

Improving Existing Homes:

Air Sealing a Flue or Chimney Shaft

**BUILDING AMERICA
ENERGY PERFORMANCE BRIEF**



You can make a sheet metal or gypsum board dam to keep insulation from touching hot metal or masonry chimneys and flues (Source: EPA 2008a).

When to Do This

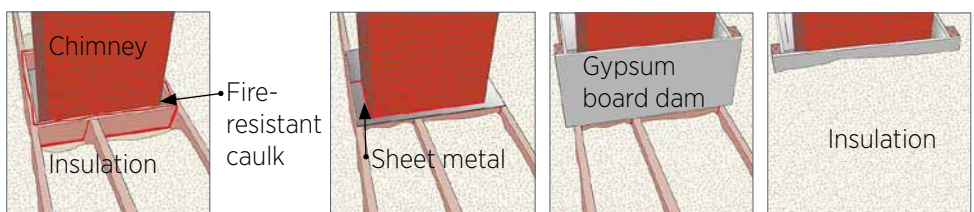
When you want to add insulation in the attic.

Durability & Health

Use the right air sealing products and techniques to keep flammable materials from touching hot flues. If combustion appliances are present in the home, always conduct combustion safety testing before and after any air sealing measure.

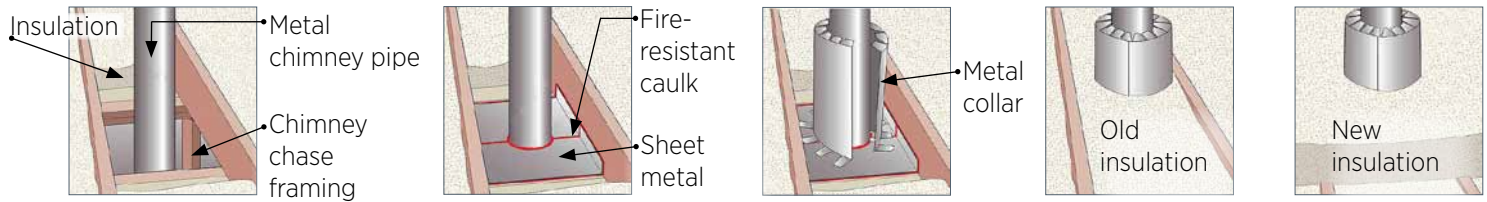
There are often gaps around chimneys and furnace and water heater flues that allow conditioned air to flow up into the attic. Insulation should not come in contact with a hot chimney or flue. The steps below show you how to safely block the air gaps around masonry chimneys and flue pipes and then construct an insulation dam to allow insulation to be placed around the chimney or flue pipe while maintaining a 3-inch clearance for fire safety. With metal chimneys and vent pipes, you can use sheet metal to form an insulation dam and air block, installed level with the bottom of the framing (see Option 1 next page) or on top of the framing (see Option 2).

How to Air Seal a Masonry Chimney Chase



- 1 Remove any insulation around the chimney. Caulk seams of framing and add a wide bead of fire-resistant caulk to the top of the framing around the chimney.
- 2 Cut the sheet metal to fit around the chimney. Fasten to the framing with nails or screws. Seal to the chimney with fire-resistant caulk.
- 3 Build a gypsum or sheet metal dam to keep insulation at least 3 inches from the chimney on all sides. Make dam 4 inches higher than the finished insulation level.
- 4 Replace any old insulation and add additional insulation to desired height (Source: Lstiburek 2010).

How to Air Seal a Metal Chimney or Flue Vent Pipe – Option 1 – Air Seal at Bottom of Framing



- 1 Pull insulation away from metal chimney pipe.
- 2 Cut two pieces of sheet metal to cover the chase opening. Allow 1 inch of overlap. Fasten the sheet metal to the framing and seal all edges and seams with fire-rated caulk.
- 3 Use sheet metal to make a shield that will wrap around the pipe with a 3-inch clearance. Fold tabs at top and every other tab at bottom in to maintain a 3-inch clearance. With tabs folded, shield should be 4 inches taller than finished insulation level.
- 4 Replace insulation.
- 5 Add more insulation to desired height. Insulation should cover rafters (Source: Lstiburek 2010).

References

DOE. 2010. *Building America Best Practices Series, Volume 10: Retrofit Techniques and Technologies: Air Sealing*, PNNL-19284, U.S. Department of Energy. www1.eere.energy.gov/buildings/building_america/publications.htm.

EPA. 2008a. *A Do-It-Yourself Guide to Sealing and Insulating with ENERGY STAR*. U.S. Environmental Protection Agency, www.energystar.gov/index.cfm?c=diy.diy_index

EPA. 2008b. "Indoor Air Quality and Attics." U.S. Environmental Protection Agency, www.epa.gov/iaq/homes/hip-attic.html

Lstiburek, Joseph. 2010. *Guide to Attic Air Sealing*. Prepared for U.S. Department of Energy by Building Science Corporation. <http://www.buildingscience.com/documents/guides-and-manuals/gm-attic-air-sealing-guide>.

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.

Option 2 – Air Seal at Top of Framing

- 1 Pull insulation away from metal chimney pipe.
- 2 Cut two pieces of framing lumber equal in height to the ceiling joists. Fasten cross pieces to joists keeping at least 3 inches of clearance to the pipe. Caulk wood blocking to framing.
- 3 Cut two pieces of sheet metal or aluminum flashing to fit around the chimney pipe with 1 inch of overlap. Fasten the sheet metal to the framing and seal all edges and seams with fire-rated caulk.
- 4 Use sheet metal to make a shield that will wrap around the pipe with a 3-inch clearance. Fold in tabs at top and every other tab at bottom to maintain a 3-inch clearance. With tabs folded, shield should be 4 inches taller than finished insulation level.
- 5 Replace insulation and cover with additional insulation to desired height. Insulation should cover rafters (Source: Lstiburek 2010).

