Acoustical Material for Less Noise and Better Hearing

CELOTEX ACOUSTICAL PRODUCTS



THE CELOTEX CORPORATION

Chicago · Illinois

THE CELOTEX CORPORATION

919 NORTH MICHIGAN AVENUE, CHICAGO, ILLINOIS

ACOUSTICAL DEPARTMENT

Member of

BACKGROUND — The Celotex Corporation is the world's largest manufacturer and distributor of acoustical materials. This immense practical field experience in thousands of installations in all types of buildings correlated with the activities of an able Research Engineering Department keeps Celotex Acoustical Service up-to-date and valuable to architects.

PRODUCTS—The Celotex Corporation offers not one but a choice of several distinct types of acoustical material of widely varying characteristics in more than 200 individual items as to size and finish. This selection has been made available in order to provide architects with latitude in esthetic expression as well as in absorption efficiencies and methods of application.

They include and comply with every requirement of decorative effect, weight, texture, light reflection, fire-law requirements, maintenance and other problems.

SALES ENGINEERING AND APPLICATION SERVICE —In every part of the United States there is an exclusive distributor for Celotex Acoustical Products.

These independently owned and operated distributors provide readily accessible and prompt service to architects in the form of acoustical analyses and recommendations with assistance always available from the Headquarters and Field staff of the Celotex Acoustical Department. Competent, dependable information regarding all Celotex Acoustical Products, their proper application and estimates of cost, etc., is promptly supplied. By this policy architects are assured of definite and continuing responsibility of satisfactory results.

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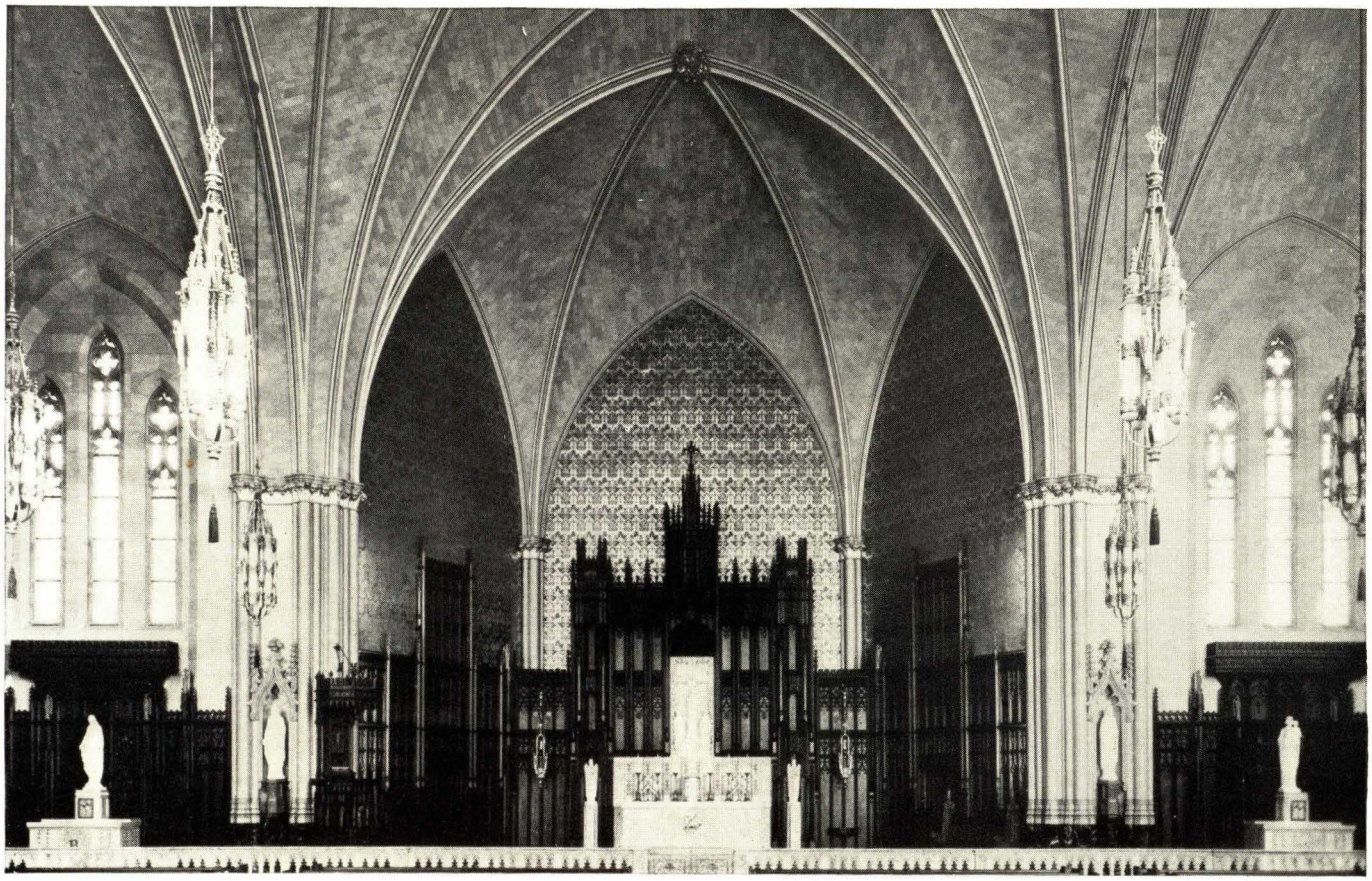
ACOUSTI-CELOTEX
Bar, Waldorf Astoria Hotel, New York City



ACOUSTI-CELOTEX
Washburn Crosby Company, Chicago, Ill.



St. Sabina's Catholic Church, Chicago, Illinois, used Calicel on vaulted ceiling. Architect: Joseph J. McCarthy, Chicago, Ill.

THE ACOUSTICAL PROBLEM

NOISE ABSORPTION—Celotex, more than any other manufacturer, has taken the mystery out of Acoustics. Acoustical correction is a rational engineering science. Celotex acoustical materials are finished product units as they leave the factory and will uniformly provide absorption in accordance with their advertised coeficients.

Noise has been defined as unwanted sound. For the elimination of unwanted sound, Celotex Acoustical Products admirably serve, whether the problem be a cathedral, a hospital, a broadcasting studio, an office, or a restaurant.

Obviously from an acoustical engineering standpoint, there are wide differences between problems in auditoria. The absorption characteristics of the acoustical material, the area to be installed and the location of the material deserve consideration as well as the specific use to which the room is to be put. For example, if two identical auditoria are to be built, one for a Roman Catholic congregation and the other for Christian Scientists, the acoustical recommendations should not be the same, because of the difference in the nature of the services.

In offices, hospitals, and restaurants where acoustical treatment is to be used for sound quieting, the competent acoustical engineer will determine at what point the law of diminishing returns makes further expenditure economically unsound.

In the selection of acoustical material to be used, 25 years of experience proves that many other factors besides absorption efficiency are worthy of the architect's consideration. These include:

Maintenance and Light Reflection—The cost and effect on absorption of conventional methods for renovating wall and ceiling surfaces.

Moisture Resistance—The effect on the acoustical material of continual high humidities as in swimming pools.

Conductivity—Important where the acoustical material is applied on the underside of a roof deck.

Rodent and Vermin Resistance—Particularly important in hospitals and restaurant kitchens, etc.

Resistance to Impact and Abrasion—Important in gymnasia and wherever acoustical material is applied on traffic-bearing wall areas.

COMMON USES—The list of places where acoustical material is used is practically limitless. The following is a partial check list of installations where it is most commonly used:

Business Offices	Churches
Banks	Courtrooms
Educational Institutions	Restaurants
Hospitals	Libraries
Theatres	Transportation Terminals
Hotels	Department Stores

Radio Broadcasting Studios

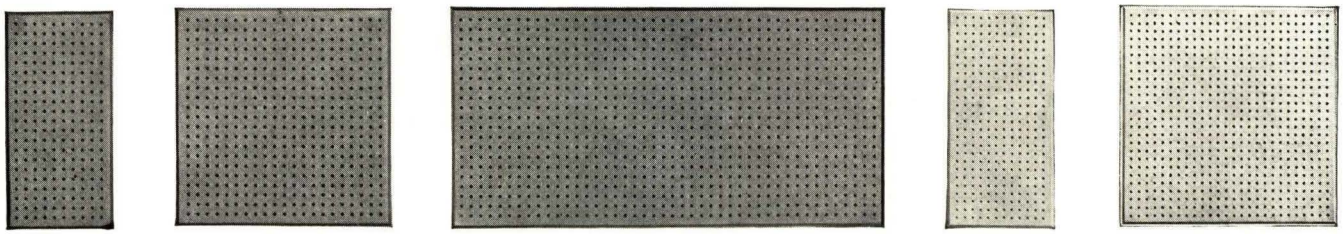
ACOUSTI-CELOTEX

DESCRIPTION—Acousti-Celotex is a light, rigid acoustical tile combining extraordinary sound absorbing efficiency with a durable, smooth finished surface. The face of Acousti-Celotex is perforated to within ⅛ inch of the back of the tile. These perforations (patented) of definite diameter, depth, and spacing act as channels which allow the sound waves ready access to the porous interior of the tile where sound absorption takes place. There are two types of Acousti-Celotex—C—Series (Acousti-Celotex Cane Tile) and M—Series (Acousti-Celotex Mineral Tile), each available in several thicknesses.

PAINTABILITY—The perforations in Acousti-Celotex permit repeated painting with any kind of paint without affecting the sound absorbing efficiency. Paint does not seal the openings to the tubular channels through which the sound waves enter the porous block and are absorbed. This important feature is especially valuable in installations in offices, hospitals, schools, restaurants, etc., where renewable light reflection is of paramount importance.

MOISTURE RESISTANCE—Integrally waterproofed during manufacture, Acousti-Celotex is highly moisture resistant. It is *not* recommended for use in rooms where continual excessive humidity exists.

RODENT, VERMIN RESISTANCE—Acousti-Celotex contains no food for rats, mice and other rodents or vermin.



6" x 12" | 12" x 12" | 12" x 24" — Cane Tile

6" x 12" | 12" x 12" — Mineral Tile

CANE TILE C—SERIES

Manufactured from a base of bagasse (the long, tough fibers of sugar cane), Acousti-Celotex Cane Tile has a thin face of high density material laminated to a back of highly absorbent fiber structure. It is perforated with 441 holes per square foot. The patented Ferox Process, used on all Celotex Cane Products, makes the material proof against termites and dry rot.

SIZES—Cane Tile comes in standard 6 x 12, 12 x 12, and 12 x 24 inch sizes. Special sizes available at additional cost. For specific data see table below.

FINISHES—Acousti-Celotex Cane Tile is made in two finishes—RI (Rolled Ivory) and VHR (Varnished and Hot Rolled). RI is a smooth, light-colored surface affording good light reflection and an attractive appearance. Paint may be applied over RI without sizing.

VHR, somewhat harder and smoother than RI is a dark brown color and is especially suited as a base for high quality paint finish.

Optional paint finishes over both are available.

For light reflection qualities of these two basic finishes and variations thereof, see table below.

CONDUCTIVITY—Acousti-Celotex Cane Tile has a thermal value of 0.33 B.t.u. per hour, per square foot, per degree F., per inch thickness.

MINERAL TILE M—SERIES

DESCRIPTION—Made of mineral aggregate pressed with a binder to form a rigid incombustible tile, Acousti-Celotex Mineral Tile is perforated with 676 holes per square foot. It is universally rated as incombustible.

SIZES—Mineral Tile is manufactured in standard 6 x 12 and 12 x 12 inch sizes. Special sizes available at additional cost. For specific data see table below.

FINISHES—Mineral Tile comes in two standard finishes (1) WA (White Asbestos), a smooth, light-reflecting surface, and (2) with flat paint or enamel.

CONDUCTIVITY—Acousti-Celotex Mineral Tile has a thermal value of 0.35 B.t.u. per hour, per square foot, per degree F., per inch thickness.

TYPES OF ACOUSTI-CELOTEX

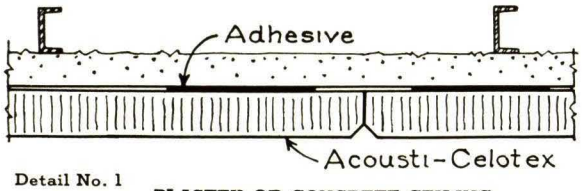
Type		Thickness (Inches)	Diam. of Perforations (Inches)	Weight Per Sq. Ft. (Pounds)
CANE TILE - - -	C1	½	3/16	0.84
	C2	5/8	3/16	0.97
	C3	13/16	3/16	1.03
	C4	1¼	3/16	1.50
	C5	13/16	¼	0.95
	C6	1¼	¼	1.37
MINERAL TILE	M1	5/8	5/32	1.43
	M2	1	5/32	2.12

LIGHT REFLECTION FACTORS*

CANE TILE Finish	Diameter of Perforations 1/4"	3/16"
Natural, Sanded	.29	.31
RI (Rolled Ivory)	.48	.56
RI plus one coat flat white	.71	.74
RI plus one coat cream white		.72
VHR (Varnish Hot Rolled) plus 2 coats white	.71	.76
VHR plus 2 coats cream white		.74
VHR plus white enamel	.69	.74
VHR plus cream white enamel		.73

By authority of Curtis Lighting, Inc.

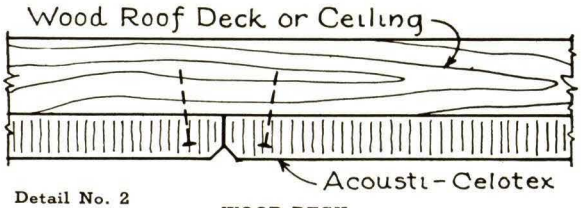
INSTALLATION DETAILS



Detail No. 1

PLASTER OR CONCRETE CEILING

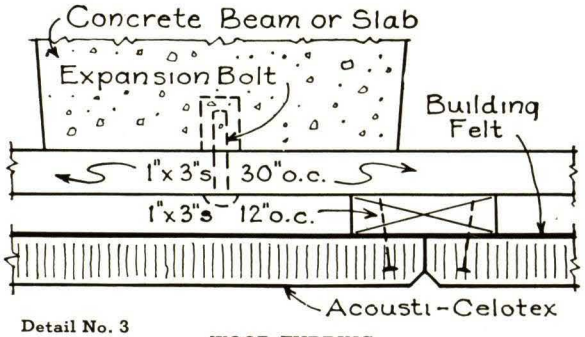
On plaster ceilings Acousti-Celotex is usually cemented (using an approved adhesive) and nailed directly to the plaster. If desired, Acousti-Celotex may be applied with a heavy bodied adhesive alone to plaster or flat concrete surfaces.



Detail No. 2

WOOD DECK

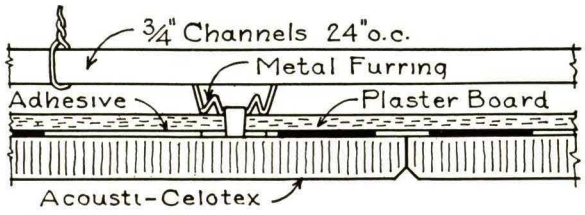
On ceilings of wood, as churches or gymnasiums having an exposed wood roof deck, Acousti-Celotex is nailed directly to deck.



Detail No. 3

WOOD FURRING

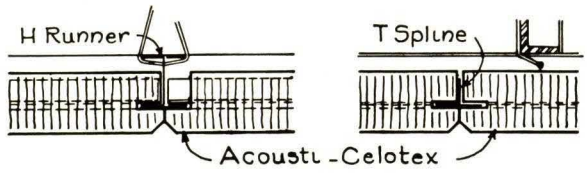
On concrete surfaces or surfaces where it is desired to fur down. 1 x 3-inch wood furring strips may be attached to the concrete with expansion plugs, and Acousti-Celotex is nailed to the furring strips. Ordinarily, a first course of strips 30 inches o.c. is used, to which is nailed a second course 12 inch o.c. to receive 12 x 12-inch tiles. A backing of building felt is used directly behind Acousti-Celotex to prevent "breathing" between joints.



Detail No. 5

PLASTER BOARD CEILING

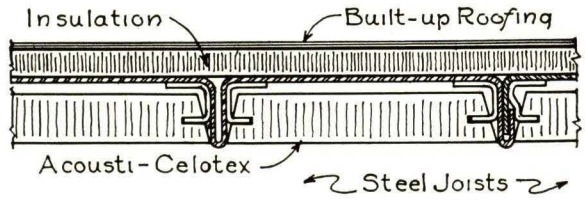
Where a suspended ceiling of lighter and cheaper construction than metal lath and plaster is desired. Acousti-Celotex may be directly fastened to gypsum board held by special suspended plaster board systems. The metal furring should not be spaced greater than 16 inches O. C.



Detail No. 6

METAL SUSPENSION—CANE TILE

Where it is desired to use the Acousti-Celotex as the suspended ceiling by itself, the Celotex metal suspension system may be used, as shown above. Details of this type of construction are available on request.



Detail No. 7

STEEL DECK

Acousti-Celotex Cane Fibre Tile may also be used in combination with steel roof decks to give a combined acoustical ceiling and steel roof deck having high heat insulating qualities. The Acousti-Celotex C-Series has the same heat insulating value as an equal thickness of Celotex. The Acousti-Celotex is cut to fit the steel deck, and fabricated before erection.

SOUND ABSORPTION COEFFICIENTS

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Material	Thickness	Coefficients 128	256	512	1024	2048	Noise Red.Coef.	Surface
ACOUSTI-CELOTEX CANE TILE								
Type C1*	½"	.24	.27	.48	.57	.59	.50	Painted by mfr. with oil-base paint. Perforated 441 holes per sq. ft. 3/16" diam. 3/8" deep.
Type C1†	½"	.36	.58	.51	.52	.62	.55	Same as above.
Type C2*	5/8"	.19	.20	.69	.85	.65	.60	Painted same as above. Perforated same as above ½" deep.
Type C2†	5/8"	.40	.59	.68	.81	.66	.70	Same as above.
Type C3*	13/16"	.25	.27	.76	.88	.60	.65	Painted same as above. Perforated same as above 11/16" deep.
Type C4*	1¼"	.37	.43	.98	.79	.57	.70	Painted same as above. Perforated same as above 1-1/16" deep.
Type C5*	13/16"	.14	.35	.63	.83	.90	.70	Unpainted. Perforated 441 holes per sq. ft. ¼" diam. 5/8" deep.
Type C6*	1¼"	.19	.41	.91	.92	.92	.80	Unpainted. Perforated same as above 1" deep.
ACOUSTI-CELOTEX MINERAL TILE								
Type M1*	5/8	.17	.29	.58	.82	.82	.65	Unpainted. Perforated 676 holes per sq. ft. 5/32" diam. ½" deep.
Type M1*	5/8"	.14	.24	.58	.93	.83	.65	Painted with oil-base paint. Perforated same as above.
Type M2*	1"	.15	.34	.88	.95	.77	.75	Same as above.

**Cemented to plaster board, considered equivalent to cementing to plaster or concrete ceiling.*

†Nailed to 1 x 2 in. wood furring 12 in. o.c. unless otherwise indicated.

The noise reduction coefficient is the average of the coefficients at frequencies from 256 to 2048 cycles inclusive, given to the nearest 5%. This average coefficient is recommended for use in comparing materials for noise quieting purposes as in offices, hospitals, banks, corridors, etc.

For auditorium treatment, attention should be directed to the coefficients at 512 cycles.

CALICEL PRODUCTS



New York Central Passenger Station, Syracuse, N. Y.
Entire ceiling and frieze of Calicel Acoustical Castone

DESCRIPTION — Calicel Acoustical Products — Calicel, Calistone, and Calicel Acoustical Castone—possess the characteristics that have made stone the traditional material for finishing monumental interiors, combining with these characteristics the softening hush of a cushion—sound absorption.

Calicel, basically, is a highly expanded stone. A cellular mineral, it is formed at temperatures in excess of 2,000 degrees F., the molten mass being expanded 10 to 40 volumes during cooling, resulting in a hard porous stone, somewhat comparable in structure to a petrified sponge. Subsequent refining produces finished Calicel, which serves as an aggregate for all Calicel Acoustical Materials—Calicel Tile, Calistone, and Calicel Acoustical Castone.

Calicel aggregate is graded for size and color, making possible a wide choice of natural colors and textures in the finished product.

In Calicel Tile, the aggregate is thoroughly mixed with a mineral binder, then moulded with hydraulic presses, after which it is kiln cured.

Calistone is made of selected Calicel aggregates mixed with certain Portland cements, moulded with hydraulic presses and cured in kilns under steam pressure. The resultant stone has the appearance as well as abrasive and wearing strength of natural stone, yet possesses high acoustical value.

In differentiating between Calicel and Calistone, remember the superior abrasive and wearing strength of Calistone and its superior moisture-resistant qualities, due to the Portland cement binder, which make it ideal for such conditions as swimming pools.

Calicel Acoustical Castone is made, under arrangements with Celotex, by Jacobson and Company, Inc., New York City, nationally known fabricators of cast plaster and interior stone ornaments, and answers the need for acoustical treatment in buildings and rooms demanding rich ornamentation. It is ideal for the formation of intricate



Standard Type



Italian Type



Tapestry Type

CALICEL PRODUCTS — CONTINUED

coffers and elaborate friezes, panels, and mouldings. The detail is cast with unusual sharpness.

SIZE—Calicel Tile are made ¾ and 1 in. thick and in standard sizes, 6 x 12 in., 12 x 12 in., and 8 x 16 in. Special sizes can also be provided.

FINISHES—

Calicel Tile—The natural finish is a light buff color of fine texture. This is the standard type and it is available, where higher light reflection is desired, with a factory-applied lacquer finish.

Calicel—Italian Type—This is made of the same fine texture as Standard Type Calicel Tile but contains a sprinkling of dark colored Calicel particles, effective for contrast.

Calicel—Tapestry Type—This resembles the Italian Type in color combination but the surface is coarser in texture.

Calistone—In Calistone the limitations are no greater than that of natural stone—texture and color can be matched.

APPLICATION—Calicel and Calistone may be applied either by cementing with approved acoustical tile adhesives against plaster or masonry or may be mechanically attached by means of a metal suspension system. Where Calistone is used to simulate natural stone, it may be erected in the same manner as stone or marble.

In certain types of construction of a monumental nature, it is desirable in the interests of permanence to install structural masonry arch or domed ceilings. Calistone, in varying thicknesses and sizes, when used in conjunction with terra cotta rough tile, makes the ideal construction. The thickness of the Calistone can be varied to provide the amount of absorption required for proper acoustical correction.

SOUND ABSORPTION COEFFICIENTS

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Material Thickness	Coefficients					Noise Red. Coef.
	128	256	512	1024	2048	
UNPAINTED						
*Standard, ¾"	.16	.19	.57	.95	.71	.60
*Standard, 1"	.20	.29	.76	.97	.79	.70
*Tapestry, ¾"	.13	.20	.64	.89	.65	.60
*Tapestry, 1"	.18	.32	.83	.82	.67	.65
†Calistone 1"	.16	.28	.60	.89	.66	.60
†Calistone 2"	.36	.58	.77	.69	.63	.65
PAINTED BY MFR., OIL BASE PAINT						
*Standard, ¾"	.15	.22	.58	.96	.76	.65
*Standard, 1"	.20	.27	.76	.99	.81	.70

**Cemented to plaster board, considered equivalent to cementing to plaster or concrete ceiling. †Laid directly on laboratory floor.*

*The noise reduction coefficient is the average of the coefficients at frequencies from 256 to 2048 cycles inclusive, given to the nearest 5%. This average coefficient is recommended for use in comparing materials for noise quieting purposes as in offices, hospitals, banks, corridors, etc.

For auditorium treatment, the coefficients at 512 cycles apply.



Calicel Ceiling, Netherland Plaza Hotel, Cincinnati, Ohio

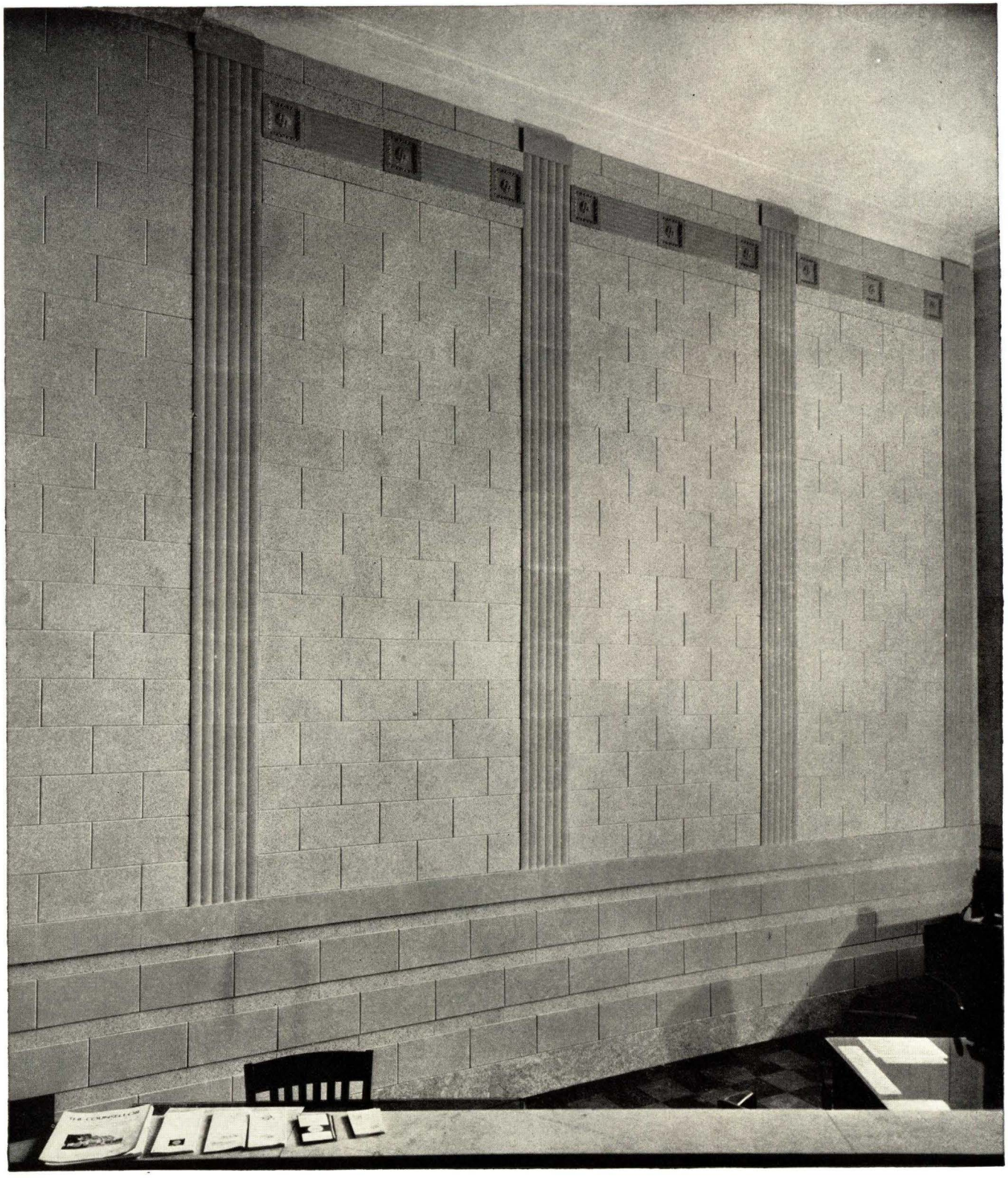


Calicel Castone, Pennsylvania R.R. Station, Newark, N. J.



Rear wall of Court House, Aberdeen, S. D., showing Calicel Acoustical Castone

CALICEL PRODUCTS



In this wall treatment of a modernized bank interior, Calicel Acoustical Products have been used in interesting fashion to accomplish interior finish, decoration, and acoustical correction.

In the dado above the marble base there are alternate courses of Calistone with recessed Calicel, Italian Type, between. Moulded Calicel units form the fluted pilasters, while in the space between the pilasters Calicel Tile of the Standard Type have been laid up. Calicel Acoustical Castone adds an interesting ornamental note, the three units in each wall panel being set in a frieze of moulded Calicel.

VIBRAFRAM

(Formerly Heerwagen Tile)

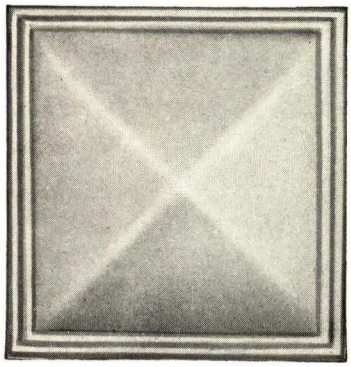
DESCRIPTION—A radical departure from conventional porous acoustical materials, Vibraframa depends for its sound-absorbing qualities on diaphragmatic action of the individual units. It is a tile 13 inches square, 1½ to 3 inches deep, and is made of fireproofed felt, sized to form plain or ornamented hollow tile shapes, yet soft enough to retain a vibratory quality. The tile weigh only 3 ounces per square foot.

ADVANTAGES—Many conventional acoustical absorbents adequately absorb high-pitched sounds but provide inadequate absorption for sounds in the lower frequencies. Due to this characteristic in some acoustically treated rooms, there is complaint of a "dead" condition, while in cases of sound picture theatres the same characteristic accounts for a "boom" in the low frequency range, disturbing to a comfortable audition. Because Vibraframa develops its greatest absorption at low frequencies, it has found wide acceptance in the sound picture theatre field, particularly in Canada where Dominion Sound Equipments, Ltd., distributors of Western Electric and RCA Sound Systems have observed its unique effectiveness in scores of theatres.

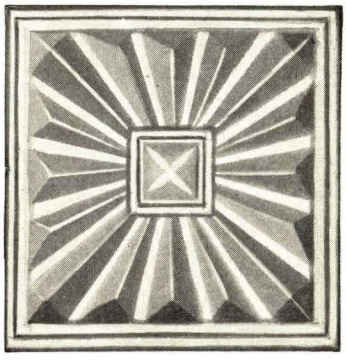
APPLICATION—Surfaces to which Vibraframa are to be applied, such as concrete, plaster, or wallboard, should be firm, true, and cleaned of calcimine, whitewash or loose paint. Surfaces to be treated are scored and chalk-lined both ways in 13-inch squares.



C-5



E-1



C-6

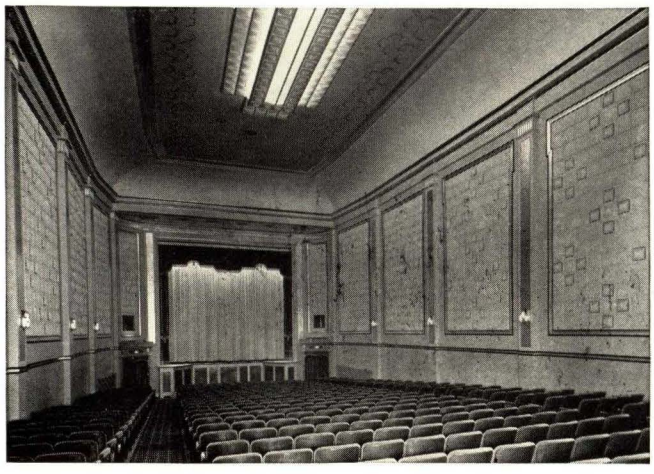
Waterproof adhesive is then applied to all half-inch margins of the tile, which are then applied and pressed firmly into position.

When Vibraframa is applied to brick walls, cement, or very rough and cracked plaster surfaces which provide an unsatisfactory base for adhesive alone, then the use of furring trellis is recommended. Information concerning this method will be furnished upon request.

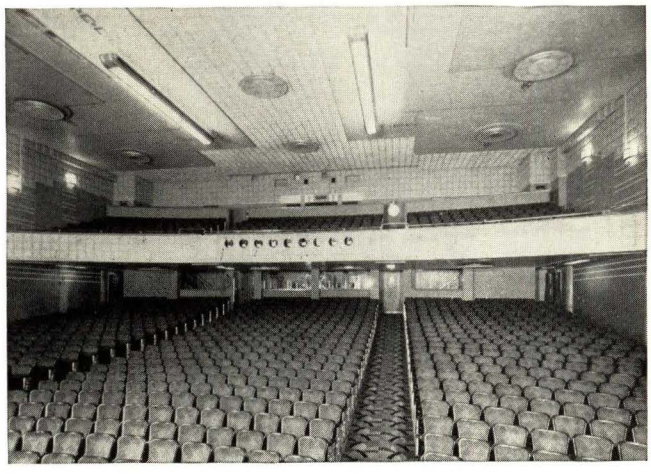
DECORATION — Vibraframa is furnished in three standard tile designs, illustrated on this page. Special individual designs may be had at slightly increased cost. Naturally light cream in color, Vibraframa may be stenciled or otherwise decorated without appreciable loss of efficiency. The manufacturer should be consulted regarding paints to be used. A variety of interesting decorative effects can be worked out with study and ingenuity, and in theatre work particularly the unique acoustical results justify the effort required to employ Vibraframa harmoniously in the design.

NOTE: *Vibraframa is not recommended for application to surfaces subject to abrasion or body contact, nor should it be used in rooms where conditions of high humidity exist, as in swimming pools, etc.*

Below—**Empire Theatre, Quebec, Canada**



Below—**Casino Theatre, Toronto, Canada**



ABSORBEX

Absorbex is a decorative sound-absorbing material available in conventional sized tile or larger units. Its texture is unique, and because of its fire-resisting quality and structural strength it offers an interesting solution for suspended ceiling construction.

DESCRIPTION—It is a cement-timber product, made by shredding timber into long tough fibers and binding them together with an emulsion of high temperature cement. This mass is then formed between rolls and steel belts at about 500 degrees F. into slabs, uniform in thickness, containing millions of minute air cells, affording high insulation, great structural strength, fire-resistance, and superior acoustical value.

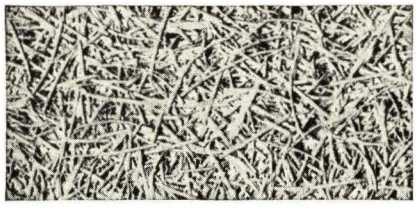
TYPES OF ABSORBEX—There are three types of Absorbex—A, C and F—depending on the fineness of the fibers. All three types are strong, not easily fractured, rodent and vermin proof, and inert to temperatures and humidity changes. They can be spray painted with lead and oil paint without noticeable loss of efficiency. They have high light-reflective qualities and are incombustible.

Type A—Furnished in tile form, beveled or unbeveled, 9 x 9, 9 x 18, 18 x 18, and 18 x 36 in. One-inch thickness only. Larger sizes or factory applied color finishes are optional at additional cost. It may be cemented to concrete or plaster backing or applied on furring strips. See table and details for absorption coefficients in installations for various acoustical requirements. In its natural finish it is light buff in color.

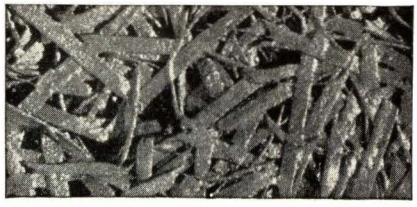
Type C—Furnished only in sheets 20 in. wide by 32, 48, or 64 in. long. Type C is coarser in texture than Type A and relatively more porous. May be placed in concrete forms without mechanical ties, but with suitable form supports.

Type F—Furnished in sheets 20 in. wide by 32, 48, or 64 in. long. Coarsest of the three types, Type F has excellent absorption efficiency, high insulation value, fire-resistance, and is economical. Recommended for high-ceilinged structures, such as gymnasiums, armories, auditoriums, etc. It may be satisfactorily placed in concrete forms without mechanical ties, but with suitable form supports.

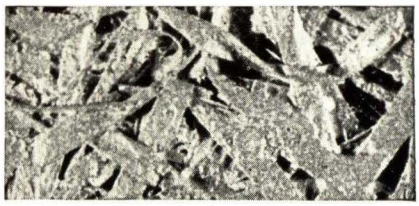
FLAME TEST—Standard flame tests as required by the Departments of Buildings, New York City, for determining the fire resisting qualities of acoustical materials were conducted by Columbia University on Absorbex. These tests showed that the material does not flame or give off smoke or noxious fumes—thus rating the material fire retardant and permitting its unlimited use in fireproof construction.



Type A Absorbex—Full Size



Type C Absorbex—Full Size



Type F Absorbex—Full Size

SOUND ABSORPTION COEFFICIENTS

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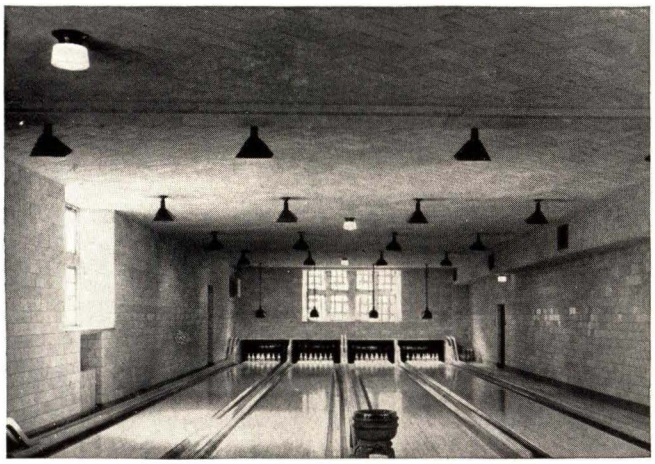
Material	Thickness	Coefficients					Noise Red.Coef.	Mounting
		128	256	512	1024	2048		
ABSORBEX PAINTED BY MFR., OIL BASE PAINT								
Type A	1"	.18	.26	.63	.96	.77	.65	Cemented to plaster board. Considered equivalent to cementing to plaster or concrete ceiling.
Type A	1"	.20	.35	.86	.90	.72	.70	Nailed to 1 x 2 in. wood furring 18 in. o.c.
Type A and F	2"	.32	.50	.95	.96	.80	.80	1 in. Type A spot cemented to 1 in. Type F cemented to plaster board. Considered equivalent to cementing to plaster or concrete ceiling.
Type A	1"	.58	.77	.98	.92	.79	.85	Tile nailed to 1 x 3 in. wood furring 18 in. o.c. and filled in between furring with 1 in. mineral wool.
Type A	1"	.91	.99	.87	.84	.88	.90	Tile nailed to 2 x 4 in. studs 18 in. o.c. and filled between studs with 3½ in. thick mineral wool.
Type C	1"	.15	.23	.40	.66	.62	.50	Cemented to plaster board. Considered equivalent to cementing to plaster or concrete ceiling.
Type C	1"	.21	.27	.48	.63	.54	.50	Nailed to 1 x 2 in. wood furring 16 in. o.c.
Type F	1"	.11	.17	.49	.68	.63	.50	Nailed to 1 x 2 in. wood furring 16 in. o.c.
Type F	1"	.45	.69	.81	.64	.64	.70	Tile nailed to 1 x 3 in. wood furring 18 in. o.c. and filled in between furring with 1 in. mineral wool.
Type F	2"	.21	.44	.85	.70	.72	.70	Cemented to plaster board. Considered equivalent to cementing to plaster or concrete ceiling.

The noise reduction coefficient is the average of the coefficients at frequencies from 256 to 2048 cycles inclusive, given to the nearest 5%. This average coefficient is recommended for use in comparing materials for noise quieting purposes as in offices, hospitals, banks, corridors, etc.
For auditorium treatment, attention should be directed to the coefficients at 512 cycles.

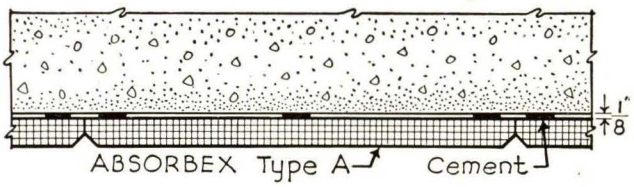


ABSORBEX—Type A
Bowling Alleys, East Liberty Presbyterian Church, Pittsburgh, Pa.
Cram and Ferguson, Archt.

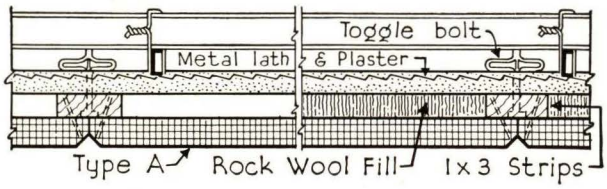


ABSORBEX—Type A
Calhoun College, Yale University—John Russell Pope, Archt.
Application on ceiling between beams

ABSORBEX INSTALLATION DETAILS

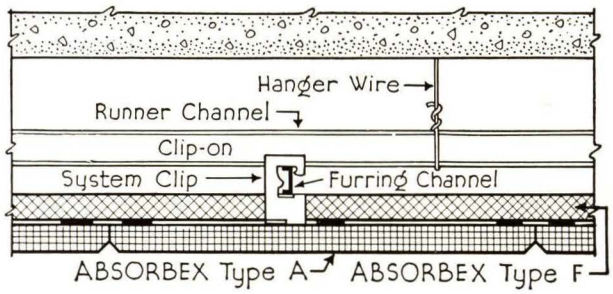


Absorbex Type A—1-in. Beveled Tile, spot cemented to the plaster or concrete ceiling. On plaster ceilings Absorbex is usually cemented (using an approved adhseive) and nailed directly to plaster. If desired, Absorbex may be applied with a heavy bodied adhesive alone to a surface such as concrete.

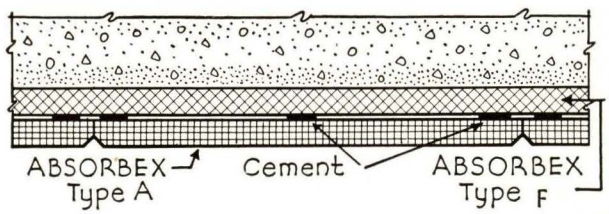


Absorbex Type A—1-in. Beveled Tile nailed to 1-in. x 3-in furring strips toggle bolted to ceiling.

METAL SUSPENSION—Where Absorbex is used as the suspended ceiling by itself, it is supported by metal members fastened to suspended metal furring. Details of this construction on request.

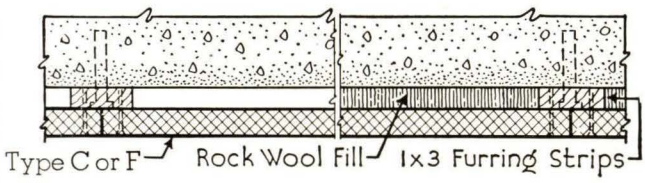


Suspended Ceiling Construction Absorbex Type A—1-in. Beveled Tile when applied to Absorbex Type F (1-in.x20-in.x64-in.) is usually cemented and nailed.

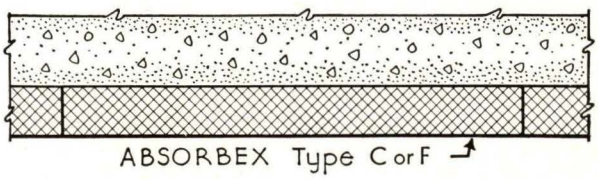


Absorbex Type A—1-in. Beveled Tile, spot cemented to Absorbex Type F (1-in.x20-in.x64-in.).

NOTE: *The type F material may be laid in the forms at the time the concrete is poured or attached afterwards to the concrete slab with expansion bolts or dryvins*



Absorbex Type C or F—(20-in.x64-in.) unbeveled, nailed to 1-in.x3-in. furring strips, bolted to ceiling.



Absorbex Type C or F—(20-in.x64-in.) unbeveled, laid in concrete forms.

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