HEALTH HAZARD EVALUATION REPORT 71-10-48
HAZARD EVALUATION SERVICES BRANCH
DIVISION OF TECHNICAL SERVICES

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U. S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH

CINCINNATI, OHIO 45202

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PPG INDUSTRIES, INC.
CLARKSBURG, WEST VIRGINIA

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I. SUMMARY DETERMINATION

A. Introduction

Section 20(a)(6) of the Occupational Safety and Health Act of 1970, 29 U.S.C. 669(a)(6), authorizes the Secretary of Health, Education, and Welfare, following a written request by any employer or authorized representative of employees, to determine whether any substance normally found in the place of employment has potentially toxic effects in such concentrations as used or found.

The National Institute for Occupational Safety and Health (NIOSH) received such a request from an authorized representative of employees regarding exposure to Polytek dust in packaging operations at PPG Industries, Inc., Works 12, in Clarksburg, West Virginia.

B. Federal Standards

No Federal Standard currently exists for occupational exposure to Polytek dust, or components contained in the dust. From an initial visit conducted in September, 1971, NIOSH investigators concluded that the only component contained in Polytek which could be potentially toxic to employees in the associated operation was salicylic acid.

C. Environmental Evaluation Results

NIOSH investigators conducted follow-up surveys on February 2-3, 1972 and October 31 - November 1, 1972.

Five (5) personal and thirteen (13) general room air samples were collected in February near the mechanical Sivoduster-dispensers. Total Polytek dust concentrations ranged from 0.42 to 1.22 milligrams per cubic meter (mg/M^3). In the one manually applied Polytek operation, a general room sample concentration of 13.2 mg/M^3 was obtained.

During the subsequent survey (October 31 - November 1, 1972) salicylic acid content of the airborne Polytek dust was measured with the associated Sivoduster (old) and Oxydry (new) Polytek dispensers in use. Salicylic acid concentrations measured on October 31 ranged from 0.010 to 0.320 mg/M^3 for 13 samples near Sivoduster; and from 0.003 to 0.355 mg/M^3 for 13 samples near Oxydry dispensers. Salicylic acid concentrations on November 1 ranged from 0.016 to 0.072 mg/M^3 for 16 samples with Sivoduster; and 0.006 to 0.017 mg/M^3 for 3 samples with the Oxydry.

Sound level pressure measurements of 120 dBA were recorded when broken glass was discarded into waste chutes at the above stations. Such levels exceed the noise exposure standard of 90 dBA (Federal Register, Part II, 1910, Table G-16).

D. Medical Evaluation Results

Medical interviews conducted in February 1972 with thirty (30) employees indicated a history of eye, nose and throat irritation in working with the Polytek Sivoduster application.

A medical study concurrent with the above reported environmental study was made on November 1, 1972. Six of eight Sivoduster workers studied noted acute symptoms of eye, nose and throat irritation. Blood tests performed on workers indicated negligible absorption of salicylic acid. Two Oxydry operators reported no symptoms and their blood tests were likewise negative. Salicylic acid is not known to produce pulmonary disease and no symptoms of lower respiratory irritation such as chronic productive cough or wheezing were elicited from any workers.

E. Toxicity Determination

Based upon the results of the studies conducted by NIOSH officers as reported above, it has been determined that salicylic acid, a component in Polytek dust, is toxic at the concentration used or found, causing the acute symptoms of irritation to eyes, nose and throat of workers exposed in glass packaging operations.

Air concentration levels of 0.07 mg/M^3 of salicylic acid does not cause significant blood levels of salicylic acid. However, this air level does not protect workers from the above mentioned symptoms.

The method of applying Polytek using the Sivoduster dispenser has repeatedly produced concentration levels in air which results in observed symptomatology. Limited evaluation of the new Oxydry dispenser operation has shown a significant reduction in such symptomatology.

F. Distribution

Copies of this Summary Determination are available from the Hazard Evaluation Services Branch, National Institute for Occupational Safety and Health, U. S. Post Office Building, 5th and Walnut Streets, Room 508, Cincinnati, Ohio 45202. Copies have been sent to:

a) PPG Industries, Inc.
b) Authorized representative of employees
c) U. S. Department of Labor - Region III

For purposes of informing the approximately 200 "affected employees", the Employer will promptly post this Summary Determination in a prominent place(s) near where affected employees work for a period of 30 calendar days.

II. INTRODUCTION

Section 20(a)(6) of the Occupational Safety and Health Act of 1970, 29 U.S.C. 669 (a)(6), authorizes the Secretary of the Department of Health, Education, and Welfare, following a written request from an employer or authorized representative of employees to determine whether any substances normally found in the place of employment has potentially toxic effects in such concentrations as used or found.

The National Institute for Occupational Safety and Health (NIOSH) received such a request from an authorized representative of employees regarding exposures to Polytek dust in packaging operations at PPG Industries, Inc., Clarksburg, West Virginia.

PPG Work 12, Clarksburg, West Virginia produces flat sheet glass. A variety of machines (Multicut, Big John) are involved in cutting operations of flat glass to customer size specifications. Immediately prior to packaging for shipment, an interleaving material is applied to separate the cut glass sheets to prevent breakage and discoloration. Polytek powder has been used as a replacement for paper as the interlining material for single and double "B" quality glass--on an experimental basis beginning in April 1970 and in permanent use since 1971 at four PPG Industries plants.

Applicators dispense Polytek dust automatically onto the sheet glass as it moves along the conveyor of the cutting machine. Adjustments to the applicator can be made to insure by visual assessment an optimum rate and even distribution of powder onto the glass.

III. BACKGROUND HAZARD INFORMATION

A. Federal Standards

There are no presently existing occupational health standards promulgated by the U. S. Department of Labor for Polytek dust, or components contained in the dust.

B. Toxic Effects

Among the components present in Polytek powder, the only potentially toxic component was judged to be salicylic acid.

Salicylic Acid: (References 1-4)

The salicylates, the best examples of which are acetyl salicylic acid (aspirin) and salicylic acid, are used in medicine for the relief of pain, temperature reduction, and the reduction of inflammation.

Salicylic acid is a well known irritant to the skin and mucosa. Salicylic acid has been used routinely in dermatology for the treatment of warts, corns (10-20% in collodion), fungal infections, and other dermatologic conditions. Contact with skin in therapeutic concentrations of 3 to 6% or greater will cause the tissue cells to swell, soften and shed. Salicylic acid is rapidly absorbed through intact skin. Its absorption is increased when the skin is broken or abraded, which is often the case in dermatologic conditions. The most common route of entry of salicylic acid is orally in the form of aspirin, accounting for the great majority of cases of salicylic poisoning. Most cases of serious toxicity from skin absorption have occured in patients with extensive cutaneous disease requiring treatment with compounds containing salicylic acid.

Salicylate Poisoning and Salicylism - Typical toxic effects of high doses of a salicylic acid (salicylate poisoning) involved many systems of the body including the central nervous system, the respiratory system, the gastrointestinal tract, and certain metabolic processes. Symptoms include: (1) central nervous system - confusion, dizziness, nausea, vomiting, ringing of the ears, deafness, psychosis, stupor and coma. (2) Respiratory - stimulation of the respiratory tract leading to an increased respiratory rate. (3) Gastrointestinal - exposure of the gastrointestinal tract may lead to the local effect of mild irritation. (4) Hemopactic: There is an increased incidence of bleeding problems when salicylates are present in the blood. Mild intoxication occurs only after the repeated administration of large does. Commonly, blood levels are performed to assess the degree of intoxication. Although symptoms of salicylate intoxication may be present with levels of salicylate in plasma as low as 10 mg percent, symptoms occurring at less than 35 mg percent are usually quite mild. According to Natelson, levels higher than 15 to 20 mg percent should be considered toxic. Normal subjects who took two aspirin tablets four times a day for three days and who remained without symptoms had salicylate acid levels between 10 and 17 percent.

Although the primary route of excretion of salicylic acid is the kidney, the amount of salicylate found in urine is greatly dependent upon the pH of the urine: For example, at identical serum levels, six times the amount of salicylic acid is excreted if the pH is 7.8 as compared with a pH of 5.8.

It should be recognized that as with almost any substance, allergic hypersensitivity reactions to very small doses of salicylates can occur: for example, skin rashes or severe reactions such as anaphlaxis. Aspirin is the compound most often involved in salicylate hypersensitivity reactions. Sensitivity to salicylic acid is rare.

IV. HEALTH HAZARD EVALUATION

A. Observational Survey

NIOSH investigators, Jerome P. Flesch, Henry Ramos, and Raymond L. Ruhe conducted an observational survey at PPG Industries, Works 12 in Clarksburg, West Virginia in September 1971. Personnel interviewed during the evaluation included:

Mr. Donald West, Plant Manager
Mr. William C. Knox, Director, Employees Relations
Mr. Thomas Durbin, Supervisor of Safety and Labor (recently assigned to a PPG plant in Oklahoma)
Mr. William Landmeyer, Supervisor of Safety & Labor (newly appointed)
Mr. Leroy Carina, Warehouse Superintendent
Mr. James T. Destinfano, Manager, Environmental Control, Glass Division
Mr. Robert Rubino, Senior Environmental Control Engineer
Mr. Paul G. Lister, Former Vice-President, Local No. 2
Mr. Jack Gorby, President, Local No. 2
Mr. Sam Benincosa, Union Member
Mr. Joe LeRoy, Union Member

A walk-through survey was made during the initial visit. Approximately 200 employees working with or near the glass cutting machines could potentially be exposed to Polytek dust. The labor force distributed in the area of interest works a three shift schedule and the United Glass and Ceramic Workers of America, AFL-CIO-CLC represent most of these employees.

Workers interviewed complained of slippery floors as a result of spillage of Polytek powder and volunteered symptoms of eye irritation allegedly due to exposure to Polytek dust. Bulk samples of Polytek powder were obtained for laboratory analysis.

B. Environmental-Medical Evaluation: February 1972

On February 2 and 3, 1972, an environmental and medical survey was conducted by Messrs. Henry Ramos, Raymond L. Ruhe, Steven K. Shama, M.D., and James Taylor, M.D., NIOSH, Cincinnati, Ohio. The purpose of the survey was to correlate airborne exposures and effects due to Polytek dust.

1. Environmental Evaluation

Exposures to airborne Polytek dust applied by the "Sivoduster" dispenser were measured using personal air sampling equipment which samples air in the close proximity to the workers breathing zone. In addition, general room air samples were obtained. MSA Model G, battery powered portable vacuum pumps were used to draw air through open-face millipore air monitors fitted with 37 mm type AA, 0.8 micrometer pore size cellulose filters. Air sample rates were maintained at 1.7 liters per minute.

Results

The Air samples were assayed by the Division of Laboratories and Criteria Development, NIOSH, Cincinnati, Ohio. The concentration of the Polytek dust ranged from 30 to 1.22 mg/M^3 near cutting machine operations. A total dust concentration of 13.23 mg/M^3 was obtained near the manually applied Polytek operation. Additional total dust exposures are found in Table I. An attempt was made to analyze the salicylic acid content in the dust samples, but unfortunately, the analytical method available in our laboratory was not sensitive enough to adequately measure salicylic acid at the low levels encountered.

Discussion

During this environmental survey, it was indicated that a "new" Polytek powder formulation was being used on some machines since the time of our first visit in December. The new Polytek appeared to be more coarse than the original Polytek. The cutting machines using the "new" or old Polytek powder are identified in Table I. Both types of Polytek contained salicylic acid.

It was also noted that exposure to air borne Polytek dust is a transient, intermittent exposure of skin, eyes, nose and throat. Exposures can occur any of three ways:

(1) If Polytek is applied very heavily on the glass sheet and another glass sheet is then placed on the top, a significant amount of Polytek dust may be dispersed into the atmosphere.

(2) Dust from broken and discarded glass previously spread with Polytek.

(3) Skin contact can occur when an employee inadvertently touches the face with Polytek contaminated gloves.

2. Medical Evaluation

On February 2, 1972 an initial medical evaluation of workers exposure to Polytek was performed. The conclusions of that evaluation were that almost all of the 30 workers with exposure to Polytek were noted to have symptoms of either eye, nose, or throat irritation. There were no signs of mucous membrane or skin irritation except for one worker with nasal mucosal erythema allegedly due to irritation from Polytek. It was believed that the active irritative ingredient of Polytek was salicylic acid.

3. Other Agents

Although it has been established that "substances" as defined in Section 20(a)(6) of the Act does not include physical agents, for completeness of our overall responsibilities for acknowledging any occupational hazard we encounter during the evaluation at the work site, we report the following observed exposure to noise. The standard for occupational noise exposure was published in the Federal Register, Part II, 1910.95, Table G-16, is shown in Table II. These standards are based on single reading of sound pressure level on the A-weighted network, slow response. Sound pressure level measurements were obtained using a General Radio Sound Level Meter, Type 1565-B. Sound level measurements of 120 decibels were recorded when broken glass is discarded in waste chutes.

C. Follow-up Environmental-Medical Evaluation: October-November 1972

A second follow-up environmental/medical survey was made on October 31 and November 1, 1972. The purpose of the survey was to measure salicylic acid in airborne Polytek dust samples and to correlate these results with blood salicylic acid and symptoms.

1. Environmental Evaluation

During this plant visit, two types of Polytek dust applicators were used: the "old" Sivoduster and a "new" Oxydry. It was indicated that Oxydry applicators will eventually replace Sivoduster applicators.

To preclude interference with production schedules, Polytek air samples were collected during the time that Polytek was in use; paper was used appreciably otherwise. Methods for collecting air samples were those previously described in this report.

Analysis and Results

The Division of Laboratories and Criteria Development, NIOSH, Cincinnati, Ohio assayed the air samples for content of salicylic

acid. A total of 45 samples were collected on October 31 and November 1, 1972. The Polytek dust samples were placed in a one percent acetic acid in chloroform solution for 24 hours and analyzed using spectrofluorometric procedures. The sensitivity of analytical method is 1.0 microgram per sample.

Airborne dust samples were collected adjacent to machines equipped with Sivoduster and Oxydry applicators.

Salicylic acid concentrations in 24 air samples collected on October 31, 1972 adjacent to a Sivoduster applicator ranged from 0.010 to 0.321 milligrams per cubic meter (mg/M^3). Levels varying from 0.003 to 0.355 mg/M^3 were found on samples taken adjacent to an Oxydry applicator.

Twenty-one air samples were collected on November 1, 1972 adjacent to Sivoduster and Oxydry Polytek applicators. The salicylic acid concentration on air samples collected near the Sivoduster ranged from 0.016 to 0.072 mg/M^3 and near the Oxydry 0.006 to 0.017 mg/M^3. Tables III and IV summarize salicylic acid air sample concentrations collected on October 31 and November 1, 1972. These salicylic acid concentrations in the summary tables represent a time-weighted average exposure for the day the samples were collected. In some instances, Polytek was used for a brief time, consequently, exposure time was also brief. The average time an employee is normally handling glass from the cutting machine is approximately six hours per day.

2. Medical Evaluation

Medical interviews were conducted on November 1, 1972 to determine irritative symptoms from acute exposure to salicylic acid and possible effects from systemic absorption of salicylic acid. In addition, blood samples were taken for salicylic acid determination. By taking morning and afternoon blood samples, it could be determined whether there was any significant increase in levels after a day's exposure. Since a new applicator for the Polytek was in operation, it was also possible to compare the old Polytek applicator (Sivoduster) with the new applicator (Oxydry), with regard to salicylic acid air levels, blood levels, and symptoms.

Method

Eight Sivoduster operators, two Oxydry operators, and five non-exposed control personnel were studied. A group of questions related to eye, nose and throat irritation and symptoms related to overdose from salicylic acid were asked of these workers. Additionally, blood samples were taken to compare blood salicylate levels. No one whose blood samples were taken admitted to taking aspirin within 24 hours of blood sampling. Thus, blood samples for salicylic acid should reflect only occupational exposure. Blood samples were taken

about one hour after beginning work and about seven hours later. Analysis for salicylate levels were performed by the Toxicology Laboratory, Division of Toxicology, Cincinnati General Hospital, by the method described by Natelson.

Results and Discussion

As can be seen in Table V, with the exception of two individuals (1 and 2), all workers exposed to the Sivoduster operation noted eye, nose and throat irritation on the day of testing. Neither of the two Oxydry workers noted any irritative symptoms. These workers also noted return of symptoms when assigned to work on the Sivoduster. Corresponding air salicylic acid concentrations for operators are also reported in Table V.

Salicylic acid blood levels showed insignificant levels. It is noted by Natelson that a value of about two milligrams percent should not be considered significant since it may be seen in the absence of salicylic acid. Only three values representing at most trace amounts of salicylic acid were noted in samples from workers 4, 10, and Control 13. The pattern for the group as a whole did not suggest absorption.

Considering the fact that values of two milligrams percent are not significant and that the highest level recorded was only 4 mg percent with one of the workers (No. 10, Table V) who was using the new method and that this value of 4 mg percent is well below the therapeutic level of 10-12 mg percent and also well below levels (35 mg percent) where mild symptoms of salicylism appear, it can be concluded that there is no appreciable absorption of salicylic acid from skin, ingestion or inhalation, and that no harmful effect, other than local irritation to eyes, nose and throat and skin may be expected from this exposure.

The Oxydry applicator did not produce concentrations of salicylic acid in the air resulting in acute symptoms in the two exposed workers; therefore, this method of Polytek dispersion may be the preferred one.

Salicylic acid is not known to produce pulmonary disease and no symptoms of lower respiratory irritation such as chronic productive cough or wheezing were elicited from workers. Thus, no further investigation seemed warranted in regard to effect on the lungs.

D. Conclusion

Based upon the results of the studies conducted by NIOSH officers as reported above, it has been determined that salicylic acid, a component in Polytek dust, is toxic at the concentration used or found, causing the acute symptoms of irritation to eyes, nose and

throat of workers exposed in glass packaging operations.

Air concentration levels of 0.07 mg/M^3 of salicylic acid does not cause significant blood levels of salicylic acid. However, this air level does not protect workers from the above mentioned symptoms.

The method of applying Polytek using the Sivoduster dispenser has repeatedly produced concentration levels in air which results in observed symptomatology. Limited evaluation of the new Oxydry dispenser operation has shown a significant reduction in such symptomatology.

V. RECOMMENDATIONS

1. Since the Oxydry Polytek applicator apparently reduces the symptomatology due to salicylic acid, it is recommended that Oxydry applicators be used.

2. To reduce airborne concentrations of Polytek the following good practice procedures should be considered:

   (a) A routine maintenance inspection program should be actively implemented on the Polytek dust applicator to control the quantity and distribution of Polytek dust on the sheet glass.

   (b) The container beneath the conveyor belt retaining overflow Polytek should be emptied regularly and kept clean.

   (c) Polytek spillage on the floor causes the floor to become slippery, creating a potential for accidents. This spillage should be avoided.

   (d) To protect workers exposed to high dust concentrations of Polytek when manually applied, a Bureau of Mines approved dust respirator should be provided.

3. It is recommended that the company conduct further noise studies to evaluate potentially hazardous exposures, particularly in discarding of broken glass operations and institute effective engineering and/or personal protective controls where applicable.

VI. REFERENCES

1. Woodbury, Dixon, M.: Analgesic-Antipyretics, Anti-Inflammatory Agents, and Inhibitors of Uric Acid Synthesis. The Pharmacological Basis of Therapeutics, 4th ed., Goodman & Gilman, editors, MacMillan Co., Toronto, 1970.

2. Von Weiss, John F. and Lever, Walter F.: Percutaneous Salicylic Acid Intoxication in Psoriasis. Arch. Derm. 90: December 1964.

3. Natelson, Samuel: Techniques of Clinical Chemistry, 3d ed., 1971. Charles Thomas, Springfield, Ill.

4. Johnson, Patricia K., et al: A Simplified Urine and Serum Screening Test for Salicylate Intoxication. J. Pediatrics Nov. 1963, 948-953.

TABLE I

POLYTEK DUST ENVIRONMENTAL AIR CONCENTRATIONS
SIVODUSTER APPLICATOR
FEBRUARY 2-3, 1972

February 2, 1972

Sample No.	Location	Type of Sample	Substance	Time Sampled (Min.)	Total Polytek Dust Concentration mg/M^3*
102	Multicut No. 1	General Room	Old Polytek Formulation	390	0.362
103	Multicut No. 1	General Room	"	390	0.347
104	Multicut No. 1	General Room	"	390	0.302
107	Big John No. 4	General Room	"	355	0.578
108	Big John No. 4	General Room	"	355	1.242
109	Big John No. 4	General Room	"	355	0.746
105	Multicut No. 1	Personal	"	390	0.528
106	Multicut No. 1	Personal	"	390	0.528
110	Big John No. 4	Personal	"	350	0.504
February 3, 1972					
101	Big John No. 8	General Room	New Polytek Formulation	240	0.392
111	Big John No. 8	General Room	"	111	1.378**
112	Big John No. 8	General Room	"	365	0.548
115	Big John No. 8	General Room	"	365	0.645
116	Big John No. 8	General Room	"	365	0.403
117	Big John No. 4	General Room	Old Polytek Formulation	325	0.452
118	Big John No. 4	General Room	"	325	0.633
119	Second Level - Manually Applied	General Room	"	12	13.235
113	New Polytek Formulation	Personal	New Polytek Formulation	350	0.571
114	"	Personal	"	340	0.571

* Milligram of contaminated air per cubic meter of air.
**Invalid air sample. Evidence of tampering with sampling equipment was noted.

TABLE II

PERMISSIBLE NOISE EXPOSURES*

Duration Per Day, Hours	Sound Level dBA Slow Response
8	90
6	92
4	95
3	97
2	100
1-1/2	102
1	105
1/2	110
1/4 or Less	115 Ceiling Value

*When the daily noise exposure is composed of two or more periods of noise exposure of different levels, their combined effect should be considered, rather than the individual effect of each. If the sum of the following fractions: C1/T1+C2/T2+ CN/Tn exceeds unity, then the mixed exposure should be considered to exceed the limit value. Cn indicates the total time of exposure at a specified noise level, and Tn indicates the total time of exposure permitted at that level.

Exposure to impulsive or impact noise should not exceed 140 dB peak sound pressure level.

TABLE III

SALICYLIC ACID ENVIRONMENTAL AIR CONCENTRATIONS
SIVODUSTER AND OXYDRY APPLICATORS
OCTOBER 31, 1972

Sivoduster Applicator

Sample No.	Location	Type of Sample	Time Sampled (Min.)	Salicylic Acid Concentration mg/M^3
6	Big John No. 4	General Room	338	0.025
7.	Big John No. 4	General Room	55	0.028
8	Big John No. 4	Personal	42	0.084
9	Big John No. 4	Personal	43	0.321
2	Multicut No. 3 Station 1	General Room	169	0.038
3	Multicut No. 3 Station 1	General Room	169	0.010
11	Multicut No. 3 Station 1	Personal	166	0.026
13	Multicut No. 3 Station 1	Personal	110	0.037
4	Multicut No. 3 Station 2	General Room	172	0.015
5	Multicut No. 3 Station 2	General Room	172	0.019
14	Multicut No. 3 Station 2	Personal	113	0.021
15	Multicut No. 3 Station 2	Personal	113	0.029
1	Multicut No. 3	High Volume	175	0.034

Oxydry Applicator

24	Big John No. 8	General Room	189	0.009
26	Big John No. 8	General Room	188	0.006
4a	Big John No. 8	General Room	30	0.098
16	Big John No. 8	Personal	176	0.012
23	Big John No. 8	Personal	174	0.010
25	Big John No. 8	Personal	167	0.009
18	Multicut No. 1	General Room	24	0.049
19	Multicut No. 1	Personal	27	0.087
20	Multicut No. 1	Personal	24	0.355
21	Multicut No. 1	Personal	28	0.053
22	Multicut No. 1	High Volume	36	0.006
27	Big John No. 8	High Volume	177	0.003
36	Big John No. 8	High Volume	363	0.014

TABLE IV

SALICYLIC ACID ENVIRONMENTAL AIR CONCENTRATIONS
SIVODUSTER AND OXYDRY APPLICATOR
NOVEMBER 1, 1972

Sivoduster Applicator

Sample No.	Location	Type of Sample	Time Sampled (Min.)	Salicylic Acid Concentration mg/M^3
42	Multicut No. 2	General Room	350	0.039
43	Multicut No. 2	General Room	351	0.071
46	Multicut No. 2	Personal	341	0.016
41	Multicut No. 2	Personal	351	0.057
44	Multicut No. 2	Personal	339	0.025
37	Multicut No. 2	Personal	351	0.054
38	Multicut No. 2	Personal	354	0.071
7a	Multicut No. 3 Station 1	General Room	447	0.072
8a	Multicut No. 3 Station 1	General Room	447	0.049
31	Multicut No. 3 Station 1	Personal	456	0.055
34	Multicut No. 3 Station 1	Personal	456	0.027
9a	Multicut No. 3 Station 2	General Room	450	0.037
10a	Multicut No. 3 Station 2	General Room	450	0.040
32	Multicut No. 3 Station 2	Personal	450	0.040
33	Multicut No. 3 Station 2	Personal	450	0.056
30	Big John No. 8	General Room	456	0.047
Oxydry Applicator				
12a	Big John No. 8	General Room	262	0.017
39	Big John No. 8	Personal	267	0.006
40	Big John No. 8	Personal	268	0.013

TABLE V

SUMMARY RESULTS OF MEDICAL EVALUATION - NOVEMBER 1, 1972

Operator	Eye Symptoms(1)	Nose Symptoms(2)	Throat Symptoms(3)	Salicylism(4)	Blood Salicylate -mg% Morning	Blood Salicylate -mg% Afternoon	Air Salicylic Acid mg/M^3
Sivoduster							
1.	X	X	X	-	-	-	0.055
2.	X	X	X	-	-	-	0.054
3.	-	-	-	-	2	-	0.040
4.	-	-	-	-	2	3	0.056
5.	X	X	X	-	2	2	0.057
6.	X	X	X	-	2	1	0.071
7.	X	X	X	-	1	1	0.016
8.	X	X	X	-	0	1	0.025
Oxydry							
9.	-	-	-	-	2	2	0.006
10.	-	-	-	-	0	4	0.013
Controls							
11.	-	-	-	-		2	
12.	-	-	-	-		0	
13.	-	-	-	-		3	
14.	-	-	-	-		0	
15.	-	-	-	-		0	

(1) Eye Symptoms - redness, tearing, irritation
(2) Nose Symptoms - sneezing, nosebleed, soreness
(3) Throat Symptoms - dry, scratchy, cough
(4) Salicylism - hearing, GI tract, bleeding problems
X Symptom