

WORKERS' ASBESTOS EXPOSURE ASSESSMENT IN QUARRYING THE GREENSTONES (OPHIOLITES) IN THE PARMA PROVINCE

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In the province of Parma we count the highest number of active Greenstones quarries. A regional survey was carried out in the years 2002-2004 in order to analyze the extracted materials and to define the workers' exposure to asbestos. In 2009-2010 a new survey was conducted to refine the research. The investigated productive sector has in total a few dozens of employees, seasonally working. The Apennine ophiolitic materials are peculiar ones, the simultaneous presence of fibrous and non fibrous serpentine makes an interesting comparison between different microscopic analytical methods. The 11 mining sites are homogeneous in types of activities (with the exception related to the use of explosive charges in a single slot). In 4 sites there was a monitoring of the workers assigned to the typical works in a quarry: excavator and wheel loaders driver, truck driver and manager of the mill. We can make considerations on the characterization of tasks even if we have a limited number of samples. The sampling was performed in accordance with the methodology established by UNI EN 589/97. We collected 13 samples of a personal nature (Cp), corresponding to n. 7 exposures for an entire work shift, as indicated by the WHO 1997 method. The filters were analyzed in phase contrast optical microscopy - PCOM for comparison with the limit value (LV), concentration in ff / cc and / or ff / liter and Scanning Electron Microscopy – SEM, both to compare the two methods and to verify the extent of the presence of asbestos fibers. The personal exposure data were statistically processed to determine the applicability of the standard UNI EN 689/97: log-normal distribution, GSD, homogeneity of the investigated group and, by the software application ALTREX we calculated the probability exceeding the LV (% Pn) with its confidence interval. Regressions were performed for comparisons between analytical methods as well as counts of total fibers and asbestos fibers. The results of the survey, concerning occupational exposures, point out that the process of extraction of green stones must be kept under control (ORANGE situation in accordance with Appendix D of the UNI EN 689/97), but above all, they suggest to think about the operative method of mining and quarrying and the intended use of the extracted materials (coarse pieces rather than crushed and powder).

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