

# RE2D-44-23 Modification

IECC RE: R408.2.6, TABLE R408.2.6

This Modification replaces the original proposal. The proposed changes, with one exception, are the same as in the original proposal; they are just moved around. Legislative edits are shown against Public Comment Draft #2. Additional information is provided in the Reason Statement.

Revise as follows:

**R408.2.6 Energy efficient appliances.** All appliances of the types listed in Table R408.2.6 installed in a residential building shall comply with the efficiency requirements specified in Table R408.2.6 that table. ~~Not less than three~~ Each appliance types from specified in Table R408.2.6 shall be installed. A clothes washer shall be installed at each location plumbed for a clothes washer. Compact size appliances shall not be used to comply with this section.

**Exception:**

In dwelling units of Group R-2 occupancies, where a dishwasher is not installed in each ~~dwelling unit~~ unit, not less than two appliance types complying with Table R408.2.6 shall be installed. ~~In common areas, each appliance type shall comply with Table R408.2.6.~~

TABLE R408.2.6 MINIMUM EFFICIENCY REQUIREMENTS: APPLIANCES

APPLIANCE TYPES	EFFICIENCY IMPROVEMENT	TEST PROCEDURE
Refrigerator	Maximum Annual Energy Consumption (AEC), <del>Ne no</del> greater than 620 kWh/yr	10 CFR 430, Subpart B, Appendix A
Dishwasher	Maximum Annual Energy Consumption (AEC), <del>Ne no</del> greater than 240 kWh/yr	10 CFR 430, Subpart B, Appendix C1
Clothes washer	Clothes washer located within <i>dwelling units</i> : Maximum Annual Energy Consumption (AEC), <del>Ne no</del> greater than 130 kWh/yr, and Integrated Modified Energy Factor (IMEF) > 1.84 cu.ft/kWh/cycle  Clothes washer not located within dwelling units and where <i>dwelling units</i> are not provided with <del>laundry facilities</del> <u>rough-in plumbing for washers</u> : Modified Energy Factor (MEF)>2.0 cu.ft/kWh/cycle	10 CFR 430 Subpart B, Appendix J2 and 10 CFR 430, Subpart B, Appendices D1 and D2

**Reason Statement**

A new version of R408.2.6 was approved in the last round. Like many new code sections, it has some loopholes and requires some clarification.

Compact Appliances

This is the annual energy use data for Energy Star Certified compact refrigerators and dishwashers:

Energy Star Certified Compact Appliances Annual Energy Use Ranges (kWh/yr)			
Energy Star Certified Appliance	U.S. Federal Standard	Energy Star	Energy Star Most Efficient
Compact Refrigerator	228 to 580	106 to 470	106 to 255
Compact Dishwasher	N/A	113 to 203	N/A

Source: [www.energystar.gov/productfinder/product/certified-residential-refrigerators/results](http://www.energystar.gov/productfinder/product/certified-residential-refrigerators/results)

R408.2.6 efficiency requirements are based on standard-size appliances. The annual energy use of compact appliances is generally, but not always, lower. R408 credit for compact appliances could be justified only if R408.2.6 includes separate criteria for compacts that ensures the installation of *more efficient* compacts.

The table above does not include the annual energy use of compact appliances that are not Energy Star Certified. However, the U.S. Federal Standard range for Energy Star Certified compact refrigerators is informative. It tells us there are compact refrigerators on the market with an annual energy consumption of at least 580. There may be non-Energy Star compact refrigerators on the market with an even higher annual energy consumption. To put that in perspective, 580 is higher than the highest Energy Star Certified standard-size top freezer.

Compact appliances are not chosen to save energy. Rather, they are used when there is limited space and/or no need for standard-size appliances. Allowing compacts to qualify for R408 credit would not incentivize lower energy use. Rather, it would provide a) freebie credit for smaller appliances that will be used in those locations regardless and b) credit for high energy use compact models. For all these reasons, compacts should not qualify for R408 credit.

#### All Appliances Must Comply To Earn Credit

R408.2.6 does not explicitly require that all appliances in each type comply. Many larger homes have multiple appliances of one or more types. So, for example, a compact refrigerator in a wet bar can qualify a home for R408 credit even when the energy consumption of the standard-size refrigerator in the kitchen exceeds the maximum allowed!

Table R408.2 footnote "a" does not prevent this situation. In fact, as applied to this measure, the footnote clouds the situation. It requires a qualifying appliance to be installed in each location listed. However, the footnote does not require that all appliances in each location comply. So, for example, the footnote does not prevent the installation of just one qualifying washer in a common area laundry room with ten washers.

An early version of RED1-360 included a footnote that made clear that all washers in a common area must comply. That footnote has since been deleted.

Finally, other IECC-R sections employ "all" when needed to make the intent clear. The same is proposed here.

#### Prevent Future Installation of Less-Efficient Clothes Washers at Plumbed Locations

In some buildings, some (typically the larger) dwelling units are plumbed for washers and common area laundry facilities are provided. Footnote "a" to Table R408.2 provides that washers must be installed in both the plumbed dwelling units and the common area(s). But that should be stated explicitly in this section. The idea is to avoid future (e.g., post-COO) installation of less efficient appliances in plumbed dwelling units.

The loopholes described above are closed by the proposed changes.

#### Clothes Washers Located Outside Dwelling Units

The phrase "Where dwelling units are not provided with laundry facilities" in Table R408.2.6 is commonly interpreted as 'where dwelling units are not provided with a common area laundry room.' That is not what the proponents intended. The proposed change conveys the proponents' intent.

Reference: IRC definition of "rough-in."

#### Appliance Types

The term "appliance types" is used three times. Its meaning is clarified by changing the left column heading in Table R408.2.6 to "appliance types."

#### Not less than three

"Not less than three appliance types . . ." is a remnant from PCD#1 when the Table contained four appliance types. Since there are now only three, to avoid confusion, that phrase has been replaced by "Each appliance type . . ."

#### Other Appliance Types

As currently drafted in PCD#2, the first sentence could be construed to prohibit the installation of ovens, ranges and other appliance types not included in Table R408.2.6. That was not the proponents' intent.

#### **Cost Impact**

This code change proposal will neither increase or decrease the cost of construction. This is an optional measure that presumably will not be chosen unless it is cost effective.