PLAINTIFF'S EXHIBIT

ATT-153

Case: 43106-8

Bell Laboratories

subject: Evaluation of the K^2 Asbestos Screening Kit for OTC Use

date: August 25, 1980

from: D. Rainer
C. P. Lichtenwalner

MEMORANDUM FOR RECORD

Introduction

Recently a method for the quick identification of asbestos incorporated into a package called the "K^2 Asbestos Test Kit" has been developed by a group working at the National Institute For Occupational Safety and Health (NIOSH).[1] The K^2 Test is a method for determining the presence of asbestos in samples of bulk material. Mr. David Rainer and Mr. Charles Lichtenwalner of the Bell Laboratories Environmental Health and Safety Department have conducted a study to evaluate the ease of use and reliability of the K^2 Test as it applies to the needs of operating telephone companies.

How the K^2 Test Kit Works

The K^2 Test is a colorimetric test for magnesium (Mg^{+2}) and Iron (Fe^{+2}) and is not specific for asbestos. Magnesium and iron are contained in all types of asbestos (Table 1).[2] The Mg^{+2} from chrysotile is complexed with p-nitrobenzene azonaphthol and forms a blue color. The Fe^{+2} from the amphiboles is complexed with 1, 10-phenanthroline and forms a red color. A positive test is indicated by the formation of these colored complexes and indicates the possible presence of asbestos. A positive test must be confirmed by means other than the K^2 kit.

Table 1: Classification of Asbestos

TYPE	COMPOSITION	CRYSTAL STRUCTURE
SERPENTINE		
Chrysotile	$3MgO \cdot 2SiO_2 \cdot 2H_2O$	monoclinic
AMPHIBOLES		
Tremolite	$2CaO \cdot 5MgO \cdot 8SiO_2 \cdot H_2O$	monoclinic
Actinolite	$2CaO \cdot 4MgO \cdot FeO \cdot 8SiO_2 \cdot H_2O$	monoclinic
Anthophyllite	$7MgO \cdot 8SiO \cdot H_2O$	orthorhombic
Amosite	$5.5FeO \cdot 1.5MgO \cdot 8SiO_2 \cdot H_2O$	monoclinic
Crocidolite	$Na_2O \cdot Fe_2O_3 \cdot 3FeO \cdot 8SiO_2 \cdot H_2O$	monoclinic

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If you have any questions about this analysis, please let me know.

Charles P. Lichtenwalner

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