

DALE E. HUDDLESTON

PITTSBURGH OFFICE - 6

R. WISHNER

KESSLER PREMIUM CASTINGS

1984 February 24

RE: ADDENDUM TO 1984-02-24 INDUSTRIAL HYGIENE SURVEY REPORT

Between the 1983-11-07 industrial hygiene survey and the issuance of the report dated 1984-02-24 the following changes were completed to the Kessler industrial hygiene program.

1. The use of 3M Model 8500 respirators has been replaced with the NIOSH approved 3M Model 8710. This 8710 respirator is used for grinding, spraying, and other particulate generating tasks. The Furnace Tenders in the Assembly and R-330 areas wear a 3M Model 9940 respirator for protection against fume exposure around the metal furnaces. Changes were implemented 1984 January 09.
2. The written respiratory protection program was completed on 1984 January 18 and meets federal and corporate standards.
3. All employees issued respirators received training on the proper way to wear the mask and the reasons for the need of respiratory protection. Training was implemented on 1984 January 06.
4. Material Safety Data Sheets were accumulated from manufacturers and assembled into a book for easy reference. Departmental use of materials is identified and Material Safety Data Sheet information is available to any employee upon request.
5. Engineering control measures are being investigated for the Foundry beryllium exposures and respiratory protection will be mandatory until effective controls are in place. Seven roof exhaust fans were installed in 1984 January but these controls did not reduce Furnace Tender's exposures below the OSHA Permissible Exposure Limit.

Kessler must be commended for identifying industrial hygiene problems, taking steps to control potentially hazardous exposures, and instituting the foundation for an effective industrial hygiene program in an expeditious manner.

Dale Huddleston

DALE E. HUDDLESTON

DEH:sc

cc: E. E. Rumberger-Pittsburgh 6
J. J. Perriello-ATC

PLAINTIFF'S
EXHIBIT
AL-1388

410994 0026

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PITTSBURGH OFFICE - 6

KESSLER PREMIUM CASTINGS

1984 February 24

RE: REVIEW OF INDUSTRIAL HYGIENE AT KESSLER PREMIUM CASTINGS 1983 NOV. 07-11

During the week of 1983 November 07, a comprehensive industrial hygiene sampling program was conducted at Kessler Premium Castings in El Paso, Texas by Dale Huddleston and Jim Perriello. All facets of plant operations were observed and selected areas were sampled for employee exposures to various physical and chemical contaminants. This report details the measurements taken, the materials used and job classifications within each department.

Kessler Premium Castings was built in 1980 and produces premium aluminum castings that are used in the aircraft industry and in National Defense projects. These products are similar to those made by Alcoa Corona Works and are constructed through a proprietary process. In general, the process consists of molds being prepared by the Core Area, assembled and castings poured in the Assembly and R-330 Areas, then the castings are processed and inspected to meet rigid specifications. The plant is presently operated during the day shift and approximately 220 people are employed at Kessler.

Dale Huddleston

DALE E. HUDDLESTON
JIM PERRIELLO

DEH/JJP:sc

Enc.

cc: E. E. Rumberger-Pittsburgh 6

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Hourly Noise Dosimeter Measurements
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CORE AREA

Process Description

In the core area, molds are formed from sand, hardened and sent to the R-330 and Assembly areas for mold assembly. Resin compounds are mixed with the sand by mechanical mixers. The sand is distributed to the work areas by buckets or wheelbarrels. The sand is placed and shaped in molds by hand, chills added, and placed in a vacuum chamber for hardening. Trimethylamine is added in the vacuum system and produces a fish-like odor when the vacuum system is opened. A new bulk storage and distribution system minimizes the amount of trimethylamine entering the workplace environment. The main industrial hygiene concerns in the Core area are skin sensitization to the polymeric M.D.I. type diisocyanate in the resin and nuisance odor of the trimethylamine.

Job Descriptions

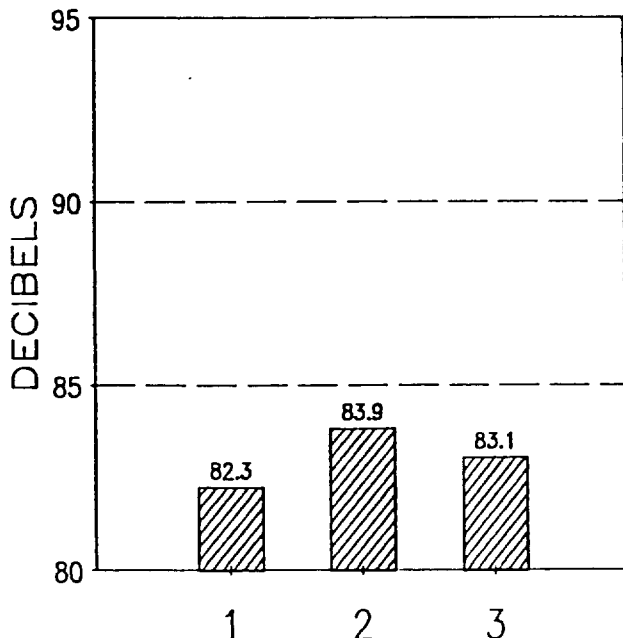
Core Maker (085) - The principal task of the Core Maker is to fabricate diversified sand molds and cores. Molds are intricate and complex.

Gateline Worker (084) - A Gateline Worker fabricates insulating liners to specific requirements for various molds.

Corebox Repairman (083) - A Corebox Repairman repairs mold patterns when cracked, broken or worn.

Booker (088) - A Booker smoothes the surface layer of sand on the mold before entering the vacuum system.

NOISE DOSIMETER READINGS, dBA
CORE AREA
1983 NOV 07-11



<u>Name/Soc.Sec. #</u>	<u>Job Title</u>	<u>Cumulative Reading</u>
1. C. Alvarado 461-50-5675	Core Maker	82.3
2. V. Rodriguez 465-43-1156	Core Maker	83.9
3. C. Franco 454-45-2259	Booker	83.1

DISCUSSION AND RECOMMENDATIONS

(NOISE - CORE AREA)

All three cumulative noise exposures were below the 85.0 decibel action level for a mandatory hearing conservation program. The greatest noise source is produced by the rollover machine and occurs for a short duration.

SAMPLING RESULTS

METHYLENE BISPHENYL ISOCYANATE (MDI)

<u>Sample No.</u>	<u>Date</u>	<u>Name</u>	<u>Soc.Sec.No.</u>	<u>(Minutes)</u>	<u>MDI,ppm</u>
4712-001	83-11-08	D. Molinar	457-98-3836	36	<0.007
4712-002	83-11-08	D. Molinar	457-98-3836	38	<0.007
4712-003	83-11-09	R. Leyva	461-21-9555	53	<0.007

DISCUSSION AND RECOMMENDATIONS

(MDI - CORE AREA)

All three MDI personal samples taken in the Core Area were less than 0.007 ppm. The present OSHA permissible exposure limit is 0.02 ppm for MDI. Samples were collected with impingers containing Marcali solution during sand mold preparation tasks.

Results indicate low inhalation exposure to MDI. The wearing of gloves should continue while handling the mixed mold sand to prevent skin sensitization. If sensitization does occur, reassignment of employee to another area should be evaluated.

Sampling was conducted for trimethylamine but the analysis could not be completed.

SAMPLING RESULTS

CRYSTALLINE SILICA

<u>Name/Soc. Sec. #</u>	<u>Job Title</u>	<u>% Quartz</u>	<u>Respirable Dust mg/m³</u>	<u>Permissible Exposure Limit mg/m³</u>
R. Martinez 460-19-1211	Corebox Repairman	5	0.34	1.43
J. Saenz 065-39-5967	Corebox Repairman	11	0.37	0.77
J. Saenz 065-39-5967	Corebox	Insufficient Sample Weight for Analysis		

DISCUSSION AND RECOMMENDATIONS

(SILICA - CORE AREA)

The tasks of gatelining were monitored for respirable crystalline silica in the Core Area. Two personal samples were collected and analyzed at the Alcoa Technical Center by x-ray diffraction to determine the content of crystalline silica (quartz and cristobalite) in the respirable dust.

Due to the high concentration of amorphous silica present in the sample, analysis is difficult and interferences can occur. It is suspected that an interference has occurred in the cristobalite analysis because discussions with material suppliers indicate very low (less than 0.5%) cristobalite being reported in bulk sample analysis. Therefore, cristobalite analysis have been disregarded in calculation of the permissible exposure limit. The OSHA permissible exposure limit for crystalline silica is a sliding limit dependent upon the content of quartz and cristobalite present.

Sample results indicate low respirable dust levels and do not exceed the OSHA permissible exposure limit. Respiratory protection is not required for routine gatelining tasks as long as exhaust systems on bandsaws are operating properly.

ASSEMBLY AREA

Process Description

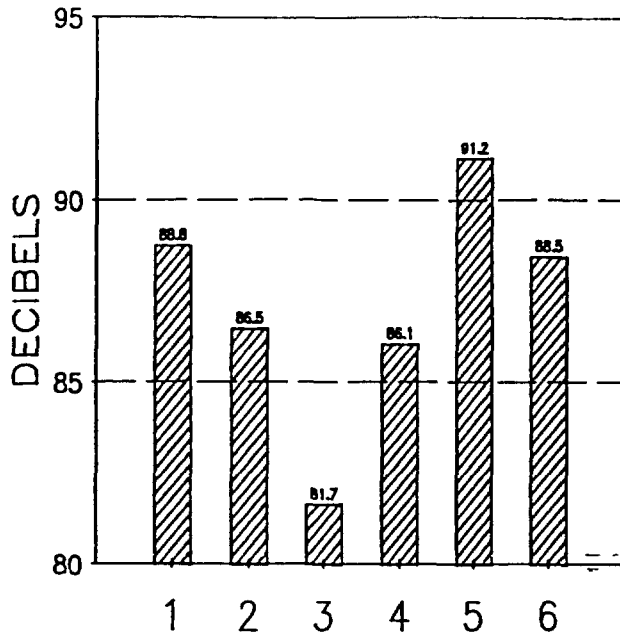
In the Assembly area, molds are received from the Core area and prepared for assembly. Final preparations are made to the casting mold, then sprayed with silocell material to prevent the aluminum from adhering to the chills and sides of the mold. After a group of molds are assembled, the Furnace Tenders pour aluminum into the casting mold. The pouring process usually occurs towards the end of the shift. A fine smoke and odor is generated from the scorching of the binding materials in the mold. The only two aluminum alloys used at Kessler are A356 and A357. Beryllium is present only in the A357 alloy at a concentration of 0.04 to 0.07%.

Job Descriptions

Furnace Tender (023) - The primary function of the Furnace Tender is to prepare molten aluminum to specifications and pour the metal into the casting mold. The Furnace Tender melts, fluxes, treats, and pours aluminum alloys. Approximately 90% of the Furnace Tender's time is adjacent to the furnaces.

Assembler (024) - The primary function of the Assembler is to perform finishing, fitting and assembly of sand cores and molds. The Assembler also assists in the metal pouring as required.

NOISE DOSIMETER READINGS, dBA
ASSEMBLY AREA
1983 NOV 07-11



<u>Name/Soc.Sec. #</u>	<u>Job Title</u>	<u>Cumulative Reading</u>
1. J. Lopez 460-44-8692	Furnace Tender	88.8
2. E. Rodgers 303-32-3122	Furnace Tender	86.5
3. F. Lozano 461-90-7105	Assembler	81.7
4. G. Valdez 551-47-8759	Assembler	86.1
5. R. Lopez 456-33-6243	Assembler	91.2
6. V. Rivera 451-45-0029	Assembler	88.5

DISCUSSION AND RECOMMENDATIONS

(NOISE - ASSEMBLY AREA)

Six noise dosimeter measurements were taken in the Assembly area and one of these readings was above the OSHA standard of 90 decibels. This employee was in the Assembler job classification and had an eight hour time weighted average of 91.2 decibels. Compressed air was used frequently to blow off the mold which may be the reason for the high exposure reading. Three of the eight hours have an average of 90 decibels or above (90.0, 92.7, and 96.6) with the remaining five hours between 87.9 and 89.4 decibels. The work area of assemblers is generally less than 85 decibels. It is the use of compressed air spraying and blowing operations that generates the noise for Assemblers. Noise dosimeter results indicate hearing protection is not mandatory for general assembly work, but should be worn for extensive work with compressed air operations. Sweeping with brooms or vacuuming should be used to clean up tasks instead of blowing the sand material with compressed air.

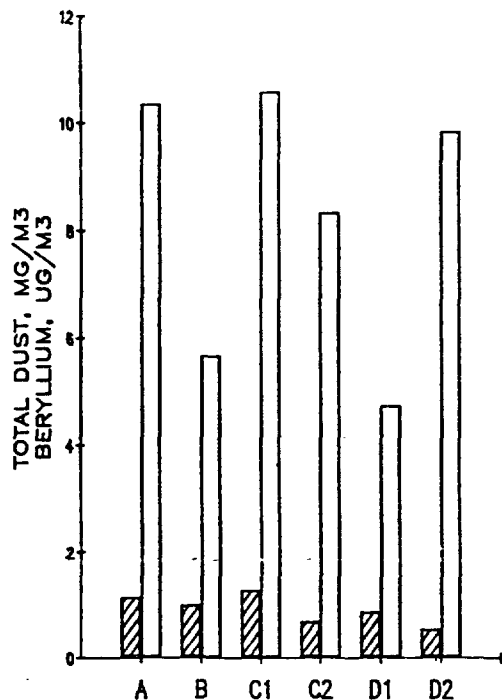
The Furnace Tenders in the Assembly area are exposed to a fairly constant noise level between 85 and 90 decibels. Most of their exposure is derived from noise produced by the metal holding furnaces. Mandatory hearing protection is not necessary for this classification unless a threshold shift has been detected in the required annual audiogram.

BERYLLIUM AND TOTAL DUST SAMPLING RESULTS ASSEMBLY AREA

OSHA Permissible Exposure Limits:

Beryllium: 2.0 $\mu\text{g}/\text{m}^3$
Total Dust: 15.0 mg/m^3

Job Classification: Furnace Tender



LEGEND

TOTAL DUST

BERYLLIUM

Name/Soc.Sec. #	Sample Length (Hours)	Total Dust mg/m^3	Beryllium $\mu\text{g}/\text{m}^3$
A. E. Rodgers 330-32-3122	6.8	1.13	10.4
B. J. Lopez 460-41-8692	6.8	0.99	5.7
C1. J. Lopez 460-41-8692	5.7	1.27	10.6
C2. J. Lopez 460-41-8692	1.2	0.69	8.3
D1. E. Rodgers 330-32-3122	5.6	0.86	4.8
D2. E. Rodgers 330-32-3122	1.4	0.55	9.9

DISCUSSION AND RECOMMENDATIONS

(BERYLLIUM - ASSEMBLY AREA)

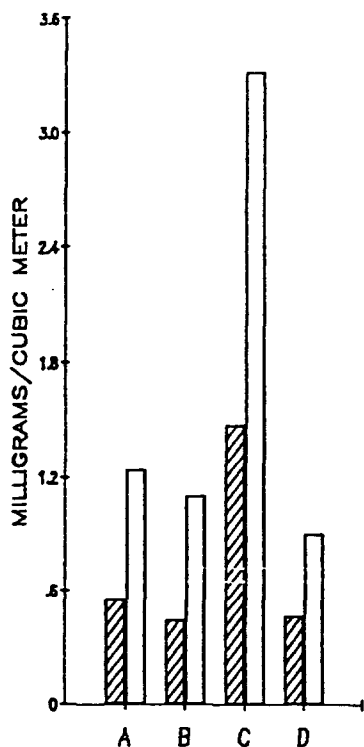
High beryllium exposures in excess of the OSHA Permissible Exposure Limit were found in samples collected on the two Furnace Tenders in the Assembly area. Four samples were collected; 2 full shift and 2 divided samples into exposure before pouring and during/after pouring. Samples were analyzed by atomic absorption at the Alcoa Technical Center. The present OSHA Permissible Exposure Limit is 2.0 micrograms per cubic meter for beryllium. All samples show the total dust exposure to be low (less than 1.5 mg/m^3) and the beryllium levels in excess of two to five times the permissible exposure limit.

Further testing of the Assembly area is needed in the near future to identify Furnace Tenders' exposure before and during fluxing and skimming, and during pouring. Also, the Assemblers in the area should be monitored for beryllium exposures.

Additional sampling will be beneficial for developing engineering controls and respiratory protection should be worn (especially during fluxing) until exhaust ventilation has been installed.

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SILICA SAMPLING RESULTS ASSEMBLY AREA



LEGEND

-  RESPIRABLE DUST
-  PERMISSIBLE EXPOSURE LIMIT

Job Classification: Assembler

Name/Soc.Sec. #	% Quartz	Respirable Dust mg/m ³	Permissible Exposure Limit µg/m ³
A. Calvazos 450-35-6764	6	0.56	1.25
B. A. Saenz 462-47-4309	7	0.45	1.11
C. A. Jaquez 455-23-1367	1	1.48	3.33
D. A. Aguirre 562-82-8067	9	0.47	0.91
E. J. Holguin 455-31-0767	Insufficient Sample Weight for Analysis		

DISCUSSION AND RECOMMENDATIONS

(SILICA - ASSEMBLY AREA)

Five respirable dust samples were collected in the Assembly area on Assemblers spraying silocell onto the casting molds. One sample contained an insufficient amount of dust for analysis. The remaining four samples were analyzed by X-ray diffraction to determine the content of crystalline silica (quartz and cristobalite) in the respirable dust collected. The four analyzed sample results indicate exposures to crystalline silica are approximately one half the permissible limit. Presently, respirators are required to be worn while spraying silocell. This policy is not necessary for compliance with OSHA but may be needed due to variability in amount of spraying and respirable particle size.

High concentrations of amorphous silica were found in the analyzed samples and may have caused interference with the cristobalite analysis. An interference is suspected to have occurred because discussions with the manufacturers indicate no cristobalite in the materials used. Cristobalite analysis have been disregarded in calculating the permissible exposure limit.

Process Description

Operations in the R-330 area are similar to those in the Assembly area except different types of castings are prepared and poured. Only Alloy A357, containing beryllium, is used in the R-330 area.

Job Descriptions

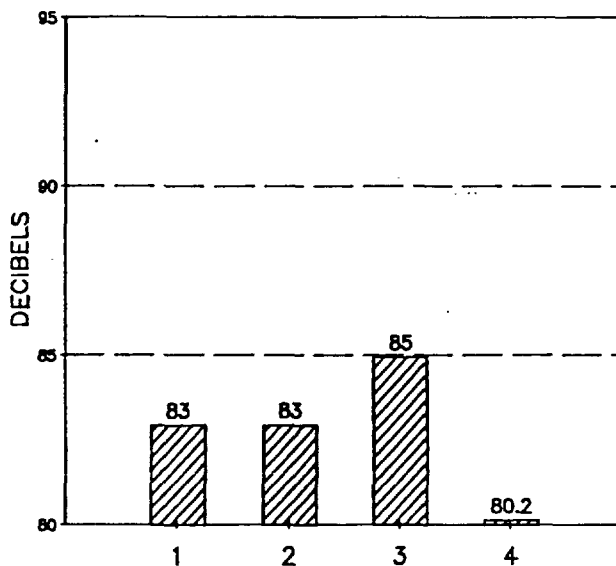
Furnace Tender (013) - The primary function of the Furnace Tender is to prepare molten aluminum to specifications and pour the metal into the casting mold. The Furnace Tender melts, fluxes, treats and pours aluminum alloys.

Assembler (014) - The primary function of the Assembler is to perform finishing, fitting and assembly of sand cores and molds. The Assembler also assists in the metal pouring as required.

Sprayer (017) - The primary function of the sprayer is the spraying of the mold with sillocell material. Duties are similar to the Assembler tasks.

Pourer (019) - The pourer is responsible for assuring the R-330 mold is poured properly. Other duties are similar to those of the Furnace Tender.

NOISE DOSIMETER READINGS, dBA
R-330 AREA
1983 NOV 07-11



<u>Name/Soc. Sec. #</u>	<u>Job Title</u>	<u>Cumulative Reading</u>
1. J. Lopez 461-90-6348	Furnace Tender	83.0
2. A. Sanchez 466-21-8817	Assembler	83.0
3. R. Cera 466-98-8149	Assembler	85.0
4. J. Morales 463-19-2658	Sprayer	80.2

DISCUSSION AND RECOMMENDATIONS

(NOISE - R-330 AREA)

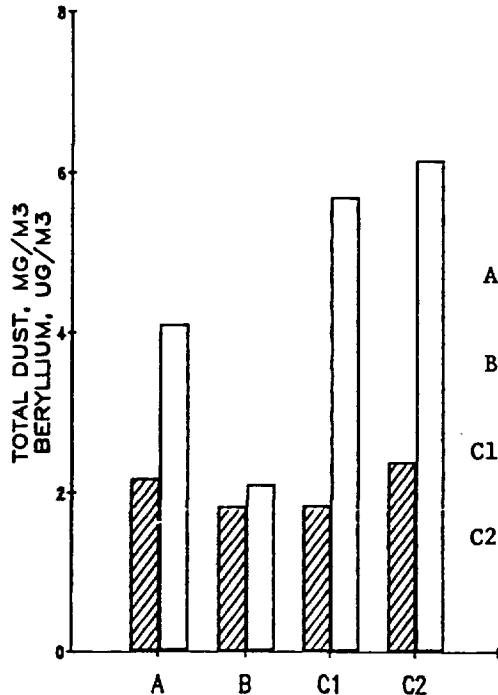
Four noise dosimeter measurements were taken in the R-330 area and all measurements were 85 decibels or lower. Lower noise levels in the R-330 area as compared to the Assembly area are attributed to reduced use of compressed air and reduced furnace noise. Wearing of hearing protection should not be required and audiograms for job classes in the R-330 area can be administered on a three year basis.

BERYLLIUM AND TOTAL DUST
SAMPLING RESULTS
R-330 AREA

OSHA Permissible Exposure Limit:

Beryllium: 2.0 $\mu\text{g}/\text{m}^3$
Total Dust: 15.0 mg/m^3

Job Classification: Furnace Tender



Name/Soc.Sec. #	Sample Length (Hours)	Total Dust mg/m ³	Beryllium μg/m ³
A. J. Lopez 461-90-6348	6.7	2.19	4.1
B. J. Scott 466-27-0787	6.4	1.84	2.1
C1. J. Lopez 461-90-6348	4.6	1.85	5.7
C2. J. Lopez 461-90-6348	2.4	2.40	6.2

DISCUSSION AND RECOMMENDATIONS

(BERYLLIUM - R-330 AREA)

Three full shift exposure samples were collected in the R-330 area on the Furnace Tenders. One sample was divided into: before pouring (C1) and during and after pouring (C2). Beryllium exposures were above the permissible exposure limit in all samples and the total dust levels were well below the 15.0 milligrams per cubic meter limit.

In comparison with the Assembly area, the beryllium exposure levels were lower in the R-330 area and the total dust levels were approximately twice as high.

Further investigation should be completed as soon as possible to identify the cause of the high beryllium exposures. A sampling strategy, engineering evaluation and respirator usage should be initiated similar to that described for the Assembly area.

SAMPLING RESULTS
CRYSTALLINE SILICA

<u>Name/Soc. Sec. #</u>	<u>Job Title</u>	<u>% Quartz</u>	<u>% Crystobalite</u>	<u>Respirable Dust mg/m³</u>	<u>Permissible Exposure Limit mg/m³</u>
S. Juarez 461-74-0596	Assembler	7	4	0.98	1.11
E. Herrera 457-31-2913	Assembler	Insufficient Sample Weight for Analysis			

DISCUSSION AND RECOMMENDATIONS

(SILICA - R-330 AREA)

Two respirable dust samples were collected in the R-330 area for crystalline silica analysis. One sample contained an insufficient amount of dust for analysis and the second sample was 88% of the permissible exposure limit. The Assemblers in the R-330 area conduct similar tasks to those in the Assembly area where overexposures to crystalline silica was not measured.

KNOCKOUT/CHILL PREP AREA

Process Description - Poured casting molds from the R-330 and Assembly areas are delivered to the Knockout/Chill Prep area for removal of the mold sand from the aluminum casting. The hardened sand is removed by sledgehammer, water blasting, or a thermal process. Metal chills are removed from the mold sand and reconditioned by the Chill Preparer. Mold sand is disposed of in a designated area behind knockout.

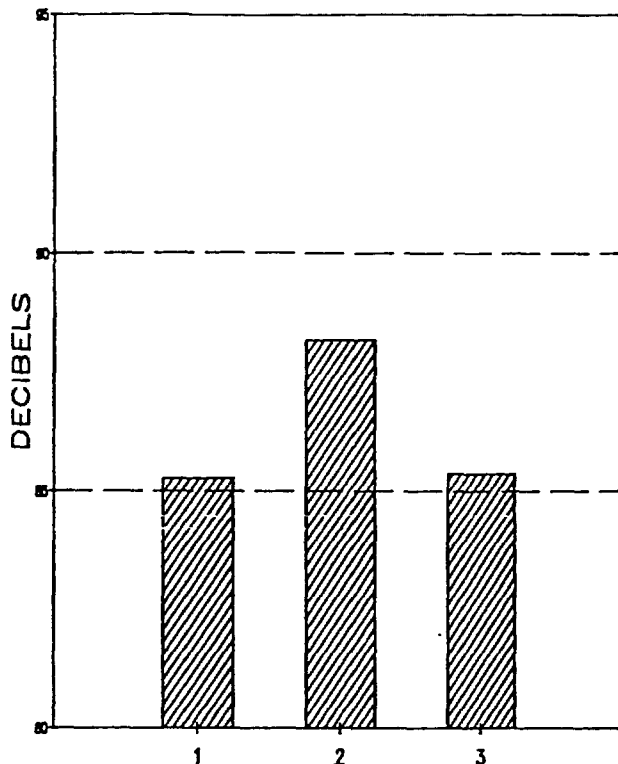
Job Descriptions

Chill Preparer (102) - The chill preparer cleans used chills from molds and reconditions and sorts them according to alloy and size for future use.

Core Remover (104) - The primary functions of the core remover are to remove cores, rods and chills from castings by hand or by use of various types of equipment.

Machine Operator (105) - The primary function of the Machine Operator is to machine new chills for the molds. Duties also consist of performing core removing tasks.

NOISE DOSIMETER READINGS, dBA
KNOCKOUT/CHILL PREP AREA
1983 NOV 07-11



<u>Name/Soc.Sec. #</u>	<u>Job Title</u>	<u>Cumulative Reading</u>
1. L. Garcia 463-08-2116	Core Remover	85.3
2. A. Aguirre 450-13-3171	Core Remover	88.2
3. K. Schnittker 365-26-9590	Chill Prep	85.4

DISCUSSION AND RECOMMENDATIONS

(NOISE - KNOCKOUT/CHILL PREP AREA)

Two Core Removers and one Chill Preparer were monitored for noise exposure in the Knockout/Chill Prep area. Eight hour average exposures for the Core Remover were 85.3 and 88.2 decibels. The one Chill Preparer who was monitored for noise had an eight hour average exposure of 85.4 decibels. All three samples were above 85 decibels and require the implementation of a hearing conservation program. Mandatory hearing protection is not required in this area because all exposures were under a 90 decibel time weighted average. Hearing protection should be used when operating noisy equipment or vehicles.

TRIM/GRIND/BANDSAW AREA

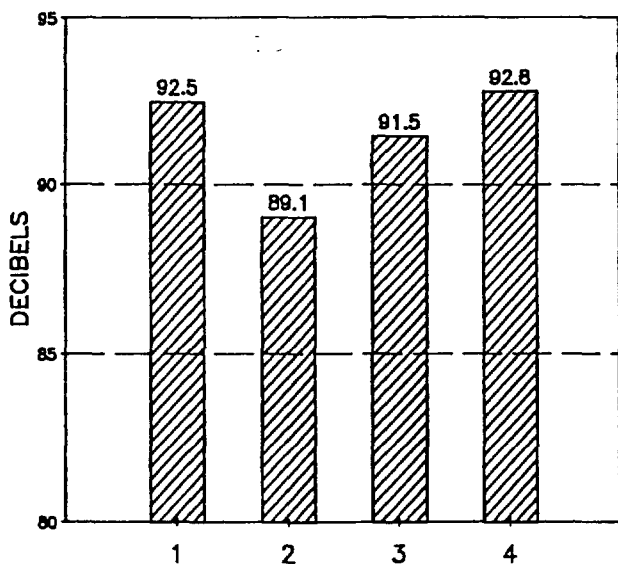
Process Description

After the castings are poured and the mold is removed, excess casting material such as flash, risers, and chill marks are removed by coarse grinding, sawing, and trimming. After coarse trimming, the castings are further processed, inspected, and finished.

Job Description

Trimmer/Grinder (113) - The main function of the Trimmer/Grinder is to remove excess casting materials from the poured castings. The castings are coarse trimmed and ground and further processed.

NOISE DOSIMETER READINGS, dBA
TRIM/GRIND AREA
1983 NOV 07-11



Name/Soc.Sec. #	Job Title	Cumulative Reading
1. J. Reyes 462-06-0206	Trimmer Grinder	92.5
2. J. Camacho 453-02-2406	Trimmer Grinder	89.1
3. G. Mena 464-39-7481	Trimmer Grinder	91.5
4. S. Leyva 460-15-1905	Trimmer Grinder	92.8

DISCUSSION AND RECOMMENDATIONS

(NOISE - TRIM/GRIND/BANDSAW AREA)

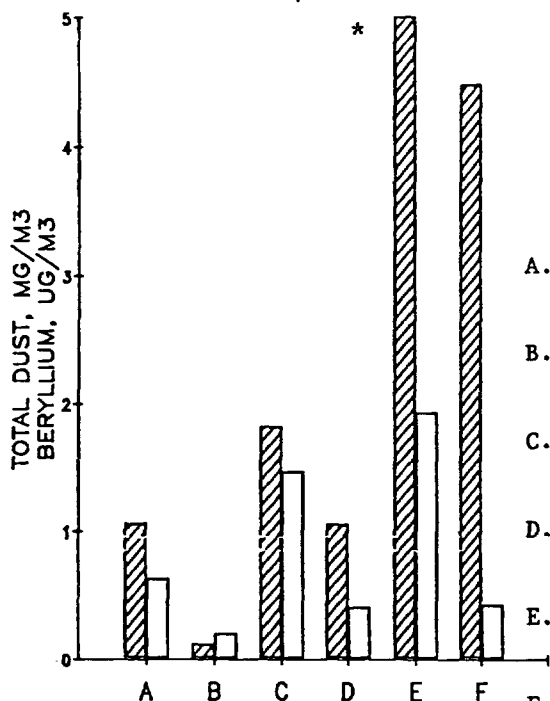
Cumulative noise readings for the individuals monitored indicate this is a high noise level area. The cumulative noise readings for all individuals monitored are in excess of 85.0 decibels. The hourly readings indicate the high noise level is continuous for the eight hour shift. Since three of the four Trimmers monitored had cumulative levels greater than the OSHA eight hour exposure limit of 90.0 decibels, engineering controls must be used to the extent that they are technically and economically feasible to reduce noise exposures below the 90.0 decibels eight hour limit. Additionally, workers in this area must be required to wear hearing protection, given annual audiometric tests and trained annually in the proper use of hearing protection. High pressure air should not be used to clean work areas without engineering modifications to reduce the noise levels of the nozzles.

BERYLLIUM AND TOTAL DUST SAMPLING RESULTS TRIM/GRIND AREA

OSHA Permissible Exposure Limit:

Beryllium: 2.0 $\mu\text{g}/\text{m}^3$
Total Dust: 15.0 mg/m^3

All Samples are 8 Hour
Time Weighted Averages



LEGEND
 TOTAL DUST
 BERYLLIUM

Name/Soc. Sec. #	Job Title	Total Dust mg/m^3	Beryllium $\mu\text{g}/\text{m}^3$
A. A. Saenz 455-47-4922	Trimmer/ Grinder	1.07	0.6
B. S. Olguin 458-51-4569	Trimmer/ Grinder	0.13	0.2
C. M. Martinez 457-93-5635	Trimmer/ Grinder	1.82	1.5
D. R. Ortiz 461-21-9792	Trimmer/ Grinder	1.06	0.4
E. M. Cisneros 455-02-2003	Trimmer/	21.49	1.9
F. S. Leyva 460-15-1905	Router/ Trimmer	4.49	0.4

* Exceeded Chart - 21.49

DISCUSSION AND RECOMMENDATIONS

(BERYLLIUM - TRIM/GRIND AREA)

Five full shift personal samples for total dust and beryllium exposures were completed in the Trim/Grind/Bandsaw area. Results indicate no over-exposures to beryllium occurred, although one total dust sample (21.5 mg/m^3) was over the 15.0 mg/m^3 permissible exposure limit. This high total dust sample had the highest beryllium exposure of 1.9 $\mu\text{g}/\text{m}^3$.

Presently, Trimmer/Grinders wear respirators while grinding on castings. This practice should continue when heavy grinding is anticipated.

PENETRANT/ETCH AREA

Process Description:

Castings are cleaned and etched by processing them through acid, caustic and detergent baths. The castings are coated with luminescent penetrating oil, washed, and blacklighted to detect surface discontinuities. Flaws are then blended, or routed and welded.

Job Descriptions:

Penetrant Processor (132) - The primary functions of the Penetrant Processor are the coating of the casting with the luminescent penetrating oil, and the ultraviolet inspection of the casting.

Degrease/Etch Operator (135) - The primary function of the Etch Operator is to perform the etch and degrease process.

Sample Results: Noise

The cumulative noise exposure of the Etch Processor monitored was 86.5 decibels. The hourly averages fluctuate from 76.9 to 94.2 decibels. This operator conducted some grinding on a casting in the dark room and the high hourly averages were found during this period. During periods of high noise exposure the worker should be required to wear hearing protection. The worker should be instructed on the proper use of hearing protection at least annually. Since the cumulative exposure was in excess of 85.0 decibels, the worker should be audiometrically tested for hearing loss annually.

Sample Results: Oil Mist

One personal sample for oil mist was taken in the Penetrant/Etch area. The eight hour time weighted average was 1.0 mg/m which is well below the OSHA Permissible Exposure Limit of 5.0 mg/m. The present personal protective measures being taken are excellent and their use should be continued.

WELD AREA

Process Description:

Castings are received from the penetrant, X-ray, and chart areas. Discontinuities outside specifications in the castings are routed and welded in the Weld area.

Job Descriptions:

Welder (031, 032) - The primary duties of the Welder are to correct casting flaws by welding the discrepant areas on the casting.

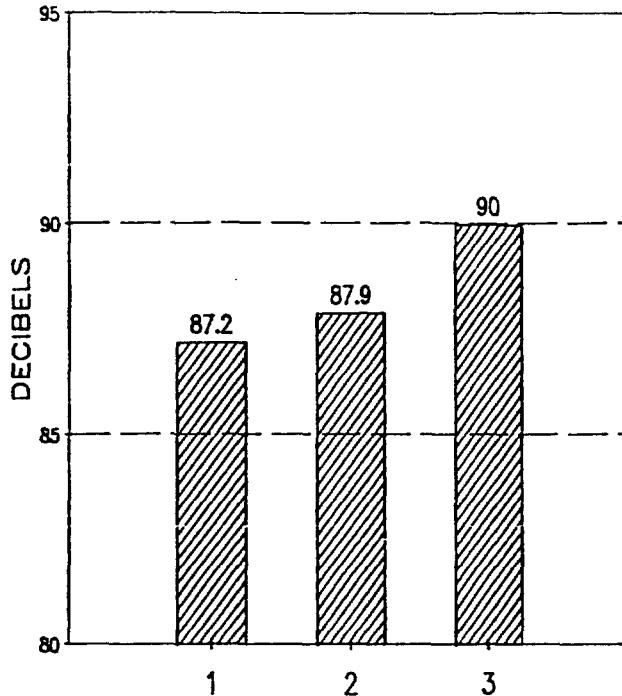
Charter (033) - The primary function of the Charter is to chart defects in the casting so they may be corrected in the Weld area.

Sand Blaster (034) - The primary function of the Sand Blaster is to operate the abrasive blasting equipment to sand blast the finished castings to produce a mat finish.

Router/Trimmer (035) - The primary duties of the Router/Trimmer are to clean out defective areas of the casting in preparation for weld.

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NOISE DOSIMETER READINGS, dBA
WELD AREA
1983 NOV 07-11



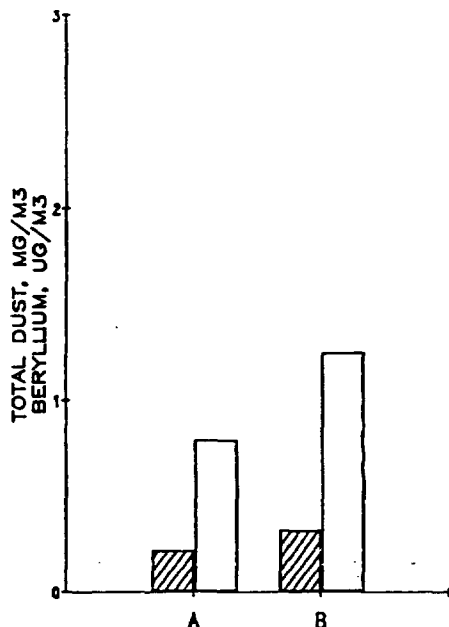
<u>Name/Soc.Sec. #</u>	<u>Job Title</u>	<u>Cumulative Reading</u>
1. J. Cisneros 561-81-3965	Welder	87.2
2. J. Hernandez 462-39-4716	Router/ Trimmer	87.9
3. T. Valdez 456-86-5810	Router/ Trimmer	90.0

DISCUSSION AND RECOMMENDATIONS

(NOISE - WELD AREA)

Two Router/Trimmers and one Welder were monitored for noise exposure. All individuals monitored had cumulative noise readings in excess of 85.0 decibels. The hourly exposure data indicates a continuous exposure to high noise levels. Since the employee exposures are greater than 85.0 decibels the area should be designated a high noise area. Hearing protection should be required for employees performing routing, trimming, and sand blasting operations. Employees working in these areas should receive annual hearing protection instruction and audiometric examinations.

BERYLLIUM AND TOTAL DUST SAMPLING RESULTS WELD AREA



LEGEND
 TOTAL DUST
 BERYLLIUM

OSHA Permissible Limit

Beryllium: 2.0 µg/m³
 Total Dust: 15.0 mg/m³

Job Classification: Welder

All Samples are 8 Hour Time Weighted Averages

Name/Soc.Sec. #	Total Dust mg/m³	Beryllium µg/m³
A. Martinez 457-93-5635	0.23	0.8
B. J. Cisneros 561-84-3965	0.33	1.3

DISCUSSION AND RECOMMENDATIONS

(BERYLLIUM - WELD AREA)

Two Welders were monitored for total dust and beryllium exposures in the Weld area. Both time weighted samples were below total dust and beryllium permissible exposure limits. The beryllium exposures were approximately half the permissible limit and monitoring exposures of the Welders should be conducted on an annual basis. Beryllium fume generated from welding poses a much greater hazard than beryllium exposures from grinding operations due to the small particle size. Either beryllium fume respirators or the supplied-air flow to the Welder's helmet should be used when welding occurs and fumes are not exhausted.

X-RAY AREA

The X-ray/laboratory area is kept very clean and quiet. Three X-ray units are used to inspect aluminum castings. Two of the units have Phillips X-ray units that produce a maximum of 160 kilovolts and the third Phillips unit produces a maximum of 320 kilovolts. A copy of the Texas Department of Health Registration Certificate for Industrial Non-Licensed Sources of Radiation is attached in the appendix. The radiation survey of the outside walls was performed and less than 0.3 millirem was detected with the unit pointed towards the surveying point. All interlocks and warning lights are functioning and signs have been posted. All radiographers have been trained and wear radiation dosimeter badges. Ed Macias, X-ray supervisor, has developed and instituted an effective radiation safety program.

HEAT TREAT/STRAIGHTEN AREA

Process Description:

Straightening - Finished castings are straightened by hammering in pounding blocks to meet specifications.

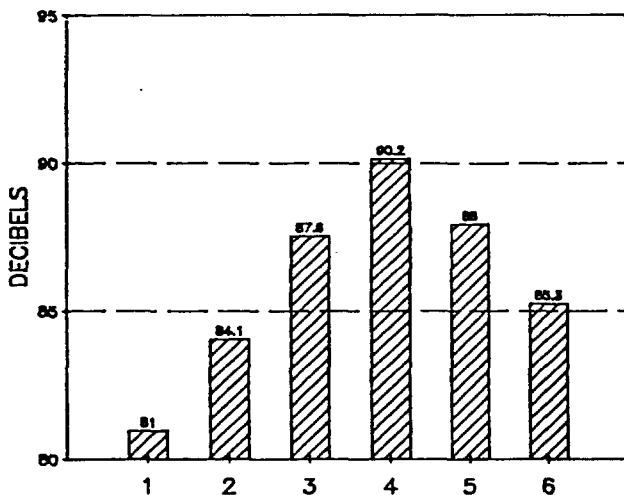
Heat Treatment - The castings are processed through thermal treatment in heat treat and aging ovens in order to control mechanical properties within specifications.

Job Descriptions:

Heat Treatment Operator (072) - The Heat Treatment Operator's primary duty is to process the castings through the thermal treatment process.

Straightener (073) - The primary function of the straightener is to straighten the casting to the required specifications through hammering out any distortions.

NOISE DOSIMETER READINGS, dBA
HEAT TREAT/STRAIGHTEN AREA
1983 NOV 07-11



Name/Soc.Sec. #	Title	Cumulative Reading
1. V. Chavarria 456-04-3987	Heat Treat Operator	81.0
2. V. Chavarria 456-04-3987	Heat Treat Operator	84.1
3. C. Galindo 467-19-4660	Straightener	87.6
4. C. Galindo 467-19-4600	Straightener	90.2
5. J. Arzola 545-02-8335	Straightener	88.0
6. Gomez 464-45-5935	Straightener	85.3

DISCUSSION AND RECOMMENDATIONS

(NOISE - HEAT TREAT/STRAIGHTEN AREA)

All Straighteners monitored had cumulative exposure levels greater than 85.0 decibels. The straightening portion of this area should be designated a high noise area and hearing protection should be required. Employees working in this area should receive annual training on the effects of noise and proper hearing protection use. Employees working in this area should receive annual audiometric testing to detect any hearing loss. The use of engineering controls and modifications of employee work practices should be investigated to reduce employee exposure to the high impact noise. Separation of the straightening area from the main plant area should be considered to reduce impact noise exposure of employees working in adjacent departments.

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FINISHING AREA

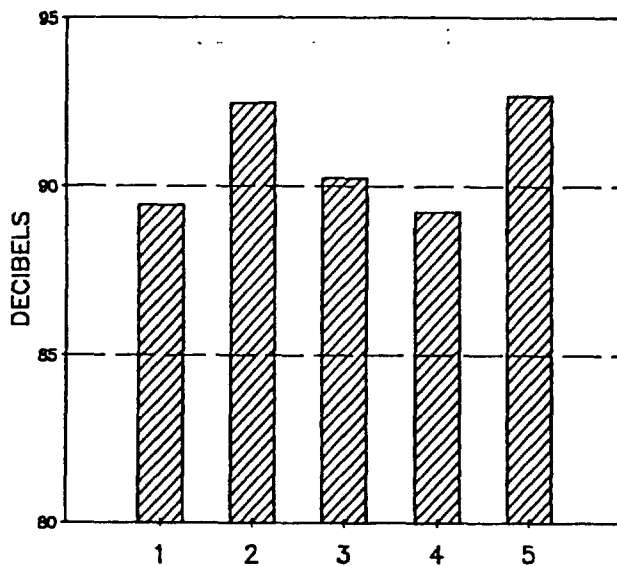
Process Description:

Castings reach the finishing area for final dimensional work and inspection. In the Finish area the castings are precision ground and trimmed to meet final blueprint dimensions and tolerances.

Job Description:

Finisher (143) - Grinds, blends, and works casting to an inspection fixture to ensure blueprint dimensions.

NOISE DOSIMETER READINGS, dBA
FINISHING AREA
1983 NOV 07-11



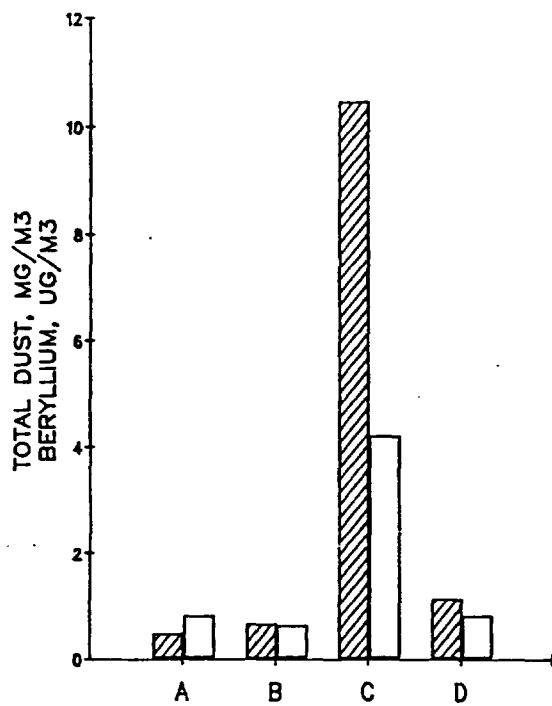
Name/Soc.Sec. #	Title	Cumulative Reading
1. L. Marquez 457-47-4236	Finisher	89.5
2. E. Gomez 464-37-9956	Finisher	92.5
3. R. Estrada 456-13-7748	Finisher	90.3
4. W. Calderon 457-27-6323	Finisher	89.3
5. G. Clauson 456-49-3328	Finisher	92.7

DISCUSSION AND RECOMMENDATIONS

(NOISE - FINISHING AREA)

Cumulative noise readings for the individuals monitored indicate this is a high noise level area. The cumulative noise readings for all individuals monitored are in excess of 85.0 decibels. The hourly readings indicate the high noise level is continuous for the eight hour shift. Since three of the four Trimmers monitored had cumulative levels greater than the OSHA eight hour exposure limit of 90.0 decibels, engineering controls should be used to the extent that they are technically and economically feasible to reduce noise exposures below the 90.0 decibels eight hour limit. Additionally, workers in this area must be required to wear hearing protection, given annual audiometric tests and trained annually in the proper use of hearing protection. High pressure air should not be used to clean work areas without engineering modifications to reduce the noise levels of the nozzles.

BERYLLIUM AND TOTAL DUST SAMPLING RESULTS FINISHING AREA



LEGEND

▨ TOTAL DUST
□ BERYLLIUM

OSHA Permissible Exposure Limits

Beryllium 2.0 $\mu\text{g}/\text{m}^3$
Total Dust 15.0 mg/m^3

Job Classification: Finisher

All Samples are 8 Hour Time Weighted Averages

Name/Soc.Sec. #	Total Dust mg/m ³	Beryllium ug/m ³
A. J. Alvarado 454-45-0734	0.50	0.8
B. I. Martinez 463-13-3324	0.69	0.7
C. I. Martinez 463-13-3324	10.49	4.2
D. J. Alvarado 454-45-0734	1.15	0.8

DISCUSSION AND RECOMMENDATIONS

(BERYLLIUM - FINISHING AREA)

In the Finishing area, four full shift personal samples for exposure to total dust and beryllium were obtained on employees in the job classification of Finishers. No overexposures to total dust were indicated but one exposure did exceed the permissible limit of 2.0 micrograms per cubic meter for beryllium. This beryllium overexposure occurred when the total dust loading was high at 10.49 mg/m^3 .

Overexposure to beryllium can occur in the Finishing area when heavy grinding is being done and total dust levels are high. Presently, respirators are being worn by the Finishers when grinding. The required respiratory protection in this area should continue and improvements listed in the respirator section of this report should be implemented.

HEARING CONSERVATION

Noise poses one of Kessler's main industrial hygiene concerns. High speed grinding, compressed air, and straightening operations generate the majority of this noise exposure. Noise dosimeter measurements were taken in various areas of the plant to identify typical exposures during an entire shift. Metrosonic 301 noise dosimeters were used to collect the exposure data.

The noise survey conducted at Kessler determined the following areas to have noise levels equal to or greater than the OSHA Hearing Conservation Amendment eight hour limit of 85 dBA:

- Finishing Area
- Penetrant/Etch Area
- Trim/Grind Area
- Knockout/Chill Prep Area
- Assembly Area
- Weld Area
- Straightening Area

In order to develop an effective hearing conservation program that meets OSHA requirements, the following suggestions should be implemented:

Employees exposed to noise levels of 85 dBA or greater for an 8-hour work shift must take part in an annual training program on the effects of noise, the care and fitting of hearing protection and the purpose and procedures of audiometric testing. This training may be included in monthly departmental safety meetings, during annual audiometric testing or individually. Records of training sessions should be maintained.

A copy of the OSHA Hearing Conservation Amendment must be posted in the work place and copies made available to employees on request.

Hearing protection should be provided for and required of all individuals working in designated high noise areas. The variety of hearing protection presently being used is adequate.

Employees working in high noise areas with exposures greater than or equal to 85 dBA must receive annual audiograms performed by qualified individuals in accordance with the OSHA Hearing Conservation Amendment. New employees who will be working in high noise level areas and employees transferred into high noise level areas from low noise areas should receive baseline audiometric testing within the first 4 months of high noise level exposure.

Employees not working in high noise level areas should receive audiometric testing every 3 years.

All employees exposed to noise levels of 85 dBA or greater who have exhibited an OSHA significant threshold shift must wear hearing protection. When an OSHA significant threshold shift is found in a noise-exposed individual, he must be provided with a copy of the test in writing.

High noise level areas should be surveyed every 2 years. Results of the survey should be provided to employees in affected areas to ensure future employee cooperation. A noise survey should be performed within 60 days of any change in production, processes, equipment, controls or personnel which may increase the noise levels above the useful range of the hearing protection or change a low noise area into a high noise area.

S. I. Roth, Corporate Noise Control Engineer, should be contacted in regard to engineering controls to reduce noise levels in the Finishing, Trim/Grind, and Straightening areas. Noise levels in these areas exceeded the OSHA noise regulation of 90 dBA for an 8 hour exposure. Engineering controls must be used to the extent that they are technically and economically feasible to reduce noise exposures to below the 90 dBA 8 hour limit. Some controls to consider are the use of quiet nozzles for the high-pressure air lines; and acoustical isolation of the Straighteners, the bandsaw, and the larger grinder. Quieter grinders might be a consideration for the Finishing, Trimming and Welding areas.

All new equipment to be purchased should be evaluated for noise production. When possible, low frequency noise is preferred to the more damaging high frequency noise.

RESPIRATORY PROTECTION

Respirators are being used throughout the plant and changes are necessary to meet OSHA requirements. Attached in the appendix is a copy of the OSHA Standard for respiratory protection. Suggested changes for Kessler's respiratory protection program are as follows:

Approved Respirators

Presently, 3M 8500 disposable respirators are being used throughout the plant and this mask does not meet the OSHA requirement for an approved respirator. This mask is designed for non-toxic particulates such as pollen and sawdust. An approved dust/mist mask should be used in place of the 3M 8500 and will provide a higher degree of protection. An approved respirator for dust uses a two strap suspension and provides protection against crystalline silica and other particulates. 3M makes several NIOSH approved respirators that are disposable with the 8710 model being the most economical of their line. Several other companies have good disposable respirators that are approved and would meet your silica protection needs.

Beryllium, a highly toxic material when inhaled, is a suspected carcinogen and requires greater protection than that necessary for silica. Approved respiratory protection for beryllium overexposure requires a high efficiency filter due to the low 8 hour permissible exposure limit of 2 micrograms per cubic meter. Three types of exposure to beryllium exist at Kessler. These exposures are from working with alloy A357 by (1) grinding in the Trim and Finish area where the particles are large, (2) tending furnaces and pouring molds in the R-330 and Assembly areas where particulates are a dust or fume and (3) welding on castings and generating a respirable fume. The only disposable respirator approved for beryllium is 3M's model 9940 and this mask is fairly expensive. Alcoa Corona Works uses reusable masks for protection against beryllium and a good cost effective program has been instituted.

Written Program

A written respiratory protection program must be developed which includes the respirator selection criteria, list of jobs requiring respirators, and training procedures. This written program documents how the total respiratory protection program is administered and is usually one of the first items an OSHA inspector would request to see. Corona Works and the Alcoa Engineering Standard 18.1.1 should be helpful in developing this manual.

Training

To insure the proper and safe use of a respirator, training must be provided to each respirator wearer. The training should contain the following elements:

1. The reason for the need of respiratory protection.
2. The nature, extent and effects of respiratory hazards to which a person may be exposed.
3. An explanation of why engineering controls are not being applied or are not adequate and what efforts are being made to reduce or eliminate the need for respirators.
4. An explanation of why a particular type of respirator has been selected for a specific respiratory hazard.
5. Instructions in the inspecting, donning, checking the fit of and wearing the respirator.
6. An explanation of how maintenance and storage of the respirator is carried out.
7. Regulations concerning respirator use.

Each respirator wearer should be retrained annually and documentation should be kept of who and when training occurred.

Fit-Testing

Each respirator wearer must be fit-tested to determine their ability to obtain a satisfactory fit with a negative pressure respirator. Fit-testing is usually qualitative and with a saccharin mist or isoamyl acetate agent. If the wearer is unable to detect penetration of a testing agent to the respirator the respirator wearer has achieved a satisfactory fit. Commercial fit-testing kits are available.

Facial hair, such as beards, is not recommended with the use of respiratory protection equipment. Studies have shown the protection provided to the respirator wearer is drastically reduced with the presence of a beard. The OSHA Standard now states "Respirators shall not be worn when conditions prevent a good face seal. Such conditions may be a growth of beard, sideburns...". Some people have interpreted this to mean if a person gets a satisfactory fit with a beard, the standard has been met. The OSHA Respirator Standard is now undergoing critical review and will probably leave no leeway in the beard issue and require no facial hair between the face and sealing surface of the respirator. Alcoa recommends the institution of a no beard policy at all facilities.

GENERAL INDUSTRIAL HYGIENE CONCERNS

The work practices of Kessler employees are very commendable. Employees do not smoke or drink coffee at work stations and clean up work areas at the end of each shift. This cleanliness policy is an excellent policy since it reduces secondary exposure of employees to hazardous materials. While this is an excellent work practice it is recommended that some modifications be made. When possible, vacuum systems should be employed to remove dust from work areas. Use of high pressure air and sweeping causes secondary generation of dust and increases airborne concentrations. High pressure air should not be used in areas containing silica or beryllium dusts. Additionally, high pressure air should not be used unless quiet nozzles are installed to reduce the noise level.

The use of aprons and arm covers is commendable and this practice should continue as it keeps personal clothing from becoming contaminated with aluminum grinding dust that contains beryllium.

Future industrial hygiene sampling should be conducted when process or engineering changes are made. After exhaust ventilation has been installed in the foundry area to reduce beryllium fumes, additional testing of Furnace Tenders should be completed.

Routine industrial hygiene sampling should be conducted on an 18 month schedule.

HOURLY NOISE DOSIMETER READINGS, dBA

1983 NOV 07-11

<u>Name/Soc.Sec. #</u>	<u>Job Title</u>	<u>1st</u>	<u>2nd</u>	<u>3rd</u>	<u>4th</u>	<u>5th</u>	<u>6th</u>	<u>7th</u>	<u>8th</u>	<u>Cumulative Reading</u>
CORE AREA										
C. Alvarado 461-50-5675	Core Maker	82.3	80.7	81.7	83.7	84.5	82.3	80.1	79.4	82.3
V. Rodriguez 465-43-1156	Core Maker	84.5	83.9	83.2						83.9
C. Franco 454-45-2259	Booker	85.0	84.5	83.6	81.1	81.8	84.1	78.2		83.1
ASSEMBLY AREA										
J. Lopez 460-44-8692	Furnace Tender	88.2	88.2	90.7	88.6	87.4				88.8
E. Rodgers 303-32-3122	Furnace Tender	87.6	86.2	86.6	87.0	87.4	86.2	85.1	84.4	86.5
F. Lozano 461-90-7105	Assembler	84.2	85.1	81.3	81.5	80.3	76.8	73.6		81.7
G. Valdez 551-47-8759	Assembler	88.8	86.9	84.8	81.2	88.1				86.1
R. Lopez 456-33-6243	Assembler	90.0	92.7	89.4	96.6	89.4	87.9	88.6	89.3	91.2
V. Rivera 451-45-0029	Assembler	85.4	87.0	87.9	90.0	86.8	94.0	84.3	85.4	88.5
R-330 AREA										
J. Lopez 461-90-6348	Furnace Tender	82.6	86.3	85.0	83.5	79.6	80.4	78.5		83.0
A. Sanchez 466-21-8817	Assembler	82.0	82.9	81.7	85.2	81.6				83.0
R. Cera 466-98-8149	Assembler	83.3	86.4	84.2	84.3	88.6				85.0
J. Morales 463-19-2658	Sprayer	81.2	81.3	79.0	78.5	77.8	83.1	78.0	85.0	80.2

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HOURLY NOISE DOSIMETER READINGS, dBA

(Page Three)

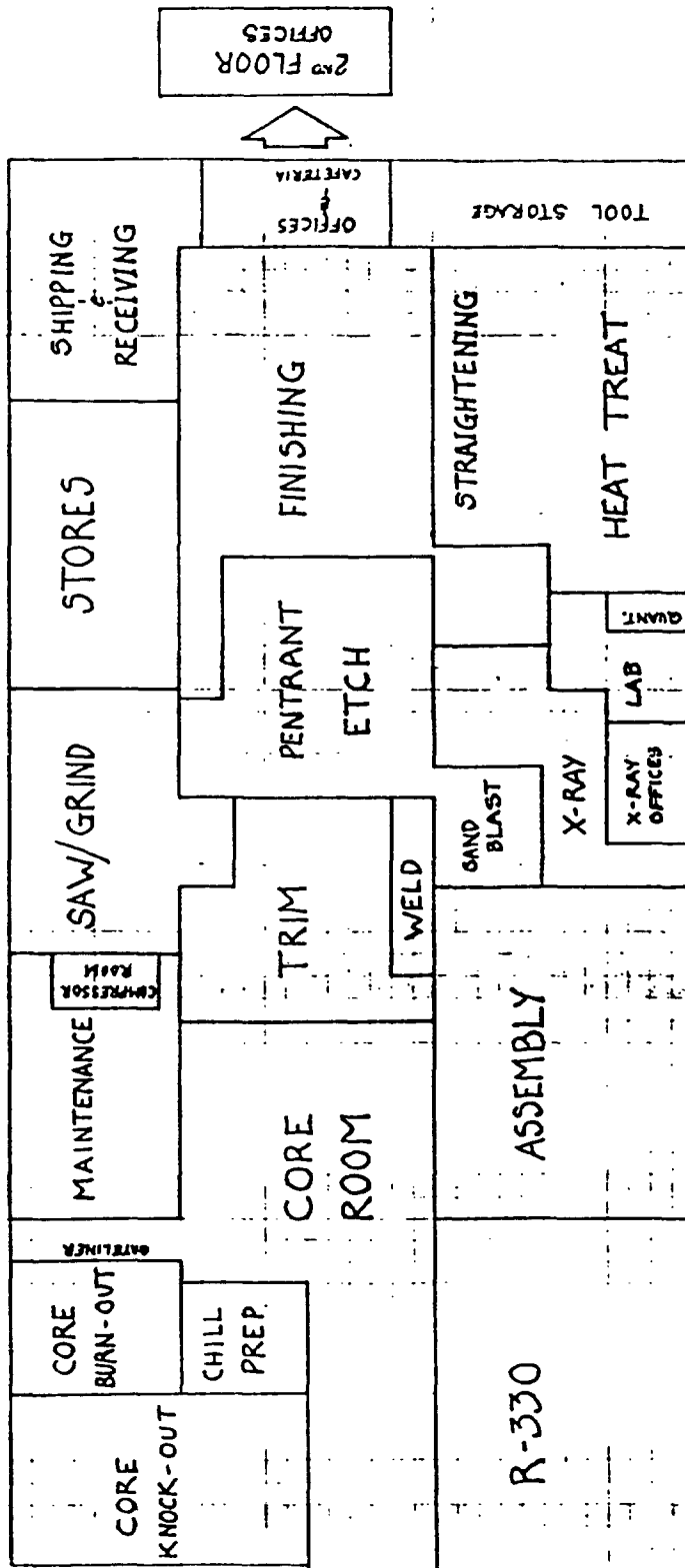
HEAT TREAT/STRAIGHTENING AREA

<u>Name/Soc.Sec. #</u>	<u>Job Title</u>	<u>1st</u>	<u>2nd</u>	<u>3rd</u>	<u>4th</u>	<u>5th</u>	<u>6th</u>	<u>7th</u>	<u>8th</u>	<u>Cumulative Reading</u>
V. Chavarria 456-04-3987	Heat Treat Operator	84.5	83.2	82.2	77.4	79.2	75.8	78.2		81.0
V. Chavarria 456-04-3987	Heat Treat Operator	87.0	84.2	85.6	83.9	76.3	81.3	86.3	74.2	84.1
C. Galindo 467-19-4660	Straight-ener	91.8	91.4	85.5	87.5	78.8	82.1	75.0		87.6
C. Galindo 467-19-4660	Straight-ener	95.5	93.6	88.1	84.4	80.6	87.5	91.7	81.5	90.2
J. Arzola 545-02-8335	Straight-ener	89.7	87.7	90.6	84.9	82.8				88.0
Gomez 464-45-5935	Straight-ener	90.1	90.0	88.6	82.5	77.7	74.6	75.9		85.3

FINISHING AREA

L. Marquez 457-47-4236	Finisher	95.0	87.0	84.6	89.0	83.6				89.5
E. Gomez 464-37-9956	Finisher	94.7	93.3	92.7	88.1	92.2				92.5
R. Estrada 456-13-7748	Finisher	91.9	90.7	86.8	91.2	88.3	91.2	90.4		90.3
W. Calderon 457-27-6323	Finisher	92.8	88.7	88.2	89.1	87.6	89.1	88.3		89.3
G. Clauson 456-49-3328	Finisher	91.0	93.0	91.9	96.3	90.9	93.7	89.8		92.7

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KESSLER PREMIUM CASTINGS

GUIDELINES FOR HEARING CONSERVATION PROGRAM

1. Noise Measurements

A. Annual sound level survey

B. Personal noise dosimetry

1. Non-repetitive exposures <12 days/year

- a. Baseline sampling required for all job classifications
- b. Exposures of >90 dBA resample every 2 years
- c. Exposures of >85 dBA but <90 dBA resample every 3 years
- d. Exposures of <85 dBA - professional judgement

2. Repetitive exposures

- a. Baseline sampling required for all job classifications.
- b. Exposures of >90 dBA resampling yearly
- c. Exposures of >85 dBA but <90 dBA resample every 2 years
- d. Exposures of <85 dBA resample every 4 years

3. Sound measurement equipment must be able to integrate noise levels between 80 and 130 dBA.

4. Results of surveys are provided to employees in affected areas.

II. Audiometric Testing

A. Annual audiogram for individuals exposed to noise levels of 85 dBA or greater.

- 1. These must be offered annually to affected employees even if employee has refused past audiogram tests.

B. All employees exposed to noise levels of 85 dBA or greater who have exhibited an OSHA STS must wear hearing protection.

C. When an OSHA STS is found in a noise exposed individual, results of test must be provided to employee in writing.

D. It is recommended that the Medical Department inform any employee who has exhibited a significant threshold shift whether or not noise exposed.

III. Training

- A. Each employee exposed to noise levels of 85 dBA or greater must have a yearly training program.
 - 1. Program includes effects of noise, care and fitting of hearing protection and purpose and procedures of audiometric testing.
 - 2. Program may be formal during monthly safety meeting or informal during annual audiogram or in a letter or pamphlet.
- B. It is recommended that a record of the training data and content of discussion be kept for future reference.
- C. A copy of the OSHA Hearing Conservation Amendment must be posted in the work place and copies made available for employees to see if requested.

IV. Hearing Protection

- A. A variety of hearing protection should be available.
 - 1. Protection should attenuate to levels below 85 dBA.
 - 2. Protection should be inventoried by medical or hygiene personnel and not department supervisors or stores department.
 - a. This maintains better control on who is wearing what protection and where it is being worn.

TEXAS DEPARTMENT OF HEALTH

REGISTRATION CERTIFICATE
FOR
INDUSTRIAL NON-LICENSED SOURCES OF RADIATION

Pursuant to the Texas Radiation Control Act and Texas Department of Health Regulations for Control of Radiation, and in reliance on statements and representations heretofore made by the registrant, this certificate is hereby issued authorizing the registrant to possess the equipment listed below; and to use such equipment for the purpose(s) and at the place(s) designated below. The registrant is subject to all applicable rules, regulations and orders of the Texas Department of Health now or hereafter in effect and to any conditions specified below.

1. REGISTRANT

Kessler Premium Castings Co.
Attn: Edmundo Macias
900 Kessler Drive
El Paso, Texas 79907

REGISTRATION NO.:

3-11093

2. EXPIRATION DATE:

February 28, 1987

REGISTERED INFORMATION

REGISTERED UNIT (S)

3. MANUFACTURER

A. Philips
B. Philips
C. Philips

4. MODEL

A. MG160
B. MG160
C. MG320

5. SERIAL NO.

A. 714879
B. 725318
C. 729957

6. REGISTERED USE

A. - C. Industrial radiography

CONDITIONS

7. THE REGISTRANT SHALL NOTIFY THE BUREAU OF RADIATION CONTROL, TEXAS DEPARTMENT OF HEALTH WITHIN THIRTY DAYS OF ANY CHANGE WHICH RENDERS THE INFORMATION CONTAINED IN THE APPLICATION NO LONGER ACCURATE. A CHANGE IN POSSESSION OF THE SOURCES(S) OF RADIATION SHALL INVALIDATE THIS REGISTRATION.