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

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THE NATIONAL BUREAU OF STANDARDS  
UNITED STATES DEPARTMENT OF COMMERCE  
WASHINGTON, D. C.



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THERMAL INSULATION

Insulating Values for Frame Wall Construction--  
Wood Shingles with Various Types of Interior Finishes

This is a brief presentation of calculated thermal insulating values for frame wall construction--wood shingles 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);<sup>1</sup> and Bureau of Standards Research Paper No. 291, "Heat Transfer Through Building Walls", (August 6, 1930),<sup>2</sup> by M. S. Van Dusen and J. L. Finck.

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<sup>1</sup>Out of print.

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

COMPARATIVE INSULATING VALUES (I.V.) FOR FRAME WALL CONSTRUCTION--  
WOOD SHINGLES WITH VARIOUS TYPES OF INTERIOR FINISHES<sup>1</sup>

Exterior Wall Construction	Commercial Insulating Materials	Interior Finish
Type of Sheathing	Placed Between 2" x 4" Studding (1 5/8" x 3 5/8" Dressed)	3/4" Plaster and Metal Lath and Wood or 1/2" Plaster Lath
		Board or Wall
		Board <sup>2</sup> alone
		Thickness of Board
		1/2" : 3/4" : 1"
	Type : Thick-	
	: ness	I.V. <sup>1</sup> : I.V. <sup>1</sup> : I.V. <sup>1</sup>
	: Inches	: : : :
Wood Shingles	Unfilled Air Space	4.6 : 4.8 : 6.0 : 6.7 : 7.5
	Flexible Insulation	6.4 : 6.6 : 7.8 : 8.6 : 9.3
	Placed against one side, with one air space	7.4 : 7.6 : 8.8 : 9.6 : 10.3
		8.3 : 8.5 : 9.7 : 10.5 : 11.2
		12.0 : 12.2 : 13.4 : 14.2 : 14.9
	Rigid Insulation Board	6.8 : 7.0 : 8.2 : 9.0 : 9.7
	Centered, with 2 air spaces of equal thickness	7.6 : 7.8 : 9.0 : 9.8 : 10.5
	ness	8.3 : 8.5 : 9.7 : 10.5 : 11.2
on wood strips form-	Flexible Insulation	7.1 : 7.3 : 8.5 : 9.3 : 10.1
ing 7/8" air space, add 1.03)	Centered, with 2 air spaces of equal thickness	8.1 : 8.3 : 9.5 : 10.3 : 11.0
	ness	9.0 : 9.2 : 10.4 : 11.2 : 12.0
		12.7 : 12.9 : 14.1 : 14.9 : 15.6
	"Fill" Insulation	16.0 : 16.2 : 17.4 : 18.1 : 18.9
	Flexible Insulation	16.9 : 17.1 : 18.3 : 19.0 : 19.8

<sup>1</sup>The 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.

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

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

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

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