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REPORT

Fiber analysis

INTRODUCTION

ASBESTOS AND FIBRES

In the last decade fibers and asbestos problematic have been paid much attention. Fibrous-forming minerals are widely distributed at the surface of the earth's crust. In these fissures and local zones in deposits could be found minor amounts of fibrous minerals. More than 250 minerals with fibrous varieties could be found. But only six of those are asbestos. Primary ores, gangue minerals and host rocks may be the source of fibrous minerals. The fibers can occur in an asbestiform variety (contain asbestos) and a non-asbestiform variety (does not contain asbestos).

A fiber refers to the individual crystal fragments having, according WHO, the following dimensions; length greater than 5 micron (1 micron = 1/1000 mm), maximum diameter less than 3 micron, and a length to diameter/width (aspect ratio) of at least 3:1.

Asbestos means a term applied to asbestiform varieties of the serpentine group and the amphibole group, particularly chrysotile, crocidolite, amosite, asbestiform tremolite, asbestiform actinolite and asbestiform anthophyllite. The asbestos mineral possesses asbestiform characteristics. But the asbestiform variety has also a non-asbestiform variety with the same chemical composition as the asbestiform variety.

The term asbestiform means an adjective describing inorganic, crystalline material that possesses the form and appearance of asbestos. Asbestiform is a subset of fibrous, where asbestiform implies relatively small fiber thickness and large fiber length, flexibility, easy separability, and parallel arrangements of the fibers in native (unprocessed) samples. Often, asbestos fibers occur in bundles, i.e., they are often polyfilamentous.

PROCEDURE FOR ANALYSIS OF FIBRES

The procedure for analysis is developed by SINTEF Civil and Environmental Engineering, Rock and Mineral Engineering. The samples were crushed down to analysis fineness by the customer. Scanning Electron Microscope (SEM) and Energy Dispersive System (EDS) are used to detect and analyze fibers. The detection limit for the analysis is 0,001 % by weight.

The results are divided into non-asbestiform fibers and asbestiform fibers. Non-asbestiform fibers are fibers based solely on dimension, whereas asbestiform fibers also must comply with chemical analysis to match with the known asbestos types mentioned previously.

Jørn Røssvoll
Responsible

ANALYSIS RESULTS

Reported results of fiber counting (in weight %):

Table 1: Results

Sample:		Non-Asbestiform fibers	Asbestiform fibers	Asbestos type
63245-1	FA-Q 984927	0,008 wt%	0,004 wt%	Tremolite
63245-2	FA-Q 995323	0,012 wt%	-	
63245-3	FA-Q 995753	0,022 wt%	-	

Note:
In Norway, a material or product is considered asbestos-containing when it contains 1% asbestos (by weight) or more. For mineral products it is also mandatory labeling when the asbestos content is > 0,1% (by weight).

The samples analyzed are all well below any limits regarding asbestos content.