
**CARLYLE COMPRESSOR AND HFC'S,
A REFRIGERATION UPDATE OF R-404A/R-507**

Carlyle Compressor has applied reciprocating compressors in stationary commercial refrigeration applications for over 3 years with the HFC's R-404A (HP62) and R-507 (AZ50) utilizing POE oil. A summarization of all the data shows that the Carlyle 06DR/DM and 06ER/EM compressors applied with HFC refrigerants (also including R-134a) are delivering service and reliability similar to that provided when CFC refrigerants were the industry standard.

Carlyle began long term testing of these refrigerants in the early 1990's. As a result of the initial testing, Carlyle increased the 06D/E oil pump pressure and selected a more viscous oil than has been previously used with CFC's or HCFC's. The results of extensive laboratory testing, along with data obtained in over ten thousand commercial refrigeration applications, is that Carlyle Compressors operating on R-404A/R-507 have efficiency, capacity and reliability similar to that of older systems that operated with R-502.

Carlyle Compressor carried out a number of in-house compatibility tests of the HFC refrigerants using POE oils prior to qualification of this product. These tests include, but are not limited to, the following:

- Valve testing in excess of 10,000,000 cycles.
- Flooded start testing:
 - 06D compressors passed flooded start tests using 10 to 15 pounds (based on crankcase size) of liquid refrigerant in their crankcases.
 - 06E compressors passed flooded start tests using 20 to 25 pounds (based on crankcase size) of liquid refrigerant in their crankcases.
- Maximum load testing - 06D/E compressors were run at their maximum bearing load for over 2000 hours.
- Continuous floodback - 06D/E compressors were run with a 10°F discharge superheat in a 100 hour continuous floodback test.

When using HFC/POE combinations in 06D/E compressors applied in stationary commercial refrigeration applications, Carlyle has not experienced the significant suction valve failure problems suffered by other compressor manufacturers.

Carlyle also introduced the 74mm screw compressor (production level) in Mid 1993. The 74mm screw compressor has also been applied successfully with R404A and R-507 in commercial refrigeration applications. The screw compressors inherent benefit of no suction or discharge valves, in addition to utilizing the system pressure differential for oil flow, has made this product extremely reliable with HFC's and Carlyle approved POE oils.

When applying either Carlyle reciprocating or screw compressors, please refer to the appropriate Carlyle application engineering guide.