

## **Key health properties - do low biopersistent fibres pose risks?**

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The key health property of all Superwool® products, including the latest member of the family, is that any fibres that might be breathed in and reach the lungs are rapidly removed. This characteristic is referred to as low biopersistence. As a consequence fibres do not accumulate in the lung, preventing the occurrence of any significant inflammatory effect that might affect the lungs.

Low biopersistence is achieved by producing the fibres that are a glassy material, which partially corrodes and then fragments when it comes into contact with the fluids found in the lungs.

### **However, does this ensure that these fibres are really as safe as they can be?**

Can we be sure that the fibre fragments and leached materials do not pose any danger?

Superwool® fibres are made only using chemical elements that are themselves generally regarded as safe. Non-fibrous materials with the same chemical composition as Superwool® are permitted ingredients in foods, medicines and cosmetics as well as having many uses in industry. In none of these applications has this group of compounds been found to be dangerous. Even fibrous calcium silicate is not regarded as carcinogenic by the World Health Organisation and is exonerated under the extremely rigorous German regulations and in the entire EU.

We are all exposed to considerable amounts of dust from environmental as well as industrial sources.

A lot of this dust resembles Superwool® fibres in that, among other components, it contains a great deal of silicates and calcium.

If fine enough to reach the lungs, this dust is removed by cells known as macrophages - the “dust carts” of the lungs. These cells with their dust content are eliminated through the lymphatic system or swept up the airways, swallowed and the dust voided via the gut. Superwool® fibres, which are initially too long to be carried away by the macrophages, are partially corroded and break into short pieces which are then cleared in a similar manner to dust particles. Chalk and cement are good examples of dusts, which contain the same elements as Superwool® fibres that are found naturally in the body. These also partially corrode and their components are eliminated via the natural lung clearance system. These calcareous dusts do not cause disease unless they are contaminated by other materials.

Of course the body also needs a regular input, usually from food, of all the major elements making up Superwool®. A simple calculation taking into account Superwool® fibre workplace levels of fibrous dusts, the amount of air breathed and fibre deposition in the lungs, shows that fibre concentrations in the air would have to be hundreds of times greater than they are to provide inputs which even approach those from food.

It is true that the concentrations and distribution of these elements in the blood, tissue and other “compartments” is very carefully controlled by a number of more or less complicated mechanisms.

Maintaining this control is essential for good health.

**Could inhaled Superwool® fibres affect these control mechanisms?**

This is unlikely as the body can easily handle dusts with similar components. The dissolved elements coming from such dusts are the same as those which dissolve out of Superwool® fibres, and no effect of even large exposure to these materials has been detected.

**Conclusion**

Although AES fibres, such as Superwool®, are designed to corrode and fragment after being inhaled, the chemical elements released into the body are the same as those commonly found in nuisance dusts or in food.

The quantity released is very small in comparison to these other sources and so the body's normal systems of regulation are easily able to cope.

These considerations have been central in the development of all Superwool® products.

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# Superwool® Plus

## Insulating fibre

### Features

### Benefits

An engineered solution (unique)	Takes insulation beyond normal performance
Patented technology	Proven chemical formulation
<b>High temperature insulating wools (Superwool® range of products) not classified according to European Regulation (EC) I 272/2008</b>	<b>Restrictions on use do not apply. No special requirements for dust control, can be supplied to the general public and considered as non-hazardous waste for disposal</b>
Lower thermal conductivity	Improves insulation by 20%
Up to 30% more fibres	Efficient prevention of heat transfer and greater strength
Less shot	Cleaner workplace
High Fibre Index	Up to 20% reduction in thermal conductivity giving energy saving
Stronger with good handleability (no tearing)	Ease of installation saving time and waste
Improved handling	Operator satisfaction
Soft & smooth feel	Less mechanical skin irritation
Consistent use of pure raw materials	Higher classification temperature, low shrinkage and consistent quality
Lower density grade for the same result	Material weight savings up to 25%
Thinner lining for the same result	Create more working space within unit
Resistant to vibration	Allows long lifetime under vibration conditions where other products fail
An environmental solution	Potential savings on waste disposal
Worldwide production	Availability