

EFFECTS OF STUDS ON HEAT LOSS AND INSULATION VALUE OF WALLS

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A considerable amount of heat is lost through wall sections of framed buildings where studs are located. In the past, the conductive effect of studs was neglected in calculating heat loss. Only the insulated portion of walls was considered when testing for insulation effectiveness, rather than the entire wall, as a unit.

But depending on wall thickness - 2 x 4, 2 x 6, etc. - and spacing of studs - 12, 16 or 24" o.c. - **heat loss through framing members, can vary from 33% to 49 % of total heat loss.** Some of these calculated values are shown in Table 1. These calculations are based on a typical section of wall, 8 ft. x 8 ft. in area, to provide a comparison of the effect which studs have on heat loss through a wall. The comparison of different stud spacing for a 2 x 4 stud wall is given in the table, along with the percentage of total heat loss through the studs. This effect is significant. From this example, Table 1 calculations, indicate that **as much as 44 percent of a wall's heat loss can be dissipated through the studs themselves.**

Table 1. PERCENTAGE OF HEAT LOSS THROUGH A STUD WALL
(8' X 8' Example Section) *

HEAT LOSS THROUGH STUDS			HEAT LOSS THROUGH INSULATED SECTION		TOTALS	
Stud Spacing	BTU/HR/F	Percent of Total	BTU/HR/F	Percent of Total	BTU/HR/F	Average R-value
-----**	----	----	4.89	100%	4.89	13.10
24" O.C.	2.03	32%	4.37	68%	6.40	10.00
16" O.C.	2.61	38%	4.23	62%	6.83	9.35
12" O.C.	3.17	44%	4.08	56%	7.25	8.82

* The example section is a 2"x 4" stud wall, with 3 1/2" inches of fiberglass insulation (R11), 1/2" gypsum dry wall and 5/8 inch plywood sheathing on the exterior - 64 square feet of area.

** This is an example showing the wall heat loss if studs are not present.