Holcim

Strength. Performance. Passion.

Actinolite

Questions and answers

May 2015

What is actinolite?
Actinolite is a commonly occurring amphibole mineral consisting of the elements calcium, magnesium, iron, silicon, oxygen and hydrogen.

There are different forms of actinolite including non-fibrous and fibrous forms.

Is actinolite harmful?
Non-fibrous actinolite (technically referred to as acicular actinolite) poses a low risk to human health and is not considered hazardous.

The fibrous type of actinolite is an asbestiform material and once airborne can be hazardous to human health. Fibrous/asbestiform actinolite is one of the regulated forms of asbestos.

The presence of actinolite in hard rock does not necessarily mean it is hazardous.

Where is actinolite found?
Actinolite is naturally formed in the earth's crust and is found across the world. Its distribution and abundance is related to the type of rock that it is found in.

It is more common and abundant in metamorphic rocks such as greenstones and banded iron formations.

Both non-fibrous and fibrous actinolite are formed by the recrystallisation of clay grains but vary with the level of metamorphism imposed on them.

What is metamorphism?
Metamorphism is a natural process that changes the composition of pre-existing rocks over many millions of years. Heat from the earth's core and/or pressure from moving tectonic plates compress and bury rock in the earth forcing the changes.

The level of metamorphism can be wide-ranging and determines the characteristics of the resulting rock and their mineral compositions.

Is actinolite the same as asbestos?
Asbestos is a commercial term for six naturally occurring fibrous, silicate materials. Fibrous actinolite is one of these six known asbestos materials.

Non-fibrous actinolite is not an asbestiform material and is low risk to human health.

What is the difference between fibrous and non-fibrous actinolite?
Fibrous actinolite (also known as asbestiform actinolite) presents as parallel sided, micro hairlike structures and the fibres are flexible.

Once these fibres are airborne it is known to be harmful to human health as the flexible, micro hairlike fibres can lodge in the lungs, leading to disease.

Non-fibrous actinolite presents in long, slender, crystals (known technically as acicular) and are hard and rigid. It is low hazard and is generally not considered harmful to human health.

How is the risk of actinolite managed at Holcim sites?
If actinolite is detected at any Holcim site a comprehensive review and detailed testing is undertaken with an expert consultant to assess the type, concentration and risk to human health.

If required, a suitable management plan is developed and implemented in accordance with all statutory regulations.

References

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Lippmann, M. (2014). Toxicological and epidemiological studies on effects of airborne fibers: Coherence and public health implications. Critical Review Toxicology, 2014; 44(8):643 -695.

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Actinolite at Beenleigh Quarry

Is actinolite found at Beenleigh quarry?
Fibrous actinolite is not present at Beenleigh quarry.

Trace amounts (averaging 1-2% by microscopic analysis) of the non-fibrous form of actinolite has been observed at Beenleigh quarries since the mid 90s. It is generally observed within the groundmass (that is “cementing” minerals) with numerous other minor minerals.

Is the actinolite found at Beenleigh harmful?
Non-fibrous actinolite does not present health risks at low concentrations. Fibrous actinolite, the type that is known to be harmful to human health once airborne, has never been identified on site even with extensive testing.

Furthermore, the metamorphism required to create the fibrous form of actinolite, has never been observed in any quarried material at Beenleigh or throughout the quarry pit. As such, there is a very low likelihood of finding fibrous actinolite in the Beenleigh quarry resource.

What type of tests do you run to ensure the actinolite doesn’t occur in fibrous form and how regularly do you test for other fibrous material?
There have been almost forty reviews and reports carried out over twenty years specifically on the mineral composition of the extracted quarry products.

This provides us confidence about the abundance, nature and form of actinolite at Beenleigh, however we will continue to conduct petrographic or microscopic rock and other analysis on a regular basis.

Additionally, long term and regular dust monitoring tracks respirable particle levels - and this includes analysis for all fibrous materials.

The likelihood of actinolite occurring in a fibrous form at Beenleigh quarry given the reports to date and knowledge of the local geology is very low.

Our site management plan is regularly reviewed with consideration given to geological and mineral composition and possible changes over time and location.

We do this as we believe we have an obligation to monitor to a high standard, often greater than required under national or state regulations, to ensure the absolute safety of our people on site and our local community.

We will continue to monitor and review the mineral content of our quarry products and will also include periodic testing of the mineral composition as part of our airborne dust monitoring going forward.

How long has Holcim known about actinolite at Beenleigh and why haven't we been told before now?
As non-fibrous actinolite poses a low risk and not considered hazardous to human health, this has not been considered an issue to report.

Actinolite was first reported at Beenleigh in the mid 1990s and only in very small percentages. Since then Holcim has undertaken almost forty reviews and engaged various experts to monitor and manage the material.

Long term and regular personal and environmental dust monitoring provides also supports ongoing material management plans.

What safety measures are in place at Beenleigh quarry?
Like all our operations, safety is extremely important and all our people are expected to comply with all our safety and environmental procedures.

Beenleigh quarry has a Dust Management Plan and various long term mitigation measures have been in place including enclosed crushing plants and dust suppression systems and procedures.

Airborne dust monitoring occurs on a regular basis in compliance with our operational approval. 10 dust deposition monitors are used with 6 being located around the quarry boundary and 4 being placed at sensitive receptors within the local community. Samples are retrieved and tested on a monthly basis and any non-conformances reported to DEHP.

It's important to note that our people work much closer to any dust source and our first concern is with their health, safety and wellbeing. We would never want to expose our colleagues and friends to unsafe or harmful concentrations of dust. It is important that exposure to any form of dust is controlled.

Personal exposure is closely monitored, as required under regulations, and no adverse health effects have been recorded with our people working on site.

What else are you doing about it now?
Considering the recent concern generated by Hanson's Wolffdene quarry extension application, Holcim has completed another internal review of actinolite at Beenleigh quarry.

Following this review we remain confident of the low risk associated with actinolite at Beenleigh quarry.

To further support this, DEHP in consultation with the local community, Cement Concrete and Aggregates Association (CCAA) and industry operators including Holcim are undertaking independent airborne dust studies in the local area.

Further information including the timeframe and publishing of results from this study is expected to be made available from DEHP for review.