



Energy Systems Laboratory
Texas Engineering Experiment Station
Texas A&M University System
3581 TAMU
College Station, Texas 88743-3581

Date: August 28, 2002

To: Persons Interested in IRC/IECC Code Requirements for Insulated Ducts in Texas

Subject: Current Requirements for Residential Duct Insulation and an Alternative Implementation Approach

Effective immediately, **two (2)** options now exist for insulating ducts in attics to comply with the IRC / IECC requirements:

- 1) The building can be built to the exact insulation requirements specified in the IRC / IECC codes **OR**
- 2) The building can be constructed with reduced duct insulation and an air-conditioner with increased efficiency in the **R-6 / SEER-12 Tradeoff** method described below. The SEER-12 rating for each unit will be determined by the ARI rating for the specific equipment model numbers installed (including evaporator, condenser, and other system parts required). This tradeoff does not cover supply and return air ducts outside the building structure.

Current IECC Code Requirements Summary:

The current IECC code requirements for duct insulation in unconditioned attics is **R-8** for the supply duct and **R-4** for the return duct (see Table 503.3.3.3 of the 2001 Supplement to the IECC). Please refer to the attached "Detailed IRC/IECC Code Requirements" in this letter for additional information.

Current IRC Code Requirements Summary:

The current IRC code requirements for duct insulation in unconditioned attics is R-5 for the supply duct and R-5 for the return duct. Use Chapter 11 of the IRC for one- and two-family dwellings (with a glazing area that does not exceed 15% of the exterior walls) or multi-family dwellings 3 stories or less in height above grade (with a glazing area that does not exceed 25% of the exterior walls). Please refer to the attached "Detailed IRC/IECC Code Requirements" in this letter for additional information.

Allowable Tradeoff To Use R-6 for Supply and Return Ducts Summary:

The **R-6 / SEER-12 Tradeoff** allows R-6 duct insulation for supply and return ducts located in unconditioned attics when an air-conditioner with a minimum SEER-12 rating is installed to offset the energy lost by lowering the duct insulation requirements from R-8 to R-6 under the IECC requirements. The Energy Systems Laboratory has calculated the energy impact and found that this **R-6 / SEER-12 Tradeoff** meets the energy efficiency requirements of Senate Bill 5 of the State of Texas. This Tradeoff may be used for all one and two-family dwellings and multi-family 3 stories or less in height above grade. The SEER-12 air-conditioner may not be used to offset other lower energy efficiency substitutions when the **R-6 / SEER-12 Tradeoff** is used.

Please review the Detailed IRC / IECC Code Requirements attachment for further clarification.

The SB5 web page will be kept current to provide further information and updates at [//eslsb5.tamu.edu](http://eslsb5.tamu.edu).

Sincerely,

Charles H. Culp, P.E., Ph.D.
Associate Director
Energy Systems Laboratory
Texas Engineering Experiment Station
Texas A&M University System
College Station, TX 77843-3581

1-877-AnM-CODE (toll free)

Attachment

Attachment: Detailed IRC / IECC Code Requirements

The State of Texas has adopted the Energy Efficiency requirements of the *2000 International Residential Code (IRC)* and the *2000 International Energy Conservation Code (IECC)*, as amended by the *2001 Supplement*(dated March 2001).

IECC Requirements

IECC Table 503.3.3.3, page IECC-5 of the *2001 Supplement to the International Codes* (March 2001) contains the following requirements for duct insulation:

- Ducts within unconditioned attics or outside of the building
 - Supply ducts - R-8 minimum
 - Return ducts - R-4 minimum
- Refer to the IECC Supplement for further information on unconditioned basements, crawlspaces and garages.

Note: For one- and two-family dwellings (with a glazing area that does not exceed 15% of the exterior walls) or multi-family dwellings 3 stories or less in height above grade (with a glazing area that does not exceed 25% of the exterior walls), one can use Chapter 11 of the IRC.

IRC Requirements

IRC Section N1103.3 Duct Insulation contains the following requirements for duct insulation:

- Supply and return ducts in unconditioned spaces within the building require at least R-5 insulation – An example of this is a duct located in an attic or a crawlspace. Note that the **R-6 / SEER-12 Tradeoff** is not required for complying with Chapter 11 of the IRC.
- Supply and return ducts located outside the building require at least R-8 insulation - An example of this is a duct located on a rooftop totally outside the building or running outside an exterior wall.
- Supply and return ducts located within the exterior wall of a building require at least R-8 insulation between the side of the duct furthest from the conditioned space and the outside of the building.

Temporary Exception

A special temporary exception to the above requirements allowed **R-6 flexible duct only**, to be used in place of R-8 flexible duct **until February 1, 2003**.