Rapid Retrofit - Do it on one call

Retrofit existing low and medium temperature HCFC (R22) systems to a HFC refrigerant (R404A, R507) in one service call using the patented Rapid Retrofit Procedure.

- **Use on low temp & medium temp systems**
- **Use of POE is minimized as compared to the "3-4 flush" process**
- **Completed in one service call, in 4 hours or less**
- **Do single compressor up to multi-compressor rack systems**

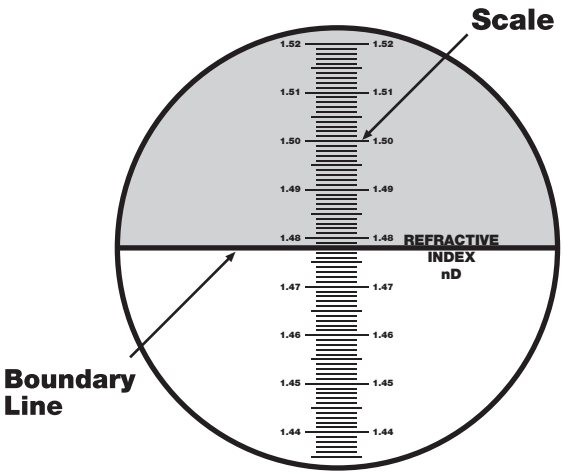
SPECIFIC INSTRUCTIONS

1. Run defrost cycle on all evaporators in order to maximize the movement (return) of mineral oil to the compressor.
2. Turn refrigeration off and isolate the compressor. Remove refrigerant from compressor via accessible ports using appropriate methods and recovery equipment. Remaining portion of HCFC refrigerant will stay in the rest of the system.
3. This "down-time" where compressor is open to atmosphere will provide for the warming of the oil in the compressor and facilitate its subsequent draining.
4. Drain mineral or alkylbenzene oil from compressor. Where possible, drain any oil remaining in other system components such as receivers, accumulators and separators. It is recommended that this step not be rushed; taking adequate time will allow for full warming and a subsequently more complete draining of the oil from the compressor. This is important, particularly on medium temp systems that may not have hot gas defrost nor electric defrost or warming.
5. Replace with equal volume (equal to what was removed) of approved EMKARATE RL lubricant. Charge with appropriate equipment (sealed refrigeration oil pumps, etc.) and procedures.
6. Change filter driers.
7. Using same hand pump (Robinair, Thermal Engineering, etc.), add an additional volume of the EMKARATE RL lubricant (equal to 1/2 of what was just charged to the compressor(s) to the system's liquid line after the condenser, and after the receiver, if there is one.
8. Continue using the pump to adequately push this additional lubricant into the system.
9. If there are multiple evaporators, be sure that all automatic defrosts are disengaged.
10. Re-charge the portion of HCFC that was removed from the compressor in step two. Again, use appropriate methods and equipment.
11. Re-energize or start system, remembering that you have approximately 50% extra lubricant in the system. This additional lubricant will enable the system to be "scoured" or more efficiently cleaned of remaining mineral oil.
12. Monitor the compressor crankcase oil level, and drain crankcase as necessary to maintain proper oil levels. In about 15-30 minutes, most of the extra lubricant, including much of the remaining mineral or alkylbenzene oil, will have been drained from the system.
13. After 30-40 minutes, run defrost cycle(s) again to maximize oil return in the compressor(s).
14. De-energize or turn off the system and sample the oil from the compressor crankcase; if there are multiple compressors, take a sample from each.
15. Using your Nu-Calgon Refractometer (P/N 4815-0), test the sample(s) for residual mineral oil content. For this first test, you should not expect the residual mineral oil to automatically have reached the target of ≤5%. If you're sampling more than one compressor, take an average of the test results.
16. Isolate compressor once again, and recover HCFC in compressor, again using appropriate procedures.
17. Drain lubricant from compressor, and charge with an equal volume of the same EMKARATE RL lubricant.
18. Change filter driers.
19. Re-charge the portion of HCFC that was removed from the compressor in step two. Again, use appropriate methods and equipment.
20. Re-energize or start system, and run to achieve full circulation of lubricant/refrigeration mixture.
21. Sample oil and test with refractometer.
    a) If mineral oil residual is below 5%, and it should be, turn system off and recover HCFC appropriately. Charge system with selected HFC refrigerant.
    b) If mineral oil residual is still above 5%, and this would by very unusual, repeat Steps 15-18 and retest.

REFRACTOMETER DIRECTIONS (NU-CALGON P/N: 4815-0)

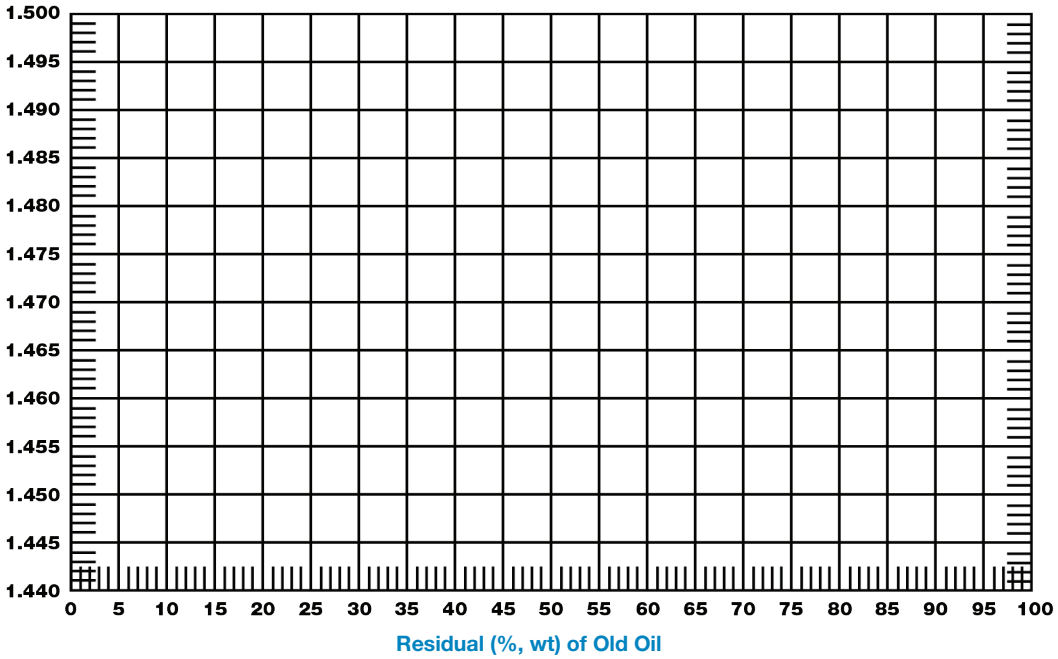
1. Measure the refractive index of a sample of the new Emkarate brand POE lubricant that you are going to use, as follows:
    a) Place a few drops of the new (targeted) oil on the prism face.
    b) Close and open the lens cover several times, and wait a few seconds to allow the solution to reach the refractometer's temperature.
    c) Hold the refractometer up to a light source and adjust the focusing ring so that you can read the scale.
    d) Note the scale position where the boundary line crosses the scale. This is the oil's refractive index; plot this number as POINT 1 on LEFT SIDE Y axis of the chart. Also, make the note of which POE Emkarate lubricant that it is.
    e) Clean the prism face and the lens cover using a soft, damp cloth, taking care not to scratch the lens cover.
2. Measure the refractive index of a sample of old oil being removed from the compressor BEFORE the start of the first oil change.
    a) Test the sample following the above procedure.
    b) Plot reading as POINT 2 on RIGHT SIDE Y axis. Again, mark what oil is being removed.
3. Connect points 1 and 2 with a straight line.
4. Before each additional lubricant change, but at least 48 hours since the last change, take a lubricant sample from the compressor and measure the refractive index.
    a) Plot the reading point as POINT 3 on LEFT SIDE Y axis.
5. Draw a horizontal line (parallel to the X axis) from point 3 to where it intersects the line connecting Points 1 and 2. Mark this new point as POINT 4.
6. From Point 4, draw a vertical line (parallel to the Y axis) to the X axis, and mark this as Point 5. This is the percent residual of old oil in the compressor. Check with the compressor manufacturer or the producer of the new oil for the recommended maximum level of residual old oil in the system.

    Note: The compressor should run 48 hours between lubricant changes to get a good mix of oils. False readings may be obtained with this is not done.



Refractive Index vs. Residual Oil Content

Refractive Index of Targeted Oil (Left y-axis) Name of Targeted Oil: _____



Refractive Index of Old Oil (Right y-axis) Name of Old Oil: _____

REFRACTIVE INDICES ON NU-CALGON LUBRICANTS

POE EMKARATE			CALUMET (Mineral)
RL22H: 1.4519	RL68H: 1.4557	RL100H: 1.4574	C-3: 1.4942
RL32H: 1.4546	RL68HP: 1.4557	RL220H: 1.4580	C-4: 1.4973
RL32-3MAF: 1.4546			C-5: 1.4953