



SOUND SCIENCE WITH A CONFIDENT VOICE SUPPORTING YOUR LEGAL EXPERTISE

Our experts represent decades of specialist knowledge with strengths in many scientific disciplines including mineral characterization. Together with our substantial analytical resources, our depth of experience results in robust support delivered by seasoned professionals.

For more than 30 years we have been . . .

- » In the forefront in identifying and characterizing asbestos and non-asbestos minerals
- » Conducting and publishing fundamental research
- » Serving on, and contributing to, method development panels and committees (ASTM, EPA, NIOSH, USP, and ISO)
- » Testifying in state and federal courts

Experts on current and historical data

While products and materials at issue are generally no longer available for testing, historic records of testing conducted on those products may exist and may be applicable to your case within proper context. We can provide the context to evaluate these historical test records and their scientific validity.

Experts in critical evaluation

We have significant expertise in the critical evaluation of case records including work history, potential exposure scenarios, relevant scientific literature concerning product testing, as well as reports and data of opposing experts.

RJ LEE GROUP ALSO HAS EXPERTS IN:

- ▶ Root Cause Failure Analysis
- ▶ Corrosion Testing
- ▶ Concrete & Construction Materials
- ▶ Particle Characterization
- ▶ Mining & Minerals
- ▶ Industrial Hygiene

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 **RJ LEE GROUP**
DELIVERING SCIENTIFIC RESOLUTION

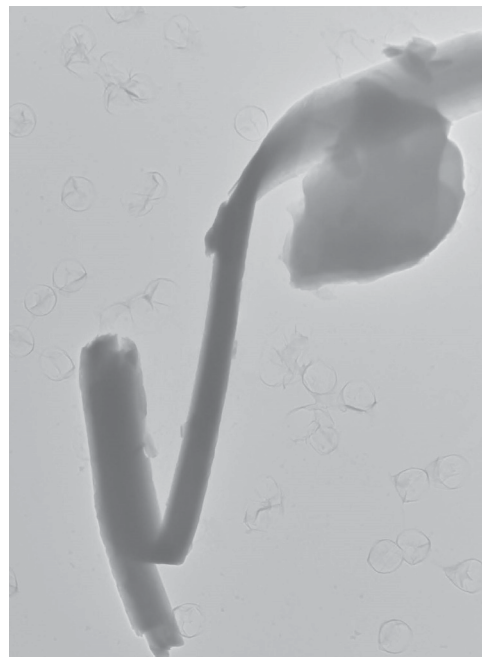
Current issues often revolve around incorrect identification and classification of amphibole minerals.

Is it Asbestos? Or Non-asbestos?

Correct mineral identification relies on particle morphology (shape and size), elemental composition (chemistry or EDS spectrum) and crystal structure (SAED pattern). However, once a particle is identified as an amphibole mineral it is important to determine whether or not the particle is in fact asbestos. An analyst should not rely on aspect ratio alone. Discrimination relies on close examination of the particle's morphological features such as whether the particle has parallel sides and fracture or cleavage surfaces.

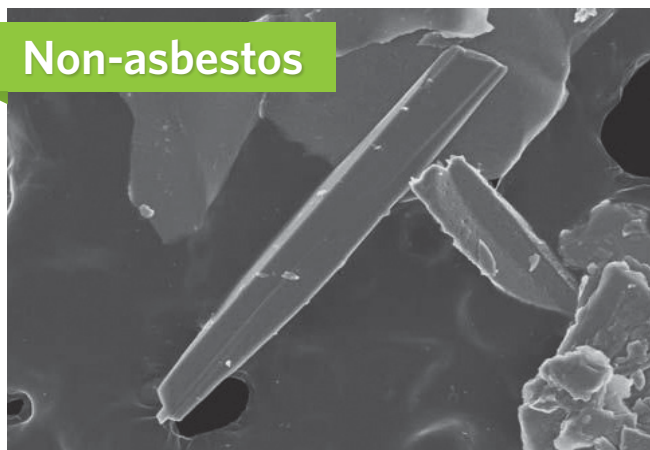
Discrimination is Necessary

The particle on the right is a talc particle that was recently misidentified by another lab as anthophyllite (amphibole). The known tensile strength of amphibole particles would not permit the bending of the particle as seen here. Rather, the ribbon-like structure of this particle is indicative of talc.



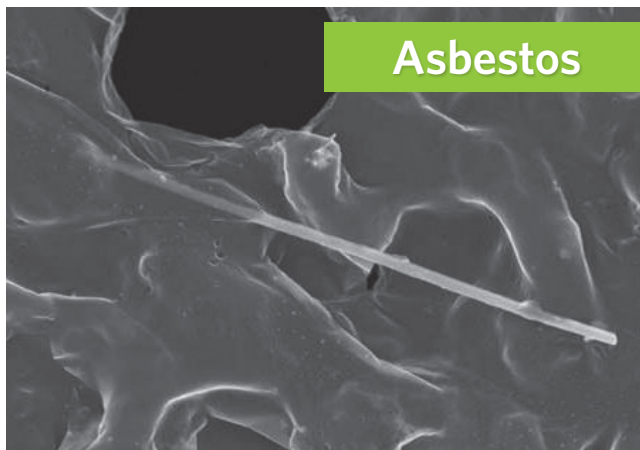
Talc particle

Non-asbestos



This is a non-asbestos amphibole particle (11 x 1.25 μm), but in many laboratories, it can be misidentified and classified as asbestos. Notice that the particle does not have parallel sides or irregular determination at the ends. You can clearly see fracture surfaces. These fractures indicate that the particle was broken to this shape and did not form that way naturally.

Asbestos



This is an asbestos amphibole fiber (about 7 x 0.15 μm) embedded in the filter matrix. This fiber has a "hair-like" appearance and parallel sides. The sides appear to be smooth and somewhat rounded, with no evidence of cleavage surfaces. There are no signs of fracture surfaces which indicates that this fiber developed into this shape naturally.



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