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SERVICE BULLETIN:

LSC OIL REQUIREMENTS AND LIMITATIONS

Listed below are the oil requirements and limitations for LSC Compressors. The limits apply to any type of oil cooling scheme e.g. water-cooled oil cooler, liquid injection oil cooler, thermo-syphon, or direct liquid injection. These limits apply to any current Hartford compressor application.

- 1) **Discharge Superheat (DSH):** This limit is applicable for refrigerants which are soluble in oil (e.g. R22 in mineral oil) in order to maintain a minimum viscosity. A minimum discharge superheat applies to insoluble combinations of refrigerant and oil (e.g. R717 in mineral oil) only in that a low discharge superheat is indicative of excessive amounts of liquid refrigerant in the compressor.
- 2) **Maximum Oil Temperatures:** These limits in conjunction with DSH are required to maintain oil viscosity for bearing lubrication. A maximum temperature is set for proper shaft seal operation. Injection oil is primarily to provide cooling of the discharge flow. Its limit is set by the maximum discharge temperature of the compressor (212°F).
- 3) **Net Oil Pressure:** The differential or net oil pressure is measured between discharge pressure and pumped oil pressure (port C15) at the compressor. The oil pump pumps oil from the oil sump which is at compressor discharge pressure. The difference between the oil pump discharge pressure and the compressor discharge pressure is referred to as the "Net Oil Pressure". A higher net oil pressure is required for air-cooled condensing applications where the potential for foaming due to large swings in discharge pressure exists. The option exists to exclude the injection oil from the pumped oil circuit to reduce oil pump requirements.
- 4) **Maximum Sump Temperature:** The maximum sump temperature is set in order to prevent chemical breakdown of the oil.

Operation of the compressor out of the guidelines stated will result in damage to the compressor and a loss of warranty coverage.

Please consult Hartford Compressors Application Engineering department for any questions.

Minimum Differential Oil Pressure:	SDT<115°F	25 psid
	SDT>115°F	35 psid
Recommended Setting:		55 psid
Maximum Oil Temperature:	Shaft Seal: Pusher-Type	130°F
	Bellows-Type	160°F
	Injection Oil:	212°F
Recommended Temperatures (all locations):		120°F
Maximum Oil Sump Temperature (off-cycle):		220°F

32 ISO Mineral Oil: (OIL3) (3GS)	<u>R22</u>	<u>R717</u>
Minimum Discharge Superheat:	65°F	20°F
Maximum Oil Temp.: Main Bearing Supply	130°F	180°F
Recommended Temperature:	120°F	120°F

68 ISO Mineral Oil: (OIL4) (4GS)	<u>R22</u>	<u>R717</u>
Minimum Discharge Superheat:	50°F	20°F
Maximum Oil Temp.: Main Bearing Supply	130°F	180°F
Recommended Temperature:	120°F	120°F

CPI #CP-4214-150***: 150 ISO Polyol-ester	<u>R22</u>
Minimum Discharge Superheat:	20°F
Maximum Oil Temp.: Main Bearing Supply	150°F
Recommended Temperature:	120°F

120 ISO Polyol-ester (ex. CPI Solest 120)	<u>R134a</u>	<u>R404A</u>	<u>R507</u>	<u>R22</u>
Minimum Discharge Superheat:	30°F	30°F	30°F	50°F
Maximum Oil Temp.: Main Bearing Supply	150°F	150°F	150°F	130°F
Recommended Temperature:	120°F	120°F	120°F	120°F

220 ISO Polyol-ester (ex. CPI Solest 220)	<u>R134a</u>
Minimum Discharge Superheat:	20°F
Maximum Oil Temp.: Main Bearing Supply	150°F
Recommended Temperature:	120°F

CPI #CP-4612-68: 100 ISO Polyalfaolefin*	R717
CPI #CP-1505-100: 100 ISO Polyalkalene Glycol*	R717
CPI #CP-1009-68: 68 ISO Semi-synthetic	R717
CPI #CP-1516-150: 150 ISO Polyalkalene Glycol	Hydrocarbons
CPI #CP-9001-100: 100 ISO Paraffinic Oil**	R50 (CH4)
CPI #CP-4614-68: 68 ISO Polyalfaolefin	R744 (CO2)
Minimum Discharge Superheat:	50°F
Maximum Oil Temp.: Main Bearing Supply	150°F
Recommended Temperature:	120°F

* R717 is soluble in these oils

** CP-9001 is commonly used in landfill applications

*** CPI #CP-4214-150 is a synthetic oil and is the only POE oil allowed to be used with R22.