The resistance of a well-designed unit filter of the adhesive impingement type usually depends upon the velocity at which the air is handled and upon whether the unit is clean or dirty. The cleaning efficiency of the unit is usually highest after it has accumulated a certain portion of its maximum load of dirt because some dust collected in the cell acts as an efficient medium for the further seizing of solids from the air. By periodically cleaning a predetermined number of cells, the resistance and capacity

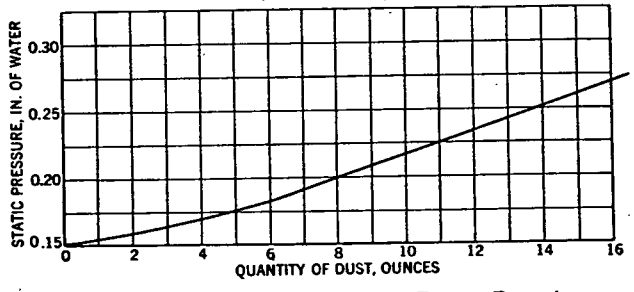

FIG. 1. CHART SHOWING CHANGE IN RESISTANCE DUE TO DUST ACCUMULATION

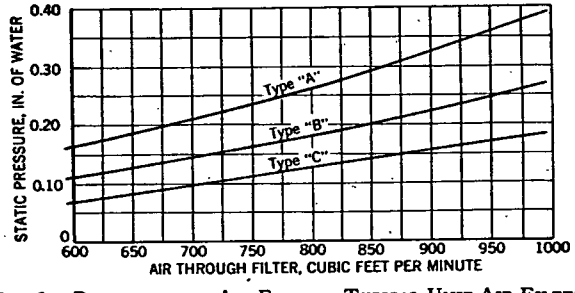

FIG. 2. RESISTANCE TO AIR-FLOW OF TYPICAL UNIT AIR FILTERS

of a built-up filter may be held at any desired figure. The frequency of cleaning any unit filter installation depends upon the dust concentration of air being cleaned, and on the amount of dirt which can be accumulated in the filter medium without causing excessive resistance. (Figs. 1, 2 and 3.)

It is difficult to satisfactorily compare the cleaning efficiencies of various filter types unless the efficiency ratings are determined under laboratory conditions in accordance with some definite test procedure such as that developed by the SOCIETY.[2] Efficiency tests made in the field with *atmospheric dust* are subject to so many variables that consistent comparisons are difficult. Of course there is no *standard atmospheric dust*, as atmospheric dust varies widely in composition and concentrations in different

[2]Loc. Cit. Note 1.

localities. Wide variations are also found due to different seasons of the year as well as the time of day and the direction of the wind. A chart showing the increase in resistance of a unit filter of the viscous impingement type, when tested with the standard test dust described in the code[3], is given in Fig. 1. The resistance to air flow of three typical clean viscous impingement type filters having different media densities is shown in Fig. 2. Type A is a dense pack used in bacteria control; Type B is a medium pack used for general ventilation work and Type C is a low resistance unit for use where low resistance is the important factor and maximum cleaning efficiencies are not essential. The operating characteristics which might be expected under various dust concentrations with air filters having different dust-holding capacities are illustrated in Fig. 3.

Filters consisting of inexpensive frames of cardboard or similar material filled with viscous-coated glass wool, steel wool or the like are available.

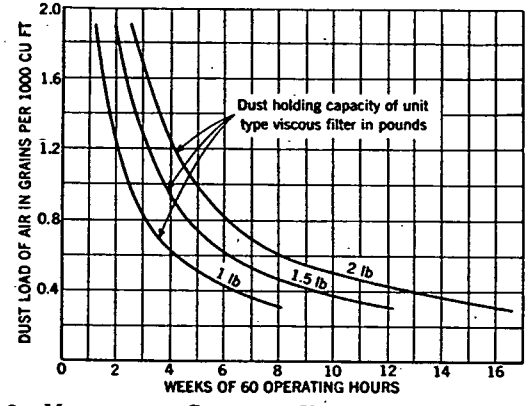

FIG. 3. MAINTENANCE CHART FOR UNIT TYPE VISCOUS FILTERS

Because of their construction these units may be discarded when dirty and replaced with new units at relatively little expense. They are used in general ventilation work and with warm-air furnaces and other installations where low first cost and low resistance to air flow are essential. The operating characteristics of these units conform in general with those of the rigid frame type.

Viscous Automatic Filters

The principle of air cleaning used in the viscous automatic filters is the same as in the unit filters. The removal of the accumulated dust, however, is done automatically instead of by hand. The automatic cleaning and recoating of these filters is based on the principle that the viscous fluid itself will perform the cleaning function, thereby eliminating a separate washing agent. The dust collected by the filter thus is deposited finally in the bottom of the viscous fluid reservoir from which it may be

[3]Loc. Cit. Note 1.