



When insulation is installed over the framing members the thermal performance of the insulation is reduced due to compression at the framing members. The Resistance value of the insulation between the framing members is reduced by 12.5 percent for framing members 16" O.C., 8.5 percent for framing members 24" O.C., and 4 percent for framing members 48" O.C.

(d) *Air supply ducts within floor cavity.* Air supply ducts located within a floor cavity shall be assumed to be heating or cooling the floor cavity to living space temperatures unless the duct is structurally isolated by the framing system or thermally insulated from the rest of the floor cavity with a thermal insulation at least equal to R-4.

(e) *Air supply ducts within ceiling cavity.* Where supply ducts are located in ceiling cavities, the influence of the duct on cavity temperatures shall be considered in calculating envelope heat loss or heat gain.

(f) The supply duct loss (and/or heat gain where applicable—See § 3280.511) shall be calculated using the actual duct surface area and the actual thickness of insulation between the duct and outside of the manufactured home. If there is an air space of at least ½ inch between the duct and the insulation, heat loss/gain need not be calculated if the cavity in which the duct is located is assumed to be at living space temperature. The average temperature inside the supply duct, including ducts installed outside the manufactured home, shall be assumed to be 130 F for

purposes of calculation of heat loss and 60 F for heat gain.

(g) *Return air cavities.* Cavities used as return air plenums shall be considered to be at living space temperature.

#### § 3280.510 Heat loss certificate.

The manufacturer shall permanently affix the following "Certificate" to an interior surface of the home that is readily visible to the homeowner. The "Certificate" shall specify the following:

(a) *Heating zone certification.* The design zone at which the manufactured home heat loss complies with § 3280.506(a).

(b) *Outdoor certification temperature.* The lowest outdoor temperature at which the installed heating equipment will maintain a 70°F temperature inside the home without storm sash or insulating glass for Zones 1 and 2, and with storm sash or insulating glass for Zone 3 and complying with § 3280.508 and § 3280.509.

(c) *Operating economy certification temperature.* The temperature to be specified for operating economy and energy conservation shall be 20°F or 30% of the design temperature difference, whichever is greater, added to the temperature specified as the heating system capacity certification temperature without storm windows or insulating glass in Zones 1 and 2 and with storm windows or insulating glass in Zone 3. Design temperature difference is 70°

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minus the heating system capacity certification temperature in degrees Fahrenheit.

HEATING CERTIFICATE

Home Manufacturer \_\_\_\_\_
Plant Location \_\_\_\_\_
Home Model \_\_\_\_\_

(Include Uo Value Zone Map)

This manufactured home has been thermally insulated to conform with the requirements of the Federal Manufactured Home Construction and Safety Standards for all locations within Uo Value Zone \_\_\_\_.

Heating Equipment Manufacturer \_\_\_\_\_
Heating Equipment Model \_\_\_\_\_

The above heating equipment has the capacity to maintain an average 70F temperature in this home at outdoor temperatures of [see paragraph (b) of this section] F. To maximize furnace operating economy and to conserve energy, it is recommended that this home be installed where the outdoor winter design temperature (97 1/2%) is not higher than [see paragraph (c) of this section] F degrees Fahrenheit.

The above information has been calculated assuming a maximum wind velocity of 15 MPH at standard atmospheric pressure.

[40 FR 58752, Dec. 18, 1975. Redesignated at 44 FR 20679, Apr. 6, 1979, as amended at 58 FR 55011, Oct. 25, 1993]

§ 3280.511 Comfort cooling certificate and information.

(a) The manufactured home manufacturer shall permanently affix a "Comfort Cooling Certificate" to an interior surface of the home that is readily visible to the home owner. This certificate may be combined with the heating certificate required in §3280.510. The manufacturer shall comply with one of the following three alternatives in providing the certificate and additional information concerning the cooling of the manufactured home:

(1) Alternative 1. If a central air conditioning system is provided by the home manufacturer, the heat gain calculation necessary to properly size the air conditioning equipment shall be in accordance with procedures outlined in chapter 22 of the 1989 ASHRAE Handbook of Fundamentals, with an assumed location and orientation. The following shall be supplied in the Comfort Cooling Certificate:

Air Conditioner Manufacturer \_\_\_\_\_
Air Conditioner Model \_\_\_\_\_

Certified Capacity \_\_\_\_ BTU/Hr. in accordance with the appropriate Air Conditioning and Refrigeration Institute Standards

The central air conditioning system provided with this home has been sized, assuming an orientation of the front (hitch) end of the home facing \_\_\_\_ and is designed on the basis of a 75 °F indoor temperature and an outdoor temperature of \_\_ °F dry bulb and \_\_\_\_ °F wet bulb.

EXAMPLE ALTERNATE I

COMFORT COOLING CERTIFICATE

Manufactured Home Mfg \_\_\_\_\_
Plant Location \_\_\_\_\_
Manufactured Home Model \_\_\_\_\_
Air Conditioner Manufacturer \_\_\_\_\_

Certified Capacity \_\_\_\_ BTU/Hr. in accordance with the appropriate Air Conditioning and Refrigeration Institute Standards.

The central air conditioning system provided with this home has been sized assuming an orientation of the front (hitch end) of the home facing \_\_\_\_\_. On this basis, the system is designed to maintain an indoor temperature of 75 °F when outdoor temperatures are \_\_ °F dry bulb and \_\_ °F wet bulb.

The temperature to which this home can be cooled will change depending upon the amount of exposure of the windows to the sun's radiant heat. Therefore, the home's heat gains will vary dependent upon its orientation to the sun and any permanent shading provided. Information concerning the calculation of cooling loads at various locations, window exposures and shadings are provided in chapter 22 of the 1989 edition of the ASHRAE Handbook of Fundamentals.

(2) Alternative 2. For each home suitable for a central air cooling system, the manufacturer shall provide the following statement: "This air distribution system of this home is suitable for the installation of a central air conditioning system."

EXAMPLE ALTERNATE 2

COMFORT COOLING CERTIFICATE

Manufactured Home Manufacturer \_\_\_\_\_
Plant Location \_\_\_\_\_
Manufactured Home Model \_\_\_\_\_

This air distribution system of this home is suitable for the installation of central air conditioning.

The supply air distribution system installed in this home is sized for Manufactured Home Central Air Conditioning System of up to \_\_\_\_ B.T.U./Hr. rated capacity which are certified in accordance with the appropriate Air Conditioning and Refrigeration Institute Standards. When the air