Component (*Cont.*)	R value
8-in CMU	1.51
3/4-in furring air space	0.97
1/2-in drywall	0.45
Inside air film	0.68
Total R =	15.99

Thus $U_o = 1/R = 0.0625$.

Table 8.2 includes the results of similar computations for common wall systems, listed roughly in the order established in Chap. 7. For some assemblies, the manufacturers' hot-box test data are used. Thermal efficiency losses through metal studs are accounted for by decreasing the R values of fiberglass insulation by one-third.

For those seeking an analytic method of parallel flow analysis through metal girts or studs and through fully insulated areas, the following procedure is offered:

$$U_{\text{average}} = \frac{S}{100} U_{\text{steel}} + \left(1 - \frac{S}{100}\right) U_{\text{insul}}$$

TABLE 8.1 ***R* Values for Selected Materials**

4-in clay brick				0.44			
4-in block (72% solid)				1.19			
6-in block (59% solid)				1.34			
8-in block (54% solid)				1.51			
10-in block (52% solid)				1.61			
12-in block (48% solid)				1.72			
Concrete, normal weight, in							
5.5				1.30			
6				1.33			
8				1.49			
10				1.64			
12				1.82			
1/2-in drywall				0.45			
Exterior air film (winter)				0.17			
Interior air film				0.68			
Dead air space (3/4 to 4-in) (winter)				0.97			
Air space at foil face				2.80			
Insulation-type thickness, in	1/2	3/4	1		1 1/2	2	3
Polyisocyanurate (foil face)	4.0	5.8	7.7		11.5	15.4	23.1
Extruded polystyrene	—	4.05	5.4		8.1	10.8	16.2
Fiberglass blanket insulation (approx.), in							
3				10			
3.5				11			
4				13			
6				19			
10				30			

Source: Compiled from Refs. 19 and 23.

TABLE 8.2 U_o **Values for Selected Wall Assemblies**

Wall assembly	Illustration	U_o
Steel siding with 3-in fiberglass insulation*	Figs. 7.1 and 7.7	0.13
Steel siding with 4-in fiberglass insulation*	Figs. 7.1 and 7.7	0.12
Concealed-fastener panel, 3-in fiberglass blanket, metal furring, and 1/2-in gypsum board†	Fig. 7.4	0.112
Concealed-fastener panel, 2-in Thermax board, wood furring, and 1/2-in gypsum board†	Fig. 7.4 (similar)	0.047
Factory-insulated panel 2-in thick‡	Fig. 7.6	0.069
8-in uninsulated CMU	Fig. 7.21	0.424
8-in CMU + 3/4-in furring + 1-in polystyrene + 1/2-in glued-on gypsum board		0.109
4-in brick + 2-in air space + 8-in CMU + 1/2-in drywall on furring	Fig. 7.28	0.193
4-in brick + 2-in air space + 2-in polystyrene insulation + 8-in CMU + 1/2-in drywall on furring (see example)		0.0625
4-in brick + 2-in air space + 1/2-in sheathing + 3 1/2-in fiberglass batt§ in 3 5/8-in steel studs + 1/2-in drywall	Fig. 7.29	0.10
5.5-in concrete	Fig. 7.36	0.465
5.5-in concrete + glued-on 1-in polystyrene insulation + 1/2-in glued-on gypsum board		0.125
8-in concrete + 3/4-in furring + 1-in polystyrene + 1/2-in glued-on gypsum board		0.069
EIFS (2-in polystyrene + 1/2-in sheathing, neglecting other materials)	Fig. 7.37	0.082
Insulated glass with 1/4- to 1/2-in air space		0.57

*As stated by Star Manufacturing Co. for Durarib or Starmark Wall, Panel to Girt Fasteners at 12 in o.c., girt spacing 5 ft 0 in o.c.
†As stated by Star Manufacturing Co. for Star CFW panel, 24-in furring spacing.
‡As stated by Star Manufacturing Co. for STARTHERM II panels.
§Insulation value decreased by one-third to account for parallel flows.

where S = percent area taken by steel framing
U_{steel} = U value for the area taken by steel framing
U_{insul} = U value for insulated area between framing

For example, for steel studs spaced 16 in on centers, the S factor is about 20 percent; for studs 24 in on centers, it is around 15 percent.[25]

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6. "Polyiso Insulation Outperforms Polystyrene in Tests," *Metal Architecture,* April 1995.