

SHORT vs. LONG ASBESTOS FIBERS

<u>AUTHOR/SCIENTIST</u>	<u>METHOD OF STUDY</u>	<u>FINDINGS/CONCLUSIONS</u>
KING (1946)	Administered chrysotile fibers to rabbits by way of intratracheal injection.	A greater tissue reaction was reported in the animals that received the long fibers. "This appears to be due to the fact that the process of phagocytosis is easier with the shorter than with the longer fiber."
VORWALD (1951)	Same as above.	"... the minimum length of fiber possessing the capacity to produce the typical peribronchiolar fibrosis in animals is somewhere between 20 and 50 microns."
KLOSTERKOTTER (1968)	Intratracheal or intra-abdominal injection.	Both chrysotile and crocidolite ground to an average fiber length of less than 5 microns produced no fibrosis when injected intratracheally or intra-abdominally.
TIMBRELL and SKIDMORE (1968)	Studies with rats and guinea pigs exposed to short-fibered amosite and long-fibered asbestos.	"A minimal reaction has been observed to short fibers but a marked reaction has been observed to the longer fibers."
WEBSTER (1970)	Monkeys treated with a finely ground crocidolite dust.	Obtained only a macrophage reaction in the lungs.
DAVIS (1972)	Injected long and short chrysotile fiber samples into the pleural cavities of mice.	"... The greatest point of difference is that long fiber dusts are the only ones to produce adhesions."
GROSS (1974)	Injected chrysotile dust intratracheally into rats.	Fibers less than 5 microns in length "could induce no more than a macrophage reaction."

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HOLT (1965)		Short fibers ("too small to be seen under the light microscope") do produce asbestosis in the guinea pig.
STANTON and WRENCH (1972)	Applied asbestos to the pleura of rats.	Smaller fiber size was responsible for the decreased carcinogenicity. "Presumably, the 20-32 % tumor incidences resulting from this sample were related to those particles that retained their fibrous structure in the optical range."
STANTON (1972)	Pleural response of rats in relation to fiber dimensions of glass.	"Morphologic observations indicated that fibers less than or equal to 8 microns in length were inactivated by phagocytosis. The negligible carcinogenicity of short fibers is perhaps related to the historical observation that virtually all coarse and fine diameter fibers with lengths of 8 microns or less are efficiently trapped by phagocytes."
SMITH (1972)	Injected hamsters intrapleurally with chrysotile.	Animals injected with less than 1 micron did not develop mesothelioma while those injected with fiber lengths of 5.3 to 6.9 microns did develop the tumor.
MAROUDAS (1972)	Studied incidence of mesothelioma in rats after vivo exposure to asbestos fibers. Attempted to grow cultured fibroblasts in the presence of asbestos fibers.	Fibers less than 20 microns in length were not able to provide the necessary substrate for tumor growth, i.e., there were no mesotheliomas observed in vivo or in vitro.
POTTS and FRIEDRICH S (1972)	Same as above.	Did report peritoneal mesothelioma with samples made up of fibers shorter than 2 microns.