

The Georgia Energy Code (GEC), effective January 1, 2003, is the 2000 International Energy Conservation Code (IECC) with Georgia Supplements and Amendments. The code is mandated statewide and all builders are required to comply.

What are the major requirements of the Georgia Energy Code?

Insulation

The GEC sets minimum insulation levels for ceilings, walls and floors. If the basement is included in the building envelope, the code requires all basement walls (including below-grade walls) to be insulated to a minimum R-5 level. Due to termite problems, exterior rigid foam insulation is not permitted within 6" of grade. Attic kneewalls must be insulated to a minimum of R-19. Trade-offs are allowed between insulation, windows and mechanical systems but R-values must exceed the following minimum levels:

| Component | Minimum Insulation |
|-----------------------------|---------------------------|
| Attic Kneewalls | R-19 |
| Cavity Walls | R-11 |
| Mass Walls | R-5 |
| Roof/Ceiling | R-19 |
| Floors over unheated spaces | R-11 |
| Basement Walls | R-5 |
| Crawl Space Walls | R-5 |
| Slab | R-0 |

Airsealing the building envelope

Because air infiltration is often a significant energy drain, the GEC makes specific provisions for caulking, gasketing and sealing penetrations in the building envelope. For example, recessed lights between a conditioned space and an unconditioned attic must be airtight and insulation contact (IC) rated fixtures.

Windows and Doors

Effective January 1, 2003, the GEC requires that all residential windows have a label displaying the window U-factor and Solar Heat Gain Coefficient (SHGC). Furthermore, all windows must have a U-factor of 0.65 or less and all glazing must not exceed a SHGC of 0.40 (effective January 1, 2004). These minimum requirements are easily met by using double-paned, low-e windows. The 2004 version of MECcheck permits orientation, overhangs and solar shade screen credit to determine the effective SHGC.

Ducts

Because duct leakage is the biggest source of energy loss in homes, all supply and return ducts in an unconditioned space must be sealed with mastic. Duct tape is not permitted as a sealant on any ducts. UL-181 pressure-sensitive tape may be used to assemble fibrous duct board. Ducts in unconditioned spaces must be insulated to a minimum of R-5.

Load calculations

The GEC requires that heating and cooling design loads for sizing HVAC systems be calculated using ACCA's Manual J or another equivalent method.

What are the differences between the old and the new code?

The IECC-2000 is much like the 1995 Model Energy Code (MEC) with a few exceptions. The new code requires that all glazing be less than a maximum SHGC. The code also identifies and sets minimum insulation levels for "weak spots" in the building envelope. In addition, the GEC strengthens basic requirements for air sealing.

What about cost?

Residential energy codes can save home owners money. For example, a systems approach to energy efficiency often leads to smaller HVAC equipment, reducing first cost. The GEC can save builders money too, by reducing contractor callbacks due to moisture, comfort and other energy problems.

How does the code work?

The GEC sets minimum energy standards for the building envelope and mechanical systems based on the home's climate zone. The GEC is flexible and allows tradeoffs between insulation levels, windows and mechanical systems. Airsealing the building envelope and mechanical systems is required for all homes. Remember, the code sets *minimum* levels and many builders already exceed these levels.

What about enforcement?

Enforcement levels vary but all homes built in Georgia are required to comply. Consistent enforcement creates a level playing field and therefore rewards the conscientious builder.

How do I show compliance?

A builder has several compliance paths:

- Ch. 5 and 6 Prescriptive Packages and the Georgia Single Step Method – a look-up and build by the chart approach.
- Georgia Trade-off Worksheet – similar to above but offers the use of hand calculated trade-offs between components.
- Ch. 4 Computer Simulation – an hour by hour simulation used only for complicated construction, such as a mostly glass house.
- MECcheck computer software – a free, user-friendly approach that also allows trade-offs between all components, including mechanical equipment.

Single Step Method and Prescriptive Packages

The Georgia amendments of IECC Chapter 5 contain several different prescriptive packages. A builder can choose the package that best fits desired insulation levels, percent openings and climate zone. Building within the limits of these pre-calculated packages automatically demonstrates code compliance.

The single-step method is the simplest way for a builder to demonstrate compliance with code. On one page, this method summarizes the code and offers a package for the builder. If the builder stays within the limits of this package, he or she will automatically be in compliance with code.

Because both the Chapter 5 and the single step prescriptive methods deal only with the building envelope, mechanical system trade-offs are not allowed. To receive credit for higher than minimum efficiency equipment use MECcheck.

Sample Georgia Chapter 5 Revised Table

Prescriptive building envelope requirements, Type A1 residential buildings
Max. Window + Door area = 15 percent of gross exterior wall area

| Climate Zone from Fig. 302.1(11) | Maximum | | Minimum | | | | | |
|----------------------------------|------------------|------|-----------------|-----------------------|---------------|-----------------------|------------------------|-------------------------|
| | Glazing U-factor | SHGC | Ceiling R-value | Exterior Wall R-value | Floor R-value | Basement Wall R-value | Slab perimeter R-value | Crawlspace wall R-value |
| 4B | 0.65 | 0.40 | R-30 | R-13 | R-11 | R-5 | R-0 | R-5 |
| 5A | 0.65 | 0.40 | R-30 | R-13 | R-11 | R-5 | R-0 | R-6 |
| 6B | 0.65 | 0.40 | R-30 | R-13 | R-19 | R-6 | R-0 | R-7 |
| 7A-1 | 0.55 | 0.40 | R-30 | R-13 | R-19 | R-7 | R-0 | R-8 |
| 7A-2 | 0.65 | 0.40 | R-38 | R-16 | R-19 | R-7 | R-0 | R-8 |
| 8 | 0.55 | 0.40 | R-30 | R-16 | R-19 | R-8 | R-0 | R-10 |

MECcheck Method

The MECcheck software is both powerful and easy to use. It allows builders to trade off nearly any component against another. A builder only has to enter the component area and the insulation value. The software calculates the energy loss for that component and automatically determines compliance. The software prints out forms showing the assumptions made, the basic requirements (such as duct and air-sealing) that must be satisfied and the proposed R-values for each component. These forms may be used to document compliance.

Georgia builders can choose between two different versions of MECcheck. The 2003 version includes only the prescriptive Georgia requirements while the 2004 version makes additional provisions for orientation, overhangs and solar screens to show compliance with the SHGC requirement.

Sample MECcheck printout:

| CITY: Atlanta, Georgia | | HDD ¹ : 2991 | | CONSTRUCTION TYPE: Single Family | | |
|--|---|-------------------------|---------------|----------------------------------|-----------------|--|
| | Gross Area or Perimeter | Cavity R-Value | Cont. R-Value | Glazing or Door U-Factor | UA ² | |
| Ceiling 1: Flat Ceiling or Scissor Truss | 1800 | 30.0 | 0.0 | | 63 | |
| Wall 1: Wood Frame, 16" o.c. | 1380 | 13.0 | 0.0 | | 60 | |
| Window 1: Wood Frame:Double Pane with Low-E | 220 | | | 0.350 | 121 | |
| Door 1: Solid | 40 | | | 0.500 | 10 | |
| Basement Wall 1: | N/A | N/A | N/A | N/A | N/A | |
| Solid Concrete or Masonry, 9.0' ht/9.0' bg/9.0' insul | 1600 | 5.0 | 0.0 | | 123 | |
| Floor 1: All-Wood Joist/Truss:Over Unconditioned Space | 1800 | 19.0 | 0.0 | | 85 | |
| COMPLIANCE: Passes ³ 7.1% better than code | | Required UA = 521 | | Your Home UA = 487 | | |
| 1 | HDD = heating degree days | | | | | |
| 2 | UA = heat flow through a building component | | | | | |
| 3 | Compliance: your home passes if it's UA is less than or equal to required UA. | | | | | |

Where can I get more information?

For more information on the Georgia Energy Code, contact the Codes and Industrialized Buildings section of the Georgia Department of Community Affairs, **404-679-3118** or **www.dca.state.ga.us**, or Southface Energy Institute, **404-872-3549** or **www.southface.org**. The MECcheck prescriptive packages and software as well as technical assistance are available free of charge from the U.S. Department of Energy at **1-800-270-CODE** or **www.energycodes.gov**.