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HOUSING DIVISION
P. H. A.

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

TIBM - 3

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



March 4, 1936.

THERMAL INSULATION

Comparative estimated fuel savings in heating dwelling
houses equipped with various means
for reducing heat loss

This is a brief digest of a section of Bureau of Standards Circular No. 376 (October 17, 1929), "Thermal Insulation of Buildings",¹ covering estimated fuel savings in the heating of dwelling houses made possible through application of weatherstripping, storm sash and insulation. The estimated savings are based on air infiltration data from The American Society of Heating and Ventilating Engineer's Guide, and heat conductivity values determined from tests conducted by the National Bureau of Standards on a large number of commercial insulating materials at ordinary temperatures.

Although the estimated fuel savings are only approximate on account of wide variations in sizes of cracks and clearances around window frames, sash and doors, such data are useful to indicate the advantages of applying heat loss preventives to the house structure.

¹Available from Superintendent of Documents, Government Printing Office, Washington, D. C. (Price 5 cents)

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TABLE I

Approximate percentages of fuel savings resulting from
the application of heat loss preventives
to a house not so protected.

Construction (conditions assumed)*		Approximate Savings Per Cent**
Walls and Roof	Windows and Doors	
No insulation	Weatherstripping only	15 to 20
No insulation	Storm sash and weatherstripping	25 to 30
$\frac{1}{2}$ " insulation	No storm sash or weatherstripping	20 to 30
$\frac{1}{2}$ " insulation	Weatherstripping only	About 40
$\frac{1}{2}$ " insulation	Storm sash only	About 50
1" insulation	No storm sash or weatherstripping	30 to 40
1" insulation	Weatherstripping only	About 50
1" insulation	Storm sash only	About 60

TABLE II

Approximate percentages of fuel savings resulting from
the addition of heat loss preventives
to a weatherstripped house.

Construction (conditions assumed)*		Approximate Savings Per Cent**
Walls and Roof	Windows and Doors	
No insulation	Storm sash	10 to 15
$\frac{1}{2}$ " insulation	No storm sash	25 to 35
$\frac{1}{2}$ " insulation	Storm sash	40 to 45
1" insulation	No storm sash	35 to 45
1" insulation	Storm sash	50 to 55

*Windows and doors: Aggregate area of such openings assumed to be 1/5 of total side-wall surface.

Wind velocity: Heat loss through windows and doors assumed equal to loss of heat resulting from a 5-mile wind striking the wall perpendicularly; this being a rough average of infiltration conditions prevailing throughout the country.

Insulating material: A typical commercial insulating material was assumed applied to walls and roof or attic.

**The percentages of fuel savings shown in Table II are approximately 15% to 20% less than those in Table I, since they are based on the amount of fuel consumed in heating a house equipped with weatherstripping, whereas those shown in Table I are based on a house not equipped with weatherstripping.