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U. S. DEPARTMENT OF COMMERCE
NATIONAL BUREAU OF STANDARDS
WASHINGTON
FEBRUARY 12, 1941.

Letter
Circular
LC-632
(Supersedes
LC-573)

SOUND ABSORPTION COEFFICIENTS OF THE MORE COMMON ACOUSTIC MATERIALS.

The following figures have been obtained at the National Bureau of Standards for the sound absorption coefficients of a number of acoustic materials. It is our intention to publish results only for materials which are on the market. The measurements on some of these materials were made several years ago, but we believe these materials are essentially the same as when the measurements were made. The inclusion of a material in this letter circular is not to be construed as a general approval. Each material should be judged on its merits in any particular case as there are other requirements such as fire resisting qualities, light reflection, appearance, etc. Figures are also given for the absorption of an audience seated in chairs of different kinds. All the results have been obtained by the reverberation method on samples having an area of approximately 72 square feet.

The sound absorption coefficient of a material is defined as the fractional part of the energy of a sound wave which is absorbed at each reflection. Experimental figures such as are given here must be regarded as approximate only. This branch of applied science is new and in a state of development. The methods and formulas used in obtaining these figures are those which, while not entirely satisfactory, are open to the least objection. The uncertainty involved is such that all the coefficients are probably somewhat too large.

The "noise coefficient" given in the table is the average to the nearest multiple of 0.05 of the coefficients for 256, 512, 1024, and 2048 cycles. It has been recommended by many consultants that such a coefficient be used when the problem is one of reducing the noise level, as in offices, restaurants, etc.

Many of the acoustic materials exhibit large variations in their sound absorption properties when the method of mounting is changed. In many cases the most important feature is the amount of air space back of the material. The figures given in this circular apply only when the materials are mounted in the same manner as when tested. For this reason the exact method of mounting is given for each test.

Acoustic plasters require special skill in their application, as improper manipulation may reduce the coefficient. Particular attention is called to the fact that a dry base coat is used for most applications. Also the sound absorption coefficients are affected quite materially by the time between the application of the first and second coat of acoustic plaster.

A number of materials have been painted and retested to determine the effect of painting. In every case the paint was applied so as to decrease the sound absorption as little as possible and still obtain a reasonably good paint job. Details of the manner in which the paint was applied on any particular material will be supplied upon application.

It is not necessarily the case that the materials of highest coefficient are the most advantageous. When there is room enough to apply the requisite quantity, a material of low coefficient will give better results than one of higher absorption, because of the more uniform distribution of material. Also, in comparing different materials it should be borne in mind that there is some variation in manufacture, hence the sample which was measured may have more or less absorption than the material delivered on the job. Minor differences in coefficients, therefore, should be disregarded in choosing between materials.

For the foregoing reasons it is advisable in drawing up specifications for auditoriums to lay emphasis upon the reverberation time desired rather than upon coefficients of material. See National Bureau of Standards Circular C418 entitled "Architectural Acoustics", which may be obtained of the Superintendent of Documents, Government Printing Office, Washington, D. C., at 5 cents per copy. Additional details regarding any of the materials mentioned in this letter circular will be furnished on application.

Additional information regarding the absorption coefficients of acoustical materials may be obtained from the Acoustical Materials Association, 919 North Michigan Avenue, Chicago, Illinois.

Trade Name of Acoustic Materials.

TYPES OF MOUNTING:

1. Cemented to wall board. This is considered equivalent to cementing to plaster or masonry.
2. Nailed on 13/16" x 2" furring 12" o.c. unless otherwise indicated.
3. Metal supports attached to 13/16" x 2" wood furring.
4. Laid directly on laboratory floor.
5. Nailed on 2 x 4's 12" o.c. unless otherwise indicated.
6. Cemented to the floor of the reverberation chamber.
7. Back of sample covered with concrete.
8. Attached to metal suspension system. 4" air space back of tile, unless otherwise indicated.
9. Acoustic tile nailed to 13/16" x 2" furring 18" o.c. Space between furring filled with Rockwool.
10. Nailed on 2 x 8's 12" o.c.
11. Laid on 24 gauge sheet iron, nailed to 13/16" x 2" furring 24" o.c.

Sound Absorption Coefficients and Description of Test Samples

TABLE I

Prefabricated Acoustic Units.

Material	Thickness	Mounting (See Page 5)	Coefficients 128	256	512	1024	2048	4096	Noise Coef.	Size of Unit Tested	Wt. (lb) sq ft	Surface	Date
ACOUSTONE COMPANY, Ltd.													
Trutone Tile, cast on 1/4" gypsum wall board	7/8"	4	.16	.17	.48	.82	.65	.74	.55	12"x 24"	-	Spray painted by manufacturer.	1932
ARMOR INSULATING CO.													
Cork	1"	1	.02	.09	.32	.63	.38	.40	.35	12"x 36"	0.67	Painted by mfr.	1939
Cork	1 1/2"	1	.05	.16	.57	.43	.32	.40	.35	12"x 36"	0.96	Unpainted	1939
ARMSTRONG CORK CO.													
Corkoustic Type B4	1 1/4"	1	.10	.17	.57	.76	.54	.67	.50	12"x 12"	.63	Painted by manufacturer.	1939
Corkoustic Type B5	1 1/2"	1	.08	.21	.67	.70	.55	.60	.55	12"x 12"	.75	Painted by manufacturer.	1939
Corkoustic Type B5	1 1/2"	2	.08	.35	.75	.55	.54	.58	.55	12"x 12"	.75	Painted by manufacturer.	1939
Corkoustic Type B5	1 1/2"	1	.07	.25	.70	.63	.53	.63	.55	12"x 12"	.82	Painted by manufacturer.	1939
Corkoustic Type B5	1 1/2"	1	.11	.33	.66	.45	.31	.39	.45	12"x 12"	-	Same as above, brush painted 4 coats at NBS.	1939
Corkoustic Type B6	1 3/4"	1	.07	.30	.79	.65	.55	.62	.55	12"x 12"	.85	Painted by manufacturer.	1939
Temcoustic F-2	7/8"	1	.15	.43	.66	.65	.65	.70	.60	12"x 12"	1.02	Painted by manufacturer.	1939
Temlok DeLuxe	1/2"	4	.12	.24	.39	.31	.31	.32	.30	48"x 54"	1.18	Painted by manufacturer.	1937
Temlok DeLuxe	7/8"	4	.22	.46	.35	.32	.39	.57	.40	48"x 54"	1.19	Painted by manufacturer.	1937
Temlok DeLuxe	1 3/8"	4	.32	.45	.37	.39	.46	.63	.40	48"x 54"	1.65	Painted by manufacturer.	1937
BASALT ROCK COMPANY													
Basalt Rock Type A	5"	4	.32	.81	.75	.73	.74	.73	.75	18"x 24"	25.2	Unpainted	1938

Material	Thickness	Mounting (See Page 5)	Coefficients 128	256	512	1024	2048	4096	Noise Coef.	Size of Unit Tested	Wt. (lb) sq ft	Surface	Date
F. E. BERRY, JR. & CO., INC.													
Berry-Cel	1"	8	.26	.66	.90	.77	.88	.91	.80	12"x 12"	2.57	Unpainted	1939
Berry-Cel, plus rockwool at back of tile.	1"	8	.43	.96	.99	.86	.89	.93	.95	12"x 12"	2.99	Unpainted	1939
SAMUEL CABOT, INC.													
Cabots Quilt	-	4	.12	.30	.69	.82	.41	.31	.55	-	.41	Covered with paper	1938
CELLUFOAM CORPORATION													
Acoustical Cellufoam Type HD	1"	1	.11	.28	.60	.70	.73	.78	.60	3'x 4'	.14	No surface covering	1939
Acoustical Cellufoam Type HD	1"	2	.14	.33	.58	.82	.83	.82	.65	3'x 4'	.14	No surface covering	1939
THE CELOTEX CORPORATION													
Absorbex Type A on 1" Absorbex Type F (10 gauge)	2"	4	-	.39	.80	.96	.92	-	.75	9"x 9" tile on 20"x 64" sheets.	-	Spray painted by mfr.	1932
Absorbex Type A	1"	1	.09	.24	.62	.89	.73	.73	.60	12"x 12"	2.4	Unpainted	1939
Absorbex Type A	1"	1	.14	.49	.83	.61	.30	.22	.55	12"x 12"	-	Same as above brush painted 5 coats at NBS	1939
Absorbex Type A	1"	9	.19	.63	.95	.86	.78	.77	.80	18"x 18"	2.6	Unpainted	1936
Absorbex Type A	1"	2 (18"o.c.)	.19	.33	.80	.86	.80	.83	.70	18"x 18"	2.7	Kerfed, spray painted 4 coats at NBS	1936
Absorbex Type C	1"	4	.14	.19	.34	.73	.62	.62	.45	20"x 64"	-	Unpainted	1932
Absorbex Type C (14 gauge)	1"	2 (20"o.c.)	.14	.21	.67	.69	.59	.62	.55	20"x 64"	-	Unpainted	1932
Absorbex Type F (10 gauge)	1"	2 (16"o.c.)	.06	.17	.47	.66	.53	-	.45	20"x 64"	-	Spray painted by mfr.	1934
Absorbex Type F (8 gauge)	2"	7	.13	.47	.98	.70	.78	.70	.75	20"x 64"	4.7	Spray painted 4 coats at NBS	1934
Acousti-Celotex Type C1	1/2"	1	.12	.26	.48	.50	.46	.56	.45	12"x 12"	.78	R.I. finish perforated 441 holes per sq ft, 3/16" dia., 3/8" deep.	1936

THE CELOTEX CORPORATION (Cont'd)

Material	Thickness	Mounting (See Page 5)	Coefficients 128	256	512	1024	2048	4096	Noise Coef.	Size of Unit Tested	Wt. (lb) sq ft	Surface	Date
Acousti-Celotex Type C1 Slow burning	1/2"	1	.17	.24	.40	.45	.43	.51	.40	12"x 12"	.88	Unpainted, perforated as above.	1936
Acousti-Celotex Type C2	5/8"	1	.11	.31	.71	.80	.67	.57	.60	12"x 12"	.88	R.I. finish, perforated as above, holes 1/2" deep.	1936
Acousti-Celotex Type C2	5/8"	2	.14	.65	.63	.73	.67	.55	.65	12"x 12"	.88	Same as above	1936
Acousti-Celotex Type C2 Slow burning	5/8"	1	.09	.25	.68	.79	.69	.66	.60	12"x 12"	.89	Unpainted, perforated as above.	1937
Acousti-Celotex Type C2 Slow burning	5/8"	2	.12	.48	.64	.70	.62	.49	.60	12"x 12"	1.07	Painted by mfr. Perforated as above	1939
Acousti-Celotex Type C3	13/16"	1	.10	.30	.78	.85	.59	.42	.65	12"x 12"	0.94	R.I. finish, perforated as above, holes 5/8" deep.	1939
Acousti-Celotex Type C3	13/16"	1	.08	.33	.83	.86	.53	.37	.65	12"x 12"	-	Same as above except brush painted 4 coats NBS.	1939
Acousti-Celotex Type C3	13/16"	8	.55	.66	.66	.80	.69	.52	.70	12"x 24"	1.09	R.I. finish, perforated as above.	1936
Acousti-Celotex Type C3 Slow burning	13/16"	1	.18	.36	.67	.74	.67	.66	.60	12"x 12"	1.35	Unpainted, perforated as above.	1936
Acousti-Celotex Type C3 Slow burning	13/16"	8	.45	.58	.67	.91	.71	.66	.70	12"x 24"	1.06	Unpainted, perforated as above.	1937
Acousti-Celotex Type C4	1 1/4"	1	.17	.48	.97	.72	.50	.41	.65	12"x 12"	1.58	R.I. finish, perforated as above, holes 1 1/16" deep.	1936
Acousti-Celotex Type C4	1 1/4"	8	.53	.68	.96	.78	.60	.50	.75	12"x 24"	1.44	Same as above	1936
Acousti-Celotex Type C4 Slow burning	1 1/4"	1	.13	.51	.94	.84	.58	.52	.70	12"x 12"	1.80	Unpainted, perforated as above	1936

THE CELOTEX CORPORATION (Cont'd)

Material	Thickness	Mounting (See Page 5)	Coefficients 128	256	512	1024	2048	4096	Noise Coef.	Size of Unit Tested	Wt. (lb) sq ft	Surface	Date
Acousti-Celotex Type C4 Slow burning	1 1/4"	8	.43	.62	.78	.81	.61	.40	.70	12"x 24"	1.93	Painted by mfr., perforated as above.	1939
Acousti-Celotex Type C5	13/16"	1	.15	.24	.62	.73	.70	.71	.55	12"x 12"	-	Unpainted, perforated 441 holes per sq ft, 1/4" dia., 5/8" deep.	1931
Acousti-Celotex Type C5	13/16"	1	.13	.26	.62	.78	.86	.77	.65	12"x 12"	-	Same as above, brush painted 1 coat glue size, 4 coats lead & oil at NBS.	1931
Acousti-Celotex Type C5	13/16"	2	.09	.56	.77	.90	.78	.62	.75	12"x 12"	.86	Unpainted, perforated as above, holes 5/8" deep.	1933
Acousti-Celotex Type C5 Slow burning	13/16"	8	.57	.70	.63	.84	.78	.68	.70	12"x 12"	1.12	Painted by mfr., perforated as above, holes 5/8" deep.	193
Acousti-Celotex Type C6	1 1/4"	4	.12	.41	.90	.92	.66	.64	.70	12"x 12"	1.44	Unpainted, perforated as above, holes 1" deep.	1932
Acousti-Celotex Type C-6 Slow burning	1 1/4"	8	.56	.72	.77	.92	.63	.53	.75	12"x 24"	1.65	Painted by mfr. perforated as above, holes 1" deep.	1939
Acousti-Celotex Type C8	1"	2	.20	.62	.66	.75	.73	.48	.70	24"x 48"	1.44	R.I. finish, perforated 462 holes per sq ft, 3/16" dia., 7/8" deep.	1940
Acousti-Celotex Type MU-1	1/2"	1	.10	.17	.63	.68	.66	.72	.55	12"x 12"	1.39	Unpainted, not perforated.	1936
Acousti-Celotex Type M1	9/16"	1	.11	.29	.68	.74	.82	.74	.65	12"x 12"	1.23	Painted by mfr., perforated 676 holes per sq ft, 5/32" dia., 1/2" deep.	1936
Acousti-Celotex Type M2	1"	8	.38	.54	.66	.95	.73	.68	.70	12"x 24"	2.32	Painted by mfr. Perforated as above, holes 7/8" deep.	1939

THE CELOTEX CORPORATION (Cont'd)

Material	Thick-ness	Mounting (See Page 5)	Coefficients 128	256	512	1024	2048	4096	Noise Coef.	Size of Unit Tested	Wt. (lb) sq ft	Surface	Date
Acousti-Celotex Type M3	1 1/4"	1	.15	.50	.93	.89	.74	.69	.75	12"x 12"	2.58	Painted by mfr., perforated as above, holes 1 1/8" deep.	1936
Calicel Acoustic Tile	3/4"	1	.07	.21	.62	.90	.75	.75	.60	12"x 12"	-	Unpainted	1936
Calicel Acoustic Tile	1"	1	.09	.26	.74	.97	.78	.84	.70	12"x 12"	2.66	Unpainted	1935
Calicel Acoustic Tile	1"	5 (12" o.c.)	.28	.90	.86	.72	.85	.89	.85	12"x 12"	2.66	Unpainted	1935
Calicel Acoustic Tile	1 1/4"	1	.14	.43	.90	.90	.82	.80	.75	12"x 12"	3.42	Unpainted	1935
Calicel Acoustic Tile	1 1/4"	5 (12" o.c.)	.38	.95	.76	.78	.89	.87	.85	12"x 12"	3.42	Unpainted	1935
Calistone	2"	4	.12	.45	.87	.82	.76	.67	.75	12"x 12"	9.3	Unpainted	1935
Calistone	2"	5 (12" o.c.)	.46	.91	.71	.75	.84	.72	.80	12"x 12"	9.3	Unpainted	1935
Calistone	4"	4	.38	.59	.60	.63	.63	.62	.60	18"x 24"	17.8	Unpainted	1937
Calistone Long edges splayed on opposite sides. 5 holes 3" in dia. through body of tile.	4"	4	.37	.78	.82	.76	.73	.67	.75	18"x 36"	17.6	Unpainted	1939
Calistone	5"	4	.45	.87	.81	.80	.78	.81	.80	18"x 24"	22.4	Unpainted	1937
Calistone, Type Y,	5"	4	.48	.77	.83	.84	.85	.91	.80	18"x 24"	25.7	Unpainted	1939
Muffletone, Standard Finish	1"	1	.19	.45	.84	.87	.83	.88	.75	12"x 12"	1.83	Painted by mfr.	1938
Muffletone, Standard Finish	3/4"	1	.13	.36	.65	.62	.70	.69	.60	12"x 12"	1.62	Unpainted	1938
Muffletone, Standard Finish	1"	1	.15	.46	.75	.80	.72	.68	.70	12"x 12"	1.84	Unpainted	1938
Muffletone, Standard Finish	1"	1	.13	.44	.78	.80	.75	.82	.70	12"x 12"	-	Same as above, spray painted 3 coats at NBS.	1938
Muffletone, Travertine Finish	1"	1	.16	.45	.71	.69	.71	.70	.65	12"x 12"	1.96	Unpainted	1938

THE CELOTEX CORPORATION (Cont'd)

Material	Thick-ness	Mounting (See Page 5)	Coefficients 128	256	512	1024	2048	4096	Noise Coef.	Size of Unit Tested	Wt. (lb) sq ft	Surface	Date
Muffletone, Travertine Finish	1"	1	.16	.44	.68	.69	.69	.71	.65	12"x 12"	-	Same as above, spray painted 3 coats at NBS.	1938

CERTAIN-TEED PRODUCTS CORPORATION

Kalite, cast on 1/4" backing of moulding plaster, Grade A(Coarse)	1"	4	.06	.19	.42	.69	.74	.64	.50	24"x 36"	-	Unpainted	1936
Kalite, cast as above, Grade A(Coarse)	1 1/2"	4	.15	.34	.64	.74	.60	.69	.60	24"x 36"	-	Unpainted	1936
Kalite, cast as above, Grade A(Coarse)	2"	4	.23	.55	.73	.67	.64	.62	.65	24"x 36"	-	Unpainted	1936
Kalite, cast as above, Grade A(Coarse)	2"	4	.26	.51	.72	.69	.67	.71	.65	24"x 36"	-	Spray painted 4 coats of Muraltone paint.	1937
Kalite, cast as above, Grade D(Fine)	1"	4	.09	.30	.49	.54	.47	.48	.45	24"x 36"	-	Unpainted	1936
Kalite, cast as above, Grade D(Fine)	1 1/2"	4	.20	.39	.59	.61	.60	.67	.55	24"x 36"	-	Unpainted	1936
Kalite, cast as above, Grade D(Fine)	2"	4	.22	.48	.55	.58	.54	.53	.55	24"x 36"	-	Unpainted	1936

CORNING GLASS COMPANY

Corning Glass Mineral Wool Acoustic Blankets	1"	4	.27	.63	.75	.75	.78	.75	.75	-	.44	Covered with thin muslin.	1938
Corning Glass Mineral Wool Acoustic Blankets	2"	4	.34	.72	.87	.87	.75	.70	.80	-	.72	Same as above	1938
Corning Glass Mineral Wool Acoustic Blankets	3"	4	.39	.91	.97	.91	.82	.85	.90	-	1.07	Same as above	1938

THE FELTERS COMPANY, Inc.

Material	Thick-ness	Mounting (See Page 5)	Coefficients 128	256	512	1024	2048	4096	Noise Coef.	Size of Unit Tested	Wt. (lb) sq ft	Surface	Date
Felt	1"	4	.11	.40	.80	.84	.78	.98	.70	-	.96	No surface covering	1938

R. GUASTAVINO COMPANY

Akoustolith Tile Grade B-1	1 1/4"	5 (12"o.c.) Not nailed	.41	.83	.78	.72	.78	.82	.80	6"x 12"	5.8	Unpainted	1936
Akoustolith Tile	2"	5 (12"o.c.) Not nailed	.42	.75	.67	.75	.80	.78	.75	6"x 12"	9.4	Unpainted	1936
Akoustolith Tile Grade B-2	1"	4	.09	.17	.46	.77	.77	.58	.55	6"x 12"	4.6	Unpainted	1932
Akoustolith Tile Grade B-2	1 1/2"	4	.14	.30	.67	.87	.82	.57	.65	6"x 12"	6.1	Unpainted	1932
Akoustolith Tile Grade B-2	2"	4	.21	.50	.85	.81	.70	.70	.70	6"x 12"	8.5	Unpainted	1932
Akoustolith Tile Grade C	1 1/2"	4	.12	.19	.44	.61	.66	.56	.50	6"x 12"	7.5	Unpainted	1930
Akoustolith Tile Grade C	2"	4	.19	.26	.53	.64	.70	.56	.55	6"x 12"	10.1	Unpainted	1930
Akoustolith Tile Grade C	4"	10 Not nailed	.54	.70	.78	.85	.88	.81	.80	12"x 12"	19.5	Unpainted	1937
Akoustolith Tile Grade C	4"	4	.32	.82	.90	.77	.79	.81	.80	12"x 12"	19.5	Unpainted	1937
Akoustolith Tile Grade C	5"	4	.43	.92	.91	.88	.86	.74	.90	12"x 12"	24.4	Unpainted	1937
Akoustolith Tile Grade C	5"	10 Not nailed	.60	.80	.95	.91	.90	.78	.90	12"x 12"	24.4	Unpainted	1937
Akoustolith Tile Grade C	5"	5 Not nailed	.67	.80	.96	.93	.80	.87	.85	12"x 12"	24.4	Unpainted	1937
Akoustolith Tile Grade D	1"	4	.08	.13	.25	.54	.67	.42	.40	-	-	Unpainted	1930

R. GUASTAVINO COMPANY (Cont'd)

Material	Thick-ness	Mounting (See Page 5)	Coefficients 128	256	512	1024	2048	4096	Noise Coef.	Size of Unit Tested	Wt. (lb) sq ft	Surface	Date
Akoustolith Tile Grade D	2"	4	.15	.26	.59	.74	.52	.50	.55	-	-	Unpainted	1930
Akoustolith Tile Grade D	4"	10 Not nailed	.54	.80	.70	.88	.87	.74	.80	12"x 12"	18.8	Unpainted	1937
Akoustolith Tile Grade D	4"	4	.27	.76	.93	.78	.74	.69	.80	12"x 12"	18.8	Unpainted	1937
Akoustolith Tile Sample 104	4"	4	.40	.75	.80	.80	.75	.82	.80	18"x 40"	21.2	Unpainted	1940
HAWAIIAN CANE PRODUCTS, Ltd.													
Hawaiian Cane Tile	1"	1	.10	.40	.69	.78	.77	.79	.65	11½"x 11½"	0.75	Unpainted	1933
Hawaiian Cane Tile	1"	2	.24	.70	.40	.48	.54	.60	.55	12"x 12"	.81	Unpainted	1935
THE INSULITE COMPANY													
Acoustilite	3/4"	1	.16	.34	.79	.72	.69	.64	.65	12"x 12"	.59	Painted by mfr.	1939
Acoustilite	3/4"	2	.12	.49	.80	.85	.80	.83	.75	12"x 12"	.57	" " "	1940
Acoustilite	3/4"	2	.11	.53	.82	.82	.72	.68	.70	12"x 12"	-	Spray painted 2 coats at NBS.	1940
Acoustilite	3/4"	2	.19	.73	.67	.55	.39	.32	.60	12"x 12"	-	Spray painted 4 coats at NBS.	1940
Fiberlite	1/2"	1	.07	.20	.53	.77	.74	.74	.55	12"x 12"	.41	Painted by mfr.	1939
Fiberlite	1/2"	2	.07	.40	.72	.75	.80	.78	.65	12"x 12"	.44	Painted by mfr.	1940
JOHNS-MANVILLE SALES CORPORATION													
Air-Acoustic Sheets	1/2"	11	.14	.45	.53	.70	.67	.70	.60	18"x 24"	.80	Unpainted	1938
Air-Acoustic Sheets	1"	11	.31	.55	.70	.74	.76	.76	.70	18"x 24"	1.51	Unpainted	1938
Fibretex Type 30R	5/8"	2	.11	.20	.59	.91	.85	.72	.65	12"x 12"	1.34	Unpainted	1938*
Fibretex Type 40R	3/4"	1	.06	.17	.37	.68	.82	.74	.50	12"x 12"	1.75	Unpainted	1938*
Fibretex Type 40R	3/4"	2	.15	.22	.61	.93	.79	.69	.65	12"x 12"	1.54	Unpainted	1938*
Fibretex Type 50R	7/8"	2	.13	.28	.70	.98	.85	.87	.70	12"x 12"	1.79	Unpainted	1938*

*These values are based on tests of Acoustex manufactured by the National Gypsum Company. Fibretex is the trade name used for this material by Johns-Manville Sales Corporation.

JOHNS-MANVILLE SALES CORPORATION (Cont'd)

Material	Thickness	Mounting (See Page 5)	Coefficients 128	256	512	1024	2048	4096	Noise Coef.	Size of Unit Tested	Wt. (lb) sq ft	Surface	Date
Fibretex Type 60R	1"	1	.07	.24	.55	.87	.86	.88	.65	12"x 12"	-	Unpainted	1937*
Fibretex Type 60R	1"	2 (1"x 3" furring)	.11	.33	.77	.92	.70	.96	.70	12"x 12"	2.07	Unpainted	1936*
Nashkote A	1/2"	1	.05	.13	.25	.26	.20	.18	.20	36"x 48"	-	Painted 2 coats of oil paint.	1929
Nashkote A	1/2"	1	.08	.15	.43	.62	.65	.58	.45	36"x 48"	-	Same as above except membrane perforated with fine holes after painting.	1929
Nashkote A	3/4"	1	.09	.16	.27	.30	.23	.23	.25	36"x 48"	-	Painted 2 coats oil paint.	1929
Nashkote A	3/4"	1	.11	.21	.51	.68	.71	.68	.55	36"x 48"	-	Same as above except membrane perforated with fine holes after painting.	1929
Nashkote A	1"	1	.12	.20	.33	.33	.28	.28	.30	36"x 48"	-	Painted 2 coats oil paint.	1929
Nashkote A	1"	1	.13	.26	.58	.73	.77	.71	.60	36"x 48"	-	Same as above except membrane perforated with fine holes after painting.	1929
Permacoustic	1"	5 Not nailed	.27	.74	.66	.82	.70	.70	.75	12"x 12"	2.33	Unpainted	1938
Permacoustic	1"	1	.20	.62	.83	.74	.77	.80	.75	12"x 12"	2.33	Unpainted	1938
Sanacoustic, Rockwool pad plus Metal facing & pad supports, 1 5/8" plus furring 2 1/2		3	.18	.58	.96	.91	.82	.74	.80	12"x 24"	Pad 1.2	Perforated enameled metal surface 4608 holes per sq ft, .068" dia.	1940
Sanacoustic, same as above except every other tile was not perforated and contained no pad.		3	.15	.86	.66	.66	.49	.44	.65	12"x 24"	Pad 1.2	Enameled metal surface. Perforated pans had 4608 holes per sq ft, .068" dia.	1940

*These values are based on tests of Acoustex manufactured by the National Gypsum Company. Fibretex is the trade name used for this material by Johns-Manville Sales Corporation.

JOHNS-MANVILLE SALES CORPORATION (Cont'd)

Material	Thickness	Mounting (See Page 5)	Coefficients 128	256	512	1024	2048	4096	Noise Coef.	Size of Unit Tested	Wt. (lb) sq ft	Surface	Date
Sanacoustic, pad plus metal facing and pad supports, plus furring	1 5/8" pad 5 1/4"	8	.43	.94	.77	.82	.78	.72	.85	12"x 24"	Pad 1.2	Perforated enameled metal surface 4608 holes per sq ft, .068" dia.	1940
Sanacoustic, same as above, except every other tile was not perforated and contained no pad.		8	.54	.72	.57	.62	.50	.43	.60	12"x 24"	Pad 1.2	Enameled metal surface. Perforated pans had 4608 holes per sq ft, .068" dia.	1940
Stackoustic	3"	4	.62	.95	.88	.85	.87	.89	.90	-	1.3 plus wt. of covering.	Covered with expanded metal lath.	1939
Sound Isolation Blanket (Rockwool)	-	4	.11	.58	.85	.83	.81	.83	.75	-	1.5	Metal lath	1932
Spongecoustic	3/4"	1	.11	.26	.71	.80	.76	.71	.65	12"x 12"	1.58	Painted by mfr.	1938
Studio Element	1"	4	.16	.54	.72	.74	.71	.81	.70	22"x 36"	1.47	No covering	1937
Transite Acoustical Units	1 1/8"	4	.19	.39	.77	.74	.70	.55	.65	12"x 12"	3.0	Transite, perforated 576 holes per sq ft, dia. 5/32".	1931
DAVID E. KENNEDY, Inc.													
Kencoustex	1"	1	.12	.29	.75	.87	.71	.76	.65	12"x 12"	2.24	Unpainted	1939
Kencoustic (cork)	1 1/2"	1	.09	.16	.66	.64	.50	.62	.50	12"x 18"	.88	Painted by mfr.	1938
Kencoustic (cork) Type CB-1.5	1 1/2"	1	.03	.16	.64	.56	.44	.57	.45	18"x 36"	-	Painted by mfr.	1939
KenKoustone	1"	1	.08	.10	.31	.29	.19	.25	.20	5 1/2"x 11 1/2"	2.34	Painted by mfr.	1938
Koustex	1 1/4"	1	.13	.33	.72	.95	.77	.86	.70	12"x 12"	2.2	Painted by mfr.	1940
LUSE STEVENSON COMPANY													
Lusco Hair Felt	1"	4	.06	.27	.57	.77	.81	.88	.60	4'x 9'	-	No surface covering	1934
Absorbatone	1"	10	.40	.91	.82	.80	.78	.86	.85	12"x 24"	2.2	Unpainted	1940

Material	Thickness	Mounting (See Page 5)	Coefficients 128	256	512	1024	2048	4096	Noise Coef.	Size of Unit Tested	Wt. (lb) sq ft	Surface	Date
MAIZEWOOD PRODUCTS CORPORATION													
Maizewood Tile	1 1/2"	4	.23	.41	.63	.79	.70	.62	.65	12"x 12"	2.1	12 saw cuts across tile 1" deep.	1932
Maizewood Tile	1 1/2"	4	.21	.41	.64	.73	.70	.58	.60	12"x 12"	2.1	Same sample as above painted 1 coat glue size, 2 coats lead & oil at NBS.	1932
MINFELT INSULATION COMPANY													
Pyrocustic	13/16"	1	.10	.30	.79	.84	.86	.80	.70	12"x 12"	1.1	Unpainted	1940
Pyrocustic	13/16"	1	.11	.42	.78	.82	.70	.65	.70	12"x 12"	-	Spray painted 2 coats at NBS.	1940
NATIONAL GYPSUM COMPANY													
Acoustex Type 30R	5/8"	2	.11	.20	.59	.91	.85	.72	.65	12"x 12"	1.34	Unpainted	1938
Acoustex Type 40R	3/4"	1	.06	.17	.37	.68	.82	.74	.50	12"x 12"	1.75	Unpainted	1938
Acoustex Type 40R	3/4"	2	.15	.22	.61	.93	.79	.69	.65	12"x 12"	1.54	Unpainted	1938
Acoustex Type 50R	7/8"	2	.13	.28	.70	.98	.85	.87	.70	12"x 12"	1.79	Unpainted	1938
Acoustex Type 60R	1"	1	.07	.24	.55	.87	.86	.88	.65	12"x 12"	-	Unpainted	1937
Acoustex Type 60R	1"	2 (1"x 3" furring)	.11	.33	.77	.92	.70	.96	.70	12"x 12"	2.07	Unpainted	1936
Acoustex Type 60R	1"	1	.07	.22	.54	.87	.78	.77	.60	12"x 12"	2.31	Painted by mfr.	1939
Acoustex Type 60R	1"	1	.09	.27	.71	.92	.62	.62	.65	12"x 12"	-	Same as above, brush painted 5 coats at NBS.	1939
Acoustex Type 70R	1 1/8"	1	.12	.28	.70	.96	.84	.88	.70	12"x 12"	2.5	Unpainted	1940
Acoustex Type 70R	1 1/8"	2	.15	.37	.84	.92	.78	.80	.75	12"x 12"	2.5	Unpainted	1940
Acousti-Metal, Rockwool pad plus metal facing and pad supports, plus furring	1 5/8" 5 1/4"	8	.40	.84	.87	.93	.82	.70	.85	12"x 24"	0.98 (Pad)	Perforated enameled metal, 4608 holes per sq ft, .068" dia.	1939
Econacoustic	1/2"	1	.09	.21	.66	.73	.72	.86	.60	12"x 12"	0.48	Unpainted	1940
Econacoustic	1/2"	2	.08	.45	.67	.62	.66	.78	.60	12"x 12"	0.48	Unpainted	1940
Econacoustic	1"	1	.14	.51	.78	.78	.78	.82	.70	12"x 12"	0.71	Unpainted	1939
Econacoustic	1"	1	.19	.48	.78	.74	.75	.80	.70	12"x 12"	-	Same as above, except spray painted 3 coats.	1939

Material	Thick-ness	Mounting (See Page 5)	Coefficients 128	256	512	1024	2048	4096	Noise Coef.	Size of Unit Tested	Wt. (lb) sq ft	Surface	Date
NATIONAL GYPSUM COMPANY (Cont'd)													
Econacoustic	1"	1	.18	.50	.79	.74	.71	.67	.70	12"x 12"	-	Same as above, except spray painted 7 coats.	1939
Travacoustic	1"	1	.11	.44	.82	.83	.77	.77	.70	12"x 12"	2.04	Unpainted	1940
THE SPHINX ACOUSTICAL COMPANY													
Sphinxstone	2"	4	.10	.33	.78	.87	.71	.70	.65	13"x 24"	-	Unpainted	1932
UNITED CORK COMPANIES													
Acoustical Cork "B"	1 1/2"	2	.09	.57	.37	.33	.29	.41	.40	12"x 12"	.94	Unpainted	1939
UNITED STATES GYPSUM COMPANY													
Acoustone Type D	9/16"	1	.09	.19	.62	.80	.78	.74	.60	12"x 12"	1.09	Unpainted	1939
Acoustone Type D	11/16"	1	.07	.24	.68	.82	.76	.73	.65	12"x 12"	1.30	Unpainted	1939
Acoustone Type D	13/16"	1	.11	.38	.79	.81	.77	.82	.70	12"x 12"	1.40	Unpainted	1939
Acoustone Type D	15/16"	1	.11	.46	.85	.85	.92	.87	.75	12"x 12"	1.48	Unpainted	1940
Acoustone Type F	9/16"	1	.07	.17	.56	.88	.82	.83	.60	12"x 12"	.88	Unpainted	1940
Acoustone Type F	11/16"	1	.09	.22	.67	.84	.78	.80	.65	12"x 12"	1.15	Unpainted	1940
Acoustone Type F	13/16"	1	.09	.34	.82	.91	.81	.86	.70	12"x 12"	1.24	Unpainted	1940
Acoustone Type F	15/16"	1	.10	.39	.83	.88	.81	.82	.75	12"x 12"	1.46	Unpainted	1940
Acoustone Type F	9/16"	1	.07	.19	.60	.85	.84	.78	.60	12"x 12"	.97	Mill painted	1940
Acoustone Type F	11/16"	1	.07	.22	.75	.92	.82	.81	.70	12"x 12"	1.13	Mill painted	1940
Acoustone Type F	13/16"	1	.14	.31	.86	.87	.78	.77	.70	12"x 12"	1.33	Mill painted	1940
Acoustone Type F	15/16"	1	.20	.48	.92	.87	.84	.78	.80	12"x 12"	1.54	Mill painted	1940
Acoustone Type F	13/16"	8	.34	.75	.71	.72	.79	.77	.75	12"x 12"	1.31	Mill painted	1940
Perfatone, Rockwool pad plus metal facing and pad supports, plus furring	1 5/8"	8	.48	.79	.80	.90	.87	.71	.85	12"x 24"	.93 Pad	Perforated enameled metal, 4608 holes per sq ft, .073" dia.	1939
Quietone	1/2"	1	.10	.22	.56	.69	.66	.69	.55	12"x 12"	0.47	Unpainted, sand finish	1939
Quietone	1"	4	.06	.47	.76	.74	.72	.76	.65	12"x 12"	0.81	Unpainted, brush finish	1932
Thermofil	3"	4	.43	.39	.66	.78	.81	.93	.65	-	-	No surface covering	1932

WOOD CONVERSION COMPANY

Material	Thickness	Mounting (See Page 5)	Coefficients 128	256	512	1024	2048	4096	Noise Coef.	Size of Unit Tested	Wt. (lb) sq ft	Surface	Date
Balsam Wool	1"	4	.18	.36	.55	.65	.67	-	.55	-	.29	Scrim facing	1928
Krexstone Tile (Balsam Wool)	1"	6	.12	.24	.62	.73	.73	.78	.60	12"x 12"	0.83	Screen wire	1931
Nuwood Bevel Lap Tile	1/2"	6	.12	.19	.30	.40	.40	.51	.30	12"x 12"	0.69	Unpainted	1931
Nuwood Bevel Lap Tile	1"	6	.14	.19	.37	.37	.41	.56	.35	12"x 12"	1.41	Unpainted	1931

Table 2

Acoustic Materials for Plastic Application

Unless otherwise stated each sample of acoustical plaster was mixed according to the specifications furnished by the manufacturers and applied by a skilled plasterer on a false ceiling at the N.B. of S. All samples of material applied with an air gun or blower were constructed at the N.B. of S. unless otherwise stated. The panels were laid on the floor of the Reverberation Chamber for test.

Material	Thick-ness	Coefficients 128	256	512	1024	2048	4096	Noise Coef.	No.of Coats	Base Coat	Application	Surface Treatment	Date
CALIFORNIA STUCCO PRODUCTS OF NEW ENGLAND, Inc.													
Stucoustic Type A.D.	3/4"	.18	.36	.65	.65	.62	.62	.55	1st coat 7/16" 2nd coat 5/16"	3/4" Gypsum plaster.	1st coat applied to half green base coat. 2nd coat applied 3 hours after 1st coat.	Finished with steel trowel.	1935
Stucoustic	1/2"	.12	.29	.52	.78	.74	.74	.60	1st coat 1/4" 2nd coat 1/4"	3/4" Gypsum plaster	1st coat applied to dry base coat. 2nd coat applied 24 hours after 1st coat.	Finished with steel trowel.	1939
THE CELOTEX CORPORATION													
Reverbolite (Regular)	1/2"	.19	.29	.51	.70	.69	.78	.55	1st coat 1/4" 2nd coat 1/4"	3/4" Gypsum plaster on metal lath.	1st coat applied on dry base coat, 2nd coat applied as soon as first coat had set.	Finished with steel trowel.	1938
Reverbolite (Pumice aggregate)	1/2"	.18	.29	.41	.51	.55	.65	.45	1st coat 1/4" 2nd coat 1/4"	3/4" Gypsum plaster on metal lath	1st coat applied on dry base coat. 2nd coat applied 24 hours after 1st coat.	Brushed with rice root brush then finished with steel trowel.	1938

CERTAIN-TEED PRODUCTS CORPORATION

Material	Thickness	Coefficients 128	256	512	1024	2048	4096	Noise Coef.	No.of Coats	Base Coat	Application	Surface Treatment	Date
Kalite H Coarse Aggregate	1/2"	.36	.33	.45	.70	.66	.68	.55	1st coat 3/8" 2nd coat 1/8"	3/4" Gypsum plaster on metal lath, attached to 1"channels.	1st coat applied to dry base coat, 2nd coat applied 1 hour after 1st coat.	Finished with steel trowel.	1935
Kalite H Coarse Aggregate	1/2"	.26	.31	.46	.67	.65	.68	.50	1st coat 3/8" 2nd coat 1/8"	Same sample as above		Brush painted 2 coats non-bridging lacquer.	1936
Kalite H Coarse Aggregate	3/4"	.43	.38	.63	.78	.65	.70	.60	1st coat 5/8" 2nd coat 1/8"	3/4" Gypsum plaster on metal lath, attached to 1"channels.	1st coat applied to dry base coat. 2nd coat applied 1 hour after 1st coat.	Finished with steel trowel.	1935

CLEVELAND GYPSUM SUPPLY COMPANY

Material	Thickness	Coefficients 128	256	512	1024	2048	4096	Noise Coef.	No.of Coats	Base Coat	Application	Surface Treatment	Date
Hushkote Acoustic Plaster	1/2"	.13	.24	.45	.71	.56	.49	.50	1st coat 1/4" 2nd coat 1/4"	3/4" Gypsum plaster on metal lath.	1st coat applied to dry base coat. 2nd coat applied 24 hrs.after 1st coat.	Finished with steel trowel.	1935
Hushkote Acoustic Plaster	5/8"	.16	.34	.50	.53	.43	.37	.45	1st coat 3/8" 2nd coat 1/4"	3/4" Gypsum plaster on metal lath.	1st coat applied to dry base coat. 2nd coat applied 24 hrs.after 1st coat.	Finished with steel trowel.	1937
Hushkote Acoustic Plaster	3/4"	.28	.36	.45	.50	.53	.57	.45	1st coat 1/4" 2nd coat 1/4" 3rd coat 1/4"	3/4" Gypsum plaster on metal lath.	1st coat applied to dry base coat. 2nd coat applied 5 days after 1st coat. 3rd coat applied 3 days after 2nd coat.	Finished with steel trowel.	1938

Material	Thickness	Coefficients 128	256	512	1024	2048	4096	Noise Coef.	No. of Coats	Base Coat	Application	Surface Treatment	Date
THE DODSON MANUFACTURING COMPANY													
Dodson Acoustic Plaster	3/4"	.15	.25	.30	.35	.34	.26	.40	1st coat 1/2" 2nd coat 1/4"	1/4" gypsum plaster on metal lath.	1st coat applied to half green base coat. 2nd coat applied as soon as 1st coat had taken initial set.	Finished with cork float and stippled to break surface film.	1939
R. GUASTAVINO COMPANY													
Akoustolith Plaster	1/4"	.13	21	.19	.23	.33	.45	.25	1 coat	Gypsum plaster.	Applied on binder coat. See mfg. directions.	Floated	1931
Akoustolith Plaster	3/4"	.20	.26	.35	.56	.59	.50	.45	1 coat	Gypsum plaster.	Applied on binder coat. See mfg. directions.	Floated	1932
GYPSUM INSULATION AND MANUFACTURING COMPANY													
Super-Acoustic Plaster	1/2"	.12	.24	.45	.71	.62	.63	.50	1st coat 1/4" 2nd coat 1/4"	3/4" Gypsum plaster on metal lath	1st coat applied to dry base coat. 2nd coat applied 24 hours after first coat.	Finished with cork float.	1938
HOLLYWOOD STUCCO PRODUCTS													
Acoustic Plaster	1/2"	.10	.22	.42	.78	.78	.70	.55	1st coat 1/2" 2nd coat 1/4"	3/4" Gypsum plaster on metal lath.	1st coat applied to dry base coat, 2nd coat applied 24 hrs. after 1st coat.	Finished with cork float.	1939

KEASBEY AND MATTISON COMPANY

Material	Thick-ness	Coefficients 128	256	512	1024	2048	4096	Noise Coef.	Application	Surface Treatment	Date
Limpet (Sprayed Asbestos)	1/2"	.25	.78	.97	.81	.82	.85	.85	Applied with air gun on metal lath, 5 7/8" air space back of Limpet.	Finished with roller, unpainted.	1941
Limpet (Sprayed Asbestos)	1/2"	.27	.75	.90	.75	.80	.88	.80	Same as above	Same as above except spray painted 2 coats at NBS.	1941
Limpet (Sprayed Asbestos)	3/4"	.41	.88	.90	.88	.91	.81	.90	Same as above	Finished with roller, unpainted.	1941
Limpet (Sprayed Asbestos)	3/4"	.49	.90	.93	.86	.81	.82	.90	Same as above	Same as above except spray painted 2 coats at NBS.	1941
Limpet (Sprayed Asbestos)	3/4"	.48	.91	.91	.86	.87	.87	.90	Same as above	Same as above except spray painted 10 coats at NBS	1941
Limpet (Sprayed Asbestos)	3/4"	.08	.19	.70	.89	.95	.85	.70	Applied with air gun on gypsum wall board	Finished with roller, unpainted.	1941
Limpet (Sprayed Asbestos)	3/4"	.09	.23	.67	.90	.93	.87	.70	Same as above	Same as above except spray painted 2 coats at NBS.	1941
Limpet (Sprayed Asbestos)	1½"	.16	.59	.98	.98	.97	.90	.90	Same as above	Finished with roller, unpainted.	1941
Limpet (Sprayed Asbestos)	1½"	.16	.62	.94	.98	.94	.91	.85	Same as above	Same as above except spray painted 2 coats at NBS.	1941

NATIONAL GYPSUM COMPANY

Material	Thick-ness	Coefficients 128	256	512	1024	2048	4096	Noise Coef.	No.of Coats	Base Coat	Application	Surface Treatment	
Macoustic Plaster (Trowel Finish)	1/2"	.15	.27	.42	.45	.36	.29	.40	1st coat 1/4" 2nd coat 1/4"	3/4" Gypsum plaster on metal lath.	1st coat applied to half green base coat. 2nd coat applied 2 hours after 1st coat.	Finished with steel trowel.	1936
Macoustic Plaster (Trowel Finish)	1/2"	.17	.27	.52	.76	.56	.55	.55	1st coat 1/4" 2nd coat 1/4"	3/4" Gypsum plaster on metal lath.	1st coat applied to dry base coat. 2nd coat applied 24 hours after 1st coat.	Finished with steel trowel.	1937
Macoustic Plaster (Trowel Finish)	3/4"	.25	.41	.67	.63	.52	.47	.55	1st coat 3/8" 2nd coat 3/8"	3/4" Gypsum plaster on metal lath.	1st coat applied to dry base coat. 2nd coat applied 24 hrs. after 1st coat.	Finished with steel trowel.	1937
Rockwall Acoustic Plaster	1/2"	.31	.36	.39	.42	.44	.41	.40	1st coat 1/4" 2nd coat 1/4"	3/4" Gypsum plaster on metal lath, attached to 1"channels.	1st coat applied to dry base coat. 2nd coat applied 24 hrs. after 1st coat.	Finished with cork float.	1938
Rockwall Acoustic Plaster	1/2"	.13	.20	.35	.65	.70	.64	.50	1st coat 1/4" 2nd coat 1/4"	3/4" Gypsum plaster on metal lath.	1st coat applied to dry base coat. 2nd coat applied 3 hrs. after 1st coat.	Finished with steel trowel.	1935

Material	Thickness	Coefficients 128	256	512	1024	2048	4096	Noise Coef.	No. of Coats	Base Coat	Application	Surface Treatment	Date
NEWARK PLASTER COMPANY													
Old Newark Acoustic Plaster	1/2"	.13	.21	.42	.70	.67	.69	.50	1st coat 1/4" 2nd coat 1/4"	3/4" Gypsum plaster on metal lath.	1st coat applied to dry base coat. 2nd coat applied 24 hrs. after 1st coat.	Finished with steel trowel.	1938
Old Newark Acoustic Plaster	3/4"	.16	.34	.63	.74	.73	.72	.60	1st coat 1/4" 2nd coat 1/4" 3rd coat 1/4"	3/4" Gypsum plaster on metal lath.	1st coat applied to dry base coat. 2nd coat applied 24 hrs. after 1st coat. 3rd coat applied 24 hrs. after 2nd coat.	Finished with steel trowel.	1938
PACIFIC PORTLAND CEMENT CO.													
Calacoustic Plaster	1/2"	.15	.28	.44	.67	.66	.66	.50	1st coat 1/4" 2nd coat 1/4"	3/4" Gypsum plaster on metal lath.	1st coat applied to dry base coat. 2nd coat applied 72 hrs. after 1st coat.	Finished with cork float.	1936
SPRAYO-FLAKE COMPANY													
Spray-Acoustic Type X	5/8"	.59	.87	.85	.88	.94	.83	.90			Applied with an air gun on metal lath. 3 5/8" air space back of material.	Finished with a roller. Surface sprayed with coat of binder.	1940
Spray-Acoustic Type X	5/8"	.65	.79	.80	.70	.83	.60	.80			Same as above.	Same as above except brush painted 4 coats at NBS.	1940
Spray-Acoustic Type X	1 1/8"	.18	.52	.95	.93	.91	.87	.85			Applied with an air gun on gypsum wall board.	Finished with a roller. Surface sprayed with coat of binder.	1940
Spray-Acoustic Type X	1 1/8"	.15	.47	.88	.92	.87	.88	.80			Same as above.	Same as above, except spray painted 3 coats at NBS.	1940

UNITED STATES GYPSUM COMPANY

Material	Thick-ness	128	256	512	1024	2048	4096	Noise Coef.	No.of Coats	Base Coat	Application	Surface Treatment	Date
Sabinite Plaster Hydraulic	1/2"	.14	.24	.27	.38	.48	.64	.35	1st coat 1/4" 2nd coat 1/4"	Gypsum plaster.	1st coat applied to dry base coat. 2nd coat applied after 1st coat had set and partly dried.	Floated with cork float.	1931
Sabinite Plaster A	1/2"	.16	.24	.38	.78	.75	.77	.55	1st coat 1/4" 2nd coat 1/4"	Gypsum plaster.	1st coat applied to dry base coat. 2nd coat applied 24 hrs. after 1st coat.	Floated with cork float.	1935
Sabinite Plaster A	3/4"	.13	.27	.59	.81	.74	.85	.60	1st coat 1/4" 2nd coat 1/4" 3rd coat 1/4"	3/4" Gypsum plaster on metal lath.	1st coat applied on dry base coat. 2nd coat applied 48 hrs. after 1st coat. 3rd coat applied 72 hrs. after 2nd coat.	Floated with cork float.	1935
Sabinite Plaster F	1/2"	.19	.22	.43	.80	.75	.75	.55	1st coat 1/4" 2nd coat 1/4"	3/4" Gypsum plaster on metal lath.	1st coat applied on dry base coat. 2nd coat applied 48 hrs. after 1st coat.	Floated with cork float.	1936

Table 3

Audience seated in chairs of various types

A - cane seat chairs, open back
B - theatre chairs, box spring seat, heavily padded back
C - same as B, but single layer of padding on back
D - church pews, seating five

Absorption per person *

		128	256	512	1024	2048	Date
Women without coats,	A	0.7	1.3	2.3	3.6	4.6	1930
Women with coats,	A	1.3	2.4	4.0	5.8	6.7	1930
Men without overcoats,	A	1.3	2.1	4.1	5.5	7.4	1930
Men with overcoats,	A	2.3	3.2	4.8	6.2	7.6	1930
Mixed audience,	B			3.9	4.7		1929
Empty seat,	B		3.4	3.0	3.3	3.6	1929
Mixed audience,	C		3.5	4.1	4.9	4.2	1930
Empty seat,	C		3.0	2.5	2.9	3.1	1929
Mixed audience,	D		2.7	3.3	3.8	3.6	1930
Plywood chair,			0.2	0.3	0.5	0.5	1930

* These figures are numerically equal to the number of square feet of a material having an absorption coefficient of 1.00, which would absorb the same amount of sound energy.

Suggestions Concerning the Proper Use of Acoustical Material.

As there has been considerable misconception as to the proper use of acoustical material it is considered desirable to call attention to two of the fundamental principles underlying the formulas which are used in acoustical design. It is assumed in all of the formulas that (1) the absorption is proportional to the area of the absorbing material and that (2) there is a uniform distribution of sound energy. As a rule neither one of these assumptions is true.

It has been found from experiment when very small areas are used, such as the panels in a coffered ceiling having areas from 1 to 4 square feet and separated from each other by a foot or more, that the effective absorption of the material in these panels is greater than when the material is installed in one large area. In fact, for materials having large coefficients, this effective absorption may be as much as 50 percent more than one would expect from the coefficient.

It has also been found when all of the acoustical material is applied on one surface of a relatively small room, say 50,000 cubic feet or under, that this creates a non-uniform distribution of sound energy in the following manner. Let us assume that the ceiling of a room is covered with a highly absorbent material. Under these conditions the sound energy which is traveling between the floor and ceiling is absorbed quite rapidly, while that traveling between the untreated wall surfaces, having very little to absorb it, may continue for some considerable time. This persistence of sound energy between the untreated surfaces may cause the measured reverberation time to be considerably longer than would be computed using the ordinary reverberation formula and the coefficient usually given. For this reason, it is essential in small rooms that the acoustical material be distributed on the side walls as well as on the ceiling, if the effective absorption of the material is to be anywhere near that which one would expect from the coefficient of the material. For further discussion of this problem see Circular C418.

We also wish to call attention to the fact that a proper distribution of the acoustical material should be worked out in the initial plans of a building, as it is frequently impossible to obtain a satisfactory distribution after the interior design has been completed without taking into account the acoustical treatment.