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Repairs – Wall Cavity Insulation

Code: 2018 Energy Conservation Code **Date:** August 29, 2019
Section: R504.2
Code: Residential Code
Section: N1110

Question:
When a repair is undertaken in accordance with R504 and its subsections, are wall cavities that are exposed required to be repaired such that **"..repair of building systems shall not make the building less conforming than it was before the repair was undertaken.**." in accordance with R504.1 which may mean typically R-13 in a 2x4 wall, ***or*** in accordance with the language in R504.2, "**Portions of walls that are part of the building thermal envelope or shall be insulated in accordance with this code …**" which, if following the requirements of Table R402.1.2 would require R-15?

Answer:
Nominal 2x4 stud cavities exposed during the course of a repair can be filled with R-13.

The wording in R504.2 refers the reader to "insulate in accordance with this code.." but does not refer to any given paragraph or Table like the R or U tables in Chapter 4 [RE], so there is not a definitive path. The wording could possibly have been meant to follow the requirements in Chapter 4 for new construction, or it could lead you right back to Section R504.1 that only has the generic requirement to make the repaired wall no less conforming than it was prior to the repair. This interpretation is taking the stance[i] that the generic requirements of Section R504.1 are minimally required, and R-13 is acceptable in the 2x4 wall. Houses built post-2018 requiring R-15[ii] would need R-15 if and when they are repaired.

Follow up question #1
In Section **R503 Alterations**, under R503.1.1, Exception 2 is an exception to R503.1.1 that allows "..existing ceiling, wall or floor cavities exposed during construction provided that these cavities **are filled** with insulation…" Does this mean filled with R-13 or R-15 for a 2x4 cavity?

Answer:
This section is only requiring that the cavities be filled, so R-13[iii] would be adequate. Similarly, R-19 batt in a 2x6[iv] cavity.

Follow up Question #2
Does this interpretation on R-13 vs. R-15 extend to Additions to a building?

Answer:
No.

Section R502.1 is clear that the portions of the addition that are built new shall conform to the requirements for new construction. Follow the R or U-factor requirements in Chapter 4 [RE].

Search Words:
Flood damage

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[i] This intent was confirmed with a discussion with the Energy ad hoc Committee Chairman.
The requirements for R-15 in 2x4 walls came relatively near the end of the 2018 ad hoc process, so there was not any explicit focus put on this issue for repairs. For years 2x4 studs and R-13 were simply taken for granted, so this language was not evaluated with an intent of upgrading to R-15. Under the next code cycle it will be brought up.

The Energy Code's existing building chapter is, in many respects, organized to allow for very simple paths that allow "low barriers to entry" to compliance when repairs and alterations in existing building components are required, in order to not discourage the use of existing building stock.

[ii] A post-2018 house could use either R-15 cavity, or may utilize R-13 plus 2.5 c.i., or some other compliance path.
[iii] There are existing houses with R-11, and although R-11 is not very common, it could still be bought, so it also would be an acceptable replacement if there is existing R-11 in an existing 2x4 wall subject to a repair. The two requirements of "shall be insulated" and "repair ..shall not make the building less conforming than it was before.." need to be fulfilled.
[iv] This progression can be continued for deeper 2x lumber that may be present in rafters and ceiling joist spaces. These nominal values are: 2x4 – R-13 (potentially R-11, see previous endnote), 2x6 – R-19, 2x8 – R-25, 2x10 – R-30, 2x12 – R-38. Data from Owens Corning, and label thickness for batt insulation. Similarly, if spray foam insulation is used, the cavities can be filled, and there is not a specific R-value required. Permit holder/design professional are responsible for following other parts of the code for proper control of moisture in building envelope assemblies.