

Improving Existing Homes:

Air Sealing Duct Boots and Duct Chases

**BUILDING AMERICA
ENERGY PERFORMANCE BRIEF**

When to Do This

When adding attic insulation, sealing ducts, or replacing HVAC or ducts.

Durability & Health

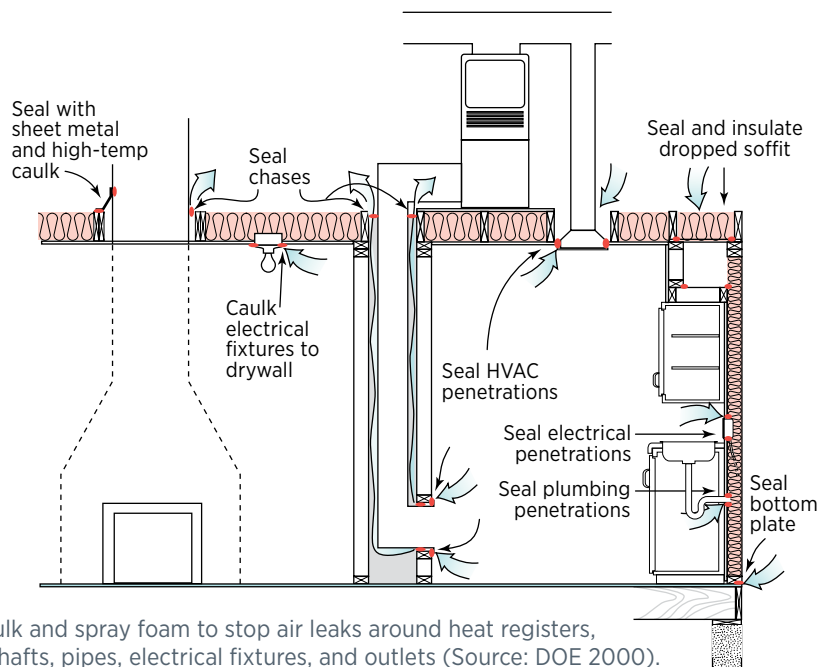
HVAC, plumbing, and wiring chases can bring conditioned air into attics, causing energy loss and leading to condensation and mold problems. If combustion appliances are present in the home, always conduct combustion safety testing before and after any air sealing measure.

2009 IECC/2009 IRC

Code Requirement for New Construction and Additions

Shafts, penetrations – Duct shafts, utility penetrations, knee walls and flue shafts opening to exterior or unconditioned space are sealed.

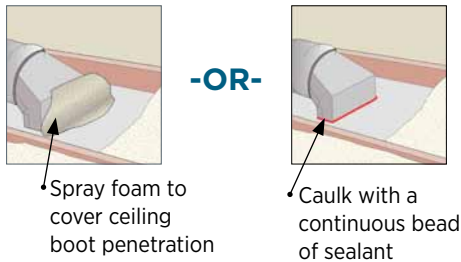
Any place where holes are made in the ceiling can become a venue for heated and cooled air to escape into the attic (as shown in the figure below). Air sealing around duct boots, duct chases, and ducts in shafts and building cavities is especially important because of the potentially large air leaks that can be present. You should inspect these areas and close the gaps with caulk, spray foam, and blocking material (pieces of rigid foam, plywood, or oriented strand board cut to fit and sealed in place with spray foam). Furnace flues may require high-temperature-rated sealing materials. Duct boots are subject to high air flow and the joints should be checked for air tightness. They can be sealed with spray foam or caulk. All duct joints and seams should be sealed with mastic, or approved metal tape, or flex duct fasteners. Studies show cloth-backed duct tape fails within months; it should not be used to seal ducts.



Use caulk and spray foam to stop air leaks around heat registers, ducts shafts, pipes, electrical fixtures, and outlets (Source: DOE 2000).

How to Seal a Duct Boot to the Ceiling

- 1 Pull back insulation to expose the duct boot.
- 2 Seal all sides of the duct boot to the gypsum board with spray foam or caulk. Apply mastic to all duct seams and joints.



- 3 Replace insulation.
(Source: Adapted from Lstiburek 2010).

References

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Lstiburek, Joseph. 2010. *Guide to Attic Air Sealing*. Prepared for U.S. Department of Energy by Building Science Corporation. www.buildingscience.com/documents/primers/guide-to-attic-air-sealing-with-details/?searchterm=air%20sealing

For More Information

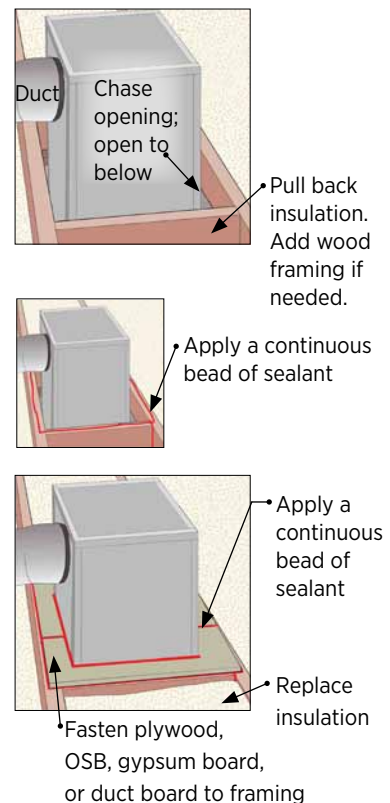
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How to Air Seal a Rigid Duct Chase

- 1 Pull back insulation to expose the chase and framing area. Add wood framing cross pieces in attic rafter bays if needed. Measure and cut an air blocking material like plywood, rigid foam, or drywall into strips to be fastened to framing in step 3.
- 2 Seal all framing joints around the chase with sealant. Lay a generous continuous bead of sealant along the top edge of the chase framing.
- 3 Place the blocking material on the framing leaving a 1/4-inch gap between the rigid duct and the material. Fasten in place with nails or screws. Seal the material to the duct with sealant. Also seal any joints in the blocking material. Replace the original insulation and add additional insulation.

(Source: Adapted from Lstiburek 2010).



How to Air Seal a Flex Duct Chase

- 1 Pull back insulation to expose the chase and the framing area. Add wood framing pieces between rafters if needed. Measure and cut an air blocking material like plywood, rigid foam, or drywall to cover the chase opening. Cut the material into two halves and then cut half circles to encompass the flex duct.
- 2 Seal all framing joints around the chase with sealant. Lay a generous continuous bead of sealant along the top edge of the chase framing.
- 3 Place the blocking material on the framing and in contact with the duct. Fasten with nails or screws. Seal the material to the duct with sealant. Also seal the joints in the material. Replace the original insulation and add more insulation if needed.

(Source: Adapted from Lstiburek 2010).

