Silver in Drinking Water

Health Effects of Silver in Drinking Water

Review of current restriction on the use of Silver

Silver is an important ingredient in the composition of GeoSIL® as it fulfills dual roles of stabilising the product and increasing its microbiological effectiveness. Its use however is often of concern because of its inclusion in various drinking water and other standards and controls. This concern is largely misplaced, because the amount of silver used is so low as to be many times below the amounts that are generally considered safe. (less than 0.08%)

Health Effects of Silver Ingestion

The World Health Organisation’s Guidelines for Drinking Water Quality (WHO, 2004) indicate a guideline of 180 µg/day for the concentration of silver ions in drinking water. Water with a silver concentration up to this value is considered safe to drink over a 70 year period, at a consumption rate of 3 litres per day. Drinking water treated with GeoSIL® will result in the consumption of 15 µg / day, i.e., 12 times less than WHO recommendations

The WHO does not describe any health effects associated with the ingestion of silver other than a condition called Argyria, which causes discolouration of the skin and hair. This is considered a cosmetic effect and does not impair body function. Other sources indicate that in the United States at least, no incidents of argyria have been attributed to drinking water consumption. All cases of this complaint appear to be from the use of silver in medicines, cosmetics, and industrial exposure (factory workers).

It has also been shown that the ingestion of large amounts of silver can be tolerated over a short term. The WHO reports a NOAEL (No observed Adverse Effects Limit) of 10g. This means that no harmful effects have been noted following the ingestion of 10g of silver, which is more than a million times the amount of silver present in a 150ml glass of water treated with the recommended dose of GeoSIL®.
Suitability and Harmlessness

The average dosage of GeoSIL® in drinking water amounts to 10 mg/l (ppm); at this rate the silver content is 0.005 mg/l.

Following are some examples of officially authorised silver levels in drinking water:

- USA, Canada, Russia, Japan: 0.05 mg/l (ppm)
- E.U.: 0.08 mg/l (ppm)
- Switzerland: 0.10 mg/l (ppm)
- New Zealand: 0.02 mg/l (ppm)

\textit{i.e. water treated with GeoSIL® has a silver content of 4 - 20 times less than officially authorised.}

Note: The New Zealand Drinking Water Standard (Drinking-Water Standards For New Zealand 2000) indicates a MAV of 0.02 mg/l. While this is lower than other overseas values it is obtained from a Provisional Australian MAV and is classified as "Usually unnecessary to recommend health based MAV because it is not hazardous to human health."

The World Health Organisation (WHO) recommends a max. harmless silver ingestion through treated drinking water of 180 µg/day. (3 l/person/day).

When consuming drinking water previously treated with GeoSIL®, the ingestion of silver (3 l water / person / day) amounts to 15 µg.
\textit{i.e. 12 times less than by WHO recommendation.}

Determination of Silver Residues on Surfaces

Independent laboratory test were carried out in Switzerland in June, 2004, to determine the silver residues on surfaces treated with 3% GeoSIL® (GeoSIL DS). Surfaces tested were new and clean wooden and synthetic cutting boards, and stainless steel.

No silver residues were detected at a detection limit of 0.05 mg/kg. (Ref. DES T194).