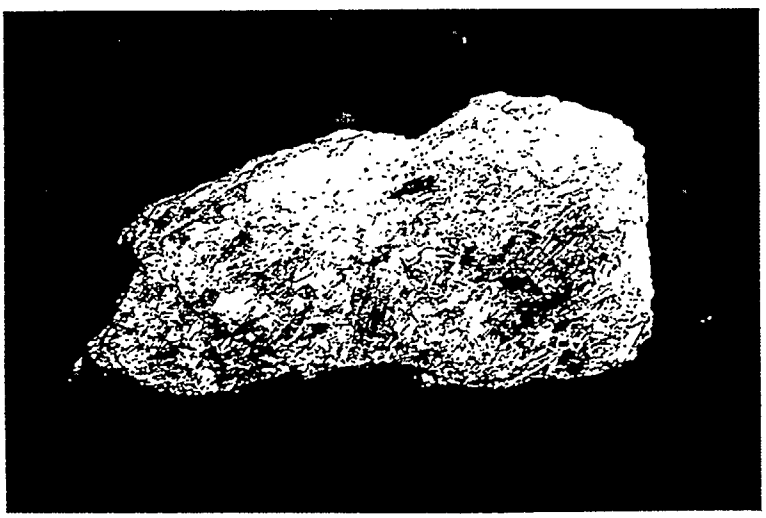
PLAINTIFF'S EXHIBIT

CAP-1481

A Matter of Fact



The truth about tremolitic talc

ASARCO ALV 0007565

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For almost a decade ...

there has been a continuing controversy concerning the safety of tremolitic talc, a valuable industrial mineral product for the ceramic, paint and plastic industries mined, milled and processed by the R. T. Vanderbilt Company, Inc.

A faulty asbestos standard established by OSHA (the Occupational Safety and Health Administration) in 1972 has given our customers the mistaken impression that all tremolite is asbestos, while mineral scientists have demonstrated that the asbestiform variety is a rare occurrence.

This booklet will discuss the origins of the confusion, state the facts, review the scientific research and present the conclusions of mineral and medical experts on the actual properties and safety of Vanderbilt's tremolitic talc.

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What is asbestos?



In the *Glossary of Geology* asbestos is defined as . . .

"A commercial term applied to a group of highly fibrous silicate minerals that readily separate into *long, thin, strong* fibers of sufficient flexibility to be woven . . ."

It is an accepted fact that excessive exposure to asbestos can cause serious adverse health effects among humans.

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How did the confusion begin?

In July of 1972, OSHA, the Occupational Safety and Health Administration, made final and published its asbestos standard.

It defined asbestos as any one of these six minerals:

- chrysotile, or white asbestos
- crocidolite, or blue asbestos
- amosite, or brown asbestos
- anthophyllite
- actinolite
- tremolite

This definition contains important errors of scientific fact which the National Bureau of Standards, the Bureau of Mines and the U.S. Geological Survey have seriously questioned.

The confusion and problems emerging from these errors are the substance of the following discussion.

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The essence of the problem

As you can see to the right, each of these six minerals included in OSHA's asbestos standard occurs in both an asbestiform and a non-asbestiform variety.

Three of the six minerals have been given a different name for each of their two forms. *Chrysotile* in its non-asbestiform variety is called *antigorite*. *Crocidolite* is called *riebeckite*. *Amosite* is called *cummingtonite-grunerite*.

The other three minerals — because they occur in their asbestiform varieties so rarely in nature — are each called by only *one* name, regardless of their form.

Tremolite, anthophyllite and *actinolite* are labeled asbestos by OSHA in both their forms. According to mineralogists, this is incorrect and it is poor science.

Dr. Malcolm Ross, an eminent mineralogist and asbestos specialist with the U.S. Geological Survey, explains:

"This has been the area where there has been a problem with the definitions. The base of the problem first is nomenclature — you have prismatic tremolite and you have an asbestiform tremolite — they both have the same mineral name and when you get to people who really don't know a great deal about mineralogy, the two things are synonymous. For convenience, I think a number of people have said all tremolite is dangerous because some tremolite is asbestiform."

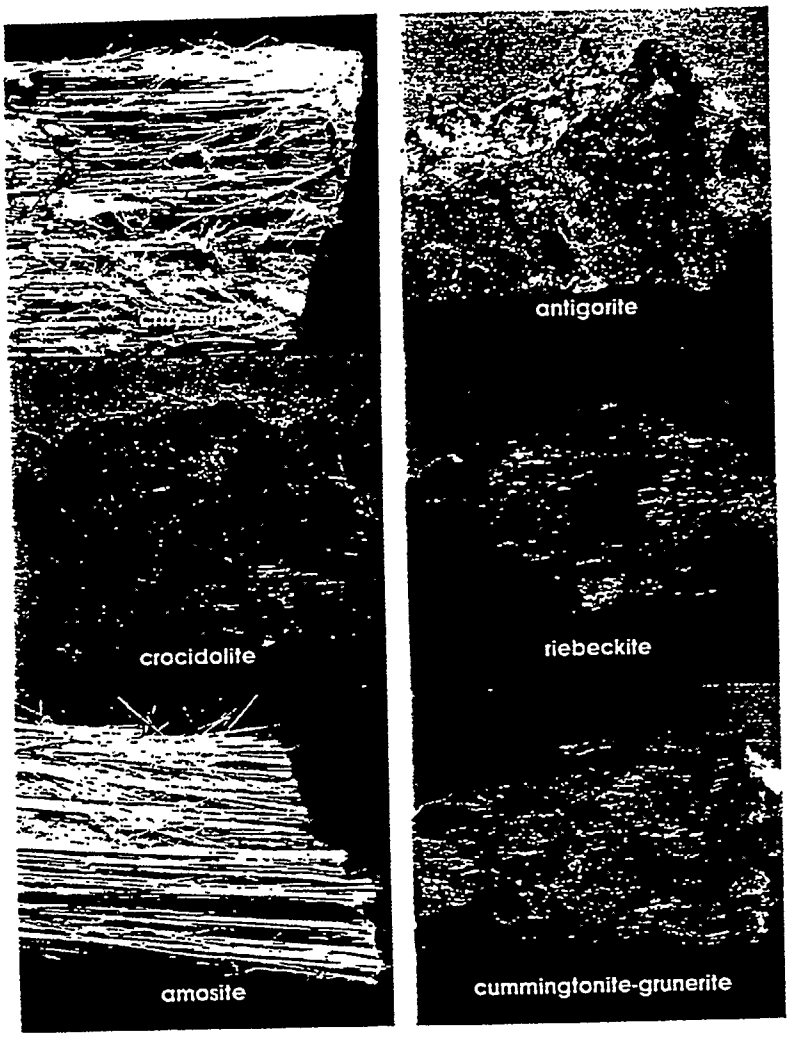
Dr. Ann Wylie, a Professor of Mineralogy at the University of Maryland agrees:

In referring to the two distinct types of tremolite, she observes that, **"these two materials have very different physical properties . . . in our regulation we do not recognize the difference between the two and I think we should. I think that's the root of the problem."**

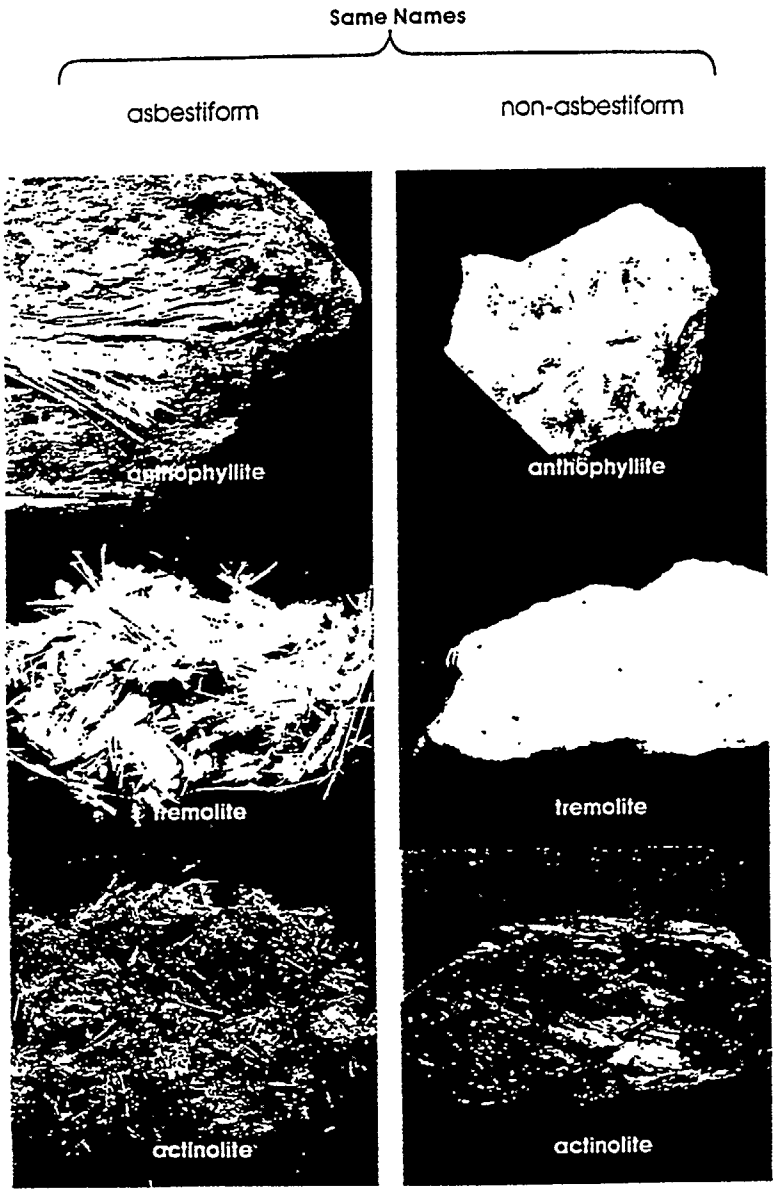
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asbestiform

non-asbestiform



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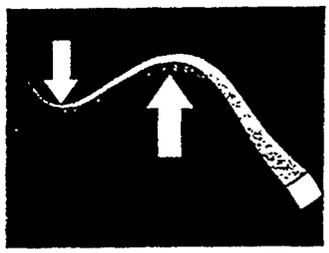


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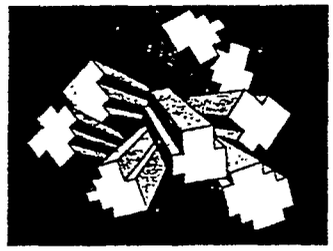
Comparison Chart

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What's the difference?



A graphic depiction of an asbestiform mineral — it grows in a single line until it forms long, thread-like strands. It doesn't shatter but simply bends much like a wire that cannot be easily broken.



The non-asbestiform mineral grows in all directions in random prismatic patterns. When pressure is applied, it fractures easily, fragmenting into prismatic particles.

It's clear from this analysis that there are two distinctly different forms of tremolite, each with distinctly different physical properties.

The asbestiform variety of tremolite obviously fits the definition of asbestos and deserves to be labeled as such. But the non-asbestiform variety of tremolite has none of the properties set forth in the definition of asbestos and should not be included in this family of hazardous minerals. The known medical problem is only associated with commercial asbestos.

It is the non-asbestiform variety and only the non-asbestiform variety of tremolite that is present in the ore and the talc products mined and milled by the R. T. Vanderbilt Company, Inc.

How long will major industries suffer the effects of a faulty government standard based on a scientific error which has never been corrected?

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The medical facts

THE HRI STUDY. At Fairleigh Dickinson University in New Jersey, the prestigious Health Research Institute undertook an intensive scientific study to determine if there was indeed any health hazard relating to the tremolitic talc mined at the R. T. Vanderbilt Company, Inc. mine at Gouverneur, New York.

A high dose of tremolite from the Vanderbilt Company was introduced into the chest cavity of 70 hamsters. Another 70 were injected with a lower dose. At the end of the experiment which ran for 600 days, none of these hamsters had developed tumors. (In a similar experiment when an asbestiform material was injected into hamsters, tumors subsequently developed.)

According to William E. Smith, M.D., Director of the Fairleigh Dickinson Health Research Institute, **"We did not get tumors with the tremolitic ore that came from the Vanderbilt Mine. So, from the results of the test that we did, we concluded that the sample was non-carcinogenic."**

THE TOMA STUDY. In 1975, the National Institute for Occupational Safety and Health (NIOSH) began an epidemiological study at the mine and mill in Gouverneur, N.Y. with the full cooperation of the Vanderbilt Company. As a result allegations have been made of a possible association between tremolitic talc and asbestos.

Because there were various questions raised by the government study, Vanderbilt asked Tabershaw Occupational Medicine Associates (TOMA) specialists in this field to undertake their own epidemiological study and evaluate the NIOSH study.

TOMA found that the NIOSH study was lacking much of the relevant information that had a direct bearing on the final results.

After exhaustive studies of their own, Jim Sharpe, Medical Administrator for TOMA concluded:

"We don't see any relationship between industrial talc as mined at Gouverneur Talc Company and cancer."

Dr. Robert Murray of Robert Murray Associates, London, England, is accepted throughout the world as a leading authority on occupational medicine. He was asked to examine both the TOMA and the

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government studies and to comment on procedures and conclusions. "The TOMA Study seemed to me to be a perfectly competent, legitimate study — the NIOSH Study was not, because it used a number of people and attributed the effect on their lung to talc, when in fact some of the people had had very short exposures indeed. To lump in everybody regardless of exposure is, to me, very bad epidemiology . . . . . The most important thing was the absence of any smoking history because cancer of the lung is so basically due to smoking. I don't think the government study stands up to serious consideration. I don't think it is a good epidemiological study which effectively associates the exposure to talc with the occurrence of lung cancer."

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