

Interoffice Communication

RECEIVED

APR 21 1977

To Messrs. John Elkins and Bill Henry, PVC Plant, Oklahoma City

From Paul Pickard, CED, Ponca City

Date April 13, 1977

Subject Sound Level Survey, Oklahoma City PVC Plant

The subject survey was completed in March, 1977, by W. G. Warren, Jr., and Paul Pickard. The dBA readings recorded during the survey along with 90 dBA contour lines are shown on the attached drawings (SLS-33-42-1-D and SLS-33-42-2-D). The results of this data indicate that there are three areas where noise abatement is needed. These are as follows:

1. The Loading Area On the West End of the Dryer Building (Ground Level and Upper Deck)
2. The Compressor and Boiler Rooms
3. The Steam Vent On the V-40 Reactors

There are areas in the plant that exceed 90 dBA (i.e., beneath the V-40 reactors), but personnel exposure is less than that allowed by OSHA. We strongly recommend that a dosimeter be placed on selected individuals to determine more accurately exposure times in various areas of the plant. This data is valuable in evaluating the noise abatement and allows documentation of personnel exposure for future needs.

Recommendations for reducing the noise levels in the areas listed above and the order of priority are as follows:

1. Loading Area On West End of Dryer Building

Noise levels in this area range from 93 to 103 dBA which, according to OSHA, allows from 5 hours 20 minutes to 1 hour 20 minutes exposure for an 8-hour shift. Present work patterns require personnel to be in this area 6 hours and longer per day. This, we feel, should be the number one priority in the plant and make the following recommendations:

- a. The air duct to the air transfer pumps is radiating a noise level of 104 dBA approximately one foot from the surface. This duct runs from one end of the building to the other and affects the noise level of the entire area. Sketch No. 1, attached, shows a system that will prevent the vibrations of the duct from transmitting to the building wall and lower the noise level to approximately 90 dBA.

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- b. The air blowers on the second deck create a noise level of 95 to 100 dBA over the main portion of this platform (see Drawing SLS-33-42-1-D). These machines and ducts should be lagged using the system shown in Sketch No. 1. Exceptions to Sketch No. 1 are 2 inches of fiberglass should be used on the blower cases and the Muffl-Jac cover may be replaced with Muffl-Lag as shown on the attached brochure.

After a and b above have been completed, another sound level survey should be conducted to determine what further steps are needed, if any, to bring this area down to an acceptable level of approximately 92 dBA.

2. The Compressor Room

The installation of the snubber on the 200-hp XLE compressor has lowered the level in this area to below 90 dBA and reduced the vibration in the offices on the east end (see Charts 1 and 2 attached). The noise and vibration reduction in the offices was not quite as much as predicted in the previous report. However, it should be noted that the predicted reduction was based on the XLE compressor alone. It is now apparent that the two unmuffled compressors were contributing more to the noise and vibration levels than expected. Installing snubbers on the two smaller compressors should eliminate this. This area has more employee exposure than in the past and even more is expected in the future. Reducing the noise level in this room would improve voice communication greatly.

We are unable to find any data sheets on these compressors in the CED files. If you can furnish us with the bore and stroke, RPM, CFM, intake size, and number of cylinders, we will size a snubber for your approval.

Boiler Room

This room has an ambient level of 78 dBA, which periodically rises to 97 dBA. The source of this noise is the control valve (PC-1) located overhead boiler No. 1. This valve and associated piping should be lagged with PF-705 fiberglass and covered with a Muffl-Jac (see attached brochure).

3. Steam Vent On the V-40 Reactors

For short periods of time during steam venting, personnel on the upper level of the reactors are exposed to levels as high as 96 dBA (see Drawing No. SLS-33-42-2-D). With the increased number of

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residential units being erected near the plant, this vent may become the source of citizen complaints. To lower the noise level on the upper level and preclude any complaints, we recommend installing a steam blowdown muffler. The "shop" type shown on the attached data sheet has been used successfully in other Conoco facilities or you may prefer a commercial model (see attached brochures on Aeroacoustic Corp. and Alwitco Blowoff Silencers).

The wide range of noise levels personnel are exposed to in the V-40 complex make it very difficult to determine the amount of exposure experienced. The use of a dosimeter on V-40 personnel would accurately determine exposure for this area. The dosimeter is also very useful in evaluating your noise abatement program and documenting personnel exposure for future needs.

As noted previously, we suggest a follow-up survey once the above listed recommendations are completed. Noise control very often requires a step-by-step approach to do an effective job, particularly in an area such as the loading area. The recommendations contained in this report are a step toward a quieter working environment.

If you have any questions concerning this report, please feel free to call.



P. L. Pickard
Designer
Technical Services

ymc

Att

CC:

C. H. Klunick, Houston

L. N. Vernon, Houston

~~J.~~ A. Kuhn, Houston

R. T. Ferrell, OKC

A. W. Sirmons, OKC

R. A. Frohreich, OKC

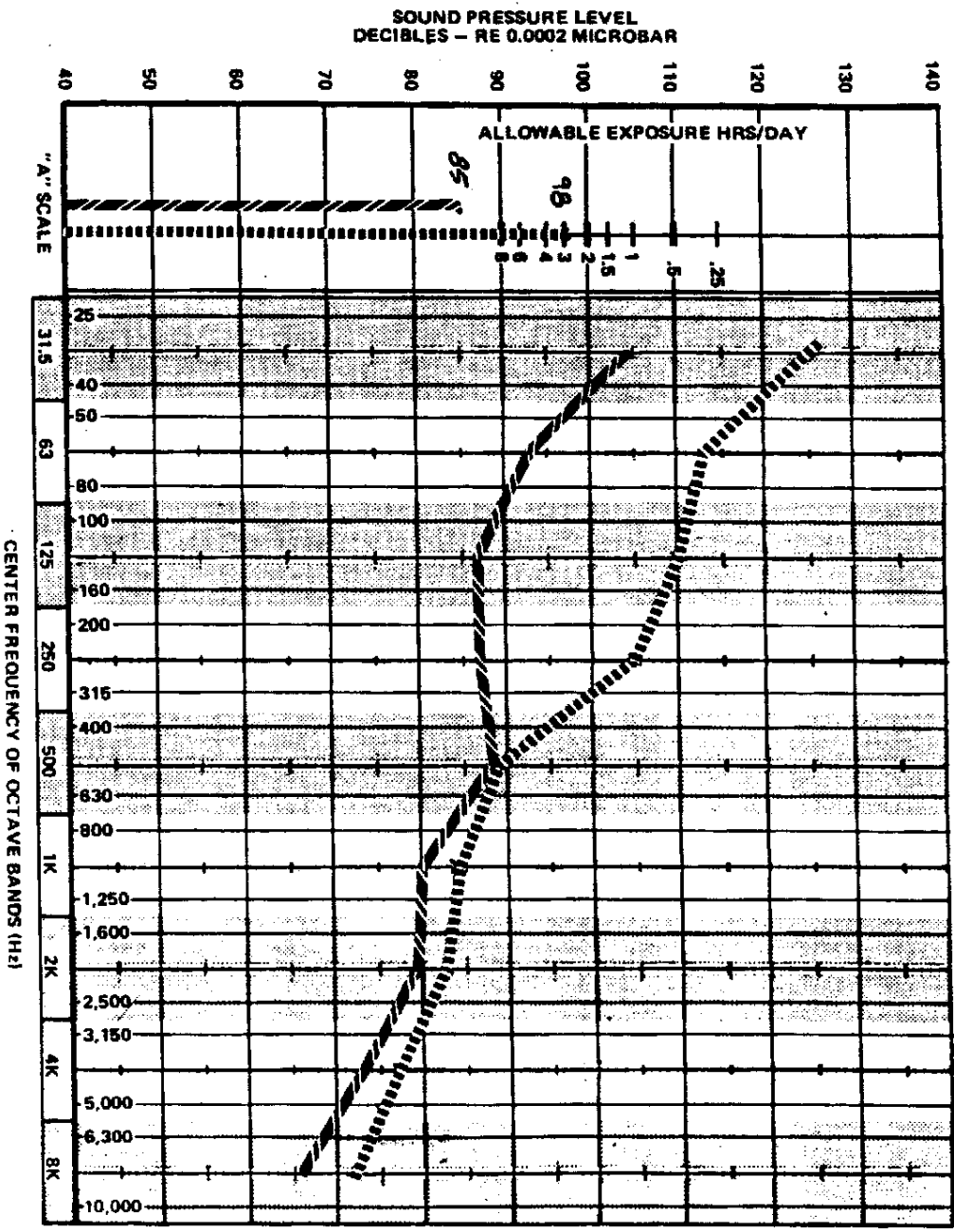
(BGL-FCH-File)

VEV-261013

OKLA. CITY PVC PLANT
200 HP - XLR Air Comp.

CHART NO. 1

BEFORE SUBMERSE INSTALLATION
AFTER SUBMERSE INSTALLATION



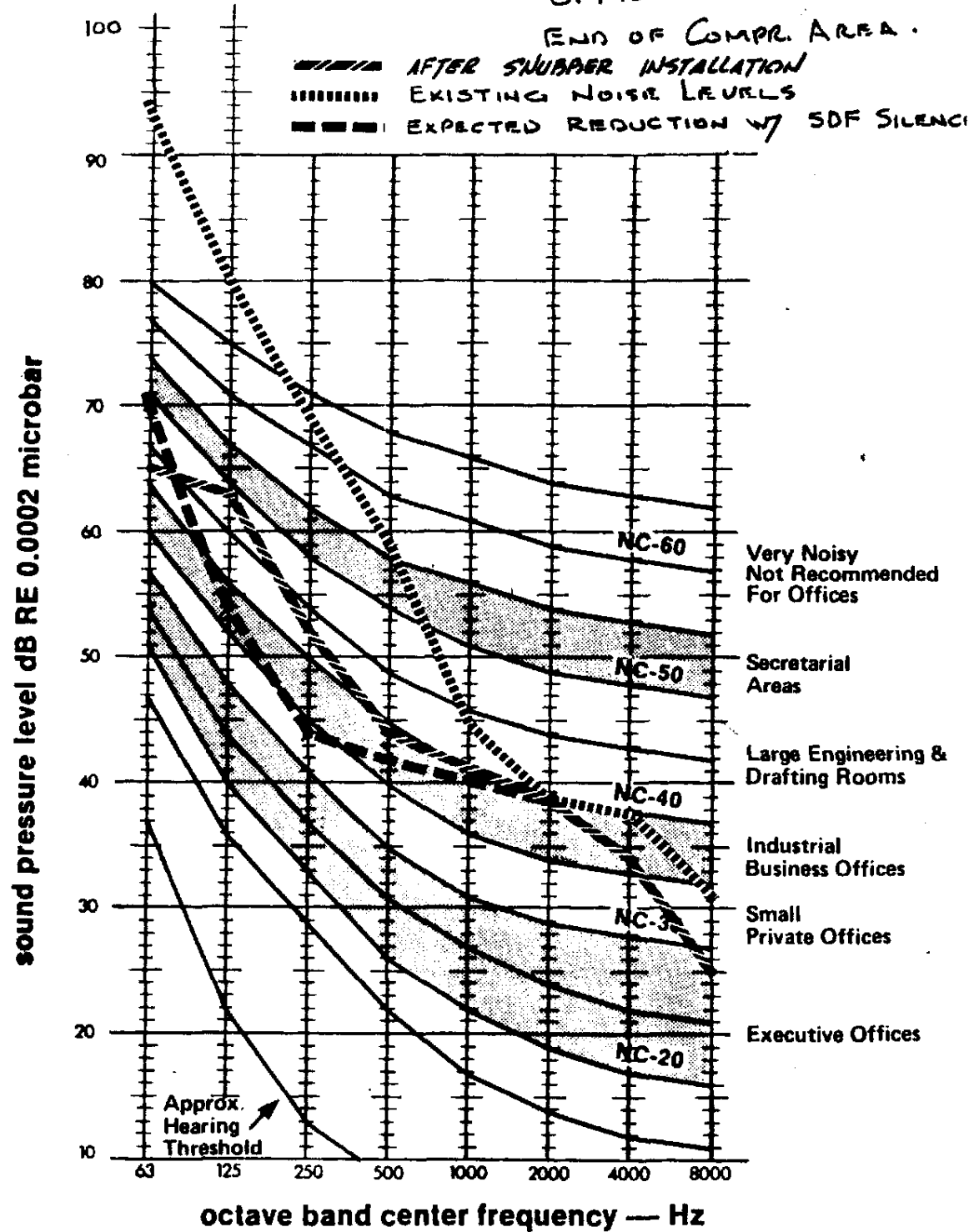
LOCATION OF ANALYZER: 3' FROM AIR INTAKE FILTER

EXPOSURE (HRS/DAY) O.S.H.A. = 3 Hours

COMMENTS: THIS AIR INTAKE FILTER SILENCER
SHOULD BE REPLACED BY ONE
DESIGNED FOR LOW FREQUENCY NOISE.

CHART No. 2

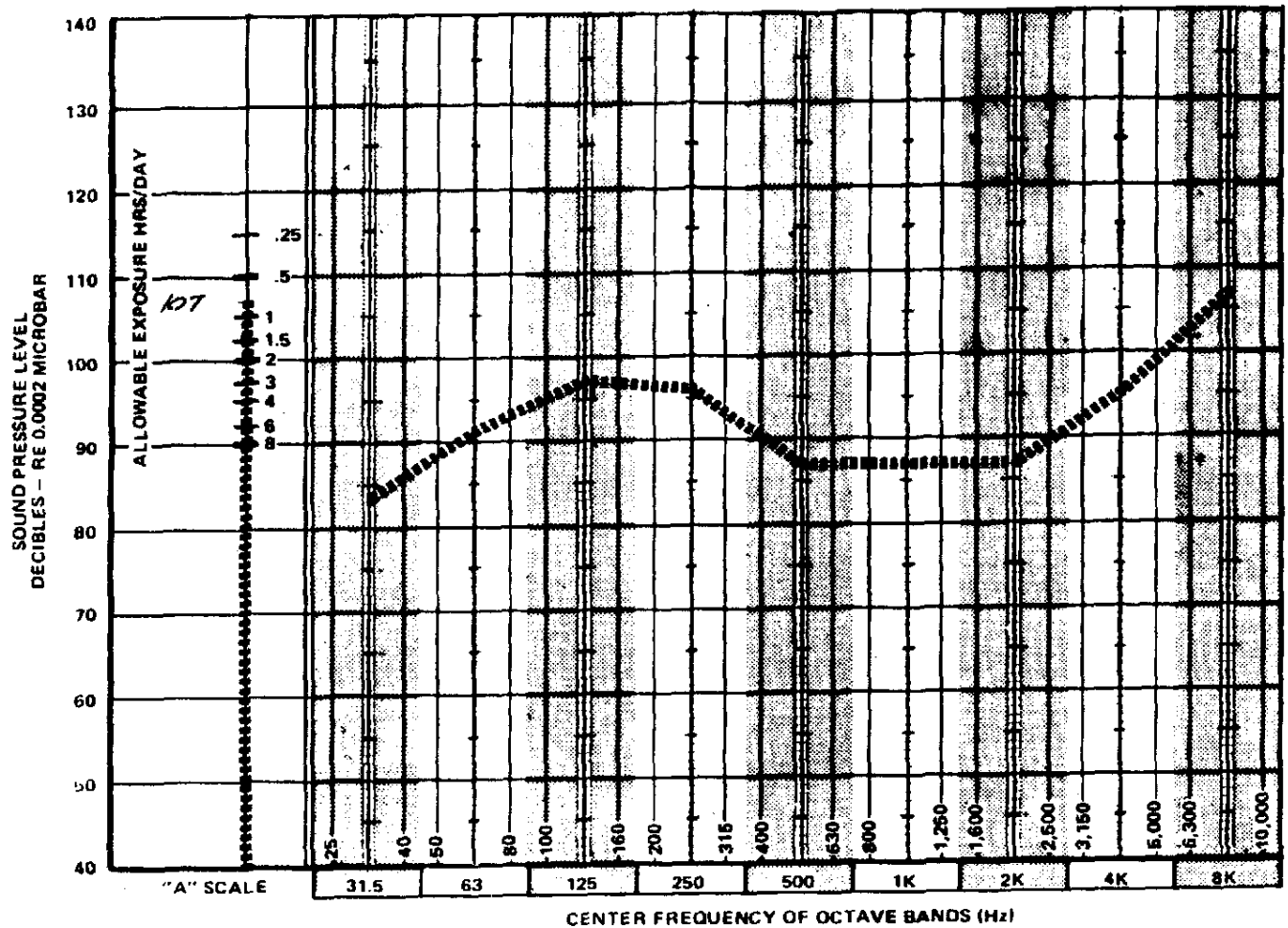
OKLA. CITY PVC PLANT
200 HP - KLE AIR COMPR.
NOISE IN 2ND FLOOR
OFFICE SPACE AT EAST
END OF COMPR. AREA.



NOISE CRITERION CURVES

OKLA. CITY PVC PLANT
MARCH 1977

CHART NO. 3



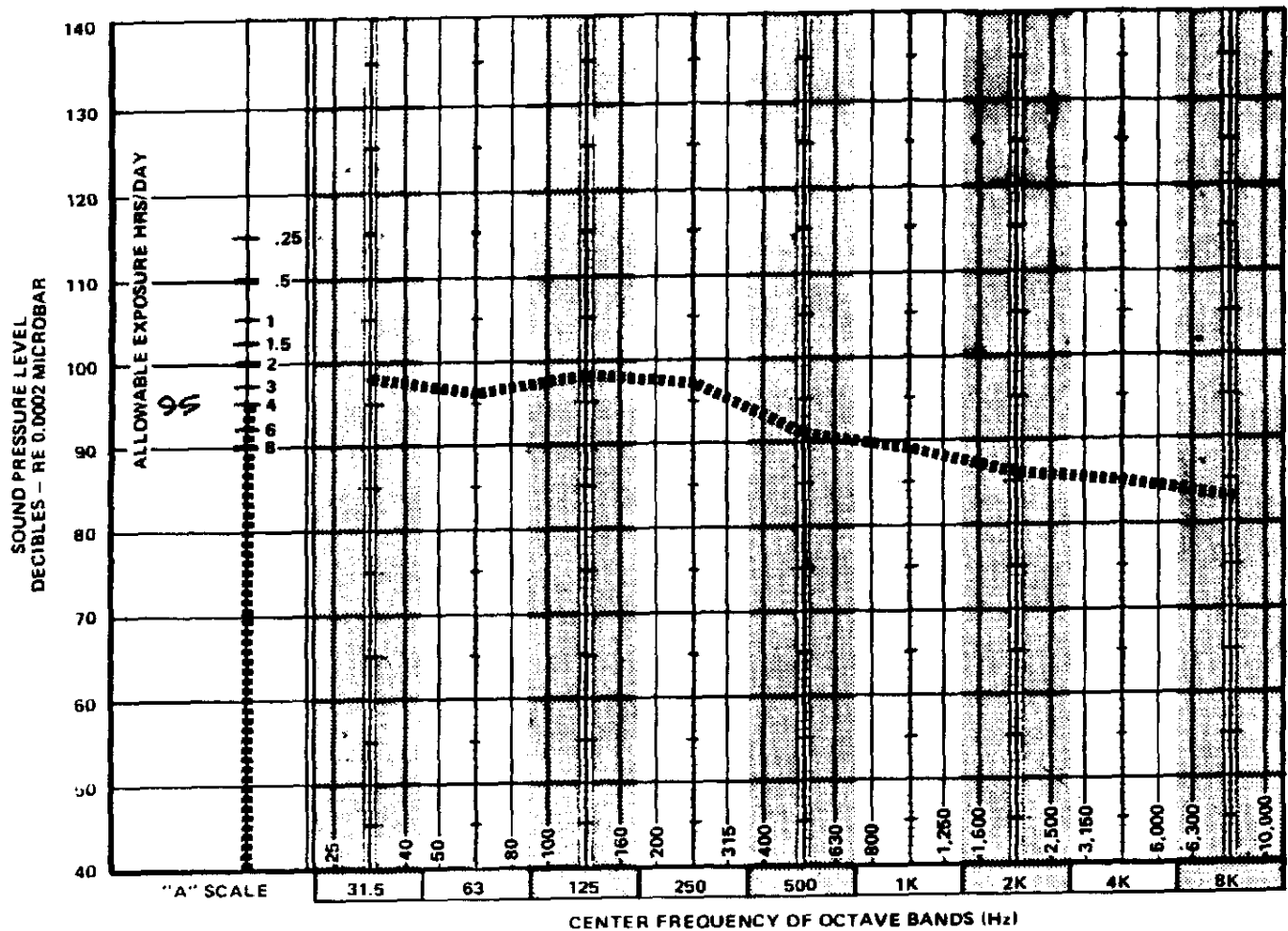
LOCATION OF ANALYZER: *West Side of Dryer Bldg. - Downstream
of Orifice in Line to Silo #4*

EXPOSURE (HRS/DAY) O.S.H.A. = *48 MINUTES*

COMMENTS: *LAGGING OF THESE ORIFICES MAY BE REQUIRED
AFTER OTHER NOISE ABATEMENT WORK IN THIS
AREA IS COMPLETE. FOLLOW-UP SURVEY WILL DETERMINE
NEED.*

OKLA. CITY PVC PLANT
MARCH 1977

CHART NO. 4



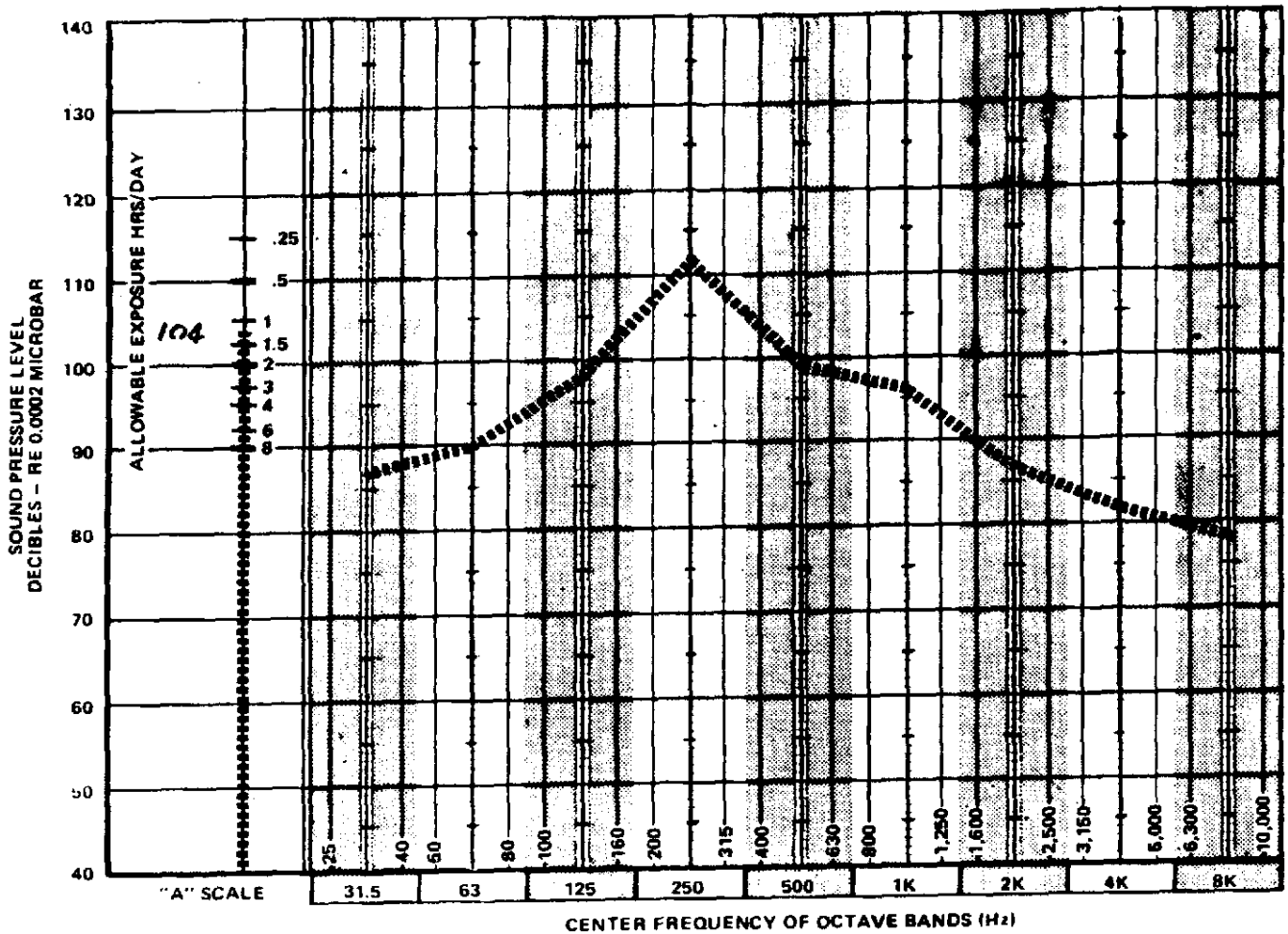
LOCATION OF ANALYZER: NEAR BLOWER EAST OF SILO No. 6

EXPOSURE (HRS/DAY) O.S.H.A. = 4 HOURS

COMMENTS: LAG BLOWER CASE & DUCT AS DESCRIBED IN REPORT
AND ON SKETCH No. 1

OKLA. CITY PVC PLANT
MARCH 1977

CHART NO. 5



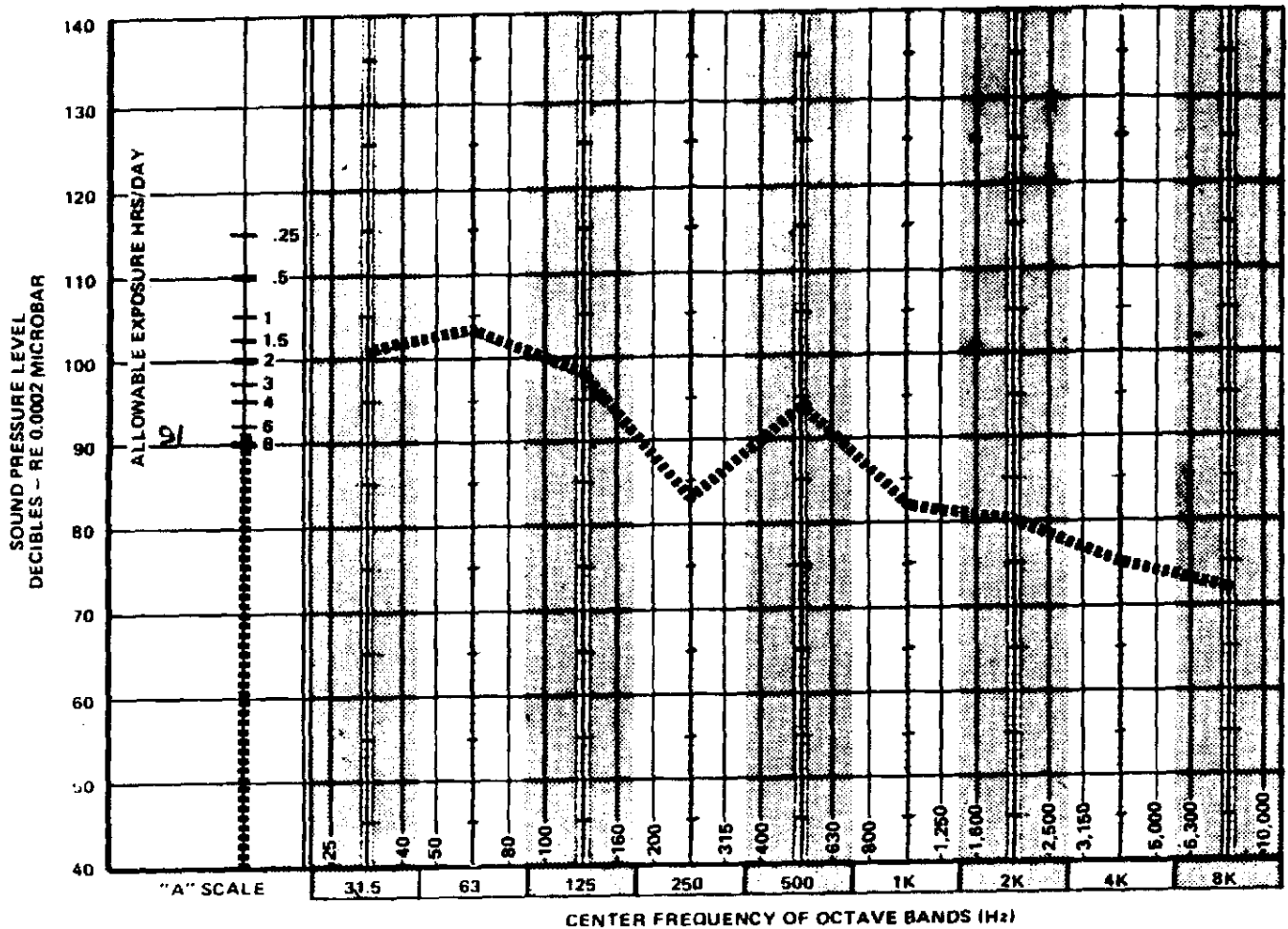
LOCATION OF ANALYZER: NEAR NW CORNER DOOR OF DRYER BLDG.

EXPOSURE (HRS/DAY) O.S.H.A. = 1 HOUR 10 MINUTES

COMMENTS: THIS NOISE COMES FROM THE AIR TRANSFER PUMPS
DUCTWORK.

OKLA. CITY PVC PLANT
MARCH 1977

CHART NO. 6



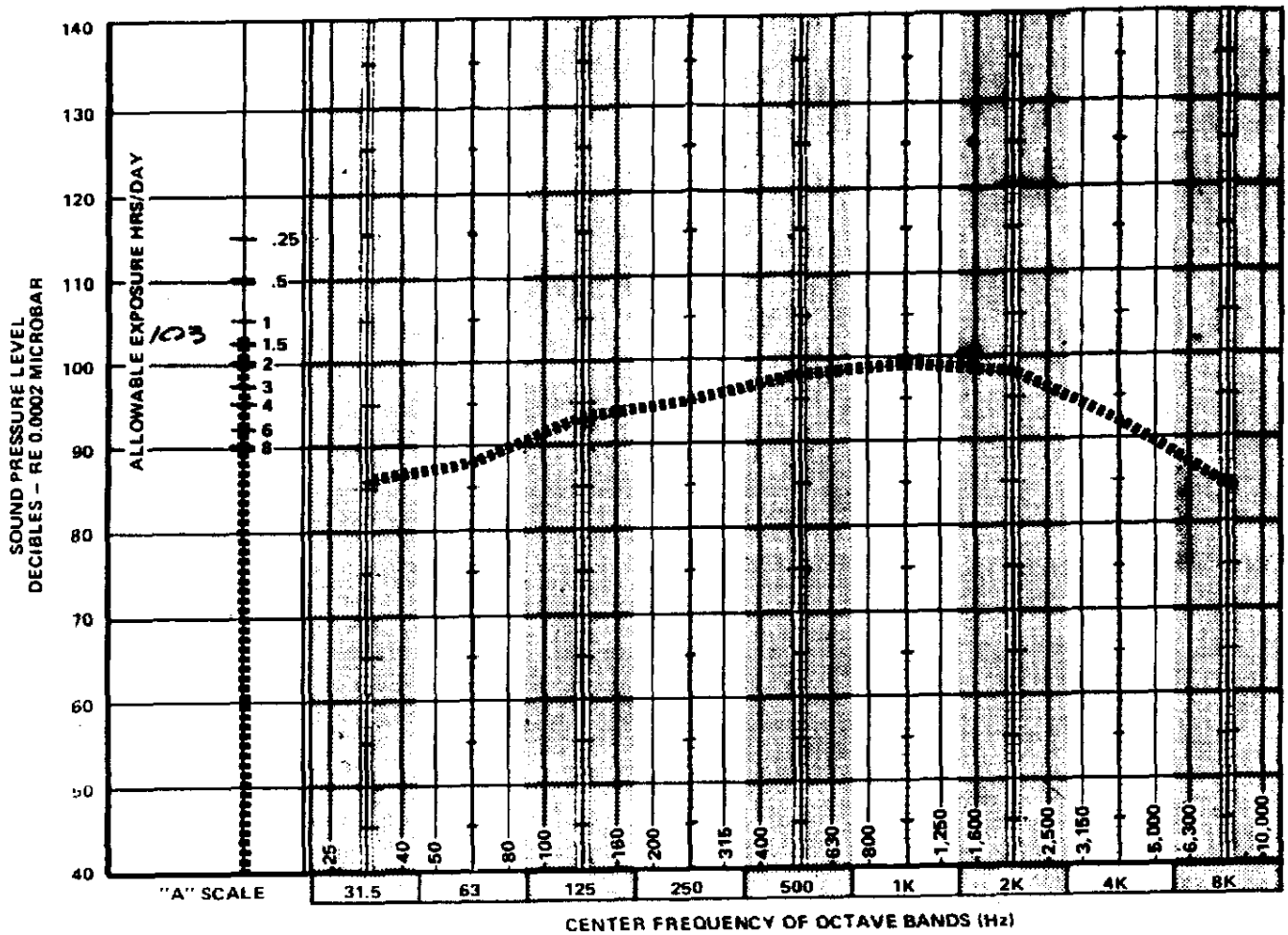
LOCATION OF ANALYZER: 3' FROM INTAKE OF COMPRESSOR C-401

EXPOSURE (HRS/DAY) O.S.H.A. = 7 HOURS

COMMENTS: INTAKES FOR C-401 & 402 SHOULD BE
FITTED WITH INTAKE SNUBBERS

OKLA. CITY PVC PLANT
MARCH 1977

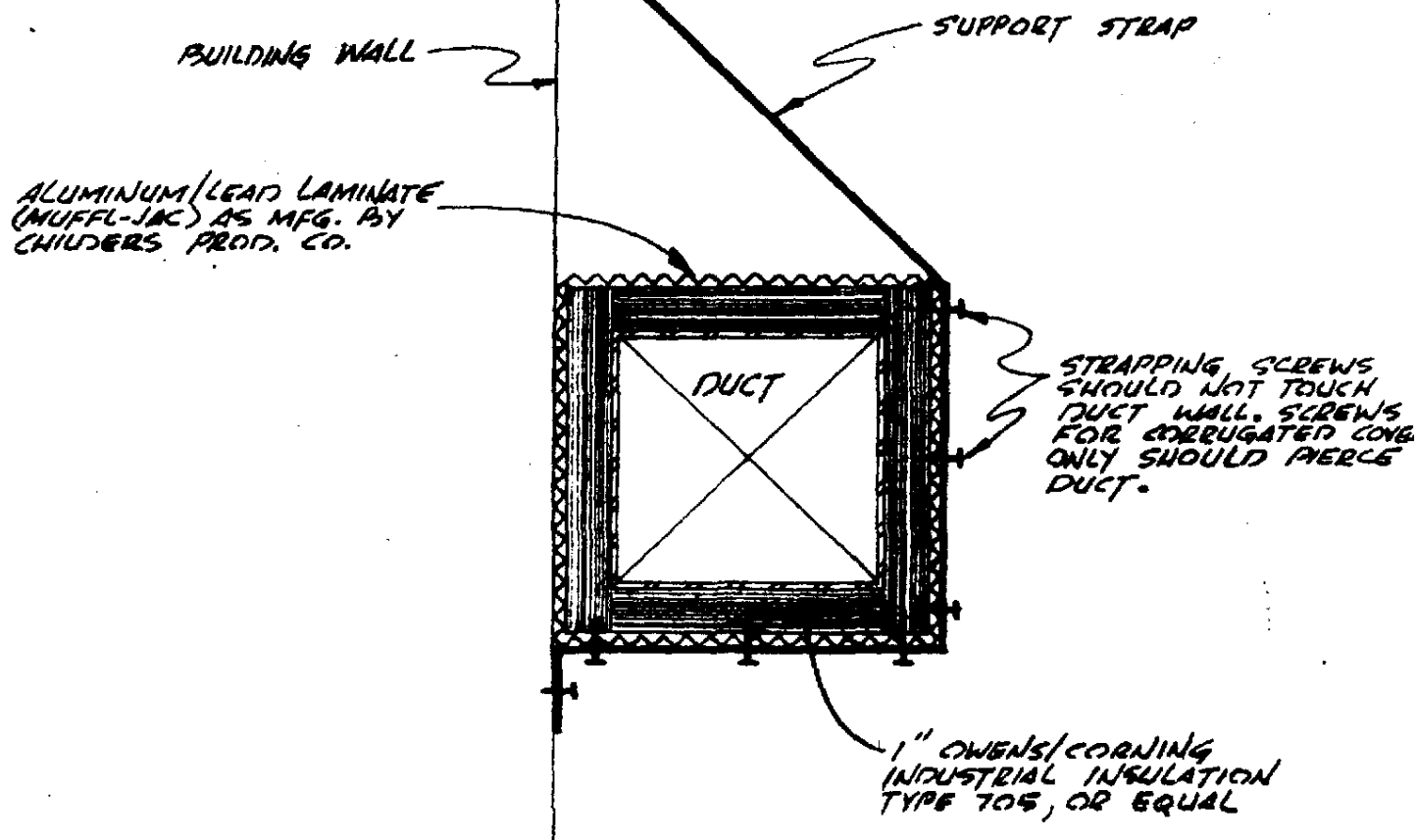
CHART NO. 7



LOCATION OF ANALYZER: *NEAR INTAKE OF AIR COMPRESSOR*
SOUTH OF DRYER BLDG.

EXPOSURE (HRS/DAY) O.S.H.A. = *1 HOUR 20 MINUTES*

COMMENTS:



NOTES:

1. THE AIR DUCT FOR THE TRANSFER PUMPS SHOULD BE LAGGED FROM THE FLEX HOSE CONNECTIONS TO WHERE IT ENTERS THE BUILDING.
2. THE CASES & DUCTS OF THE AIR BLOWERS SHOULD BE LAGGED USING THIS SYSTEM EXCEPT USE 2" OF FIBERGLASS AND THE MUFFL-JAC COVER MAY BE REPLACED BY MUFFL-LAG.

SKETCH NO. 1

VEV-261021

BY PLP DATE 4-5-77
CHKD. BY WGLV DATE 4-7-77

SUBJECT DUCT LAGGING
SYSTEM FOR OKLAHOMA
CITY PWS PLANT

SHEET NO. _____ OF _____
JOB NO. _____

OWENS CORNING
FIBERGLAS

Industrial Insulation 700 Series

Commercial D-9
Industrial D-36
January 1974

A highly versatile group of Fiberglas insulating boards designed to insulate ductwork and equipment operating at temperatures to 450F.



uses

The 700 Series boards have been designed primarily to insulate heating and air conditioning ducts, ovens, tanks, boilers, hot water generators and other hot equipment.

Type 701—A lightweight resilient insulation, in board form, used on vessels having irregular surfaces where the exterior finish is supported by welded studs, pins or other mechanical attachments.

Type 703—A semi-rigid board recommended for use on equipment, vessels and air conditioning ductwork.

Type 705—A rigid board with very high strength characteristics for use on chillers, hot and cold equipment, heating and air conditioning ductwork where greater abuse resistance and good appearance is required.

description

Fiberglas® 700 Series Industrial Insulations are made of inorganic glass fibers pre-formed into semi-rigid to rigid rectangular boards of varying densities. The series consists of Type 701, 703 and 705. Each type has specific thermal and physical characteristics which makes it suitable for the uses described. Type 703 and 705 are available with a factory-applied vapor-barrier facing to prevent condensation on cold surfaces and to provide a neat finished appearance.

benefits

Lower operating costs—the exceptional thermal efficiency of Fiberglas 700 Series Insulations lowers operating costs.

End-use tailored—three densities offer a selection of products to meet specific performance and economic requirements.

Lower maintenance costs—700 Series resists damage, maintains structural integrity and efficiency. Thickness stays uniform.

Neat, finished appearance—the boardlike characteristics of the heavier density 703 and 705 products provide neat square corners. The factory-applied facing provides an attractive finished appearance.

Immediate building code approval—Fiberglas 700 Series Insulation has a UL flame spread rating of less than 25.

*Trademark Registered Owens-Corning Fiberglas Corporation

VEV-261022

performance characteristics

Sound absorption coefficients (2" thick # 6 mounting)

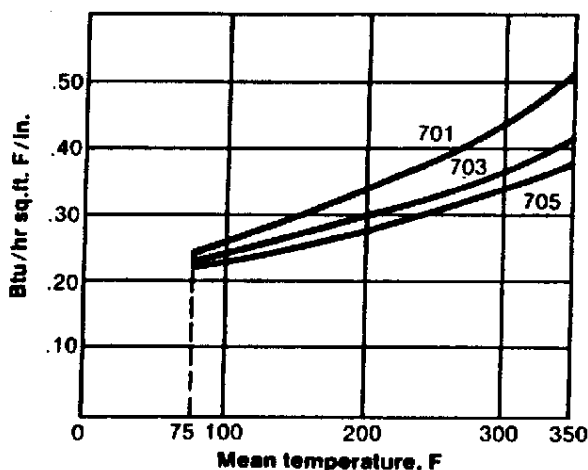
Frequency (Hz)	Insulation Type		
	701	703	705
125	.34	.32	.48
250	.70	.74	.82
500	.96	.97	.97
1000	.97	.98	.99
2000	.86	.87	.90
4000	.83	.85	.86
NRC	.87	.89	.92

Size and density

Density (pcf)	701	703	705
Thickness (in 1/2" increments)	1"-4"	1"-2"	1"-2"
Compressive Strength (psf at 10% deform.)	4.5†	100	350
Standard Size (inches)	24" x 48"		
Thermal Cond. @ 75F Mean Temp.	0.242	0.230	0.220

† After compression packaged.

Thermal conductivity



Moisture absorption—less than 2% by volume.

Bacteria and fungus resistance—does not breed nor promote.

Odor—odorless.

Humidity and temperature effect—cycling conditions will not cause spalling or crumbling.

Corrosion—does not accelerate corrosion of copper, steel, or aluminum.

facings

Types 703 and 705 are also available with the following factory-applied vapor barrier facings:
FRK—foil-reinforced kraft (available UL rated if specified in order).

NEOPRENE COATED—either clear or black (UL rated).

fire hazard classification

Unfaced, faced, and coated

flame spread 25

fuel contributed 50

smoke developed 50

(Compared to untreated Red Oak as 100.)

caution

The recommended Economic Thicknesses shown are chosen with respect to cost, thermal performance, and energy conservation. It is possible that heat may be generated from the resinous binder of insulations if ignited by external sources such as welding slag, cutting torches, etc. Care should be taken to avoid direct contact with the insulation by fire or ignition sources.

application recommendations

Type 701—lightweight unfaced flexible insulation in board form for use on vessels having irregular surfaces, where the compressive strength is not a performance criteria.

Types 703 & 705—board insulations normally impaled on welded pins on flat surfaces. They are cut in segments and banded in place on irregular surfaces. Unfaced boards are normally finished with reinforced insulating cement or weatherproof mastic. Faced boards, with joints taped to provide a continuous vapor barrier, may be left unfinished or may be canvas jacketed.

specification compliance

HH-I-558B, Form A, Class 1. 703** & 705.

HH-I-558B, Form A, Class 2. 703** & 705.

HH-I-558B, Form B, Type 1, Class 7. 701.

Navy Bureau of Yards and Docks, 16YF. 703** & 705.

Corps of Engrs. C.E.—301.08, .11 thru .17. 703** & 705.

NFPA, 90A, 703 & 705.

Type 703 G is specially produced for contracts where certification of compliance to the above Federal Specification is required. Available plain or faced for use on hot or cold equipment and for air conditioning ductwork.

economic thickness

Selection of an insulation for any specific application should take into consideration the following important criteria: 1. Cost of insulation applied. 2. Cost of heat energy at midlife. 3. Cost of capital. 4. Capital investment in heat production equipment. 5. Temperature differential. 6. Size of the pipe surface. 7. Conductivity of insulation. 8. Depreciation period—insulation and facility. The thicknesses shown in the tables below are based on the following typical conditions:

Commercial (full time):

Annual fuel price increase: 4%
Initial heat cost: \$2.75/1000 lb. steam
Heat cost at midlife: \$4.07/1000 lb. steam
Cost of money: 7½%/year
Capital investment: \$20/lb. steam/hour
Flat insulation cost (1"): \$3.40/sf
Depreciation time: 20 years
Hours of operation: 8760/year

Commercial (part time):

Annual fuel price increase: 4%
Initial heat cost: \$3.00/1000 lb. steam
Heat cost at midlife: \$4.44/1000 lb. steam
Cost of money: 7½%/year
Capital investment: \$20/lb. steam/hour
Flat insulation cost (1"): \$3.40/sf
Depreciation time: 20 years
Hours of operation: 5400/year

Economic thickness for heated equipment to 450F (80F ambient, still air, commercial full time)

Surface Temp.	Type 701			Type 703			Type 705		
	ET	HL	ST	ET	HL	ST	ET	HL	ST
150	2½	7	85	2½	7	84	2½	6	84
200	3½	9	86	3½	9	86	3½	8	86
300	5½	13	89	5	13	89	5	12	88
400	7	17	92	6½	16	91	6	16	91
450	7½	20	93	7	18	92	7	17	91

Economic thickness for heated equipment to 450F (80F ambient, still air, commercial part time)

Surface Temp.	Type 701			Type 703			Type 705		
	ET	HL	ST	ET	HL	ST	ET	HL	ST
150	2	9	86	2	8	86	2	8	85
200	3	11	87	3	10	87	3	10	86
300	4½	16	91	4	16	90	4	15	90
400	5½	21	95	5	20	94	5	19	93
450	6	24	97	6	21	94	5½	21	94

ET = economic thickness inches HL = heat loss, Btu/hr./lineal foot ST = surface temperature, F

Thickness to prevent condensation on cold ducts and equipment

The following chart indicates the recommended thickness for installation on cold air ducts at various temperature differences (duct to air). Also shown are values for heat gain and approximate maximum relative humidity allowable.

Temperature Differences	Recommended Thickness (inches)	Heat Gain Btu/ft ² hr	Permissible Relative Humidity
20	1	4.3	90%
25	1	5.2	87%
30	1	6.1	89%
35	1	7.1	88%
40	1½	5.7	90%
45	1½	6.3	89%
50	2	5.4	90%

Offices of Owens-Corning Fiberglas Corporation

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Buffalo, New York	716-832-1410	Nashville, Tennessee	615-298-3646
Charleston, W. Va.	304-744-2291	Newark, New Jersey	201-484-8800
Charlotte, N.C.	704-372-7065	New Orleans, Louisiana	504-837-2902
Cherry Hill, New Jersey	609-428-8590	New York, New York	212-759-3810
Chicago, Illinois	312-583-0100	Norfolk, Virginia	804-855-0114
Cincinnati, Ohio	513-281-1173	Oklahoma City, Okla.	405-528-4468
Cleveland, Ohio	216-884-9440	Omaha, Nebraska	402-397-2072
Columbia, S. C.	803-252-9983	Orlando, Florida	305-424-6371
Columbus, Ohio	614-451-6420	Philadelphia, Pa.	215-688-8650
Dallas, Texas	214-233-9241	Phoenix, Arizona	602-277-6217
Denver, Colorado	303-757-6121	Pittsburgh, Pa.	412-563-7766
Des Moines, Iowa	515-274-4748	Portland, Oregon	503-620-1014
Detroit, Michigan	313-547-8000	Providence, R. I.	401-434-7437
East Hartford, Conn.	203-289-6411	Raleigh, N. C.	919-833-7716
Elkhart, Indiana	219-294-3627	Richmond, Virginia	804-272-5851
Evansville, Indiana	812-425-5124	Rochester, New York	716-381-0340
Flint, Michigan	313-787-6573	Rock Island, Illinois	309-788-6309
Fort Wayne, Indiana	219-483-9552	Sacramento, California	916-927-1896
Fresno, California	209-266-4193	St. Louis, Missouri	314-991-2640
Grand Rapids, Michigan	616-452-8788	Salt Lake City, Utah	801-487-6204
Greensboro, N. C.	919-273-0528	San Antonio, Texas	512-342-9531
Greenville, S. C.	803-271-9331	San Bernardino, Calif.	714-885-3496
Harrisburg, Pa.	717-761-0430	San Diego, California	714-292-7722
Honolulu, Hawaii	808-537-3832		
Houston, Texas	713-869-9363		

San Francisco, Calif.	415-873-7950
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Scarsdale, New York	914-472-3400
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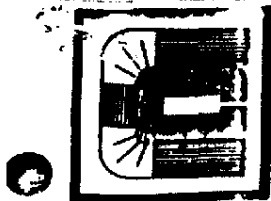
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OWENS-CORNING FIBERGLAS CORPORATION
Mechanical Products Division
Fiberglas Tower, Toledo, Ohio 43659



METAL JACKETING SYSTEMS

TECHNICAL PRODUCT INFORMATION

MUFFL-JAC® ACOUSTICAL JACKETING

DESCRIPTION

Childers Muffl-Jac® is a special composite jacketing of high quality lead laminated to Aluminum for the reduction of noise levels and protection of thermal insulation materials. It is designed to reduce the radiation of sound generated by or within piping and equipment.

Standard Childers Muffl-Jac® is supplied with an outer layer of Type 3003 or 5005 high purity Aluminum, exhibiting exceptional resistance to most weathering and corrosive environments, and an inner layer of lead. It is manufactured in rolls, sheets, or is pre-fabricated.

A special $\frac{3}{16}$ " corrugation is incorporated into standard Muffl-Jac®; corrugated jacketing adds stiffness (for attenuation of the lower frequencies) and strength, reduces glare from external light sources, allows for expansion of the jacketing, eliminates "coil break" over small size piping, and does not show dents as readily. For special uses, Muffl-Jac® is available in a variety of metals and finishes.

ADVANTAGES

Muffl-Jac® is applied in one operation, unlike comparable products, thereby reducing application costs. The acoustical effectiveness of Muffl-Jac® is superior to the separate applications of lead and Aluminum, due to the special bonding properties of the adhesive. Muffl-Jac® has high transmission loss characteristics, and also serves to protect underlying sub-structures and/or thermal insulations against mechanical abuse, weather, and corrosive environments.

Childers Products Company provides technical assistance in the choice, selection, and applications of complete acoustical insulation systems for industry. If studies are required to determine the solution of a noise reduction problem, Childers is assisted by recognized industrial acoustical engineering consultants.

Childers Muffl-Jac® has been tested by an independent acoustical laboratory in accordance

with ASTM designation E 90-70, standard classification for determination of sound transmission class. Muffl-Jac® has an STC-26 rating. The sound transmission loss graph for Muffl-Jac® is printed on the reverse side for reference.

USES

Childers Muffl-Jac® is used over mineral fiber or glass fiber insulations. It is applied over straight runs of piping, HVAC Ducting, casings, enclosures, gearboxes, and other regular surfaces. For irregular surfaces, such as compressors, pumps, blowers, fittings, flanges, and valves, Childers offers an equally effective noise reduction mastic material, MUFFL-LAG®, a trowelable transmission loss compound.

APPLICATION

Childers Muffl-Jac® is applied in a similar manner as standard insulation metal jacketing. It is applied over the insulated surface, making sure a two inch overlap exists for each radial and longitudinal lap of jacketing. For vertical applications, mechanical supports should be applied to hold the insulation and Muffl-Jac® in place and support the load. Muffl-Jac® is then secured with conventional fastening devices such as strapping and wing seals or other mechanical means of attachment.

For maximum acoustical effectiveness, a separation should exist between the radiating surface and the Muffl-Jac®. This separation is filled with previously applied glass fiber or mineral fiber insulation of 1 to 2 inch thickness and 4 to 8 lbs./cu. ft. density. Like all transmission loss materials, Muffl-Jac® must be sealed at all joints, laps, cutouts, and gaps with either Childers Chil-Joint (CP-70) or Chil-Byl (CP-76) joint sealants. For large irregular cutouts, gaps, and all irregular surfaces, MUFFL-LAG® is used to provide an essentially air-tight monolithic treatment. When sealed, the Muffl-Jac® application is considered complete, and effective noise control is achieved.

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P. O. Box 22228 (23350 Mercantile Rd.) Beachwood, Ohio 44122 (216) 464-8020 Telex 98-5497

OTHER PLANTS AT:

Bristol, Pa. 19007
(215) 943-7800
Telex 84 3408

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Telex 77-6184

Los Angeles, Calif. 90022
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(519) 944-6800
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Caracas, Venezuela
51.79.11
Telex 21245

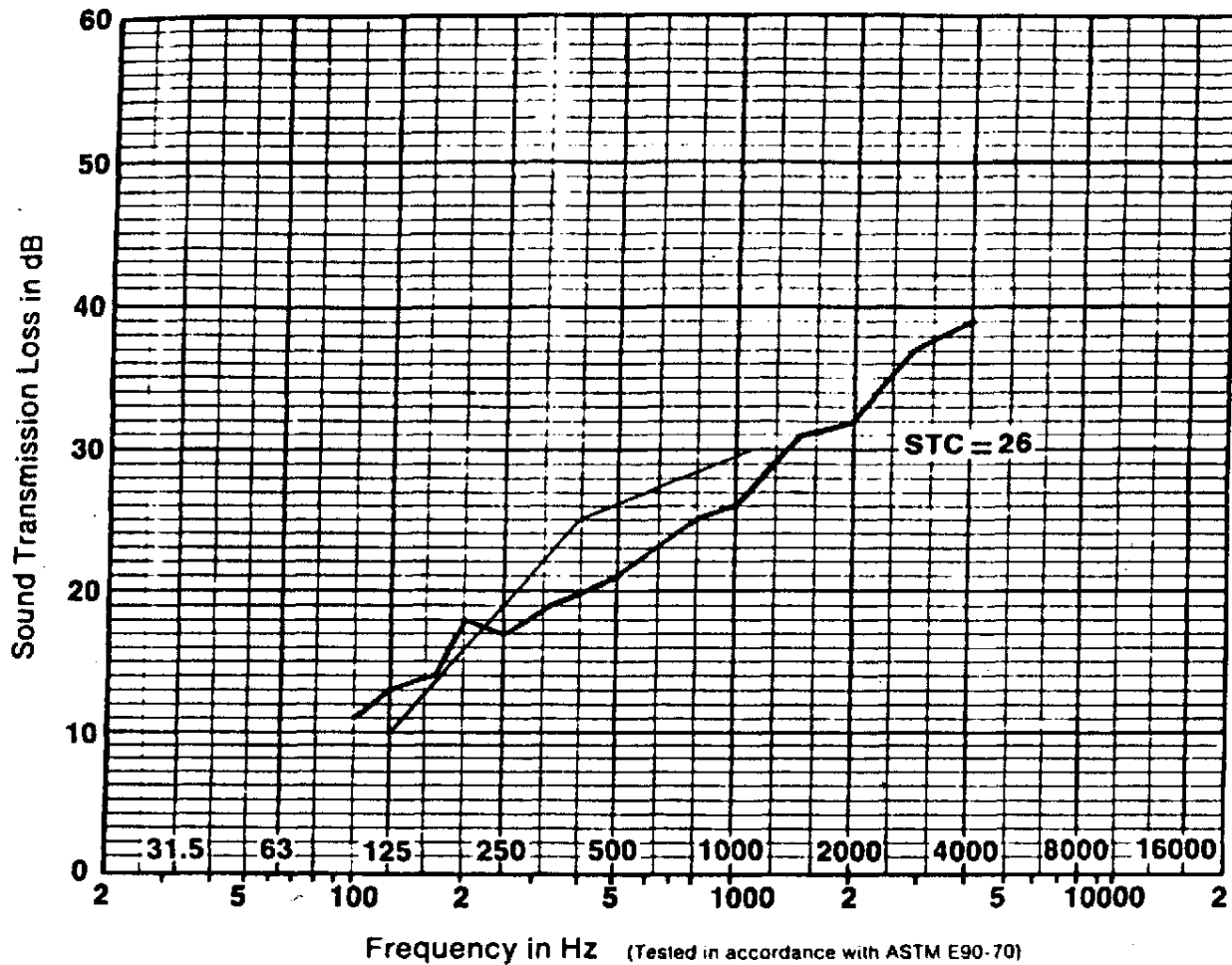
Calgary, Alberta, Canada
(403) 276-6638
Telex 038 24793

Supersedes
CRL-AL-866

MJE-874

VEV-261026

Test Report of Cedar Knolls Acoustical Laboratories



The following Octave Band Analysis shows the procedures for arriving at the noise reduction capability of typical Muffl-Jac® applications

GAS PIPE							
Hz	125	250	500	1K	2K	4K	Total
Lp (dB)	110	102	106	97	90	85	113 dB (lin)
Adjustment for A-weighting (dB)	-15	8	-3	0	1	1	
Weighted Levels (dB)	95	94	103	97	91	86	105 dBA
MUFFL-JAC® (dB) (T L)	8	-17	-20	-26	-32	-38	
Resultant weighted levels (dB)	87	77	83	71	59	48	88 dBA
CHEMICAL PIPE							
Lp (dB)	111	106	99	95	92	93	113 dB (lin)
After lagging — weighted levels	88	81	76	71	61	64	89 dBA
FLOUR PIPE							
Lp (dB)	95	99	103	106	102	92	109 dB (lin)
After lagging — weighted levels	72	74	80	80	71	63	84 dBA

LP = dB rel 20 μ Pa Pa = Pascal = N/M²

.016x36"x36' Aluminum Muffl-Jac

\$1.40 per sq. ft.

Available in Rolls & Pre-fabricated — Weight 1 $\frac{1}{2}$ lbs. per sq. ft.

Prices Apply to Quantity Shipped to One Destination at One Time
 PRICES SUBJECT TO CHANGE WITHOUT PRIOR NOTICE.
 ORDERS SUBJECT TO PRICES IN EFFECT AT TIME OF SHIPMENT.

F.O.B. SHIPPING POINT

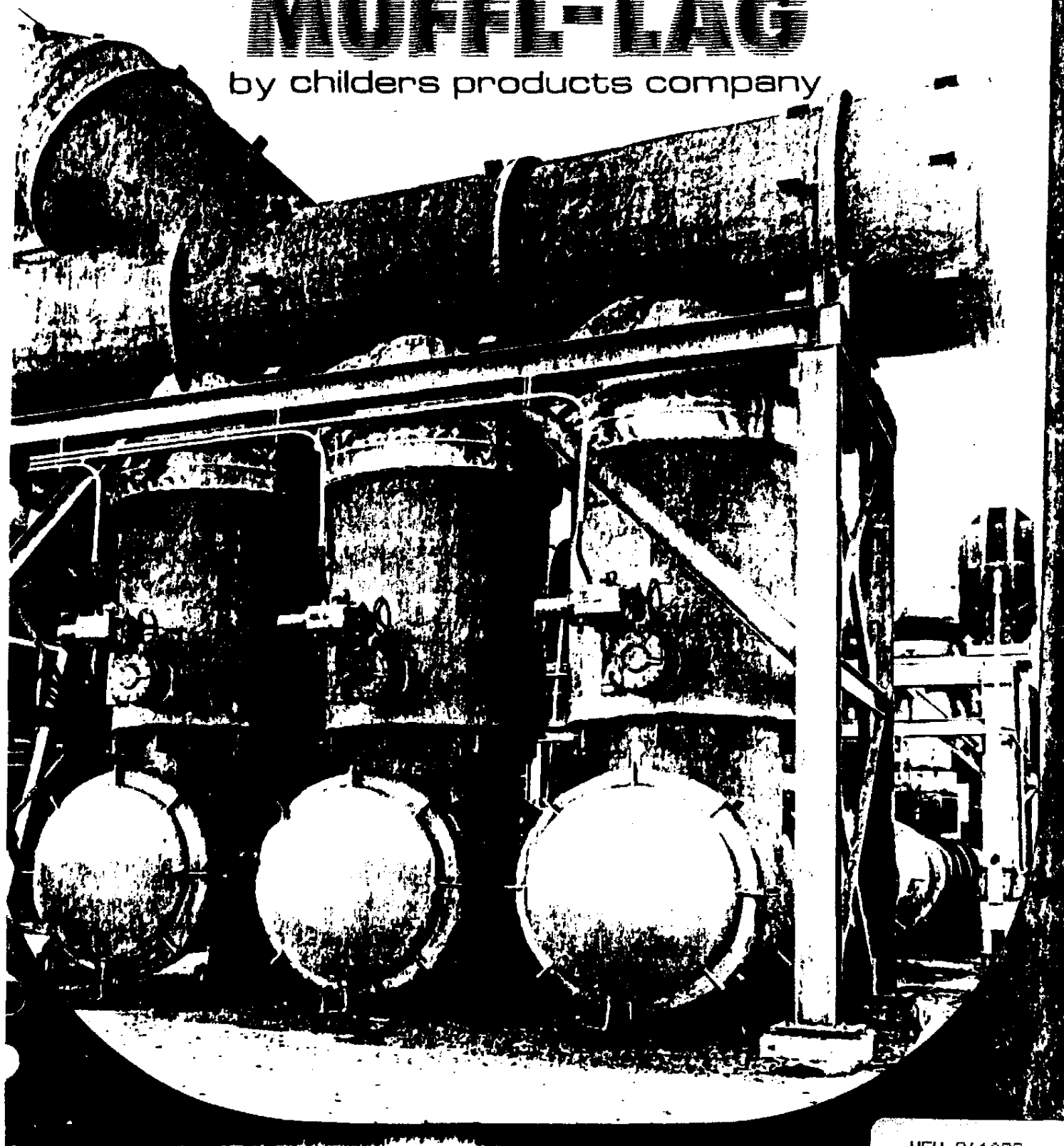
TERMS: NET 30 DAYS.
 1% PER MONTH SERVICE CHARGE
 ADDED TO PAST DUE BALANCE.

VEV-261027

**Effective Noise Control with Lagging that's simple
to apply, and Guaranteed to do the job!**

MUFFL-LAG®

by childers products company



VEV-261028

MUFFL-LAG® acoustical coating reduces

...a revolutionary material for sound attenuation
developed by established acoustical engineering consultants

Years of specialization in industrial noise control preceded the introduction of MUFFL-LAG®.

The formulation for MUFFL-LAG® was developed specifically to overcome the shortcomings of existing products used for noise control in piping, tanks, machinery, and other industrial installations.

Now Childers offers not only a practical method of controlling noise, but also reliable technical guidance before and after attenuation.

If your noise problem has not been fully identified, send for our information form, which is easy to complete. After examining your situation, at no cost, Childers will advise you the best route to take.

In some cases, a free evaluation in your plant may provide the solution.

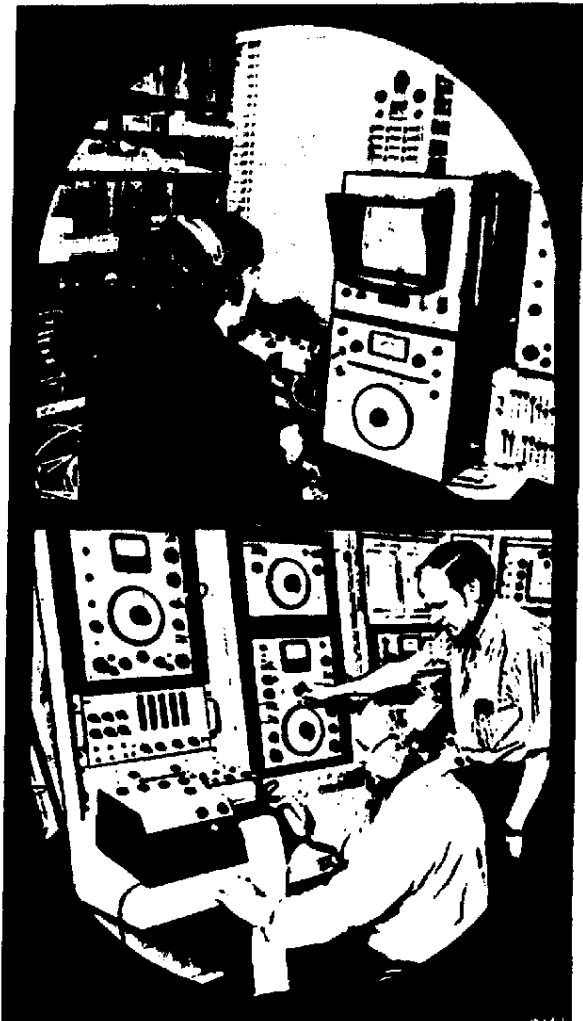
When more information is required to determine the proper solution (cost of effectiveness, influence on production, etc.) a detailed study will be made, leading to a specification from Childers which will be backed by the Childers Guarantee.

Studies will be made by recognized Engineering industrial noise consultants. Years of accomplishment in noise control for architects, engineers, industry, and government have distinguished these firms in this field.

Recommendations are made on the basis of your specific needs, regardless of the products marketed by Childers.

Lead by itself and other metals traditionally used for noise reduction oftentimes have many shortcomings.

Developed with the advice and counsel of established experts in the acoustical engineering field, MUFFL-LAG® overcomes virtually all of the drawbacks of these other materials. It has exceptionally high transmission loss characteristics. MUFFL-LAG® is monolithic in treatment, and has resistance to impact and contamination.



(TOP) In-house lab analysis at Donley, Miller & Nowikas, Consulting Acoustical Engineers associated with Childers Products Company for the development of new noise control products.

(BOT) Remote instrumentation console measures transmission loss effectiveness of MUFFL-LAG at Cedar Knolls Acoustical Laboratories. For testing sound transmission and absorption and other characteristics, their facilities are among the most extensive in the world.

This polymer based acoustical coating combines substantial reductions in installation costs with highly effective noise control.

If you have already measured accurately the extent of your noise problem and MUFFL-LAG® is the logical solution, we welcome your order.

Installation costs as much as it reduces noise

Economical Installation — MUFFL-LAG® can be applied easily with a trowel in its liquid form. It adheres readily to most materials. No special skills are required. An air-tight seal can be formed readily, even around elbows, valves, and other fittings. Its thixotropic characteristics permit application to vertical surfaces. MUFFL-LAG® cures to a non-volatile, touch-dry condition in less than one hour. The coating is normally applied over glass fiber or mineral wool. A coating of .140" thick will yield surface density of 1.5 lb./sq. ft.

Highly Efficient Noise Control — Independently certified test results show transmission loss for frequencies between 100 Hz and 5000 Hz. MUFFL-LAG® has a rating of STC 28 (sound transmission class). This material has high mass and cures to a firm condition with no voids.

The following Octave Band Analysis shows the procedure for arriving at the noise reduction capability of a typical Muffl-Lag application.

GAS PIPE										Sum of
Hz	63	125	250	500	1K	2K	4K	8K		Readings
Lp (dB)	106	110	102	106	97	90	85	85		113 dB (lin.)
Adjustment for A-weighting (dB)	-25	-15	-8	-3	0	1	1	1		
Weighted Levels (dB)	81	95	94	103	97	91	86	86		105 dBA
Muffl-Lag (dB) (T.L.)	-8	-10	-14	-17	-28	-37	-45	-45		
Residual weighted levels (dB)	72	85	80	86	69	54	41	41		89 dBA
CHEMICAL PIPE										
Lp (dB)	106	111	106	99	95	92	93			113 dB (lin.)
After lagging — weighted levels	72	86	84	79	67	57	50			88 dBA
FLOUR PIPE										
Lp (dB)	94	95	99	103	106	102	92			109 dB (lin.)
After lagging — weighted levels	60	70	79	83	78	66	58			85 dBA
LP dB rel 20 μ Pa Pa Pascals N M²										

Requires no Maintenance — MUFFL-LAG® is supplied in aluminum gray color and does not require painting. Areas damaged by mechanical abuse are easily repaired.

Mechanical Protection — When cured, MUFFL-LAG® remains flexible, and forms a tough protective coating. If damaged accidentally, this polymer based material can be spot repaired to form an air-tight seal simply by patching the break with MUFFL-LAG®. In addition to its exceptional acoustical properties, MUFFL-LAG® is an excellent weather-proofing coating for thermal insulation, being easy to apply and quick setting.

Impervious to Chemicals — MUFFL-LAG® is inert in its cured state and is non-

corrosive and impervious to almost all acids, alkalis, and oils (see Chemical Corrosion Resistance Chart).

Air tight, Waterproof Seal — MUFFL-LAG® contains no voids when cured and is waterproof and air-tight. Chil-Glas #5 is recommended as a reinforcing membrane.

High Melt Point — Unlike some types of lagging, which can melt at temperatures as low as 180° F., MUFFL-LAG® with-stands temperatures in excess of 350° F.

Contains No Lead — MUFFL-LAG® meets the chemical ingredient requirements of the Food and Drug Administration. It can be used in conjunction with other Childers Products coatings to meet U.S.D.A. Standards.

Consistency — MUFFL-LAG® is available in two gallon cans, complete with 1 small bottle of mixing material which is mixed simply prior to application. It comes in the consistency of plaster and is applied with a trowel. Normal curing time is 1 hour to touch dry. In the unmixed condition, shelf life is at least than six months.



Transmission Loss Test — ASTM E90-70 — The special test facilities available at Cedar Knolls Acoustical Laboratories enable them to conduct this test exactly in accordance with the standard of the American Society for Testing of Materials

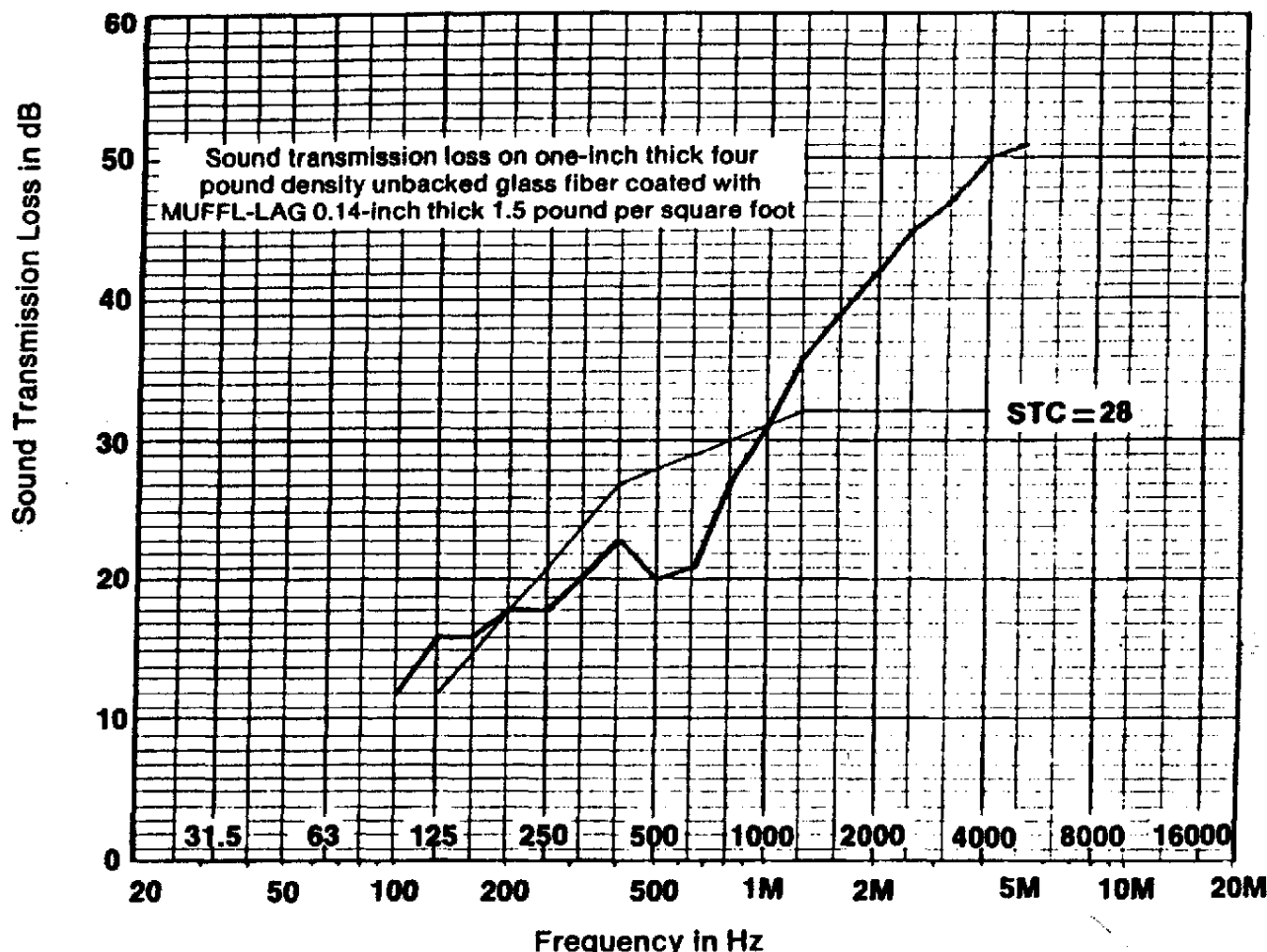
and their independent report shows the results achieved and the STC 28 for which the material qualified.

SUPERIOR DAMPING CHARACTERISTICS

Though flexible in character, the energy losses in flexure are high so that MUFFL-LAG® can be applied to any resonant surface to provide superior damping characteristics.

Sound Transmission Class (STC) Average Weighting

Test Report of Cedar Knolls Acoustical Laboratories



(Tested in accordance with ASTM E90-70)

Physical Properties of MUFFL-LAG*

Trough applied Transmission Loss Coating	
Coverage @ 1.5 lb./sq. ft.	Approx. 11 sq. ft./gal.
Flame Retardancy:	UL-94, SE-0 Vertical test (1/2")
Consistency:	Like thick plaster
Weight:	Approx. 17 lbs./gal.
Stability (uncured)	Minimum 6 months (test in prog)
Hardness:	Barecol hardness 30-35
Clean-up:	Chlorinated Solvents (N-F)
Water Absorption: (Soaked in Boiling Water)	0.4% by weight
Service Temp.:	-10°F to 350°F
Application Temp.:	20°F to 100°F
% Solids by Vol.:	95%
STC	28 (Cedar Knolls Acoustical Lab)

MUFFL-LAG is a registered trademark

Chemical Corrosion Resistance

Solution	Weight Change (%)			Appearance
	14 Days	90 Days	355 Days	
Conc. Ammonium Hydroxide	None	—	1.1%	Very Slightly Darker
10% Ammonium Hydroxide	None	3%	0.5%	Very Slightly Darker
10% Sulphuric Acid	None	None	0.2%	Very Slightly Darker
Concentrated Nitric Acid	None	—	1.8%	Slightly Yellow
10% Nitric Acid	None	0.2%	0.6%	None
Concentrated Hydrochloric Acid	None	—	0.7%	Slightly Darker
10% Hydrochloric Acid	None	0.1%	1.1%	None
25% Aqueous Calcium Chloride	None	0.4%	0.4%	Very Slightly Darker
Distilled Water	None	0.5%	0.5%	None
Brake Fluid	None	0.5%	0.6%	None
Gasoline	None	0.1%	0.4%	None
Toluene	0.1%	0.3%	1.1%	Slightly Darker
Methyl Alcohol	0.5%	0.2%	0.5%	None
Motor Oil	0.4%	0.7%	0.7%	Very Slightly Darker



On vessels & pipes MUFFL-LAG®
is applied easily with a trowel and
adheres well to most materials. It
is self-supporting in its cured state.
An air-tight seal can be formed
readily around elbows, valves, fit-
tings, or other irregular surfaces.

On enclosures
An effective noise attenuating
enclosure is achieved simply and
quickly by forming a structure of
glass fiber board 4-6 lb. /cu. ft.
and coating it with MUFFL-LAG®.



To seal a pipe or vessel, MUFFL-LAG is applied to the surface with a trowel. An air-tight seal is formed around elbows, valves, fittings, or other irregular surfaces.

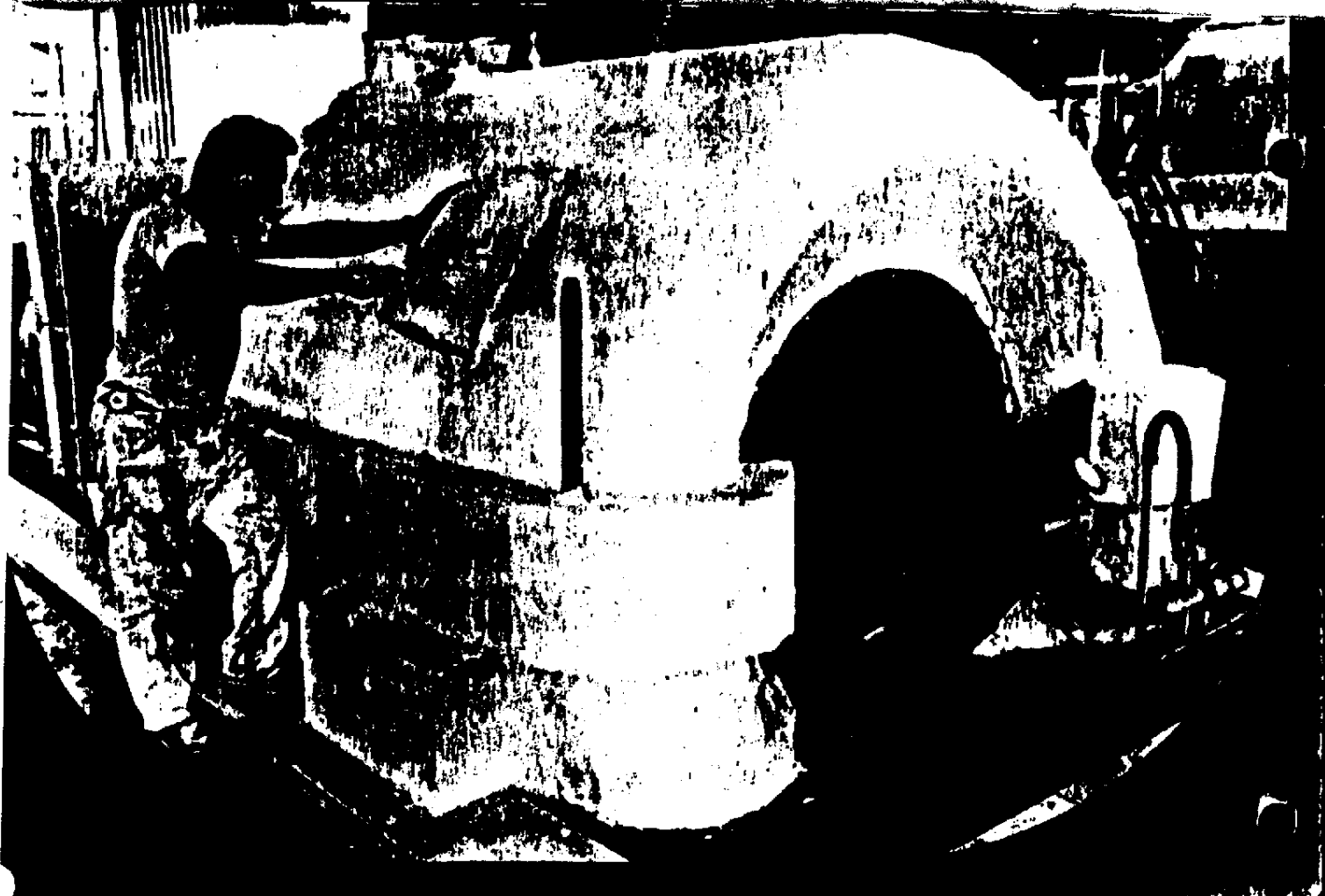


To seal a pipe or vessel, MUFFL-LAG is applied to the surface with a trowel. An air-tight seal is formed around elbows, valves, fittings, or other irregular surfaces.



To seal a pipe or vessel, MUFFL-LAG is applied to the surface with a trowel. An air-tight seal is formed around elbows, valves, fittings, or other irregular surfaces.

OUR GUARANTEE This Childers Guarantee is issued at the discretion of Childers Products Company and states that the sound reduction required will be achieved if the work is completed as specified. This guarantee is issued with a specification number to which the guarantee refers. There are no other conditions.



TYPICAL APPLICATIONS

Power Houses, Steel Mills
Casings of blowers, generators, compressors
Inlet and exhaust pipes
Steam pipes
Fan casings
Pump casings or enclosures

Petro-Chemical Refineries
Pipes
Blowers, generators, compressors
Gearbox enclosure
Pump casings or enclosures

Heavy Fabrication
Gearbox enclosures
Crane drive enclosures
Partial enclosures for presses, saws
Compressor casings
Hydraulic pump enclosures
Fan casings
Cyclone air extractor casings

Food Industries
Conveyor chutes pipes
Cyclone casings
Compressor casings
Gearbox casings
Pump enclosures
Mill casings

Architectural
H.V.A.C. ducting
Pumps, blowers, fan casings

General Manufacturing
Small enclosures for gearbox
Enclosures for hydraulic pumps
Steam pipes
H.V.A.C. ducting
Compressor houses, generators
Equipment test rigs
Exhaust pipe and muffler casings
Casings of Vibratory Screws

Plastics Industries
Pelletisers
Grinders
Conveyor pipes

childers products company

World's Largest Manufacturer of Metal Jacketing, Coatings, Adhesives, and Sealants



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Telex 77 5164

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Telex 67 3639

Windsor, Ontario, Canada
(519) 944-6800
Telex 24-77647

Caracas, Venezuela
61 79 11
Telex 21245

Calgary, Alberta, Canada
(403) 276-6638
Telex 038 24793

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VEV-261033



MUFFL-LAG®

COATINGS / ADHESIVES / SEALANTS

HIGHLY EFFICIENT TRANSMISSION LOSS COATING FOR EFFECTIVE NOISE CONTROL

DESCRIPTION

MUFFL-LAG® is a tough, durable, and flexible polymer based acoustical coating for use in conjunction with 4 to 6 lb. density fibrous glass and other insulations; it may be used over any surface needing sound attenuation. It has a Sound Transmission Class rating of STC-28. MUFFL-LAG is waterproof, forms an air-tight seal, and is thixotropic.

USES

MUFFL-LAG is a superior noise control coating which was developed for use over any surface, such as piping, enclosures, HVAC Ducting, compressors, pumps, fittings, flanges, valves, and other large surfaces. It has found many applications in the Petro-Chemical, Power, Plastics, Gas, and Heavy Fabrication Industries. MUFFL-LAG is also used to seal gaps, cutouts, and overlaps when MUFFL-JAC® (a composite metal jacketing of aluminum and lead) has previously been applied to regular surfaces.

MUFFL-LAG is gray in color, harmonizing with process equipment and metal jacketing. It is also available in other colors upon request.

ADVANTAGES

MUFFL-LAG® combines substantial reduction in installation costs with highly effective noise control. It has a rating of STC-28 (Sound Transmission Class). MUFFL-LAG is easy to apply by trowel or palm, has high mass, sets up quickly, cures to a limp condition, and contains no lead. It may be used in Food Processing facilities. MUFFL-LAG requires no maintenance; areas damaged by impact are easily repaired by coating the break with MUFFL-LAG. When catalytically cured, MUFFL-LAG remains permanently flexible to permit limited expansion and contraction.

MUFFL-LAG has a high melt point; it will stand temperatures up to 350°F with no effect upon the coating. It is impervious to most chemicals, acids, alkalis, oils, and is non-corrosive.

APPLICATION

MUFFL-LAG is applied by trowel or palm firmly on to 4-6 lb. density fibrous glass insulation. Other fibrous types of insulation may be used, however higher densities may be required. The insulation is first secured in place and a tack coat of MUFFL-LAG is applied at a coverage rate of 20 sq. ft./gal into which Chil-Glas 45 reinforcing membrane is embedded. Then a finish coat of MUFFL-LAG is applied to achieve a .140" dry film thickness, or a total coverage rate of 10-11 sq. ft./gal. approx. Embedding the Chil-Glas within the MUFFL-LAG affords maximum strength and dimensional stability to the cured film and should be applied. Joints or patches should have at least a 2" thick overlap of Chil-Glas. The thixotropic consistency of MUFFL-LAG also permits vertical and overhead applications without sagging. It easily bridges gaps and imperfections.

COLOR

Gray
(Other colors available upon request)

NET WEIGHT

17 lbs./gal. approx.

AVERAGE NON-VOLATILE

95% by volume

SERVICE TEMPERATURE RANGE

(Temperature to which dry coating is subjected)
-10°F to 350°F

APPLICATION TEMPERATURE

(Including wind chill factor)
20°F to 100°F

CURING TIME

To touch — 30 minutes
(Curing time will vary depending upon temperature, humidity, and amount of hardener used.)

COVERAGE

11 sq. ft. per gallon

CLEAN-UP

Methylene Chloride

FLAME RETARDENCY

UL-94, SE-0 Vertical Test (1/8")

List Price \$40.00/Gal.

(Supplied in 1½ gal. containers)

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P. O. Box 22228 (23350 Mercantile Rd.) Beachwood, Ohio 44122 (216) 464-8020 Telex 98-5497

OTHER PLANTS AT:

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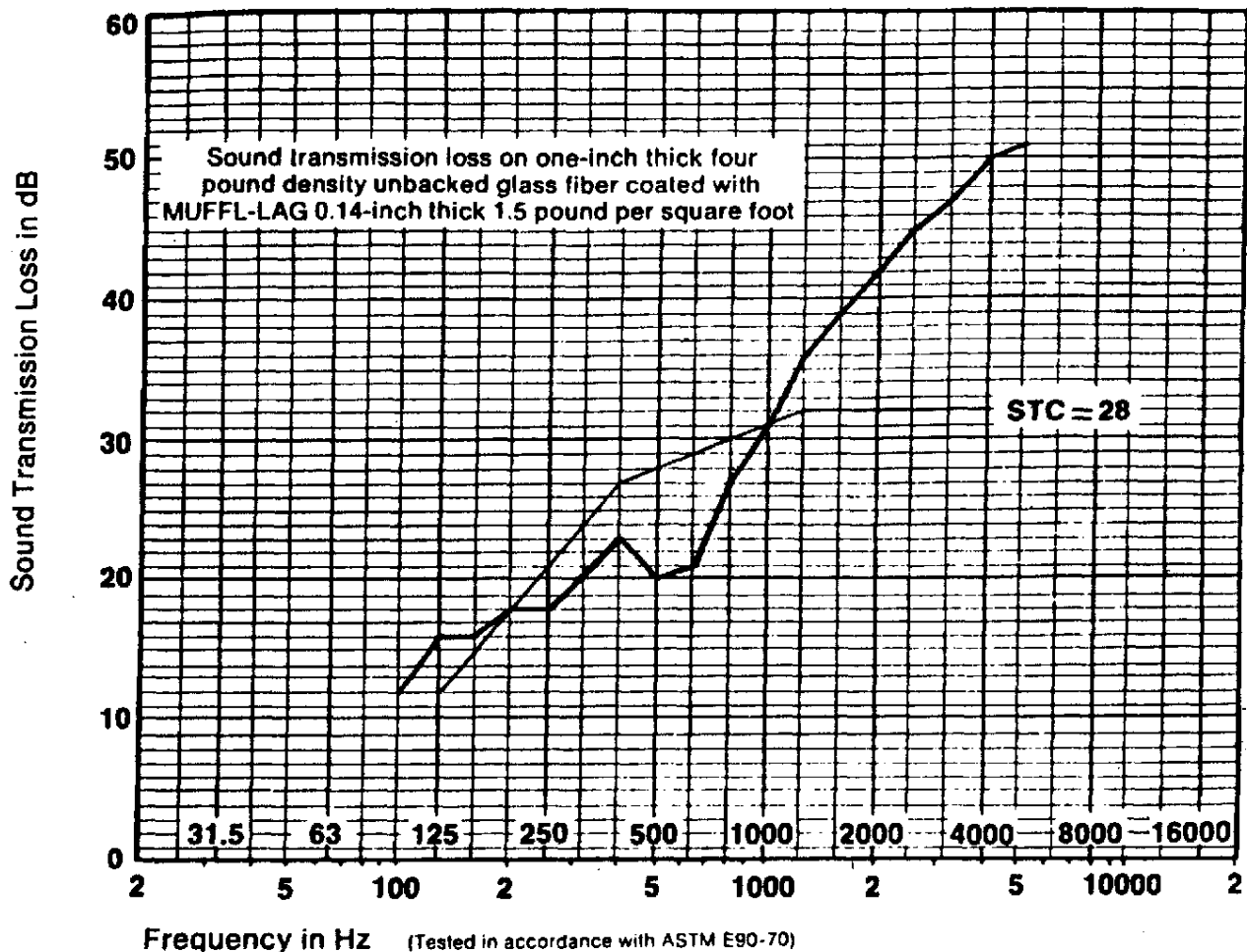
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MLE-176
Supersedes
MLE-1174

VEV-261034

Test Report of Cedar Knolls Acoustical Laboratories



HANDLING, MIXING & APPLICATION INSTRUCTIONS

STORAGE

1. Keep the materials stored in a cool location (approximately 50 to 80 degrees F) prior to application.
 2. Avoid prolonged storage at elevated temperatures.
- CAUTION:** High temperatures will shorten the shelf life of this product.

MATERIALS & MIXING EQUIPMENT

1. 1½ gallons of Mufflag in 2 gallon container
2. 1-2 oz. squeeze bottle of thickener
3. 1-2 oz. squeeze bottle of hardener
4. A long, thin, flat, non-splintering wooden or metal mixing device (paint type mixer), approximately 12 inches long.

MIXING INSTRUCTIONS

To mix the total contents (percentages also apply)

1. Add a sufficient portion of the thickener squeeze bottle for desired viscosity to the contents of the bucket and blend in. Mix thoroughly for 1-2 minutes.
2. Add the contents of the hardener squeeze bottle to the mixed Mufflag and thickener and blend in. When ambient temperatures are above 90°F add only one half the contents of the hardener squeeze bottle to extend the pot life. Mix thoroughly for 1-2 minutes.

NOTE: Unnecessary mixing beyond two minutes only reduces the time available for application prior to cure.

3. Be certain to wipe cling on side walls and base of container into mixture.

APPLICATION INSTRUCTIONS

The contents of the container in which the Mufflag is shipped will cover approximately 16 square feet at the recommended dry film thickness of 0.14 inches.

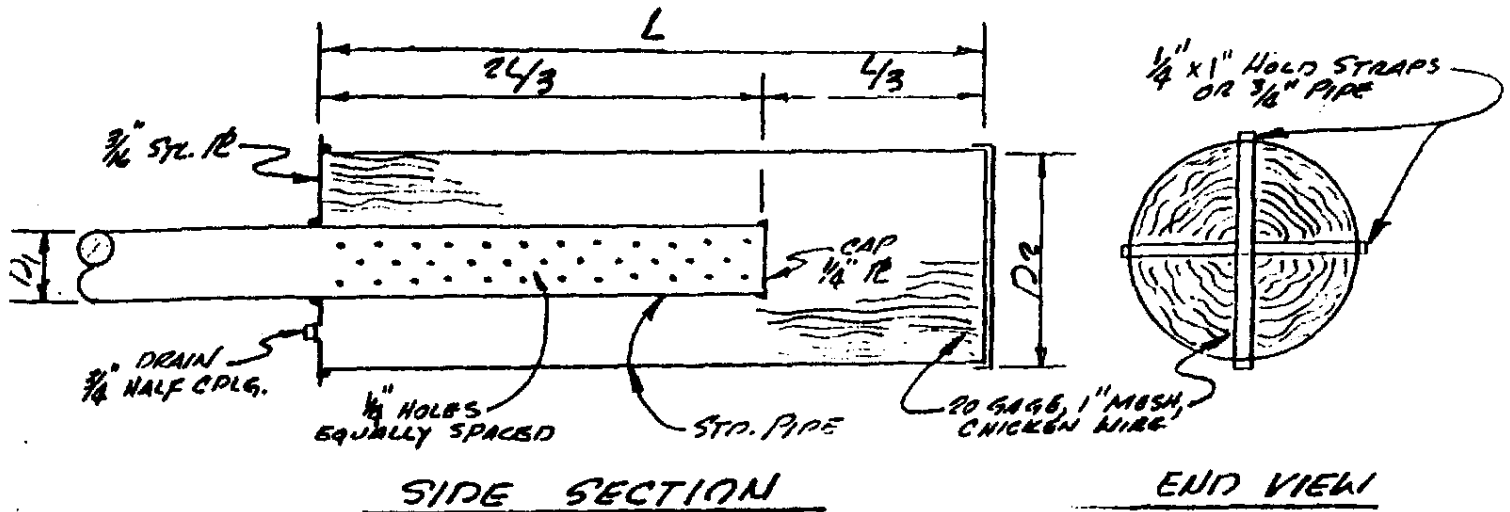
1. Transfer mixed material to the surface to be treated.
2. Spread a thin coat over the surface. Using a trowel or other application tool, apply pressure to the coating when spreading to assure contact and impregnation of the glass or other type insulation being coated.
3. Embed Chit-glas #5 into coating.
4. Apply flood coat of Mufflag to desired wet film thickness.

NOTE: To help determine proper wet film thickness, small swatches of desired dry film thickness can be attached to insulation using catalyzed Mufflag as the adhesive, and used as a gauge.

The following Octave Band Analysis shows the procedure for arriving at the noise reduction capability of a typical Mufflag application.

GAS PIPE 3 1/2" Diameter	63	125	250	500	1K	2K	4K	Sum of Results
Lp (dB)	106	110	102	106	97	90	85	113 dB (A)
Adjustment for A-weighting (dB)	25	15	8	3	0	1	1	
Weighted Levels (dB)	81	95	94	103	97	91	86	105 dB (A)
Mufflag (dB) (T.L.)	6	12	18	21	29	40	47	
Resultant weighted levels (dB)	75	83	76	82	68	51	37	86 dB (A)
CHEMICAL PIPE								
Lp (dB)	106	111	106	99	95	92	91	113 dB (A)
After lagging — weighted levels	75	84	80	75	66	51	45	85 dB (A)
FLOUR PIPE								
Lp (dB)	94	94	99	103	106	102	92	109 dB (A)
After lagging — weighted levels	62	68	75	76	77	67	44	87 dB (A)
Lp (dB) of 20 Pa								

MUFFLER FOR STEAM BLOWDOWN



SIZING TABLE

Steam Cap. lb/hr*	L Ft.	D ₁ In.	D ₂ In.	Number of 1/4" Dia. Holes for Press.			
				20 PSIG	40 PSIG	75 PSIG	150 PSIG
4,000	2	1 1/2	4	36	24	20	20
10,000	2 1/2	2	6	90	58	40	36
15,000	3	3	8	133	87	55	40
25,000	3	3	10	221	145	91	51
40,000	3	4	12	353	232	145	82
50,000	3	4	14	442	290	182	102
80,000	4	6	18	706	464	291	164
100,000	4	6	20	884	580	364	204
150,000	6	8	24	1326	870	546	306
200,000	8	10	30	1768	1160	728	408

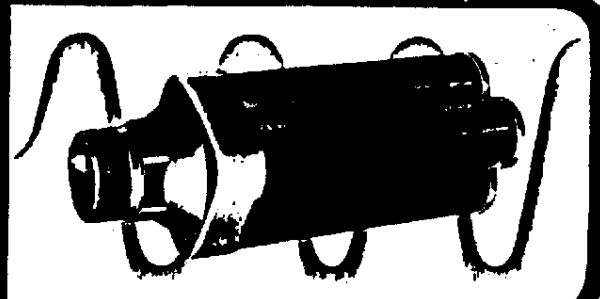
*For air, use next size smaller muffler.

This muffler has been made as small as 2" o.d. 12" long with 3/4" x 8" inner pipe, 36 - 3/16" holes for 225 PSI steam with fine results.

Muffler may be installed vert. or horiz. - preferably vertical to direct pressure waves upward.

Steam Exhaust Muffler

SM TYPE



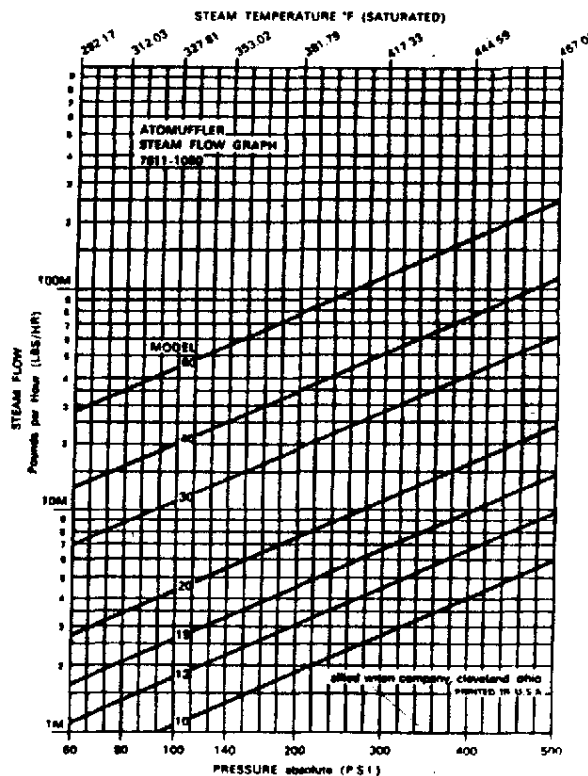
Low in cost, compact, lightweight and easy to handle, SM Type Mufflers effectively silence the annoying and objectionable noise created by steam exhaust outlets.

Unlike other mufflers for steam exhaust service, they are constructed with expansion chambers completely free of obstructions, in which the exhaust steam is expanded, then disseminated at reduced velocity through the perforated cylinder wall openings of the muffler—without noise, and with negligible mechanical impedance.

As an additional safeguard for meeting the requirements of unusually demanding applications, SM Mufflers are supplied with heavy duty metal cylinder wall disseminators for successfully combating the otherwise potentially damaging effects of high flow rate and temperatures up to 1000° Fahrenheit.

Constructed of corrosion resistant materials and treated with a special coating for resistance to conditions where alkalis could be a problem.

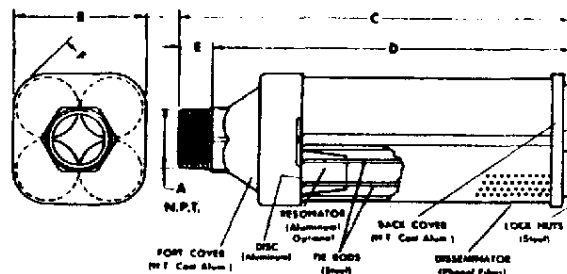
For quick, direct connection to steam exhaust ports, SM Mufflers are supplied with standard pipe thread connections in a full range of sizes from 1 to 6 inches.



SM TYPE SPECIFICATIONS

Model	S10	S12	S15	S20	S30	S40	S60
A	1	1 1/4	1 1/2	2	3	4	6
B	3 1/2	3 3/4	5 1/4	5 1/2	6 3/4	7 3/4	10 1/2
C	8	8 1/4	13 1/4	18 1/4	23 1/4	23 1/2	30 1/4
D	7 1/4	7 1/4	12	17	15 3/4	21 1/4	27 1/4
E	9	1	1 1/4	1 1/4	2 1/4	2 1/4	3 1/4
F					8 1/4	9 3/4	13 1/4
Wght./lb.	1	1	4	5	11	14	26
Exhaust Surface Area/in²	21.8	39.9	79.5	119.3	294.4	344.0	636.4

(All dimensions in inches)



allied with company

Presented By:

VEV-261038

WGIW
for your info
BHL

4-4-
BULLETIN B-32 R2

• BLOWOFF SILENCERS

THE **AEROACOUSTIC** CORP.
P.O. BOX 65 - AMITYVILLE, NEW YORK 11701 - 516-226-4433

VEV-261039

BLOWOFF SILENCERS

Whenever a gas under high pressure discharges into the atmosphere or to a lower pressure in a pipeline, a large amount of objectionable noise is generated.

A large steam boiler blowing off excess steam at 2600 p.s.i. through a power relief valve will generate noise levels of 140 db. at 50'. Noise levels of this magnitude will permanently damage the hearing of people in the vicinity of the discharge and will provoke neighborhood complaints from as far away as two miles. A type RBS (see Fig. 1) blowoff silencer will bring these levels down to a safe, under 90 dbA level at 50' and eliminate neighborhood complaints.

A small 1/4" air line, discharging 100 p.s.i. air from a pneumatic cylinder, will generate 100 db. 5' from the discharge. This is above the present OSHA 90 dbA limit for continual exposure. It is an annoying and distracting noise that can easily and cheaply be eliminated by using a small type SBL (see Fig. 2) blowoff silencer.

The noise of these discharges is generated by the turbulent reaction of the jet with the surrounding atmosphere plus the noise generated by the shock waves associated with supersonic flow.

The Aeroacoustic blowoff silencers quiet these jets by first diffusing the jet down to a relatively low subsonic velocity. The small type SBL depends entirely on the diffuser for its noise reduction. An acoustically absorptive section follows the diffuser section in the large type RBL, HBL, RBS and HBS silencers, providing the additional silencing required by large volume flow.

BLOWOFF SILENCER DESIGNATIONS

When the gas being silenced is dry (air, methane, etc.) and rain is kept out of the silencer, the less expensive types RBL and HBL silencers are satisfactory.

For use with steam or where rain can enter the silencer, types RBS and HBS must be used. The Models RBS and HBS incorporate our proprietary water resistant acoustic packing in the absorptive section to minimize the effect of water on their operation.

The Model SBL silencers are inexpensive units for flows below that of the smallest RBL series.

BLOWOFF SILENCER SIZING

The maximum permissible flows for Model RBL, RBS, HBL and HBS silencers are given in TABLE 1. These units will handle and silence any flow up to that tabulated. Exceeding the tabulated flow rates may result in damage to the silencers, so be certain of the design flow.

Flow rates for Model SBL's are given in TABLE 2.

CLUSTERING DISCHARGES

Models RBL, RBS, HBL and HBS can be provided with several inlet connections, to allow one silencer to service several discharge lines. Sizing is still based on maximum total flow per TABLE 1.

SILENCER EXIT & INTERNAL VELOCITY

The silencing effect can be negated because of aerodynamic noise generated within the silencer or by the silencer exhaust, if velocities exceed 300 ft./sec. Internal and exhaust velocities of Aeroacoustic Corp. Blowoff silencers are well below this value if sized per TABLE 1.

BLOWOFF SILENCER ACOUSTIC PERFORMANCE

Fig. 3 gives dbA values at various distances from an unsilenced, vertical discharge steam jet, based on actual measurements of a typical system.

Figs. 4 and 5 give the corresponding noise levels, also based on actual measurements when using RBS and HBS blowoff silencers.

The small SBL silencer gives a 25 to 30 dbA reduction when used on 100 p.s.i. air.

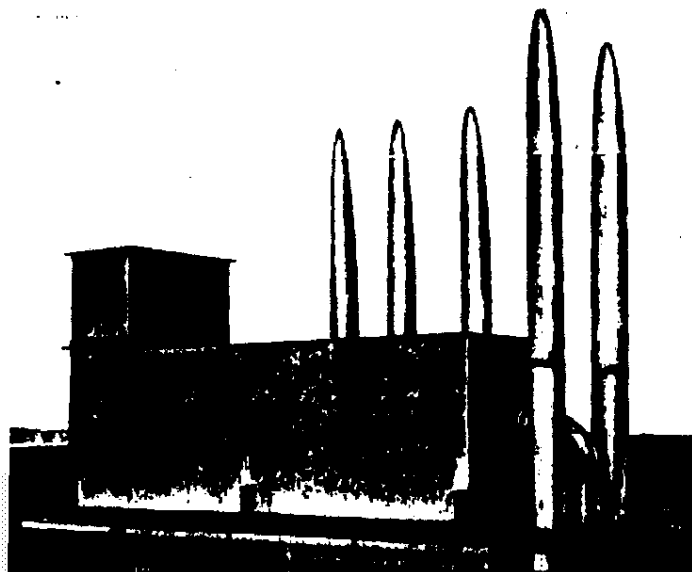


FIGURE 1 Long Island Lighting Company Northport Power Station 360,000 KW power control valve silencer (Blowoff Silencer) 220,000 PPH steam - 1,000° F - 2695 PSIG

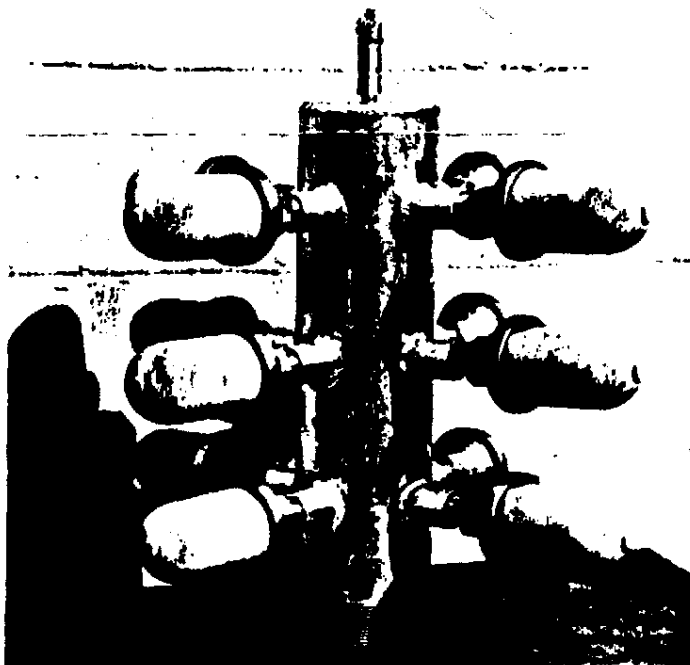


FIGURE 2 MODEL SBL 412

SOUND PRESSURE LEVEL db
re .0002 db - A weighted

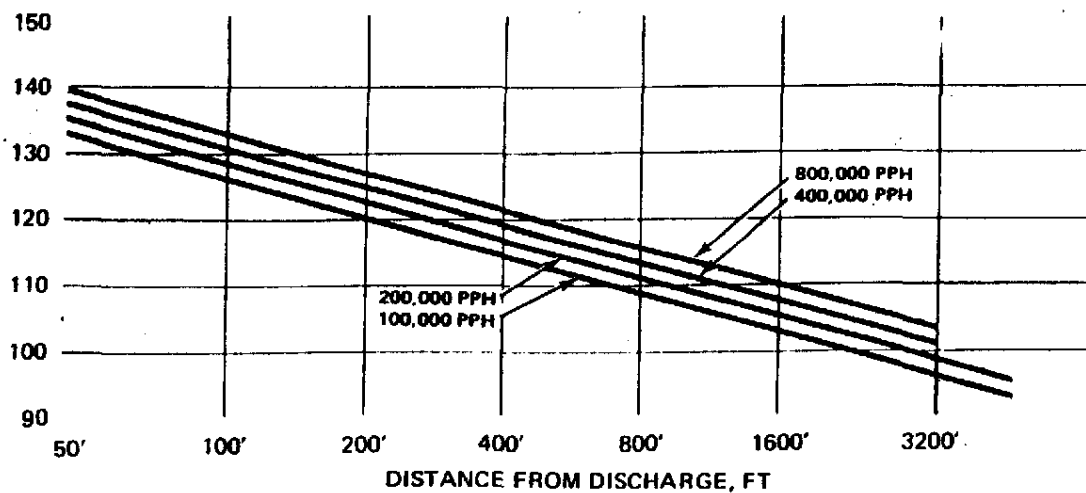


FIGURE 3. UNSILENCED STEAM JETS Over 200 PSIG; 1000°F

SOUND PRESSURE LEVEL db
re .0002 db - A weighted

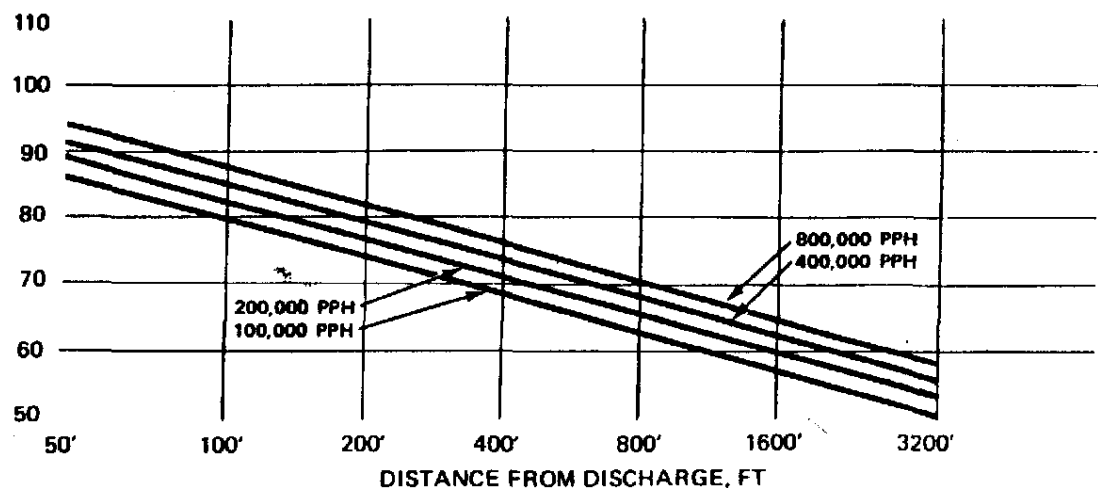


FIGURE 4. SILENCED STEAM JETS Model RBS SILENCER

SOUND PRESSURE LEVEL db
re .0002 db - A weighted

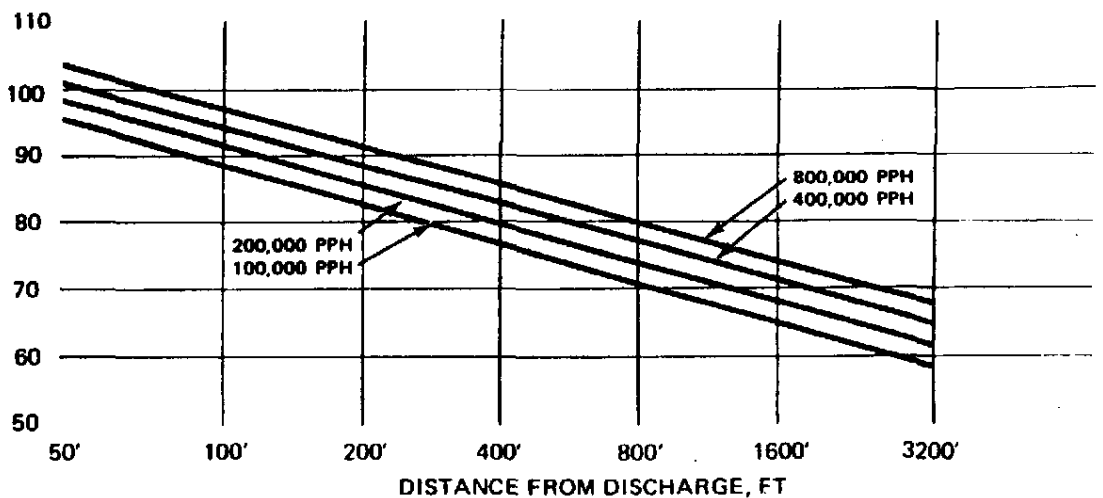


FIGURE 5. SILENCED STEAM JETS Model HBS SILENCER

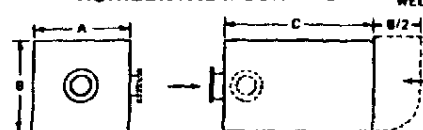
TABLE 1

MAXIMUM FLOW CAPACITIES - STEAM

MAXIMUM FLOW CAPACITIES - AIR

Model No.	Dimensions, inches			Wt., Lbs.	Model RBS Silencer In 1000 PPH Steam			Model HBS Silencer In 1000 PPH Steam			Model RBL Silencer In 1000 PPH Air			Model HBL Silencer In 1000 PPH Air		
	A	B	C		250° F	500° F	1000° F	250° F	500° F	1000° F	50° F	250° F	500° F	60° F	250° F	500° F
-1	12	12	60	220	8.4	7.3	6	10.5	9.1	7.5	14	11.5	10	17.5	14.4	12.5
-1.5	12	18	60	275	12.6	11	9	15.8	13.7	11.2	21	17	15	26	21.5	18.8
-2	12	24	60	410	16.8	14.6	12	21	18.2	15	28	23	20	35	29	25
-3	12	36	60	550	25.2	22	18	31.5	27.5	22.5	42	34	30	52	43	37
-4	24	24	60	650	33.6	29.2	24	42	36.5	30	56	46	40	70	58	50
-5	24	30	68	780	42	36.5	30	52.5	44.5	37.5	70	57	50	87	72	62
-6	24	36	68	880	50.5	44	36	63	55	45	84	69	60	105	86	75
-7.5	24	45	68	1,050	63	55	45	78	69	56	105	86	75	131	108	94
-9	36	36	69	1,465	76	65	54	95	81	67	126	103	90	157	130	113
-10	36	40	75	1,685	84	73	60	105	91	75	140	115	100	175	144	125
-11	36	42	75	1,753	93	80	66	116	100	82	154	126	110	192	158	137
-12	36	48	75	1,902	101	88	72	126	110	90	168	138	120	210	173	150
-13.5	42	48	84	2,525	113	96	81	141	120	101	189	155	135	236	194	169
-16	48	48	84	3,275	135	117	96	169	146	120	224	184	160	280	230	200
-20	48	60	84	3,900	168	146	120	210	182	150	280	230	200	350	288	250
-25	60	60	84	4,740	210	182	150	263	229	188	350	288	250	437	360	312
-30	60	72	102	5,550	252	220	180	315	275	225	420	345	300	525	432	375
-36	72	72	102	6,210	303	260	216	380	325	270	504	415	360	612	520	450
-42	72	84	102	6,950	354	304	258	442	380	323	590	483	420	735	605	525
-49	84	84	108	7,940	412	354	294	515	442	368	685	565	490	857	707	612
-56	84	96	120	10,025	471	405	336	590	506	420	785	645	560	980	808	700
-64	96	96	123	11,200	540	462	384	675	580	480	900	735	640	1120	922	800
-72	96	108	123	12,350	605	520	431	755	650	540	1010	825	720	1260	1040	900
-81	108	108	123	13,900	695	607	486	870	760	610	1135	930	810	1410	1160	1010
-90	108	120	129	15,500	770	675	540	960	845	675	1260	1030	900	1570	1285	1120
-100	120	120	129	17,200	880	750	600	1070	940	750	1400	1150	1000	1750	1435	1250
-110	120	132	135	19,800	945	825	660	1180	1030	825	1540	1270	1100	1920	1580	1370
-121	132	132	135	21,800	1040	910	725	1300	1140	905	1700	1390	1210	2120	1740	1510
-132	132	144	141	23,800	1140	990	795	1420	1230	990	1850	1520	1320	2300	1900	1650
-144	144	144	141	26,000	1248	1080	865	1550	1350	1080	2020	1660	1440	2520	2070	1800

HORIZONTAL MOUNTING

INLET AVAILABLE WITH
WELD NECK OR FLANGED CONNECTIONOPTIONAL
STACKINLET CONNECTION SIZED
TO CUSTOMER'S REQUIREMENTS

OPTIONAL SIDE INLET

VERTICAL MOUNTING

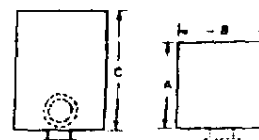
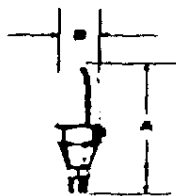


TABLE 2 TYPE SBL BLOWOFF SILENCERS

Single
UnitMultiple
Units

Model	Pipe Connection Size (IPS)	A in	B in	Discharge SCFM at ΔP across Silencer (Air)		
				1 PSI	10 PSI	100 PSI
SBL 1	1/4	1.92	0.83	8	25	79
2	3/8	2.56	1.06	14	45	143
3	1/2	4.14	1.70	28	87	275
4	3/4	6.60	2.60	54	170	540
42	1 1/2	11.0	15.1	108	340	1090
43	1 1/2	16.0	15.1	162	510	1620
44	2	16.0	15.5	216	680	2160
45	2 1/2	16.0	16.0	270	850	2700
46	3	21.0	16.0	324	1020	3240
48	3 1/2	16.0	17.1	430	1360	4300
410	3 1/2	21.0	17.1	540	1700	5400
412	4	21.0	17.6	650	2040	6500

BLOWOFF SILENCER CONSTRUCTION

The Blowoff Silencer has to handle very large amounts of energy, during its operating period and hence, has to be of very rugged construction.

For example steam, at 1,000° F and 1,000 PSI pressure, vented to atmosphere through a 4" valve, will flow at a rate of 910,000 PPH and dissipate energy equivalent to 141,000 horsepower. Unsilenced, this jet will produce 170 db of acoustic power referred to 10⁻¹² watts.

The AeroAcoustic Blowoff Silencer dissipates this velocity energy in the silencer diffuser section. In order to handle these tremendous amounts of power, the internal diffuser section of the AeroAcoustic Type RBL Blowoff Silencers is made of 1/2" steel plate in the larger models.

To be sure of getting a Blowoff Silencer that can do the job and also stand up under the tremendous forces involved in the blowoff gas velocity, specify the AeroAcoustic Type RBL or SBL Blowoff Silencer.



THE AEROACOUSTIC CORP. TM

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