ZONOLITE* WATER-REPELLENT MASONRY FILL INSULATION... the most economical, effective way to insulate masonry walls.

economy

Heat transmission is reduced approximately 50% in masonry wall systems when Zonolite Masonry Fill Insulation is used.

Per square foot installed cost of Masonry Fill is extremely low, approximately:

$0.10 for 6 in. concrete block or 10 in. cavity walls
$0.13 for 8 in. concrete block walls.
$0.21 for 12 in. concrete block walls

A report submitted to the U. S. Army Corps of Engineers by J. N. Pease & Co., architects and engineers, Charlotte, N. C. reveals:

1. A 2-company army barracks insulated with Masonry Fill (cost to insulate, $1,567) effects at least an $800 annual saving in cost of the heating equipment.
2. If air-conditioning were intended, the cost of insulating would be fully recovered before occupancy through equipment savings.[2]

Annual savings in heating and cooling frequently exceed the additional cost of the Zonolite Masonry Insulation when it is financed as part of construction. Mechanical operating cost is reduced as much as $0.04 per sq. ft. of wall area in northern climates.[2]

Savings are especially significant in electrically-heated structures.

easy installation

Zonolite Masonry Fill Insulation is lightweight and free-flowing, filling cores or cavities to heights up to 20 feet in a single pour without bridging. There is no cutting, fitting or patching. With the use of a simple hopper it is easy to insulate up to 29 sq. ft. of wall area per minute.

added comfort

Insulated masonry walls afford greater year-'round comfort. In winter, inside wall temperatures are as much as 13°F higher, reducing radiant heat loss from the body to the wall 10 to 28 percent. Conversely, insulated walls reverse the radiant heat flow in summer to increase comfort.[2]

sound transmission

Filling blocks with Zonolite Masonry Fill Insulation reduces loudness of sound 20 to 31% (see table D).

heat transmission

Heat transmission tests have been conducted on a number of wall constructions at Pennsylvania State University.[4] Complete tables are shown below. Wind-driven rain has no significant effect on the Masonry Insulated walls. Interior wall temperatures are uniform within 2°F.

TECHNICAL DATA—"U" VALUES—COEFFICIENTS OF HEAT TRANSMISSION

table A—cavity walls

4" Exterior Wythe		Face Brick		Common Brick		Concrete Block (a)	
Actual Cavity Dimension, in.		2½	4½	2½	4½	2½	4½
Interior Wythe: 4" Concrete Block (Sand & Gravel)	Uninsulated	.34	.34	.30	.30	.31	.31
	Insulated	.13	.08	.13	.08	.13	.08
4" Concrete Block (Cinder) or 4" Clay Tile	Uninsulated	.30	.30	.27	.27	.25	.25
	Insulated	.13	.08	.12	.08	.12	.08
4" Concrete Block (Lightweight)	Uninsulated	.27	.27	.24	.24	.21	.21
	Insulated	.12	.08	.12	.08	.11	.07
6" Concrete Block (Lightweight)	Uninsulated	.26	.26	.23	.23	.20	.20
	Cavity Insulated	.12	.08	.11	.08	.10	.07
	Block & Cavity Insulated	.10	.07	.10	.07	.09	.07
8" Concrete Block (Lightweight)	Uninsulated	.22	.22	.21	.21	.18	.18
	Cavity Insulated	.11	.07	.11	.07	.10	.07
	Block & Cavity Insulated	.08	.06	.08	.06	.08	.06
4" Face Brick	Uninsulated	.37	.37	NA (b)		NA	
	Insulated	.14	.09				
4" Common Brick	Uninsulated	.33	.33	.29	.29	NA	
	Insulated	.13	.08	.13	.08		

(a) Aggregate same as interior wythe.
(b) NA: Not applicable.
U values are expressed in Btu per sq ft - hr - deg F.

table B—solid brick and block walls

Exterior Wythe		4" Face Brick	4" Common Brick
Interior Wythe: 6" Concrete Block (Lightweight)	Uninsulated	.34	.33
	Insulated	.23	.21
8" Concrete Block (Lightweight)	Uninsulated	.29	.26
	Insulated	.16	.15
8" Concrete Block (Sand & Gravel)	Uninsulated	.43	.37
	Insulated	.31	.28

table C—concrete block walls

Wall Thickness Inches	Type of Block	Block only		Block Insulated Furred & Plastered		
		Uninsulated	Insulated	1" Air Space Uninsulated	1" Air Space Insulated	2" Air Space Insulated
6	Lightweight	.60	.26	.18	.15	.11
8	Lightweight	.33	.17	.13	.11	.09
	Sand and Gravel	.53	.36	.23	.18	.13
12	Lightweight	.30	.15	.12	.11	.09
	Sand and Gravel	.47	.33	.22	.17	.12

(c) All masonry dimensions are nominal.
(c) ⅝ in. gypsum lath and ½ in. of vermiculite-gypsum plaster.

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vapor permeance

No vapor barrier is required in Zonolite Masonry Fill insulated walls where average interior relative humidity does not exceed 50 percent.[4]

water permeance

In a test procedure developed by the National Bureau of Standards, a Zonolite-insulated cavity wall with a badly leaking exterior wythe was subjected to 5½ in. of water per hour with winds of 60 mph for six consecutive days. ". . . There was no permeation of water across the cavity space through the vermiculite during the entire period of the test."[6] Repeated wetting and drying has virtually no effect on its water-repellency.[7]

non-settling

Zonolite water-repellent Masonry Fill Insulation supports its own weight in the wall. A 10-month test of its resistance to vibration, high humidity, and free water have proved its resistance to settlement.[8]

acceptance

Zonolite water-repellent Masonry Fill Insulation is acceptable in FHA financed housing.[10] The Structural Clay Products Institute recommends it. Hundreds of buildings have employed it with good success.[11]

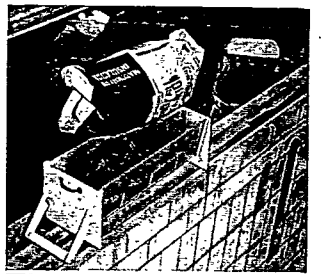
general properties

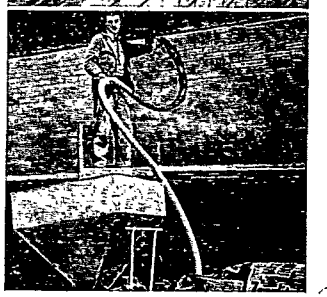
Inorganic, rotproof, verminproof, fire-resistant. Fusion point approximately 2200°F.



Masonry Fill pours easily from lightweight bags. Insulation flows freely to bottom of wall; no need to tamp or rod.

Simple hopper, which can be constructed on job site, is used by many contractors.





Some contractors employ mechanical blowers to afford rapid installation.

Zonolite Masonry Fill fills solidly, uniformly; will not settle.

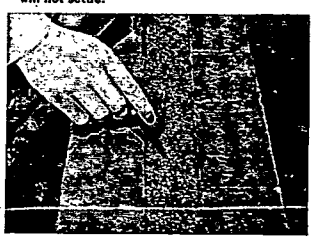


table D—sound transmission

Wall Type	Average Sound Transmission Loss in decibels		Noise Reduction Percentage (a)
	cores empty	cores filled with vermiculite	
8 in. unpainted cinder block	33	36	20%
8 in. painted lightweight block	43	48	31%

(a) Decibel reduction converted to sones and expressed as a percentage reduction in loudness.

table E—approximate coverage (f)

Sq. ft. of wall area	1" Cavity	2" Cavity	2½" Cavity	4½" Cavity	8" Block	12" Block
100	2	4	5	9	7	13
500	10	20	25	45	34	63
1,000	21	42	50	95	69	125
2,000	42	84	100	189	138	750
3,000	62	124	150	279	207	375
5,000	104	208	250	468	345	625
7,000	146	292	350	657	483	875
10,000	208	416	500	950	690	1250

(f) 4-cubic foot bags required to fill.

REFERENCE DATA: Copies of the following reports are available upon request.

1. J. N. Pease & Co., Comm. No. 3210, March 24, 1960.
2. The Economics of Thermal Insulation for Building Enclosures, Zonolite, November 15, 1960.
3. Radiant Heat Exchange Between Building Enclosures and Occupants, Zonolite, February 17, 1961.
4. Heat Transmission Tests, Pennsylvania State University, Jan. 18, Feb. 10, Feb. 25, and April 29, 1960.
5. Vapor Transmission Test, Pennsylvania State University, Jan. 22, 1960.
6. Structural Clay Products Institute, Technical Note Vol. 10, No. 4, April 1959.
7. Building Materials Research Laboratory, Zonolite, Report No. 619, August 11, 1961.
8. Sound Transmission Test, Riverbank Acoustical Laboratories, Test TL60-22, October 26, 1959.
9. Building Materials Research Laboratory, Zonolite, Report No. 462, April 27, 1960.
10. FHA Use of Materials Bulletin UM-30, March 1, 1961.
11. MF-77 & MF-78 — Current list of Masonry Fill Insulated Buildings, Zonolite, March, 1963.