Sustainable Coils LLC

Replacement Coil Solutions!

AHRI formula for calculating the Internal Refrigerant Volume (IRV) of a coil

((SlabFinnedLength*NumberOfTubes*((((EvapOD-(2.00*WallThickness))/2.00)^2)*3.14))+ChargeCompensator

Determine the IRV of an A-coil that is 3/8" OD rifled copper, 0.012 WT, 3 rows, 24 tubes high and 16" finned length

Step 1: determine the wall thickness and multiply by 2.00
Example: 0.012 X 2 = 0.024

Step 2: subtract step 1 answer from tubing OD
Example: 0.375 - 0.024 = 0.351

Step 3: divide step 2 answer by 2.00
Example: 0.351 / 2 = 0.1755

Step 4: square the step 3 answer
Example: 0.1755 x 0.1755 = 0.0308

Step 5: multiply step 4 answer by 3.14
Example: 0.0308 x 3.14 = .096761839

Step 6: multiply the slab finned length times the number of tubes in the coil
Example: A-coil that is 3 rows, 16" fin length, 24 tubes tall
3 rows x 2 (2 slabs make up the A-coil) = 6 rows x 24 tubes high = 144 total tubes
144 total tubes x 16" fin length = 2,304 linear inches

Step 7: multiply the total linear inches times step 5 answer
Example: 2,304 X .09676 = 222.9393 Cu. In. of volume

Step 8: If your coil has a charge accumulator, add volume to coil volume for total IRV.

To make it easier for you, we have run the calculations for the most popular tube specifications.

3/8" OD copper, .012 back wall thickness	.0967618
3/8" OD aluminum, .029 back wall thickness	.0789239

To determine the IRV in an aluminum N-coil, measure the fin length of each slab.
Determine the number of tubes per slab and multiply by 3, or the number of slabs.
Multiply the total linear inches of tubing X .0789239 to determine the IRV.
Match the IRV from the old aluminum coil to our IRV for the proper heat pump replacement.
For best results keep the IRV from 95% to 105% of the system coil to be replaced.

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