

The impact loss is commonly determined from the formula:

$$MV_{\text{primary}} + MV_{\text{secondary}} = MV_{\text{mixture}} \quad (8)$$

Common efficiencies for commercial ejectors are: nozzle efficiency 90 per cent, diffuser efficiency 60 to 70 per cent. Customary steam rates in pounds per ton are approximately as follows:

Evaporator temp.	50 F	Steam press.	100 lb	Steam press	12 lb
Condenser temp.	105 F	Steam rate	30 lb per hour per ton	Steam rate	45 lb per hour per ton.
Evaporator temp.	40 F	Steam press.	100 lb	Steam press	12 lb.
Condenser temp.	105 F	Steam rate	40 lb per hour per ton	Steam rate	70 lb per hour per ton.

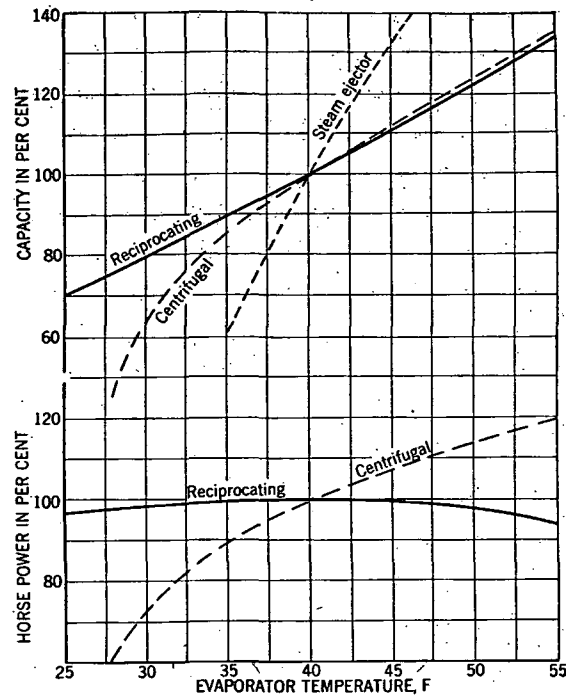


FIG. 6. PERFORMANCE CHARACTERISTICS OF COMPRESSION REFRIGERATION MACHINES AT CONSTANT SPEED

Condenser Temperature 100 F

The steam ejector uses large amounts of condenser water and steam, and therefore this system has relative advantages when large quantities of water and steam are available at reduced costs. Characteristic curves show that the ejector performance is independent of condenser temperature up to a certain temperature, depending upon the particular design, and above this temperature the ejector breaks and loses all capacity. (See also Chapter 10.)

Characteristics of Compression Systems

The different types of compression systems have quite different characteristics of capacity and power with varying evaporator temperature and with varying condenser temperature, as will be seen from curves in Figs. 6 and 7.

The capacity of the reciprocating and rotary compressor varies slowly with a change of evaporator temperature, and the variance of power requirements, in the air conditioning range of operation, is small for a change of evaporator temperature. On the other hand, the capacity and power of the centrifugal machine vary rapidly, and the capacity of the

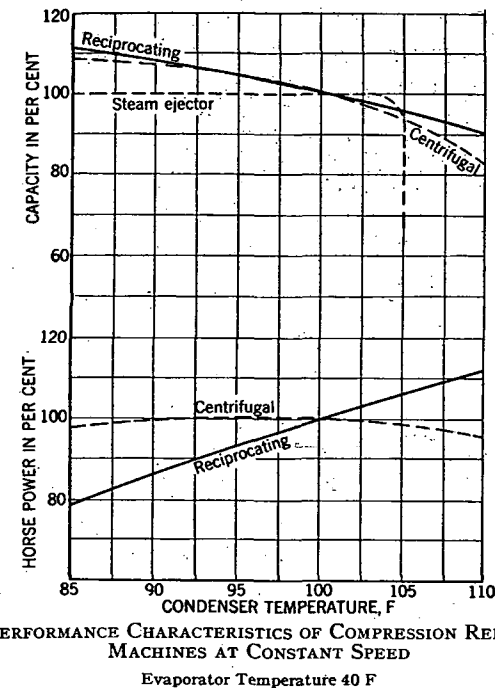


FIG. 7. PERFORMANCE CHARACTERISTICS OF COMPRESSION REFRIGERATION MACHINES AT CONSTANT SPEED

Evaporator Temperature 40 F

steam ejector also varies considerably. Thus, both these latter types tend to be more nearly self-regulating than the reciprocating and rotary compression type. On the other hand, the operating range of the latter near standard capacity is superior. Although the capacity of the reciprocating and rotary compressor is little affected by the condenser temperature, the power of the compressor is greatly affected, while the reverse is true for the centrifugal compressor. As previously indicated, the condenser temperature has no effect on the capacity of the steam ejector type of compressor until a certain point is reached, beyond which the capacity is zero. The steam consumption for the performance characteristic curves shown in Figs. 6 and 7 remains constant for all evaporator and condenser temperatures.