

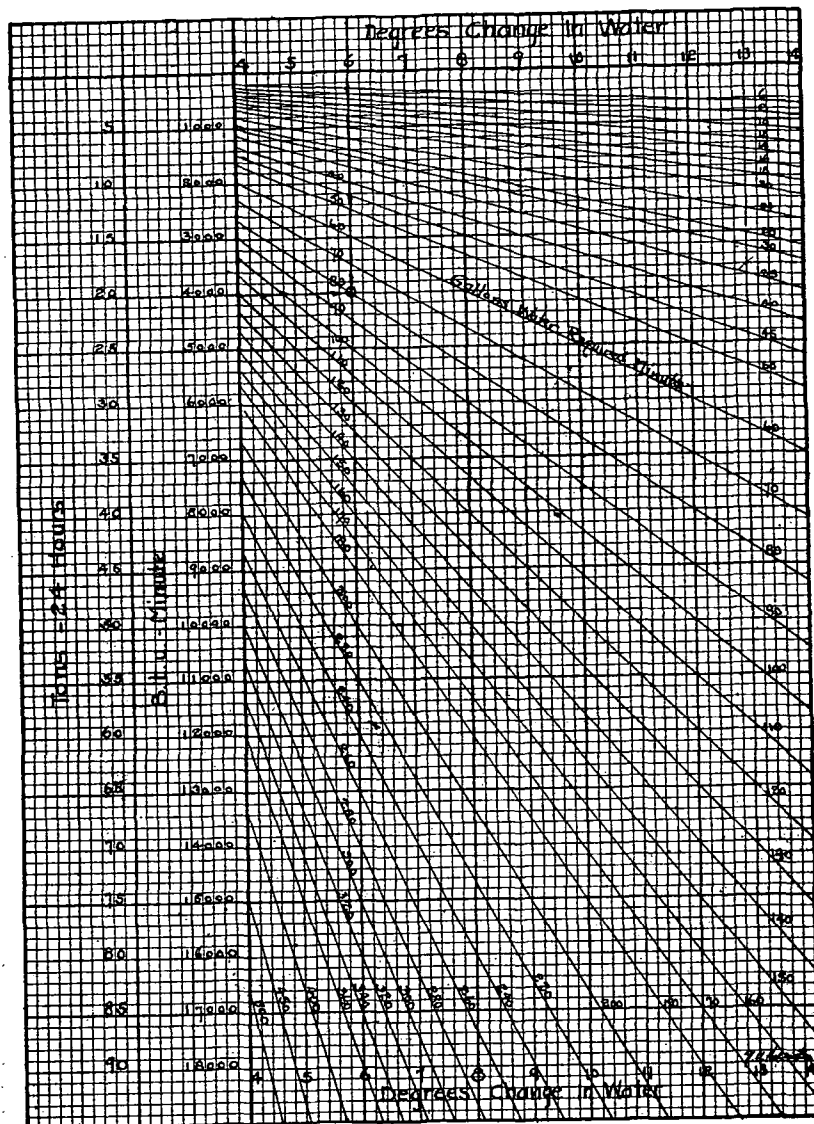


FIG. 1. GALLONS WATER REQUIRED PER MINUTE

$\frac{20,000 \times 56}{20} = 56,000$ cu. ft. per minute. (Note. The factor 56 is a convenient factor representing the air volume in cubic feet that will rise 1 deg. in absorbing 1 B.t.u.)

The above briefly expressed shows the method of determining air capacity required for the problem considered.

Dehumidification being required to first cool the air to 50 deg. during warm months of the year involves the use of mechanical refrigeration. The next step is to determine the refrigeration load and water cooling surface requirements. It must not be presumed that the 20,000 B.t.u. factor used in the above example to determine air capacity also represents the refrigeration load.

The refrigeration load should be based upon the cooling of 56,000 cu. ft. of air to at least 50 deg. The total heat to be removed in cooling air to 50 deg. is dependent upon the difference between the total heat of the air before and after cooling.

The total heat to be removed varies with the proportion of the outside air and return air used, and this in turn is governed by the nature of the particular problem and geographical location. It should be understood that the greater the proportion of outside air used during maximum summer weather the greater will be the refrigeration or cooling load.

The usual way of adding moisture to air in large plants is with the use of an air washer while in homes and offices, water pans in furnaces, or devices used in connection with radiators tend to better prevailing indoor conditions. While with air washers the degree of humidity as well as the temperature can be definitely controlled, little attention is paid to these items in the average dwelling as contrasted with factories, theatres, schools and other large buildings.

USE OF REFRIGERATION IN AIR CONDITIONING

The advantages of one method of cooling air over another and the general factors governing the proportioning and design of air conditioning units are of interest to all whose work may bring them in contact with systems using refrigeration. It is the purpose of this section to give those not familiar with this important branch of air conditioning a better understanding of how refrigeration is applied in this work.

The producing of the refrigeration for an air conditioning installation is a problem for the engineer, and is the same as any other refrigerating problem with a varying load. The method of treatment of the air, and its distribution is a separate study involving the entire subject of air conditioning.

The remaining problems, then, in connection with the use of refrigeration in air conditioning is the actual application of refrigeration in a unit or apparatus for cooling the air.

The transfer of heat in air conditioning apparatus is usually accomplished by one of three methods:

1. Passing air through cold water or cold brine sprays.
2. Passing air directly over cold coils.
3. Combination of the above two methods.