

Table 1

Weights of Dust and of Lead Removed From the Air by Electrostatic Precipitation While Abrasive Wheels Containing Lead Were Being Used to Cut C1020 Steel. (No Exhaust Ventilation)

<u>Sample Number and Description</u>	<u>Duration of Sampling</u>	<u>Mgs. Particulate Matter/m³</u>	<u>Per Cent of Particles Below 10 Microns in D.</u>	<u>Mgs. Pb Per m³ of Air</u>	<u>Proportion of Lead (Per Cent) Represented by Particles Less Than 10 Microns in D.</u>
1. Background, before start of operations.	15' (minutes)	1.21	-	0.001	-
2. At Breathing Zone, while using wheel #A194-901 (Lead Free) during 120 cuts.	21' 26"	24.90	-	0.019	100
3. At Breathing Zone, while using wheel #A194-902 (3% Lead) during 80 cuts.	10' 25"	25.30	79.9	0.487	80.5
3B. General Air 12' from cut-off machine	10' 25"	34.40	85.0	0.666	71.5
4. At Breathing Zone, while using wheel #A194-903 (12% Lead) during 80 cuts.	9' 45"	24.40	91.0	1.200	85.0
4B. General Air 12' from cut-off machine.	9' 45"	13.06	-	1.317	80.5

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<u>Sample Number and Description</u>	<u>Duration of Sampling</u>	<u>Mgs. Particulate Matter/M3</u>	<u>Per Cent of Particles Below 10 Microns in D.</u>	<u>Mgs. Pb Per M3 of Air</u>	<u>Proportion of Lead (Per Cent) Represented by Particles Less Than 10 Microns in D.</u>
5. Background before start of afternoon operations.	15'	0.76	-	0.025	-
6. Breathing Zone, while wheel #A194-901 (Lead Free) was used during 80 cuts.	11' 36"	29.50	-	0.050	78.0
6B. General Air 12' from wheel #A194-901.	11' 36"	26.00	-	0.039	92.5
7. Breathing Zone, while wheel #A194-902 (3% Lead) was used during 58 cuts.	6' 45"	35.20	85.5	2.960	71.3
7B. General Air 12' from wheel #A194-902 (3% Lead) during 58 cuts.	6' 45"	43.10	-	0.811	60.5
8. Breathing Zone, while wheel #A194-903 (12% Lead) was being used during 80 cuts.	7' 42"	33.00	80.5	1.624	81.0

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<u>Sample Number and Description</u>	<u>Duration of Sampling</u>	<u>Mgs. Particulate Matter/m³</u>
8B. General Air 12' from wheel #A194-903 (12% Lead) during 80 cuts.	7' 42"	23.60
*9. Breathing Zone, while wheel #A194-903 (12% Lead) was being used during 80 cuts.	7' 29"	2.17

Average

*Exhaust ventilation on.

**Excluding samples 1, 2, 5 and 6.

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Per Cent of
Particles Below
10 Microns in D.

Mrs. Pb
Per
m3 of Air

Proportion of Lead
(Per Cent) Represented
by Particles Less
Than 10 Microns in D.

-

0.770

70.0

-

0.100*

84.4

75.0**

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Table 2

Frequency of Occurrence (Per Cent) of Particles Found in the Atmosphere, According to Size

<u>Sample Number and Description</u>	<u>Sampling Method</u>	<u>Range in Microns</u>				
		<u>0-1⁻</u>	<u>1-2⁻</u>	<u>2-5⁻</u>	<u>5-10⁻</u>	<u>10 and Greater</u>
3. At Breathing Zone while using wheel #A194-902 (3% Lead) during 80 cuts.	Electrostatic Precipitator	7.5	17.8	34.0	20.6	20.1
3B. General Air, 12 feet from cut-off machine.	Electrostatic Precipitator	10.7	25.5	31.8	18.0	15.0
3C. At Breathing Zone while using wheel #A194-902 (3% Lead) during 80 cuts.	Membrane Filter	63.0	18.2	16.6	1.8	None
4. At Breathing Zone while using wheel #A194-903 (12% Lead) during 80 cuts.	Electrostatic Precipitator	10.9	22.0	39.1	19.0	9.0
7. At Breathing Zone while wheel #A194-902 (3% Lead) was used during 58 cuts.	Electrostatic Precipitator	8.0	24.4	43.9	9.2	14.5
8. At Breathing Zone while wheel #A194-903 (12% Lead) was being used during 80 cuts.	Electrostatic Precipitator	3.5	20.0	39.5	17.5	19.5
8C. At Breathing Zone while wheel #A194-903 (12% Lead) was being used during 80 cuts.	Membrane Filter	70.0	16.7	11.1	1.4	0.8

*Limit of detection approximately 0.7 micron.

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Table 3Comparison of Findings From Samples Collected With

Sample Number and Description	Electrostatic Precipitator		
	Sampling Time	Total Lead Per M ³	Mgs. Pb/M ³ in Particles <10 μ *
3. At Breathing Zone while using wheel #A194-902 (3% Lead) during 80 cuts.	10' 25"	0.467	0.393
4. At Breathing Zone while using wheel #A194-903 (12% Lead) during 80 cuts.	9' 45"	1.200	1.020
7. Breathing Zone while wheel #A194-902 (3% Lead) was used during 58 cuts.	6' 45"	2.960	2.100
8. Breathing Zone while wheel #A194-903 (12% Lead) was being used during 80 cuts.	7' 42"	1.624	1.318

*From sedimentation data.

**Sampling rate 3 liter per minute, the volume of air sampled
the samples were collected closer to the wheel.

h Three Different Pieces of Equipment

Two Stage Sampler		Membrane Filter**	
Sampling Time	Mgs. "Respirable" Lead per M3	Sampling Time	Mgs. Pb Per M3
10' 25"	0.250	10' 25"	0.800
2' 1"	1.22	None Taken	
2'	1.10	None Taken	
1' 25"	1.47	7' 42"	3.330

ed was less than 1 cubic foot and

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<u>Sample Number and Description</u>	<u>In Fine Particles (<10μ)</u>	<u>In Coarse Particles (>10μ)</u>	<u>Total</u>
3. At Breathing Zone while using wheel #A194-902 (3% Lead) during 80 cuts.	0.393	0.094	0.487
3B.* General Air, 12' from cut-off machine.	0.475	0.191	0.666
4. At Breathing Zone while using wheel #A194-903 (12% Lead) during 80 cuts.	1.020	0.180	1.200
4B.* General Air, 12' from cut-off machine.	1.060	0.258	1.318
7. At Breathing Zone while wheel #A194-902 (3% Lead) was used during 58 cuts.	2.110	0.850	2.960
7B.* General Air, 12' from wheel #A194-902 (3% Lead) during 58 cuts.	0.492	0.319	0.811
8. At Breathing Zone while wheel #A194-903 (12% Lead) was being used during 80 cuts.	1.318	0.306	1.624
8B.* General Air, 12' from wheel #A194-903 (12% Lead) during 80 cuts.	0.541	0.229	0.770

*Collected simultaneously with sample indicated by numeral only.

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Mr. S. D. Mark, Jr.
Manager Technical Branch
Bonded Abrasives Division
Carborundum Company, Inc.
Building 32-3, Buffalo Avenue
Niagara Falls, New York

Dear Mr. Mark:

As directed by Mr. R. A. Baumgartner in a telephone conversation on December 9th, we are enclosing copies of four tables of data developed from the analysis of samples collected in your plant on November 26th. We believe the tables to be self-explanatory, but if you need more detailed information please let us know and we will try to supply the additional information.

As was indicated to Mr. Baumgartner our final report will be submitted as soon as possible following the return of Dr. R. A. Kehoe, Director of the Laboratory from Florida during the first week of January 1964.

As per your request, we are also enclosing a statement covering the cost of this work. The total cost includes a charge for writing the final report.

Sincerely yours,

J. Cholak
Director, Division of
Industrial Hygiene Technology

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Enclosures

cc: Dr. Robert A. Kehoe

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