

MAINTENANCE OF ACOUSTONE INSTALLATIONS

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BY VACUUM BRUSHING, VACUUM SANDING, OR SPECIAL PAINTING.

VIII - MAINTENANCE OF MOTIF'D ACOUSTONE

BY REPAINTING

DETAILED DISCUSSION

I - GENERAL

Acoustone can be easily and economically maintained. The best method of cleaning and painting will, of course, depend on the surface finish of the Acoustone and the type of dirt to be removed or concealed. This bulletin has been written to give you a thorough understanding of the subject and to put you in a position to analyze and make recommendations which will aid your customers to keep their Acoustone installations clean and attractive.

Dirt on any surface makes it unsightly. Acoustone is no exception. Acoustone installations are often neglected by owners who fail to realize how easily it can be maintained. It is good business to keep in contact with all Acoustone installations in your territory and when ready for cleaning or painting to give the owner the information which will enable them to restore the original attractiveness. Sales opportunities will be greatly increased when you have a large number of clean attractive installations in your territory.

PLAINTIFF'S EXHIBIT

USG-1563

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II - DEFINITIONS, METHODS, AND DISCUSSION

A - ORDINARY SURFACE DIRT - Cleaned by Vacuum Brushing.

This is ordinary air borne dirt deposited on the face of the tile in a similar manner to the way dirt is deposited on plaster walls or ceilings. This is termed surface dirt only in cases where there is no stack action caused by air currents drawn directly through the tile, and through cracks, or openings in the ceiling base to which the tile are cemented. If this ceiling base is sealed to form a dead air space in back of the tile and this seal remains unbroken, air borne dirt deposited on the tile is called surface dirt. It is the result of air currents flowing parallel to the tile surface instead of air currents passing through the tile. This dirt can be removed satisfactorily a number of times by vacuum brushing. Vacuum brushing is more economical than vacuum sanding or painting and should receive first consideration. (See 11-D "Vacuum Brushing Equipment and Operation.")

B - ENCRUSTED SURFACE DIRT - Cleaned by Vacuum Sanding.

The air of some cities or sections of cities contains a small amount of volatile oil mixed with the dirt. The surface dirt on the tile in these areas gradually becomes hardened due to slow oxidation of the oil and forms an encrusted film about 1/64" in thickness. This film is generally yellow or brown in color and is not always easily removed by vacuum brushing. Vacuum sanding, however, will virtually restore the tile to its original color and appearance. Surface dirt that cannot readily be removed with vacuum brushing will respond very well to vacuum sanding. After a job has been vacuum sanded, it should respond well to several cleanings by vacuum brushing before a vacuum sanding is again necessary. (See 11-E "Vacuum Sanding Equipment and Operation.")

C - BREATHING

The term breathing, as used in connection with acoustical installations, is the filtration of dirt from air currents passing through the tile structure in sufficient amount to cause objectionable soiling on the face side of the tile. This objectionable soiling occurs only when air passes through the tile from the face towards the back side.

In general the space in back of a suspended plaster ceiling has openings which lead to pilasters, pipe chases, elevator shafts, etc. This allows easy flow of air to furred ceiling areas and from floor to floor throughout the entire building. Masonry partitions are generally not carried up to the floor slabs, and if they are, they are not grouted tight against the slab. Duct or pipe openings in these partitions above the ceiling are rough cut and larger than the ducts or pipes passing through them. A stack effect thus sometimes occurs in multi-story buildings, causing a rapid flow of air from a room through any crack or opening in a suspended plaster ceiling.

It is, therefore, essential that openings in any suspended ceiling base as cracks, holes at electrical outlets and pipe risers, joints in plaster board, etc. be sealed in accordance with instructions under "application procedure" before unpainted tile are cemented in place. If this sealing is done in a workmanlike manner and remains unbroken no breathing will occur.

It is good practice to seal these openings even when mill painted tile are used, although the mill painting in itself will prevent the objectionable results of breathing.

In a very few cases a new partition erected in an old building will sometimes settle 1/8" to 1/4" producing a crack at the ceiling wall angle after the tile are erected.

Air will not pass, in sufficient amount to cause breathing, directly through a 1/2" to 3/4" scratch and brown coat of plaster, on metal lath. Even though the plaster is over sanded and weak there is sufficient cement to entirely fill the voids between the sand particles. Thin places in the plaster where metal lath is exposed should be sealed.

It is easy to discern between breathing and surface dirt on tile cemented in place. If they are breathing, the face area of the tile directly over the cement spots will have less soiling than the remainder of the tile and consequently will be lighter in color. This is because the air will not pass through the area sealed by cement. In the case of surface dirt only the tile will be uniformly soiled, the outline of the cement spots now showing as a lighter color.

In rare cases where air passes through the tile from the back towards the face side, objectionable soiling on the face side should not occur. The dirt will be filtered out, after the air penetrates about 1/4 inches into the tile from the back side. This condition has occurred several times on the top floor of a high building. The air accumulates by stack action above the ceiling. In the summer when the roof temperature is high the heated air expands, passing downward through any opening in the ceiling.

The fine porosity of the various acoustical tile on the market cause them to act as efficient air filters. Standard mill painted tile do not breathe as readily, because the fine porosity is sealed on the tile surface. This does not hold true on mill primed tile because the fine surface porosity is not well sealed. The fine surface porosity between the larger fissures on Acoustone "D" or "F" can be sealed without destroying the sound absorbing qualities. The larger fissures offer sufficient surface area for passage of sound into the cellular structure of the tile. This feature has a background of authentic tests, and may be compared to perforated painted acoustical tile on which the surface area is entirely sealed except for the perforations. These perforations in the tile or the larger fissures in Acoustone need comprise only 12 to 15 per cent of the entire surface area.

Painting of some acoustical materials on the market does not decrease their tendency to breathe. These tile are made of wood or excelsior fibres, or of other materials in which the surface texture is very uniform and does not have the combination of fine porosity and larger open fissures. When these tile are carefully mill painted there is no bridging of the paint film across the surface fibres, or pores. As no actual surface sealing results, there is no reduction in the tendency to breathe. Fifty per cent or more of the surface remains open allowing easy and free passage of air. As there are no large fissures, job painting with a brush, in time, will entirely close the surface porosity.

Acoustone on the other hand has fissures (12 to 15 per cent of surface area) that will allow repeated job paintings without a reduction in sound absorption. This allows a high per cent of the remaining surface area to be flat, smooth and sealed against air travel. This smooth, flat, surface on painted Acoustone prevents surface dirt accumulation much more than on tile having a high percentage of open surface porosity and a low per cent of flat, smooth surface. Tile with a high per cent of smooth, flat surface can also be easily washed.

It is concluded that mill painted Acoustone "D" or "F" prevents objectionable breathing and can be economically maintained by repeated painting or washing. It is also concluded that unpainted Acoustone applied to a ceiling base which has been properly sealed will not breathe.

D - VACUUM BRUSHING - Equipment and Operation.

This is cleaning unpainted Acoustone with a brush to which a vacuum hose is attached. (See discussion above under 11-A "Ordinary Surface Dirt" and 11-B "Encrusted Surface Dirt.")

1. Type of Vacuum Cleaner:— The nozzle of the cleaner should not be over 10" in width and should be completely surrounded with a brush attachment. The combination of the abrasive action of the brush and the vacuum will remove the dirt.

The vacuum cleaner found to be efficient for this purpose is called:— Premier Mandy Vacuum Motor with special equipment as assembled for United States Gypsum Company.

<u>2. Description:</u>	<u>Part No.</u>
Motor 1/2 H.P. with Stand	25182
Cloth Dust Bag	2443
30 Feet Rubber Cover Extension Cord	—
Shoulder Strap	2434
Hose Coupling	25070
8 Ft. Flexible Braided Hose	6973
One Extension Tube 22 Inches	133136
One 9 Inch Bristle Brush and Adapter	133177

All parts are standard, but as it is a special assembly job the order should be placed at Premier Vacuum Cleaner Company located at 540 North Lake Shore Drive, Chicago, Illinois.

The price should not exceed \$60.00 with all attachments.
(Price subject to change without notice).

3. Cost of Cleaning: One man should clean 600 to 1000 square feet in eight hours, depending on job conditions.
4. Scaffold: Two step ladders and a plank are sufficient for ordinary ceiling heights.
5. Procedure: The nozzle should be passed back and forth over the tile in one direction and the process repeated in the opposite direction. The second operation will eliminate streams that might result from passing the cleaner continually in one direction across the ceiling. A good cleaning job can be done, only, if the operator keeps the nozzle of the cleaner in a level position with respect to the tile surface. This procedure must sometimes be accompanied by a small amount of hand sanding on very dirty areas around air supply grills. Use No. 1 sandpaper on a short piece of 1" x 3" wood block.

E - VACUUM SANDING

This is cleaning unpainted tile with a vacuum sanding machine - a machine which we have developed especially for this purpose. This machine consists essentially of a rotating sanding disk with a vacuum attachment and is so designed that the depth of sanding can be regulated. This machine is used primarily for removing encrusted surface dirt from Acoustone; however, it is equally suitable for Quietone. It can also be used for sanding off oil or casein paints on either Acoustone or Quietone.

We have five sanding machines, one in the New York Office and four in the Chicago Office. When available one of these machines will be shipped to you, on your request, for three weeks use without charge, providing you pay the express charges both ways and that the machine is returned to us in good condition. The shipping weight is 85 lbs. If the machine is not back in our hands within three weeks it will be necessary for us to charge you \$3.00 per day for any time over the three weeks. Only 3 weeks of free usage can be allowed a district contractor per year.

The machine will be shipped complete in one box which will also contain a complete instruction folder covering its use, care and operation. The sander will give good job performance only if operated by some one who will read and implicitly follow the instruction folder.

The labor cost for sanding an Acoustone ceiling should range from 1½ to 3 cents per square foot. Two men can average 1000 sq.ft. or more in 8 hours with one sander depending on job conditions.

F - NORMAL DRY CONDITIONS

Wherever the phrase "Normal Dry Conditions" is mentioned in this Bulletin its meaning covers the following factors:

1. All plaster work in the room to be in place and dry enough to receive oil paint.
2. Terrazzo floors should have finish grinding completed.
3. Concrete finish floors should be dry enough to receive linoleum, tile, or wood finish.
4. All windows glazed.
5. The heat should be on during cold winter weather if the building is new and still contains considerable moisture.
6. If all of the above conditions cannot be met, good judgment should be exercised in deciding if work can proceed successfully.

G - WASHABILITY OF STANDARD MILL PAINTED ACOUSTONE

The washability of standard mill painted Acoustone is equivalent to the washability of an average grade of flat interior oil paint. Washing is generally done with a sponge and a mild soap in water as Ivory soap flakes. A few tiles should be washed and then rinsed with clean water, followed by wiping with a rag or sponge squeezed dry.

III. MAINTENANCE OF STANDARD MILL PAINTED ACOUSTONE "D" OR "F"

A - WASH, STARCH, OR REPAINT with oil, casein, or calcimine paints. Standard mill painted tile may be calcimined or starched, periodically, washing off the old calcimine, or starch before applying a new coat. (See 11-G for washing procedure.)

1. MECHANICALLY erected tile

- (A) Can be painted with oil paint immediately after erection.
- (B) Can be painted with casein, calcimine paints, starched, or washed immediately after erection if normal dry conditions (see definition under 11) are present.

2. STUCK tile

- (A) Can be painted with oil paint immediately after erection.
- (B) Can be painted with calcimine, casein paints, starched or washed two months after erection.

B - PAINTS

1. Oil Paints - A good grade of interior flat oil paint as made by a reliable manufacturer should be used. These paints will generally have a Titanox or Lithopone pigment. Lead and oil paint is not generally used on inside work but can be used when specified.
2. Casein Paint - Texolite 330 (manufactured by U.S.G.) is recommended.
3. Paint Coverage - One coat work brush applied should be sufficient. The paint coverage should be similar to that obtained on repainting over existing paint on general surfaces. This information should be obtained from the paint dealer.
4. Instructions to Painter - No attempt should be made to stipple, or fill the large surface fissures with paint. If the tile are dirty they should be washed or brushed off before painting. (See 11-G for washing instructions.)

5. Cost of Painting - The painting cost should be the same as for one coat work over existing paint on plaster surfaces.
6. Starching - Material and procedure should conform to standard practice as used by decorators over oil paint.

IV - MAINTENANCE OF PRIME COATED MILL PAINTED ACOUSTONE "D" OR "F"

Same as for standard mill painted tile except tile cannot be washed, or starched before receiving an additional job coat of oil paint.

V - MAINTENANCE OF UNPAINTED ACOUSTONE "D" OR "F"

- A - ORDINARY SURFACE DIRT - USE VACUUM BRUSHING
See Method and Discussion under 11-A.
See Equipment and Operation under 11-D.

- B - ENCRUSTED SURFACE DIRT - USE VACUUM SANDING
See Method and Discussion under 11-B
See Equipment and Operation under 11-E.

C - SPECIAL HANDLING OF SURFACE DIRT AT AIR SUPPLY GRILLS

Air supply grills on the ceiling, or on walls where the top of the grill is within 5 inches of the ceiling, in many cases, cause rapid soiling on adjacent tile. This unsightly soiling becomes a nuisance when it occurs too rapidly. If the air which is coming out of the grills is not adequately filtered and if the filters are not kept clean this condition must be remedied. (In checking on this remember that recirculated air should be filtered also.) If it is possible to deflect the air away from the Acoustone surface by changing the angle of the grill this should be done.

If, after above have been corrected as far as practical, rapid soiling still occurs it is sometimes possible to remove the dirt from an unpainted Acoustone surface by vacuuming the soiled area in front of the grills as often as necessary. If the type of dirt is such that this proves ineffective, painting of a small number of tile in front of the grill with an enamel paint will reduce the rate of soiling and permit washing as often as necessary. (Enamel used should be known as "flat air dry enamel" as this type has the least gloss.) (Prime with Texolite before applying enamel). The tile may also be finished with oil paint over Texolite, or finished with Texolite only if a flat finish is desired.

D - BREATHING

Replacing tile or painting with casein, oil or calcimine paints.

In general, breathing tile cannot be vacuum sanded or vacuum brushed to give a satisfactory appearance, unless the breathing has been of very short duration. As breathing will occur again shortly after cleaning, unless the cause is remedied the owner or tenant will not be satisfied.

1. Replacing tile - If only a few tile are breathing it is more economical to remove them, seal the opening, and erect new tile, than to paint the entire job. One objection to this is that the new tile will show up lighter in color. This can be remedied to a considerable degree by vacuum brushing the remaining tile in the panel. Vacuum sanding, of course, will result in less color variation than brushing. If the panel is too small to bother sending for a vacuum sander, it may be gone over once with a vacuum brush, hand sanded with No.1½ sand-paper, and gone over again with the vacuum brush.
2. Painting with casein, oil or calcimine paints. (See discussion under 11-C on how mill painting corrects breathing.) Proper job painting of unpainted Acoustone will successfully correct breathing tile. The surface dirt should first be removed from the tile with an ordinary hand desk brush, or with vacuum brushing. The paint should be reduced with water according to instructions on the can which call for 1/2 gallon of water per gallon of paste.

The coverage will be approximately:- 150 to 175 sq. ft. per gallon of paste, or 100 to 115 sq.ft. per gallon of mixed paint.

The Texolite should be brush applied using a 6 inch calcimine brush, keeping the brush well filled with paint. No attempt should be made to fill in the larger surface fissures or the bevels. Paint the tile as a flat wall or ceiling surface. Do not paint around the tile bevels first on a few tile and then fill in the center. Due to rapid suction of the tile this first painting will partially set and when the center is painted there will be overlapping of wet paint on partially set paint. The result will be two coats of paint around the tile borders and one coat in the center. When dry the border of each tile will be lighter color than the center. When this happens a two coat job is necessary to obtain a satisfactory appearance.

If the above instructions are followed, satisfactory results will occur with a one coat application even though the tile are very dirty from breathing.

If an oil paint finish is desired, one coat of Texolite should be applied over which apply one coat of oil paint. A cereal (starch) type cold or hot water size may be used in lieu of the Texolite, but as this is not a pigmented size, two coats of oil paint will be necessary, resulting in a three coat application. Do not use a glue or casein size. If neither Texolite or cereal size can be used, a two or three coat oil paint application can

be used, but brushing qualities of oil paint direct on unpainted Acoustone are poor. The paint coverage will be very low. The first, or size coat should be a 50-50 mixture of varnish and paint. This is much better than a straight varnish size because its pigmentation will allow for less succeeding coats. Follow this with one or two coats of oil paint as required to give a satisfactory appearance.

After tile have had one coat of Texolite the coverage of succeeding coats of Texolite, or oil paint will be approximately the same as obtained over plaster walls, which have been sized or painted once. The application qualities of the succeeding coats will be good.

If a calcimine paint finish is desired, it must be put over an oil paint (applied as described) so it can be washed off before applying a new coat. The same procedure applies for starching. The starch should be the same as used in standard practice over oil paints.

Note following schedule showing when above paints can be applied:

MECHANICALLY ERECTED TILE

Can be painted with oil paint immediately after erection.

Can be painted with casein paint immediately after erection if normal dry conditions (See definition under 11-F) are present.

STUCK TILE

Can be painted with oil paint immediately after erection.

Can be painted with casein paint 2 months after erection.

PAINTS - (See General Description under 111-B)

VI - MAINTENANCE OF UNPAINTED ACOUSTONE "W"

Same as for unpainted Acoustone "D" or "F" with the following exceptions. Acoustone "W" being more porous, and having a slightly rougher surface will collect surface dirt more readily. Breathing will enter deeper into the tile, therefore, it will not respond as well to vacuum brushing or vacuum sanding, although, fair success in cleaning by these methods can be accomplished, especially if surface dirt only is present. Due to its greater porosity it has more suction when painted. When possible the first painting should be with Texolite. Succeeding coats of paint may be oil paint if desired.

VII - MAINTENANCE OF UNPAINTED ACOUSTONE "A"

Acoustone "A" is not sold as a paintable tile and cannot be painted, by ordinary methods, without a material reduction in sound absorption.

It can be brush painted on the job with two coats of very thin consistency paint without more than 10 points loss in sound absorption. The paint to use is Texolite reduced with 2½ gallons of water per gallon of paste. The third coat of this paint will noticeably decrease the sound absorption. Two coats of this paint will give satisfactory hiding power over dirty tile, if the surface dirt is first removed with a vacuum brush. The Texolite should be applied with a 6 inch calcimine brush, keeping the brush well filled with paint. The paint being thin will flow out of the brush and drop to the floor to some extent. Good protection with drop cloths is, therefore, necessary.

For time of painting see painting schedule for Acoustone "D" or "F" under V-D.

The two coats of Texolite mentioned above can be easily removed by vacuum sanding, and this must be done before applying a succeeding two coats. This process can be repeated many times.

Surface dirt on Acoustone "A" is very readily removed by vacuum brushing or vacuum sanding, therefore, painting should never be considered except in cases where a large percentage of the job is breathing. If only a few tile are breathing they should be removed, the openings sealed, and new tile erected.

VIII - MAINTENANCE OF MOTIF'D ACOUSTONE

Motif'd Acoustone is sold only with a standard mill coat of paint and in "F" texture. It is erected only with adhesive.

It can be job painted with casein or oil paints, brush applied. The surface dirt should be removed by hand brushing with an ordinary desk brush, or vacuum brushing before painting. It should be painted as a flat surface with no special attempt to fill in the etched surface.

The tile may be painted immediately after erection with an oil paint, or 2 months after erection with a casein paint.

Cleaning without painting may be done by vacuum brushing, followed by washing the unetched portion of the design with soap and water.

(End)