

TECHNICAL INFORMATION ON BUILDING MATERIALS
FOR USE IN THE DESIGN OF LOW-COST-HOUSING

TIBM-14

THE NATIONAL BUREAU OF STANDARDS
UNITED STATES DEPARTMENT OF COMMERCE
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THERMAL INSULATION

Insulating Values for Frame Wall Construction--
4" Brick Veneer with Various Types of Interior Finishes

This is a brief presentation of calculated thermal insulating values for frame wall construction--4" brick veneer with various types of interior finishes, based on tests conducted by the National Bureau of Standards and presented in detail in former Letter Circular No. 227, "Thermal Insulation", (April 19, 1927);¹ and Bureau of Standards Research Paper No. 291, "Heat Transfer Through Building Walls", (August 6, 1930),² by M. S. Van Dusen and J. L. Finck.

¹Out of print.

²Out of print and not available by purchase but may be consulted in Government depository libraries.

COMPARATIVE INSULATING VALUES (I.V.) FOR FRAME WALL CONSTRUCTION---
1/4" BRICK VENEER WITH VARIOUS TYPES OF INTERIOR FINISHES¹

Exterior Wall Construction	Finish	Type of Sheathing:	Interior Finish									
			Commercial Insulating Materials	Placed Between 2" x 4" Studding (1 5/8" x 3 5/8" Dressed)	"Board or Wall	"Board ² alone	"	"	"	"	"	"
			Type	Thick- ness Inches	I.V. ¹	I.V. ¹	I.V. ¹	I.V. ¹	I.V. ¹	I.V. ¹	1 1/2"	1"
			Unfilled Air Space	3 5/8"	3.7	3.9	5.1	5.8	5.8	5.8	13.3	14.0
			Flexible Insulation	1/2"	5.5	5.7	6.9	7.7	7.7	7.7	8.4	8.4
			Placed against one side;	3/4"	6.5	6.7	7.9	8.7	8.7	8.7	9.4	9.4
			with one air space	1"	7.4	7.6	8.8	9.6	9.6	9.6	10.3	10.3
			3/4" Wood:	2"	11.1	11.3	12.5	13.3	13.3	13.3	14.0	14.0
1/4" Brick Veneer			Sheathing: Rigid Insulation Board	1/2"	5.9	6.1	7.3	8.1	8.1	8.1	8.8	8.8
			and Centered, with 2 air	3/4"	6.7	6.9	8.1	8.9	8.9	8.9	9.6	9.6
			Buildings: spaces of equal thick-	1"	7.4	7.6	8.8	9.6	9.6	9.6	10.3	10.3
			Paper ^{3,4,5} ness									
			Flexible Insulation	1/2"	6.2	6.4	7.6	8.4	8.4	8.4	9.2	9.2
			Centered, with 2 air	3/4"	7.2	7.4	8.6	9.4	9.4	9.4	10.1	10.1
			spaces of equal thick-	1"	8.1	8.3	9.5	10.3	10.3	10.3	11.1	11.1
			ness	2"	11.8	12.0	13.2	14.0	14.0	14.0	14.7	14.7
			"Fill" Insulation	3 5/8"	15.1	15.3	16.5	17.2	17.2	17.2	18.0	18.0
			Flexible Insulation	3 5/8"	16.0	16.2	17.4	18.1	18.1	18.1	18.9	18.9

¹The insulating value is defined as the number of hours required for the passage of 1 Btu of heat through 1 square foot of wall area, per degree Fahrenheit temperature difference between the air on one side of the wall and the air on the other.

²If 1/2" plaster is applied to plaster board or wall board, add 0.22.

³If wood sheathing is replaced by 1/2", 3/4", or 1" rigid insulation boards, add 0.77, 1.52, or 2.28 respectively.

⁴If 1/2", 3/4", or 1" rigid insulation board is used with wood sheathing, add 1.52, 2.27, or 3.03 respectively.

⁵If 1/2", 3/4", or 1" flexible insulation is used with sheathing, add 1.85, 2.78, or 3.70 respectively.

