



R Value Tables for Integrally Insulated CMU

February 2010

R VALUES TABLE FOR INTEGRALLY INSULATED CMU (135 PCF)

WALL DESCRIPTION	No Grout	Fully Grouted	Grout @ 16"	Grout @ 24"	Grout @ 32"	Grout @ 40"	Grout @ 48"	Comments:
12" EnerBlock with 4" Insert	4.46	NA	3.72	3.94	4.06	4.13	4.18	2 1/2" Insert in Grouted Cells
12" EnerBlock with 4" Insert	4.46	NA	3.20	3.54	3.73	3.85	3.93	2" Insert in Grouted Cells
12" EnerBlock with 2 1/2" Insert	4.14	3.19	3.60	3.77	3.85	3.91	3.94	
12" EnerBlock with 2" Insert	3.19	2.78	2.97	3.04	3.07	3.10	3.11	
12" EnerBlock with 1 1/4" Insert	2.83	2.47	2.63	2.70	2.73	2.75	2.76	
12" Block with No Insulation	1.99	1.76	1.87	1.91	1.93	1.94	1.95	
12" Block with Foam Fill	4.30	NA	2.50	2.91	3.16	3.34	3.45	No Insulation in Grouted Cells
10" EnerBlock with 4" Insert	4.20	NA	3.01	3.33	3.51	3.63	3.70	2" Insert In Grouted Cells
10" EnerBlock with 2 1/2" Insert	3.90	NA	2.69	3.01	3.18	3.31	3.38	1 1/4" Insert in Grouted Cells
10" EnerBlock with 2" Insert	3.11	2.63	2.85	2.93	2.97	3.00	3.02	
10" EnerBlock with 1 1/4" Insert	2.75	2.32	2.52	2.59	2.63	2.65	2.67	
10" Block with No Insulation	1.92	1.61	1.75	1.81	1.83	1.85	1.86	
10" Block with Foam Fill	3.58	NA	2.22	2.55	2.74	2.88	2.96	No Insulation in Grouted Cells
8" EnerBlock with 4" Insert	3.73	NA	2.74	3.01	3.16	3.26	3.32	2" Insert In Grouted Cells
8" EnerBlock with 2 1/2" Insert	3.52	NA	2.46	2.74	2.90	3.00	3.07	1 1/4" Insert in Grouted Cells
8" EnerBlock with 2" Insert	2.98	2.51	2.72	2.80	2.84	2.87	2.88	
8" EnerBlock with 1 1/4" Insert	2.62	2.16	2.37	2.45	2.49	2.52	2.53	
8" Block with No Insulation	1.85	1.45	1.63	1.70	1.73	1.75	1.76	
8" Block with Foam Fill	3.05	NA	1.97	2.24	2.39	2.50	2.57	No Insulation in Grouted Cells

Notes:

- R Values were calculated in accordance with the ASHRAE Handbook of Fundamentals Isothermal Planes Method mandated by the Minnesota Commercial Energy Code for concrete masonry with integral insulation. Partially grouted R Values were calculated in accordance with NCMA TEK 6.2-B. The U Value is the inverse of the R Value.
- R Values include interior and exterior air films.
- Thermal Resistivities of the mortar and air spaces are based on NCMA TEK 6-2B Table 4. Thermal Conductivity of .204 Btu*in/hr*ft²*°F was used for Foam Fill. Thermal Conductivity of .23 Btu*in/hr*ft²*°F was used for Enerblock Inserts.
- Thermal Conductivities of the concrete block and grout (140 PCF) are based on Table A9.4E in ANSI/ASHRAE/IESNA 90.1-2004
- 4" and 2 1/2" Enerblock inserts are centered in the cell, 1 1/4" and 2" Enerblock inserts are located at the edge of the cell. Enerblock Inserts are continuous through grouted and non grouted cells unless noted otherwise in comments. Foam Fill is only used in ungrouted cells.

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the state of Minnesota.

Signature: 

Date: 2/12/2010

MN License #: 12113

R VALUES TABLE FOR INTEGRALLY INSULATED CMU (115 PCF)

WALL DESCRIPTION	No Grout	Fully Grouted	Grout @ 16"	Grout @ 24"	Grout @ 32"	Grout @ 40"	Grout @ 48"	Comments:
12" EnerBlock with 4" Insert	5.95	NA	4.92	5.23	5.39	5.49	5.56	2 1/2" Insert in Grouted Cells
12" EnerBlock with 4" Insert	5.95	NA	4.23	4.69	4.94	5.12	5.23	2" Insert in Grouted Cells
12" EnerBlock with 2 1/2" Insert	5.36	4.20	4.71	4.91	5.01	5.08	5.12	
12" EnerBlock with 2" Insert	4.02	3.56	3.78	3.86	3.90	3.92	3.94	
12" EnerBlock with 1 1/4" Insert	3.48	3.06	3.26	3.33	3.36	3.39	3.40	
12" Block with No Insulation	2.23	1.95	2.08	2.13	2.15	2.16	2.17	
12" Block with Foam Fill	6.30	NA	2.98	3.63	4.04	4.36	4.57	No Insulation in Grouted Cells
10" EnerBlock with 4" Insert	5.72	NA	4.04	4.48	4.73	4.90	5.01	2" Insert In Grouted Cells
10" EnerBlock with 2 1/2" Insert	5.15	NA	3.49	3.92	4.16	4.33	4.43	1 1/4" Insert in Grouted Cells
10" EnerBlock with 2" Insert	3.96	3.40	3.66	3.76	3.81	3.84	3.86	
10" EnerBlock with 1 1/4" Insert	3.42	2.91	3.14	3.23	3.28	3.31	3.32	
10" Block with No Insulation	2.18	1.78	1.96	2.03	2.06	2.08	2.10	
10" Block with Foam Fill	5.17	NA	2.65	3.18	3.51	3.75	3.91	No Insulation in Grouted Cells
8" EnerBlock with 4" Insert	5.16	NA	3.75	4.13	4.34	4.48	4.57	2" Insert In Grouted Cells
8" EnerBlock with 2 1/2" Insert	4.76	NA	3.25	3.64	3.86	4.01	4.11	1 1/4" Insert in Grouted Cells
8" EnerBlock with 2" Insert	3.87	3.29	3.55	3.65	3.70	3.74	3.75	
8" EnerBlock with 1 1/4" Insert	3.31	2.74	3.00	3.10	3.15	3.18	3.20	
8" Block with No Insulation	2.10	1.61	1.83	1.91	1.96	1.98	2.00	
8" Block with Foam Fill	4.31	NA	2.35	2.78	3.04	3.23	3.36	No Insulation in Grouted Cells

Notes:

1. R Values were calculated in accordance with the ASHRAE Handbook of Fundamentals Isothermal Planes Method mandated by the Minnesota Commercial Energy Code for concrete masonry with integral insulation. Partially grouted R Values were calculated in accordance with NCMA TEK 6.2-B. The U Value is the inverse of the R Value.
2. R Values include interior and exterior air films.
3. Thermal Resistivities of the mortar and air spaces are based on NCMA TEK 6-2B Table 4. Thermal Conductivity of .204 Btu*in/hr*ft²*°F was used for Foam Fill. Thermal Conductivity of .23 Btu*in/hr*ft²*°F was used for Enerblock Inserts.
4. Thermal Conductivities of the concrete block and grout (140 PCF) are based on Table A9.4E in ANSI/ASHRAE/IESNA 90.1-2004
5. 4" and 2 1/2" Enerblock inserts are centered in the cell, 1 1/4" and 2" Enerblock inserts are located at the edge of the cell. Enerblock Inserts are continuous through grouted and non grouted cells unless noted otherwise in comments. Foam Fill is only used in ungrouted cells.

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R VALUES TABLE FOR INTEGRALLY INSULATED CMU (105 PCF)

WALL DESCRIPTION	No Grout	Fully Grouted	Grout @ 16"	Grout @ 24"	Grout @ 32"	Grout @ 40"	Grout @ 48"	Comments:
12" EnerBlock with 4" Insert	6.54	NA	5.41	5.75	5.92	6.04	6.11	2 1/2" Insert in Grouted Cells
12" EnerBlock with 4" Insert	6.54	NA	4.64	5.15	5.43	5.62	5.74	2" Insert in Grouted Cells
12" EnerBlock with 2 1/2" Insert	5.84	4.61	5.15	5.36	5.47	5.54	5.58	
12" EnerBlock with 2" Insert	4.36	3.88	4.11	4.19	4.23	4.25	4.27	
12" EnerBlock with 1 1/4" Insert	3.74	3.31	3.51	3.58	3.62	3.64	3.66	
12" Block with No Insulation	2.31	2.02	2.16	2.21	2.23	2.25	2.26	
12" Block with Foam Fill	7.18	NA	3.16	3.90	4.38	4.75	5.01	No Insulation in Grouted Cells
10" EnerBlock with 4" Insert	6.32	NA	4.45	4.95	5.23	5.41	5.53	2" Insert In Grouted Cells
10" EnerBlock with 2 1/2" Insert	5.64	NA	3.81	4.29	4.55	4.73	4.85	1 1/4" Insert in Grouted Cells
10" EnerBlock with 2" Insert	4.31	3.72	3.99	4.10	4.15	4.18	4.20	
10" EnerBlock with 1 1/4" Insert	3.69	3.15	3.40	3.49	3.54	3.57	3.58	
10" Block with No Insulation	2.27	1.85	2.04	2.11	2.15	2.17	2.18	
10" Block with Foam Fill	5.86	NA	2.82	3.42	3.81	4.09	4.29	No Insulation in Grouted Cells
8" EnerBlock with 4" Insert	5.75	NA	4.16	4.59	4.83	4.99	5.09	2" Insert In Grouted Cells
8" EnerBlock with 2 1/2" Insert	5.25	NA	3.57	4.01	4.25	4.42	4.53	1 1/4" Insert in Grouted Cells
8" EnerBlock with 2" Insert	4.22	3.61	3.89	4.00	4.05	4.08	4.10	
8" EnerBlock with 1 1/4" Insert	3.58	2.98	3.25	3.36	3.41	3.44	3.46	
8" Block with No Insulation	2.20	1.68	1.90	1.99	2.04	2.07	2.09	
8" Block with Foam Fill	4.86	NA	2.50	2.99	3.30	3.52	3.68	No Insulation in Grouted Cells

Notes:

1. R Values were calculated in accordance with the ASHRAE Handbook of Fundamentals Isothermal Planes Method mandated by the Minnesota Commercial Energy Code for concrete masonry with integral insulation. Partially grouted R Values were calculated in accordance with NCMA TEK 6.2-B. The U Value is the inverse of the R Value.
2. R Values include interior and exterior air films.
3. Thermal Resistivities of the mortar and air spaces are based on NCMA TEK 6-2B Table 4. Thermal Conductivity of .204 Btu*in/hr*ft²*°F was used for Foam Fill. Thermal Conductivity of .23 Btu*in/hr*ft²*°F was used for Enerblock Inserts.
4. Thermal Conductivities of the concrete block and grout (140 PCF) are based on Table A9.4E in ANSI/ASHRAE/IESNA 90.1-2004
5. 4" and 2 1/2" Enerblock inserts are centered in the cell, 1 1/4" and 2" Enerblock inserts are located at the edge of the cell. Enerblock Inserts are continuous through grouted and non grouted cells unless noted otherwise in comments. Foam Fill is only used in ungrouted cells.

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R VALUES TABLE FOR INTEGRALLY INSULATED CMU (100 PCF)

WALL DESCRIPTION	No Grout	Fully Grouted	Grout @ 16"	Grout @ 24"	Grout @ 32"	Grout @ 40"	Grout @ 48"	Comments:
12" EnerBlock with 4" Insert	6.94	NA	5.73	6.09	6.28	6.40	6.47	2 1/2" Insert in Grouted Cells
12" EnerBlock with 4" Insert	6.94	NA	4.92	5.46	5.76	5.96	6.09	2" Insert in Grouted Cells
12" EnerBlock with 2 1/2" Insert	6.15	4.89	5.45	5.67	5.78	5.85	5.89	
12" EnerBlock with 2" Insert	4.58	4.10	4.33	4.41	4.45	4.48	4.49	
12" EnerBlock with 1 1/4" Insert	3.91	3.47	3.68	3.75	3.79	3.81	3.83	
12" Block with No Insulation	2.37	2.07	2.21	2.26	2.29	2.30	2.31	
12" Block with Foam Fill	7.79	NA	3.27	4.08	4.61	5.02	5.30	No Insulation in Grouted Cells
10" EnerBlock with 4" Insert	6.72	NA	4.74	5.26	5.56	5.75	5.88	2" Insert In Grouted Cells
10" EnerBlock with 2 1/2" Insert	5.97	NA	4.03	4.53	4.81	5.00	5.13	1 1/4" Insert in Grouted Cells
10" EnerBlock with 2" Insert	4.54	3.94	4.22	4.32	4.37	4.40	4.42	
10" EnerBlock with 1 1/4" Insert	3.86	3.31	3.57	3.66	3.71	3.74	3.76	
10" Block with No Insulation	2.33	1.90	2.09	2.17	2.20	2.23	2.24	
10" Block with Foam Fill	6.35	NA	2.92	3.58	4.00	4.32	4.54	No Insulation in Grouted Cells
8" EnerBlock with 4" Insert	6.15	NA	4.44	4.90	5.15	5.33	5.43	2" Insert In Grouted Cells
8" EnerBlock with 2 1/2" Insert	5.58	NA	3.79	4.25	4.51	4.69	4.81	1 1/4" Insert in Grouted Cells
8" EnerBlock with 2" Insert	4.46	3.82	4.12	4.23	4.28	4.32	4.34	
8" EnerBlock with 1 1/4" Insert	3.76	3.14	3.42	3.53	3.58	3.62	3.64	
8" Block with No Insulation	2.26	1.72	1.95	2.05	2.10	2.13	2.15	
8" Block with Foam Fill	5.24	NA	2.59	3.13	3.47	3.72	3.89	No Insulation in Grouted Cells

Notes:

1. R Values were calculated in accordance with the ASHRAE Handbook of Fundamentals Isothermal Planes Method mandated by the Minnesota Commercial Energy Code for concrete masonry with integral insulation. Partially grouted R Values were calculated in accordance with NCMA TEK 6.2-B. The U Value is the inverse of the R Value.
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R VALUES TABLE FOR INTEGRALLY INSULATED CMU (95 PCF)

WALL DESCRIPTION	No Grout	Fully Grouted	Grout @ 16"	Grout @ 24"	Grout @ 32"	Grout @ 40"	Grout @ 48"	Comments:
12" EnerBlock with 4" Insert	7.23	NA	5.98	6.35	6.55	6.67	6.75	2 1/2" Insert in Grouted Cells
12" EnerBlock with 4" Insert	7.23	NA	5.14	5.70	6.01	6.22	6.35	2" Insert in Grouted Cells
12" EnerBlock with 2 1/2" Insert	6.39	5.10	5.67	5.90	6.01	6.08	6.12	
12" EnerBlock with 2" Insert	4.76	4.27	4.50	4.58	4.62	4.65	4.66	
12" EnerBlock with 1 1/4" Insert	4.04	3.60	3.81	3.88	3.92	3.94	3.96	
12" Block with No Insulation	2.41	2.11	2.25	2.30	2.33	2.34	2.35	
12" Block with Foam Fill	8.27	NA	3.36	4.21	4.78	5.22	5.52	No Insulation in Grouted Cells
10" EnerBlock with 4" Insert	7.02	NA	4.95	5.50	5.81	6.01	6.15	2" Insert In Grouted Cells
10" EnerBlock with 2 1/2" Insert	6.21	NA	4.20	4.72	5.01	5.21	5.34	1 1/4" Insert in Grouted Cells
10" EnerBlock with 2" Insert	4.71	4.10	4.39	4.49	4.54	4.58	4.60	
10" EnerBlock with 1 1/4" Insert	4.00	3.44	3.70	3.79	3.84	3.87	3.89	
10" Block with No Insulation	2.37	1.94	2.13	2.21	2.24	2.27	2.28	
10" Block with Foam Fill	6.73	NA	3.01	3.70	4.15	4.50	4.73	No Insulation in Grouted Cells
8" EnerBlock with 4" Insert	6.45	NA	4.65	5.14	5.40	5.58	5.70	2" Insert In Grouted Cells
8" EnerBlock with 2 1/2" Insert	5.83	NA	3.95	4.44	4.71	4.90	5.02	1 1/4" Insert in Grouted Cells
8" EnerBlock with 2" Insert	4.64	3.99	4.29	4.40	4.46	4.49	4.51	
8" EnerBlock with 1 1/4" Insert	3.90	3.26	3.55	3.66	3.71	3.75	3.77	
8" Block with No Insulation	2.30	1.76	1.99	2.09	2.14	2.17	2.19	
8" Block with Foam Fill	5.54	NA	2.67	3.24	3.60	3.87	4.06	No Insulation in Grouted Cells

Notes:

1. R Values were calculated in accordance with the ASHRAE Handbook of Fundamentals Isothermal Planes Method mandated by the Minnesota Commercial Energy Code for concrete masonry with integral insulation. Partially grouted R Values were calculated in accordance with NCMA TEK 6.2-B. The U Value is the inverse of the R Value.
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R VALUES TABLE FOR INTEGRALLY INSULATED CMU (85 PCF)

WALL DESCRIPTION	No Grout	Fully Grouted	Grout @ 16"	Grout @ 24"	Grout @ 32"	Grout @ 40"	Grout @ 48"	Comments:
12" EnerBlock with 4" Insert	8.03	NA	6.65	7.07	7.28	7.42	7.51	2 1/2" Insert in Grouted Cells
12" EnerBlock with 4" Insert	8.03	NA	5.72	6.34	6.68	6.92	7.06	2" Insert in Grouted Cells
12" EnerBlock with 2 1/2" Insert	7.03	5.68	6.28	6.52	6.64	6.71	6.76	
12" EnerBlock with 2" Insert	5.23	4.72	4.96	5.05	5.09	5.12	5.13	
12" EnerBlock with 1 1/4" Insert	4.40	3.94	4.16	4.24	4.28	4.30	4.32	
12" Block with No Insulation	2.53	2.21	2.36	2.41	2.44	2.46	2.47	
12" Block with Foam Fill	9.63	NA	3.59	4.57	5.23	5.76	6.13	No Insulation in Grouted Cells
10" EnerBlock with 4" Insert	7.84	NA	5.54	6.15	6.49	6.72	6.87	2" Insert In Grouted Cells
10" EnerBlock with 2 1/2" Insert	6.87	NA	4.65	5.22	5.55	5.77	5.91	1 1/4" Insert in Grouted Cells
10" EnerBlock with 2" Insert	5.19	4.56	4.85	4.96	5.02	5.05	5.07	
10" EnerBlock with 1 1/4" Insert	4.36	3.78	4.05	4.15	4.20	4.23	4.25	
10" Block with No Insulation	2.49	2.03	2.24	2.32	2.36	2.38	2.40	
10" Block with Foam Fill	7.80	NA	3.23	4.03	4.57	4.98	5.26	No Insulation in Grouted Cells
8" EnerBlock with 4" Insert	7.27	NA	5.24	5.79	6.09	6.29	6.42	2" Insert In Grouted Cells
8" EnerBlock with 2 1/2" Insert	6.51	NA	4.40	4.95	5.25	5.47	5.60	1 1/4" Insert in Grouted Cells
8" EnerBlock with 2" Insert	5.13	4.44	4.76	4.88	4.94	4.97	5.00	
8" EnerBlock with 1 1/4" Insert	4.27	3.60	3.90	4.02	4.08	4.11	4.14	
8" Block with No Insulation	2.43	1.85	2.10	2.20	2.25	2.29	2.31	
8" Block with Foam Fill	6.38	NA	2.87	3.53	3.96	4.28	4.51	No Insulation in Grouted Cells

Notes:

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