**Refrigerant Leak Repair Flow Chart**

1. **Start**
   - **Is the normal charge of the refrigeration system > 50 lbs?**
     - **No**: System is outside the scope of this rule. No action required. [82.156(i)(1), 82.156(i)(2), 82.156(i)(5)].
     - **Yes**: **Is the system classified as either industrial process or commercial?**
       - **No**: **Trigger leak rate is 15% annually. [82.156(i)(5)]**
       - **Yes**: **Trigger leak rate is 35% annually. [82.156(i)(1) & 82.156(i)(2)]**
         - **Calculate annual leak rate.**
           - **Is the leak rate greater than the trigger rate?**
             - **No**: No action required.
             - **Yes**: **Commercial, Comfort A/C, & Other** (Flow Chart)
               - **Leak Repair Option**
                 - Repair leaks sufficient to lower leak rate below 15% annually (35% for commercial) within 30 days of discovery.* [82.156(i)(1), 82.156(i)(5) & 82.156(i)(9)].
                 - **End**
               - **Retrofit/Retire Option**
                 - Develop, within 30 days of leak discovery*, a one-year retrofit or retirement plan for the leaking system. Keep plan (or a legible copy) at the site of the equipment. [82.156(i)(6)].
                 - Complete plan within one year of plan date.* [82.156(i)(6)].
                 - **End**
               - **Industrial Process Refrigeration** (Flow Chart)
                 - **Leak Repair Option**
                   - Follow leak repair process.*
                   - **End**
                 - **Retrofit/Retire Option**
                   - Develop, within 30 days of leak discovery*, a one-year retrofit or retirement plan for the leaking system. Keep plan (or a legible copy) at the site of the equipment. [82.156(i)(6)].
                   - **End**

*Note: All time-related requirements for repairing, retrofitting, or retiring a leaking system are temporarily suspended if the system is mothballed. [82.156(i)(10), 82.152]*
Determine the total time allowed for retrofit/retirement of leaking refrigeration equipment by following each of the three pathways below which is applicable.

Custom Built/Critical Component Path (Path 1)

Is a custom-built system required? [82.156(i)(7)(ii)(A)]

No

Is quoted delivery for any critical component > 30 weeks from when order is placed? [82.156(i)(7)(ii)(B)]

No

Maximum time of one year from the plan's date allowed for retrofit/replacement unless additional time allowed from a different pathway.

Yes

Notify EPA within 6 months after the end of the 30-day period after ≥35% leak discovery per 82.166(o) [82.156(i)(7)(ii)(C)]

Maintain records adequate to determine unit is custom built and quoted delivery for critical components >30 weeks. [82.156(i)(7)(ii)(D)]

Additional one-year period beyond initial one-year period allowed for retrofit/retirement. [82.156(i)(7)]

Yes

If you have not already done so, follow the other applicable pathways to determine the total amount of time allowed for retrofit/retirement activities.

If the estimated completion date previously submitted under 82.166(o) must be extended, notify EPA within 30 days of discovering the need for the change. Submit the reason and the new completion date. [82.166(o)]

Complete the retrofit or retirement work within the total time allowed. [82.156(i)(6) & 82.156(i)(7)]

End

*Note: All time-related requirements for repairing, retrofitting, or retiring a leaking system are temporarily suspended if the system is mothballed. [82.156(i)(10), 82.152]
30-day repair period allowed. [82.156(i)(9)]

Is an industrial process shutdown needed to repair leaks? [82.156(i)(2)(ii)]

120-day repair period allowed. [82.156(i)(2)(ii)]

Are necessary leak repair parts unavailable or do other regulations make a repair within 30/120 days impossible? [82.156(i)(2)(i)]

No

Conduct leak repairs within 30/120 days of discovery. An unlimited number of repair attempts is permitted within the allowed time.

Yes

Notify EPA within 30 days of this determination per 82.166(n) [82.156(i)(2)]

Retrofit or retirement required. [82.156(i)(3)(ii)]

Conduct all necessary repairs, if any, that do not require time beyond 30/120 days. Once parts received or regulations complied with, conduct remaining repairs within remaining time of original 30/120-day repair period. 82.156(i)(2)

Conduct initial verification testing at the conclusion of the repair effort (and prior to replacement of the refrigerant, if evacuated). If off line, system may not be brought back on line until test(s) are successful. [82.152, 82.156(i)(3), & 82.156(i)(3)(i)]

Does testing indicate leak(s) were successfully repaired? [82.156(i)(3)(i)]

No

If off line, system may be brought back on line, but retrofit or retirement is required. System automatically fails follow-up verification test. [82.156(i)(3)(i)]

Yes

Re-verify success of leak repairs by conducting follow-up verification test(s) at normal operating conditions** within 30 days of completing repairs or bringing the system back on-line. [82.152 & 82.156(i)(3)]

Does testing indicate leak(s) were successfully repaired?

End

Yes

No

** The follow-up verification test may be conducted prior to achieving normal operating conditions in some circumstances. See pg. E-3 of the guidance document for details.
Leak(s) not successfully repaired during first repair effort.
(from pg. 4)

Within 30 days of failed follow-up verification test:
1) Notify EPA that verification test was failed per 82.166(n); and,
2) Develop a one-year retrofit/retirement plan. Keep plan (or a legible copy) at the
site of the equipment.
Choose one or more of the options below. Two options, if successfully
taken, may relieve the obligation to retrofit or retire.***
[82.156(i)(3)(ii), 82.156(i)(3)(iii) & 82.156(i)(6)]

Relief from Retrofit/Retirement:
2nd Repair Efforts Option

Repair same leaks subject to first repair efforts
within 30 days of the failed follow-up
verification test (120 days if industrial process
shutdown is required). An unlimited number of
repair attempts is permitted within the allowed
time.
[82.156(i)(3)(iv)]

Conduct initial verification testing at the conclusion of
the repair effort (and prior to replacement of the
refrigerant, if evacuated.) If off line, system may not be
brought back on line until test(s) are successful.
[82.152, 82.156(i)(3), & 82.156(i)(3)(i)]

Does testing indicate leak(s) were successfully repaired?
[82.156(i)(3)(i)]

Yes

No

If off line, system may be brought back on line.
Retrofit or retirement is still required.
[82.156(i)(3)(i)]

Re-verify success of leak repairs by conducting follow-up
verification test(s) at normal operating conditions** within
30 days of completing repairs or
bringing the system back on-line.
[82.152 & 82.156(i)(3)]

Does testing indicate leak(s) were successfully repaired?

Yes

No

Retrofit or retirement is still required.
[82.166(i)(3)(ii)]

Notify EPA within 30 days of successful verification per
82.166(n). Obligation to retrofit/retire is relieved.
[82.156(i)(3)(iv)]

End

Go to pg. 6 for 180-day Verification or
Retrofit/Retirement Options

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** The follow-up verification test may be conducted prior to achieving normal operating conditions in some circumstances.
See pg. E-3 of the guidance document for details.

*** IMPORTANT NOTE: The deadline for completing a retrofit or retirement and the deadline for requesting an extension if more than one year is
needed to retrofit or retire are both based on the date of the failed verification test from the initial repair efforts. You should be aware of these
deadlines and make appropriate provisions if you intend to attempt one or both of the options to be relieved of the obligation to retrofit or retire and
are ultimately unsuccessful.