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# Characterization and assessment of the potential toxicity/pathogenicity of Russian commercial chrysotile

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## Abstract

Today, cancer is one of the main health issues faced in the workplace, with asbestos an important carcinogen in the occupational environment. Among the asbestos minerals, chrysotile is the main species of socio-economic and industrial relevance. Although chrysotile asbestos is classified as a "carcinogenic substance" by the International Agency for Research on Cancer (IARC), this fiber is still mined and used in Russia. The effective health hazard posed by the Russian commercial chrysotile has not been quantitatively assessed to date. In this work, the potential toxicity/pathogenicity of Russian chrysotile was quantitatively determined using the fiber potential toxicity index (FPTI) model. This model was applied to a representative commercial chrysotile from the Orenburg region, Russia, whose morphometric, crystal-chemical, surface activity, and biodurability related parameters were determined. We have quantitatively assessed that the toxicity/pathogenicity potential of Russian chrysotile (FPTI = 2.4) is lower than that of amphibole asbestos species but higher than the threshold limit set for "safe" mineral fibers (FPTI = 2.0), although it does not contain impurities of amphibole asbestos. Differences with other chrysotile samples were discussed, and it was found that the investigated Russian commercial chrysotile shares several features with the Italian Balangero chrysotile, indicating that widespread concern on commercial Russian chrysotile is justified.

**Keywords:** Asbestos, chrysotile, Russia, adverse effects, FPTI