TABLE 7. MAXIMUM TONS OF COMPRESSOR CAPACITY FOR CCl_2F_2 LINES[a] (Only for temperatures indicated)

LINE SIZE INCHES	SUCTION LINES BASED ON 105 F CONDENSING TEMPERATURE						DISCHARGE LINES	
	Psi Pressure Drop per 100 Ft Equivalent Length at 40 F Saturation						Condensing Temperature	
	¼	1	2	3	4	5	115 F	90 F
½ OD	0.14	0.20	0.28	0.35	0.41	0.45		
⅜ IPS	0.17	0.24	0.34	0.42	0.49	0.54		
⅝ OD	0.25	0.35	0.51	0.62	0.73	0.81	1.43	1.15
½ IPS	0.35	0.45	0.65	0.79	0.93	1.03	1.87	1.50
⅞ OD	0.55	0.76	1.10	1.34	1.58	1.75	2.97	2.38
¾ IPS	0.68	0.94	1.35	1.65	1.92	2.12	3.26	2.62
1⅛ OD	1.26	1.80	2.57	3.17	3.76	4.15	5.05	4.05
1 IPS	1.43	2.01	2.89	3.54	4.17	4.60	5.29	4.25
1⅜ OD	2.21	3.12	4.45	5.50	6.38	7.05	7.72	6.19
1¼ IPS	2.70	3.82	5.37	6.72	7.68	8.48	9.16	7.35
1⅝ OD	3.40	4.78	6.79	8.42	9.77	10.8	10.92	8.75
1½ IPS	4.05	5.75	8.10	10.12	11.6	12.8	12.5	10.0
2⅛ OD	6.12	8.60	12.1	15.1	17.4	19.2	19.2	15.3
2 IPS	7.66	10.9	15.3	19.2	32.2	24.5	20.6	16.5
2⅝ OD	12.0	17.1	24.0	30.1	34.6	38.2	32.2	25.9
2½ IPS	12.0	17.1	24.0	30.1	34.6	38.2	32.2	25.9
3⅛ OD	19.1	27.2	38.2	47.8	55.0	60.7	51.5	39.8
3 IPS	20.9	29.4	42.3	51.8	60.0	66.2	54.5	43.8
3⅝ OD	27.8	39.7	55.7	69.8	80.3	88.7	72.0	57.6
3½ IPS	30.2	43.2	61.0	76.1	87.0	96.0	78.8	63.3
4⅛ OD	38.6	55.2	78.0	97.3	111	123	95.8	77.1
4 IPS	40.7	58.6	83.0	103	118	130	101.6	81.6
5 IPS	71.3	100	141	176	203	224	171.5	137.8
6 IPS	126	183	257	322	366	403	266	214
8 IPS	211	297	422	523	602	664	461	370
10 IPS	352	503	712	887	1024	1130	725	582
12 IPS	550	780	1106	1373	1582	1748	1041	836

[a] Refrigerant 12.

Oil separators are installed between the compressor and condenser to prevent excessive oil removal from the compressor crankcase and its passage into the condenser and evaporator. The oil is separated from the gaseous refrigerant by gravity during its passage through a chamber of sufficient size to reduce the velocity. A float-operated valve maintains a maximum oil level in the separator, and additional oil is forced by pressure difference through a line back to the crankcase.

Screen strainers are frequently installed in the liquid line piping before solenoid valves and expansion valves, as well as before regulating valves in water lines leading to water cooled condensers. Sight glasses which permit visual inspection of the condition of the refrigerant are sometimes installed on factory assembled commercial unit systems. It is particularly advisable to place such a fitting before the expansion valve, if the evaporator is located above the condenser.

Flexible vibration eliminators, usually consisting of a bellows design covered with woven copper wire, are sometimes installed in copper lines where units such as compressors are installed on flexible mountings, or

TABLE 8. APPROXIMATE SUCTION-LINE CAPACITY FACTORS FOR EQUAL PRESSURE DROP OF CCl_2F_2 (REFRIGERANT 12)

SATURATED SUCTION TEMPERATURE, F.	50	40	30	20	10	0	−10	−20
Factor	1.09	1.00	0.92	0.86	0.80	0.74	0.66	0.56

where vibration is otherwise a problem. Packed or packless shut-off valves are necessary where it may be required to isolate portions of a system.

EQUIPMENT CHARACTERISTICS AND SELECTION

The various types of compression systems have quite different characteristics of capacity and power with varying evaporator and condenser temperatures, as may be noted from curves in Figs. 15 and 16.

From Fig. 15 it may be observed that power requirements for the centrifugal compressor increase much more rapidly than for the reciprocating compressor, with increase in evaporator temperature. Similarly, the capacities of the steam ejector and centrifugal compressors increase more rapidly than those of the reciprocating compressor with increase in evaporator temperature. Thus, both the steam jet and centrifugal machines tend to be more self-regulating than the reciprocating. It is also evident from Fig. 15 that the steam jet equipment is best suited for operation at high evaporator temperatures.

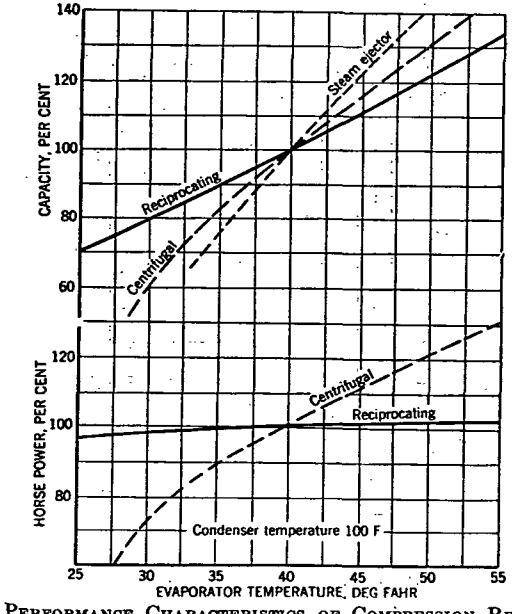

FIG. 15. PERFORMANCE CHARACTERISTICS OF COMPRESSION REFRIGERATION MACHINES AT CONSTANT SPEED

The effect of condenser temperature upon the power and capacity of the different types of compressors is shown in Fig. 16. It may be noted that the power required by the reciprocating compressor increases rapidly with increase in condenser temperature, while the power curve for the centrifugal compressor is relatively flat. It is also evident that the capacity of the steam jet compressor is independent of condenser temperature until a certain point is reached, where it drops to zero. As previously stated, steam jet equipment requires more condensing water than other types of compression systems. Consequently, steam jet systems are well