

Tech Bulletin: CAS-TB2-2003

### ***IECC Commercial R-Value Compliance in 2003?***

The International Energy Conservation Code (IECC) is proposing code changes for the R-Value of insulations used in commercial buildings that will affect the specification of double-wall and single-wall lined duct products. Although still in the proposal stage, several local and state codes appear to be requiring these new R-Value requirements in 2003 HVAC ductwork specifications. Following is the proposed language found in Section 803.2.8 of the IECC.

*All supply and return air ducts and plenums shall be insulated with a minimum of R-5 insulation when located in unconditioned spaces and within a minimum of R-8 insulation when located outside the building [envelope]. When located within the building envelope assembly, the duct or plenum shall be separated from the building exterior or unconditioned or exempt spaces by a minimum R-8 insulation.*

The majority of liner and insulating materials currently used in HVAC duct and panel

systems have a thermal conductivity (k) ranging between 0.24 and 0.26 BTU – in / (hr - sq ft - °F), resulting in the commonly specified 1-inch insulation having an R-Value of 4. The proposed R-5 would require all single-wall lined and double-wall duct systems and plenums in unconditioned spaces to have a minimum of 1-1/2 inches of the standard insulation @  $k = 0.24$  or 0.26, which actually achieves an R-6.

Increasing the standard insulation thickness by 1/2-inch for a typical fixed height duct installation will result in a 3- to 4-inch increase in major axis dimension. Higher aspect ratio ductwork translates to heavier gauges, more reinforcement and more supports resulting in increased material and labor costs. In-duct air is moving so quickly there is little opportunity for it to appreciably lose or gain heat, except in extreme temperature differentials, so increasing insulation thickness by 1/2-inch will have negligible thermal benefit. There

is also little appreciable acoustical benefit (see McGill AirFlow *Engineering Report 131*).

Standard 1-inch (and on occasion 2-inch) insulations have been sufficient in meeting most, if not all, the thermal and acoustical performance requirements of duct systems installed within *conditioned* spaces of commercial buildings for decades. Why change now? Application of this new code appears to be hanging on the definition of *conditioned vs. unconditioned* spaces. Design engineers for HVAC duct systems are cautioned not to incorporate the IECC into their duct specifications, at least until it becomes a standard.

Visit [www.energycodes.gov](http://www.energycodes.gov) for more detailed information on the IECC.

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