

30 million, which equals 3 million (good practice); 30%, with average total dust concentration of 50 million, would equal .3 times 50, or 15 million 9 (unsatisfactory).

This formula is not applicable to any dust containing less than 5% free silica."

Theodore Hatch in his article "Some Fundamental Data on Mechanical Dust Traps" (Tech. Pub. No. 637-A. 60, Amer. Inst. Min. & Met. Engrs., Aug., 1935) gives these

Safe Dust Concentrations, Impinger Samples;

(Light Field, Low Power Counts.)

Kind of Dust	Maximum Permissible Concentration
Containing no Silica.	50 millions per cubic foot
Containing any small amount of silica, free combined.	30 " " " "
Containing 20 to 40 per cent. Free Silica	10 " " " "
Greater than 40 per cent. Free Silica	5 " " " "
	(Preferably as much less as possible)

Dr. R. R. Sayers, Medical Officer in Charge, Industrial Hygiene and Sanitation, U.S. Public Health Service in answer to a question as to permissible dustiness writes:

"During recent years, it has been customary to recommend threshold or permissible dust limits ranging from five to ten million particles per cubic foot as determined by Public Health Service technique, especially with dust in which the percentage of free silica is above five per cent. There is no basis for the application of this criterion to all dusts, but it is generally considered a safe practice and one which can be attained in most industries by exhaust ventilation, wetting, or other methods of dust control."

As pointed out by Drinker and Hatch ("Industrial Dust" - 1936) it is unfortunately impossible to evaluate dust exposures with the arithmetical nicety that we should have liked yet it is commonly claimed - by laymen - that prolonged exposure to low concentrations is just as serious as short exposures to heavy concentrations. This claim is contrary to a fundamental law of physiology. In discussing the subject Clark and Drinker ("Industrial Medicine" - 1935) remark that ".....a sub-threshold stimulus (dust inhalation) for a long time produces no reaction whereas a relatively brief super-threshold stimulus may cause a reaction". If workers are exposed to sudden heavy concentrations, the threshold values suggested previously would be correspondingly lowered. However, most threshold values are weighed -- an average of the ranges.

V - HOW MAY THE CONCENTRATION AND CHARACTER OF INDUSTRIAL DUSTS BE DETERMINED?
The properties of a dust which determine its harmfulness have been shown to be its composition, concentration (the quantity suspended in the industrial atmosphere), and its particle size. The methods used for the determination of the concentration and character of industrial dusts vary from a routine dust count for the purpose of evaluating the efficiency of dust control methods to a detailed study of both the concentration and the character of the dust in connection with medical and engineering surveys.