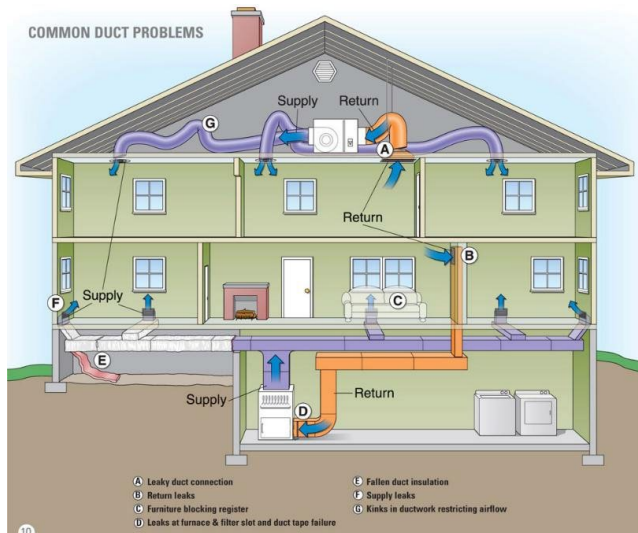


## RESIDENTIAL DUCT LEAKAGE

### Typical Leaks in Finished Homes

- Uneven Temps
- Uneven Airflow
- Indoor Air Quality
- Infiltration / Exfiltration



### Concealed Leakage

Traditional methods of “Hand Sealing” is limited to only what you can see and touch in finished homes.

Sealing from the inside using the positive pressure Aeresal Method:

- Seals concealed leakage
- Provides Certified results
- Tighter overall ducts
- Lowers temperature differentials
- Improved system performance
- Balanced airflows
- Cleaner Air / IAQ benefits

### Total Duct Leakage

Includes:

- **Duct Leakage**
  - Seams
  - Connections

- **Boot Leakage**
  - Gaps between boots and drywall or subflooring
- **Equipment Leakage**
  - Plenum connections
  - Cabinet penetrations

### **Connection Leaks**

Connection leaks are found in sheet metal duct and flexible duct connections.

Areas include:

- Sheetmetal elbows, seams leak

Note: Register boots have up to 15 seams each

### **Supply Boot Leakage**

- Gaps between boots and drywall or subflooring are passive leaks to what's on the other side. (attics, basements, crawlspaces, etc.)
- Due to the "venturi effect" pulls unwanted, dirty secondary air through these gaps when the system is running.
- In cooling, the hot/humid secondary air will cause registers to sweat, causing potential mold growth and rust
- Pro-tip: include this leakage in the PreSeal leak test and take credit for these repairs.

### **Boot Leakage: Department of Energy Guidelines**

Sealing Heating, Ventilating, and Air-Conditioning Supply and Return Register Boots - Code Compliance Brief

The DOE provides guidelines on sealing duct boots to floor or drywall. It includes code-related information about properly sealing heating, ventilating, and air conditioning (HVAC) register boots to help ensure that the measure will be accepted as being in compliance with the code.

Providing consistent information to document compliance with codes and standards to all relevant parties responsible for verifying with those codes and standards (e.g., code officials, builders, contractors, designers, etc.) is expected to result in increased compliance and more timely, less challenging and more uniform plan review and field inspections.

Heating, ventilating, and air conditioning register boots are products located at the beginning and end of an HVAC duct run to transfer the air moving within the ducts to and from the conditioned space; these products are commonly known as "supply and return register boots."

If HVAC register boots are not properly sealed and insulated, the following problems can arise:

- Proper air sealing leading to leaks around boot into interstitial cavities possible failure of blower door test required by code
- Duct leakage and possible failure of the mandatory duct leakage test required by code
- Condensation forming around the HVAC supply and return register boots
- Water damage from condensation occurring where the HVAC supply and/or return register boot is attached to the structure (e.g., subfloor, ceiling, or wall covering).

### **Manually Sealing Boot Leakages**

- Use a high-quality Roll Mastic tape for a fast, effective, and permanent solution
- Take care to keep tape inside the footprint of the register/grille to conceal it from view

### **EQUIPMENT LEAKAGE**

Location of possible leakage in HVAC equipment include:

- Refrigerant lines
- Seals
  - Supply duct connection
  - Where refrigerant lines penetrate cabinet
  - Around condensate drain
  - Filter access cover
  - Unused electrical knockout
  - Around electrical connections
  - AHU cabinet covers
  - Return plenum to AHU cabinet
  - Return duct connection
- Condensate line
- High voltage disconnect

Open-face filter racks are a huge leak point.

### **EFFECTS ON HOME PRESSURES**

A Forced Air System relies on ductwork and a fan to circulate air to/from the HVAC Equipment. Designed to be a “closed loop,” air leakage in either the Return or Supply ducts significantly reduce the system performance.

#### **Return Duct Leakage**

In addition to pulling in hot/humid or cold/dry air from unconditioned spaces, the air is also full of Contaminants. This is further impacted by the space going into a positive pressure causing Exfiltration - losing conditioned air through leaks in the home envelope.

## **Supply Duct Leakage**

Losing conditioned air through leaks into unconditioned spaces affects the space going into a negative pressure causing Infiltration – pulling in outside, unconditioned, hot/humid or cold/dry air, full of contaminants, through leaks in the home envelope.

## **Leakage Solution: Balance is Key**

Seal the entire duct system for best results.

## **Positive Effects of Sealing**

- It is critical to seal Return as well as Supply ducts
- Reduces occupant comfort by increasing draft and producing unbalanced airflow.
- Worsening Indoor Air quality by introducing outdoor pollutants from: crawlspaces, attics, and unconditioned spaces.

## **Got Humidity?**

Just 100 CFM of duct leakage brings in up to 10 Gallons of Water/Day in a humid climate.