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NATIONAL BUREAU OF STANDARDS · Lyman J. Briggs, Director

BUILDING MATERIALS

National Bureau of Standards

and STRUCTURES

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SUPPLEMENT TO REPORT BMS17

Sound Insulation
of
Wall and Floor Constructions

by V. L. CHRISLER



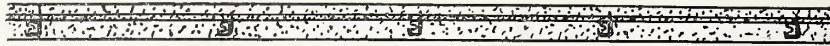
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This supplement reports the results of sound-transmission measurements made on a number of additional types of construction since the issuance of the original report in March 1939.

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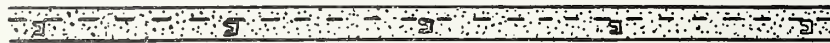
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taken from the Library.*



PANEL 170

PANEL 170.—*Two-inch solid plaster partition; 3/4-inch channel studs; perforated gypsum lath; gypsum plaster; smooth, white finish.*



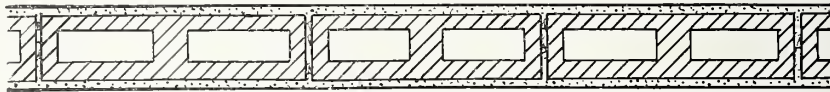
PANELS 171A,B,C, 172

PANEL 171A.—*Two-inch solid plaster partition; 3/4-inch channel studs; expanded metal lath; gypsum plaster; smooth, white finish.*

PANEL 171B.—*Same construction as panel 171A.*

PANEL 171C.—*Same construction as panel 171A.*

PANEL 172.—*Two and one-half inch solid plaster partition; 3/4-inch channel studs; expanded metal lath; gypsum plaster; smooth, white finish.*



PANEL 173A

PANEL 173A.—*Hollow tile panel constructed of 4- by 8- by 16-inch partition tile, two cells.*

(Tiles were made of pumice and portland cement. Partition was plastered on both sides with a brown coat of gypsum plaster, and had a smooth, white finish; thickness of plaster 1/2 inch.)

PANEL 173B.—*Same as panel 173A, but it was plastered on one side only.*

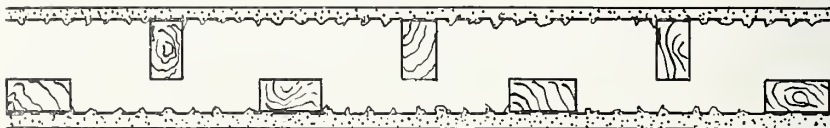
PANEL 173C.—*Same as panel 173A, but it was not plastered.*

(Note the poor insulating properties of this panel. This was caused by the large number of pores extending through the walls of the tiles.)



PANEL 174

PANEL 174.—*Wood studs; Steeltex lath with paper backing nailed to studs with special nail; scratch and brown coats of gypsum plaster; smooth, white finish; thickness of grounds 3/4 inch.*

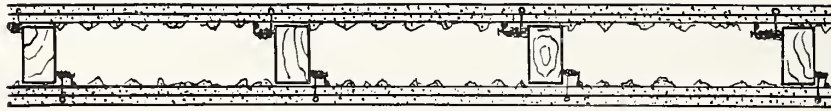


PANEL 175

PANEL 175.—*Wood studs staggered; expanded metal lath; scratch and brown coats of gypsum plaster; smooth, white finish; thickness of grounds 3/4 inch.*

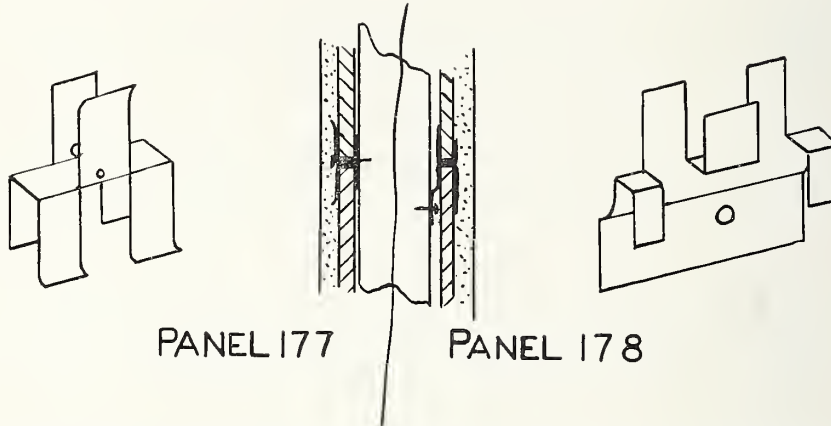
TABLE 1.—*Sound-transmission loss— wall structures*

Panel No.	Transmission loss (in decibels at frequencies (cycles per second)										Weight	
	128	192	256	384	512	768	1,024	2,048	4,096	Average		
										256 to 1,024		128 to 4,096
SOLID PLASTER												
170-----	30.2	27.7	33.2	35.2	30.6	32.7	37.9	47.6	53.0	33.9	36.5	<i>lb/ft²</i> 19.4
171A-----	35.9	31.5	30.1	31.6	33.8	35.5	39.3	46.9	54.0	34.1	37.6	16.4
171B-----	29.2	29.9	25.6	30.4	30.5	33.5	37.0	46.4	53.8	31.4	35.1	17.7
171C-----	35.2	33.3	22.3	31.6	31.3	30.8	37.7	46.7	54.9	30.7	36.0	18.8
172-----	34.3	26.4	33.0	36.8	34.6	37.4	43.2	50.5	56.9	37.0	39.2	22.4
HOLLOW TILE												
173A-----	32.3	32.4	33.5	34.0	36.2	36.2	39.0	41.6	51.8	35.8	37.4	25.3
173B-----	30.9	26.9	27.4	35.8	34.6	33.1	35.9	40.2	46.6	33.4	34.6	20.4
173C-----	7.9	7.5	5.2	7.3	8.6	12.2	14.1	18.5	17.4	9.5	11.0	15.5
WOOD STUDS												
174-----	30.0	27.3	24.8	31.0	34.5	37.3	38.2	38.0	53.8	33.2	35.0	12.6
175-----	43.8	46.6	47.4	47.7	47.4	49.9	50.0	52.1	63.4	48.5	49.8	19.8



PANEL 176

PANEL 176.—Wood studs; perforated gypsum lath attached to studs with clip consisting of a coiled spring and a piece of heavy wire extending across the face of the gypsum lath and interlocking with the adjoining clip; scratch and brown coats of gypsum plaster: smooth, white finish; thickness of plaster $\frac{1}{2}$ inch.



PANEL 177

PANEL 178

PANEL 177.—Wood studs; gypsum lath attached to studs with clip, as shown in drawing (the nail went through the edge of the gypsum lath holding it and the clip firmly against the stud); scratch and brown coats of gypsum plaster; smooth, white finish; thickness of plaster $\frac{1}{2}$ inch.

PANEL 178.—Wood studs; gypsum lath attached to studs with clip, as shown in drawing (the nail held only the back of the clip against the stud and allowed a small movement of the gypsum lath); scratch and brown coats of gypsum plaster, smooth, white finish; thickness of plaster $\frac{1}{2}$ inch.



PANEL 179A

PANELS 179B,C

PANEL 179D

PANEL 179A.—Wood studs; $\frac{3}{8}$ -inch, three-ply plywood was attached to both sides.

(A light weight cotton fabric was applied to one side with casein glue and a heavy cotton duck to the other side.)

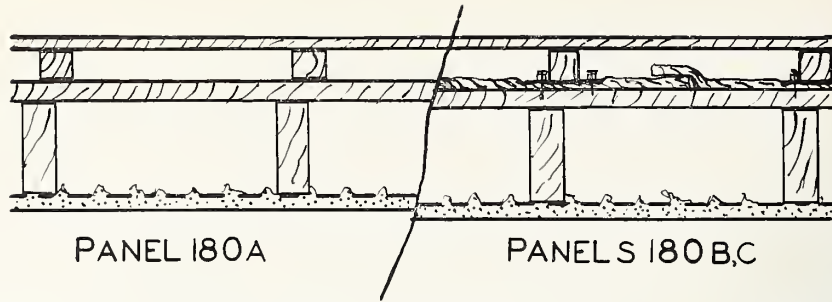
PANEL 179B.—Same as panel 179A, but a 4-inch cotton bat, which had been flameproofed, was placed in the air space between the studs.

PANEL 179C.—Same as panel 179B, but a 1-inch cotton bat, which had been flameproofed, was used in place of the 4-inch bat.

PANEL 179D.—Same as panel 179A, but a strip of 4-inch flameproofed cotton bat was cut, having a width equal to the depth of the studs, and these strips were tacked to each side of the studs.

TABLE 1.—*Sound-transmission loss—wall structures— Continued*

Panel No.	Transmission loss (in decibels at frequencies (cycles per second)										Weight	
	128	192	256	384	512	768	1,024	2,048	4,096	Average		
										256 to 1,024		128 to 4,096
WOOD STUDS—Continued												
176-----	40.0	42.0	41.9	46.6	47.7	49.3	47.5	54.0	65.5	46.6	48.3	16.4
177-----	19.0	23.9	28.8	33.0	35.0	39.1	41.6	42.4	59.9	35.5	35.9	14.4
178-----	33.4	42.1	42.4	45.6	45.1	46.1	46.3	47.8	63.8	45.1	45.8	14.9
179A-----	14.6	20.2	27.6	33.2	29.1	34.3	37.5	43.3	39.7	32.3	31.1	4.57
179B-----	13.8	26.7	32.8	36.9	33.5	39.3	41.7	46.3	44.1	36.8	35.0	4.83
179C-----	14.6	24.4	28.5	36.9	31.1	38.1	42.6	49.1	46.0	35.4	34.6	4.63
179D-----	13.0	22.6	31.4	36.7	33.7	38.3	41.9	46.8	44.7	36.4	34.3	4.74

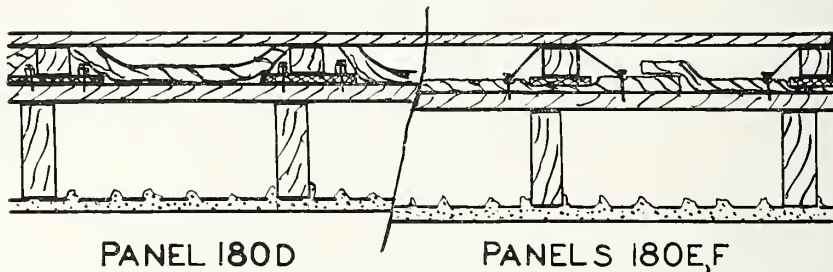


PANEL 180A.—*Floor panel, 2- by 6-inch wood joists; scratch and brown coats of gypsum plaster applied on expanded metal lath for ceiling; smooth, white finish; grounds $\frac{3}{4}$ inch thick.*

(The floor consisted of a subfloor; 2- by 2-inch sleepers, 16 inches on centers, and a hardwood finish floor.)

PANEL 180B.—*Same as 180A, but a $\frac{1}{2}$ -inch Balsam Wool was laid on the subfloor and the 2- by 2-inch sleepers were attached with Gorman clips.*

PANEL 180C.—*Same as panel 180B, but 1-inch Balsam Wool was used in place of the $\frac{1}{2}$ -inch Balsam Wool.*



PANEL 180D.—*Same as panel 180A, but strips of Nuwood $\frac{1}{2}$ -inch thick and 6 inches wide were placed under the 2- by 2-inch sleepers.*

(The sleepers were attached with Gorman clips. Strips of Balsam Wool 1-inch thick by 16 inches wide were placed between the sleepers.)

PANEL 180E.—*Same as panel 180A, except $\frac{1}{2}$ -inch Balsam Wool was laid on the subfloor and on this were placed small squares ($2\frac{1}{2}$ - by $2\frac{1}{2}$ - by $\frac{1}{2}$ -inch thick) of Nuwood, spaced 16 inches on centers in each direction; the 2- by 2-inch sleepers were laid on top of these squares and held in position by a metal strip over the sleeper at each square; the hardwood floor was applied on the sleepers as before.*

PANEL 180F.—*This floor panel was the same as panel 180E, but 1-inch Balsam Wool was used instead of $\frac{1}{2}$ -inch material.*

PANEL 181.—*Heavy wooden door, approximately $2\frac{1}{2}$ inches thick; special hardware; rubber gasket around sides and top; special felt strips which pushed down from the bottom of the door as it was closed, thus eliminating any crack under the door.*

PANEL 182.—*Approximately same as panel 181, but manufactured by another firm.*

TABLE 2.—*Sound-transmission loss—floor structures*

Panel No.	Transmission loss (in decibels) at frequencies (cycles per second)										Tapping	Weight	
	128	192	256	384	512	768	1,024	2,048	4,096	Average			
										256 to 1,024			128 to 4,096
WOOD JOISTS													
180A-----	35.3	22.6	24.3	31.5	34.1	39.3	41.9	50.4	62.0	34.2	37.9	10.3	<i>lb/ft²</i> 16.3
180B-----	32.5	37.3	37.9	46.2	48.3	52.4	55.1	64.6	76.0	48.0	50.0	15.8	16.6
180C-----	35.0	37.6	37.4	47.9	48.9	51.6	54.7	63.9	75.4	48.1	50.3	18.7	16.7
180D-----	37.1	38.1	39.0	46.9	48.5	52.0	54.8	62.6	74.9	48.2	50.4	17.6	16.7
180E-----	32.0	32.2	33.1	41.3	44.5	49.4	51.9	59.9	72.2	44.0	46.3	13.4	16.6
180F-----	29.5	36.2	35.5	46.1	48.1	51.2	54.2	62.9	74.8	47.0	48.7	15.8	16.7

TABLE 3.—*Sound-transmission loss—door structures*

Panel No.	Transmission loss (in decibels) at frequencies (cycles per second)										Weight	
	128	192	256	384	512	768	1,024	2,048	4,096	Average		
										256 to 1,024		128 to 4,096
DOORS												
181-----	23.1	25.6	25.9	27.6	28.9	29.5	26.5	32.8	33.1	27.7	28.1	<i>lb/ft²</i> -----
182-----	30.4	30.5	29.5	28.6	23.7	24.7	26.3	36.7	36.5	26.6	29.7	12.5

