# NATURALLY OCCURRING ASBESTOS IN SERPENTINITE QUARRIES: A CASE STUDY IN VALMALENCO, CENTRAL ALPS, NORTHERN ITALY

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Serpentinites are renowned ornamental and dimension stones, characterized by a wide variety of green shades and by interesting technical properties, such as high compressive strength and durability. They are produced in the Malenco Valley, Central Alps (northern Italy, Sondrio) where the geological set-up is dominated by the ultramafic Malenco massif. Good quality long fibre chrysotile asbestos was also produced in this alpine district since the XIX century: little mines acquired importance in the years preceding the WW2, with maximum exploitation during war years (1940-1945). Some serpentinite quarries "cross" at times tunnels of the old asbestos mines: the chrysotile veins (some cm in thickness) are concentrated along the main fractures, that at present time "guide" the serpentinite extraction. These chrysotile veins are fairly common especially in the Val Lanterna area, associated to an important ENE-WSW striking fracture and hydrothermal vein system. Workers' exposure during quarrying and processing can not be ruled out and must be assessed according to national laws. From 2004 to nowadays, the INAIL Regional Management of Lombardia – supported by the Central Contarp, with the collaboration of University of Milan-Bicocca – carried out extensive monitoring campaigns both in quarries and in manufacturing laboratories. More than 500 samples divided between massive rock/vein and airborne dust samples were collected during the 2005-2008 surveys. Airborne personal and environmental samples were analyzed by means of phase-contrast microscopy (PCM) and SEM-EDS at the INAIL-CONTARP laboratories, whereas the massive samples were studied at the laboratories of the University of Milano-Bicocca (SEM-EDS, XRPD, PLM, IR). Geological and geostructural mapping of the chrysotile veins was also performed by the University, in order to characterize and quantify the "asbestos content" in every quarry. Prevention actions were planned on the basis of the analytical results, and are still in progress: drilling technologies, dust suction and water abatement were tested in the field, under coordinated supervision of the local authorities, procedural and organizational solutions are implemented both in the quarries and in the manufacturing sites. Employers and workers are trained appropriately according to the law. A specific method for monitoring NOA exposure in these workplaces will be soon released.

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