



An explanation of energy code compliance using software e.g. COMCheck[®] for building designs that incorporate masonry foam insulation filled Concrete Masonry Unit (CMU) in their exterior walls in most Climate Zones.

The 2013 version of the *ASHRAE Energy Standard for Buildings Except Low-Rise Residential Buildings* is suggested as a guide. Section 5.2 of ASHRAE governs compliance with building envelope standards for energy efficiency and offers two options:

- a. Section 5.5 “Prescriptive Building Envelope Options” or,
- b. Section 5.6, “Building Envelope Trade-Off Options.”

Note: While Section 5.5 allows insulated mass walls with prescribed R-values, the tables also require “c.i.,” or Continuous Insulation. Therefore, Section 5.5 should not be used for foam-filled Concrete Masonry Unit (CMU) walls. Instead, follow the path of Section 5.6.

Section 5.6 allows for comparison of the proposed building with a “budget” building, or a code-compliant building given the thermal zone, energy costs, and other applicable factors.

Note: What this means is that there is no specific R-value requirement for the wall assembly (regardless of the Thermal Zone), rather the actual R-value of the wall assembly is incorporated with all other building envelope components using software that makes trade-offs and comparisons.

Section 5.6 references “Normative Appendix C” of ASHRAE which describes the methodology used for Building Envelope Trade-Offs and lists some acceptable software programs.

When using software (such as COMcheck), it’s important to input the proper information.

Note: Don’t rely on the software’s standard tables for R-values of CMU walls. Why not? Because the default values reflect ASHRAE standards that use:

- a. Loose-Fill Insulation (instead of Injection Foam Insulation).
- b. Since foam has higher R-values than loose-fill, whole wall R-values will be higher.
- c. Pre-ASTM C-90-11b CMU designs instead of current CMU designs. Current CMU designs offer fewer & thinner webs; thus, reducing thermal bridging. As a result, whole-wall R-values are increased significantly.
- d. An assumed “basis of code” (32” x 48”) reinforcement/grout pattern that is more conservative than more typical reinforcement/grout patterns; thus, atypically conservative whole-wall R-values are suggested by the ASHRAE standard (assuming the building is not in a seismic or wind zone).

- e. Instead, use values for R, U, and Heat Capacity (HC) that are specific to the actual components of the wall design of the proposed building design using information calculated for each CMU density and Vertical (V) or Horizontal (H) reinforcement/grout pattern along with the specific insulation intended for the wall assembly. In COMCheck, enter the wall assembly under the “Other” wall type and input precise values for U-factor, R-value and Heat Capacity as required.

Note: CfiFOAM, Inc. offers “shovel-ready” tables that provide these values. Don’t forget, though, to enter all of the elements of the proposed wall assembly—drywall, brick, air films etc. as well as other insulation materials, if present.

This process facilitates using COMCheck to demonstrate energy code compliance for building designs that incorporate integrally insulated exterior CMU walls in most Climate Zones. Remember, there is no prescribed “minimum” whole-wall R-value requirement for exterior wall assemblies when using the software compliance method e.g. COMCheck. It simply is what it is.

If there are further questions, please contact our corporate offices.