PLAINTIFF'S EXHIBIT

UC-3979

UC-3979-2

UNION CARBIDE

INTERNAL CORRESPONDENCE

UNION CARBIDE CORPORATION • 270 PARK AVENUE, NEW YORK, NEW YORK 100

To (Name) H. Childs
Division Linde Division
Location 4801 W. 16th St.
Floor Number

Copy to

Date August 18, 1980

Originating Dept.

Floor Number

Answering letter date

Subject 1979 Industrial Hygiene Data Summary

File: Speedway Factory

Dear Hank:

Attached is the statistical summary for the 1979 industrial hygiene data collected at the Speedway Factory.

Your plant sampling program for the next year will be forthcoming shortly!

Thanks for all your help last week.

Very truly yours,

R. G. Hanlon

RGH:mtf

A21773

UCC 011742

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SUMMARY OF JOB EXPOSURES

UCC IH-3-77-D

Division Linde - Cryogenics

Facility Speedway Factory Bldg. No. Report Period 1979

Job Description or Title	ID Code	Dept. a/o Operation	Air Contaminants and/or Physical Hazards	Number of Measurements	Range of Measurements (units)	Geometric Mean (GM)	Geometric Std. Dev. (GSD)	Current TLV (units)	*	Exposure as % of TLV	Comments or Notes
Utility		511	asbestos fiber	4	fibers/cc 0.01-0.02	0.01	1.41	fibers/cc 2	1	% 0.5	
Stampes		---	"	1	0.01	0.01	---	2	1	0.5	
Autoclave Fitter		---	"	2	0.01	0.01	---	2	1	0.5	
Filler Topoff		---	"	2	0.04-0.09	0.06	1.77	2	1	3.0	
Assembly - Large cylinder		---	"	2	0.01-0.2	0.01	1.63	2	1	0.5	
Q.C. Insp.		---	"	1	0.05	0.05	---	2	1	2.5	
Painter		---	toluene	3	ppm 0.9 - 6.8	3.1	2.96	ppm 100	1	3.1	commulative exposure to
		---	n-butyl acetate	5	0.9 - 298	9.3	9.12	ppm 150	1	6.2	toluene, n-butyl
		---	butanone	5	3.6 - 12.9	7.3	1.76	ppm 200	1	3.7	acetate, MEK and ethyl
		---	ethyl acetate	3	5.6 - 25.1	10.0	2.23	ppm 400	1	2.5	acetate exceeded unity for
		---	diacetone alcohol	2	11.1-19.6	14.7	1.49	ppm 50	1	29.4	1/5 samples
		---	cyclohexanone	1	0.6	0.6	---	ppm 50	1	1.2	
		---	cellosolve acetate	2	2.0 - 2.2	2.1	1.07	ppm 100	1	2.1	

Geometric Mean(GM) = $\sqrt[n]{(x_1)(x_2)\ldots(x_n)}$
where: x_1 = value of first measurement
x_n = value of last measurement
n = the nth root of the product

Geometric Standard Deviation(GSD) = 10^{s_1}

$s_1 = \sqrt{(1/n-1)\left[(y_1^2+y_2^2+\ldots+y_n^2) - n(\bar{y})^2\right]}$

$y_1, y_2, \ldots, y_n$ = log of each measurement

$\bar{y} = (1/n)(y_1 + y_2 + \ldots + y_n)$

* - Source of Standards:
1 - OSHA
2 - ACGIH or NIOSH
3 - UCC-HSEA

A21774
UCC 011743
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SUMMARY OF JOB EXPOSURES

Division Linde - Cryogenics

Facility Speedway Factory Bldg. No. Report Period 1979

Job Description or Title	ID Code	Dept. a/o Operation	Air Contaminants and/or Physical Hazards	Number of Measurements	Range of Measurements (units)	Geometric Mean (GM)	Geometric Std. Dev. (GSD)	Current TLV (units)	*	Exposure as % of TLV	Comments or Notes
Painter			2-hexanone	1	ppm 0.6	0.6	---	25 ppm	1	2.4	
Operating Engineer		316	total particulate	2	mg/m3 o.50-2.84	1.19	3.42	mg/m3 10	3	11.9	
Millwright		316	"	1	0.39	0.39	---	mg/m3 10	3	3.9	
Repairer Liq. Containers		556	"	1	2.75	2.75	---	mg/m3 10	3	27.5	
Machine Oper. Prod.		523	"	2	0.38-0.56	0.46	1.32	mg/m3 10	3	4.6	
Paint Sprayer		511	"	3	0.29-1.12	0.51	2.03	mg/m3 10	3	5.1	
Fork Truck Metal Blast		513	"	1	0.35	0.35	---	mg/m3 10	3	3.5	
Packer Small Cont.		521	"	1	0.50	0.50	---	mg/m3 10	3	5.0	
Pickler-Cleaner		554	"	1	0.27	0.27	---	mg/m3 10	3	5.6	
Painter		554	"	1	0.56	0.56	---	mg/m3 10	3	5.6	
Utility		523	"	1	0.16	0.16	---	mg/m3 10	3	1.6	
Set Up Oper.		523	"	1	0.13	0.13	---	mg/m3 10	3	1.3	

A2 7775

UCC 011744

Geometric Mean(GM) = $\sqrt[n]{(x_1)(x_2)\ldots(x_n)}$

where: x_1 = value of first measurement
x_n = value of last measurement
n = the nth root of the product

Geometric Standard Deviation(GSD) = 10^{s1}

$$s_1 = \sqrt{(1/n-1)\left[(y_1^2+y_2^2+\ldots+y_n^2) - n(\bar{y})^2\right]}$$

$y_1, y_2, \ldots, y_n$ = log of each measurement

$\bar{y} = (1/n)(y_1 + y_2 + \ldots + y_n)$

* - Source of Standards:
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2 - ACGIH or NIOSH
3 - UCC-HSEA

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SUMMARY OF JOB EXPOSURES

Division Linde - Cryogenics

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Facility Speedway Factory

Bldg. No. ____

Report Period 1979

Job Description or Title	ID Code	Dept. a/o Operation	Air Contaminants and/or Physical Hazards	Number of Measurements	Range of Measurements (units)	Geometric Mean (GM)	Geometric Std. Dev. (GSD)	Current TLV (units)	*	Exposure as % of TLV	Comments or Notes
Crater-Packer		341	total particulate	2	mg/m^3 0.92-52.79	7.0	17.52	mg/m^3 10	3	70.0	
Wrapper		554	"	1	1.23	1.23	---	mg/m^3 10	3	12.3	
Cylinder Control Operator		513	"	1	3.04	3.04	----	mg/m^3 10	3	30.4	
Fork Truck Operator		343	noise	3	% 17-31	24.5	1.38	90dbA = 100%	1	24.5	
Machine Welder		554	"	1	62	62	---	100%	1	62	
Materials Handler		343	"	2	4 - 7	5.3	1.49	100%	1	5.3	
Liq. Cyl. Assem.		554	"	2	23 - 25	24.0	1.06	100%	1	24.0	
Union Melt Operator		522	"	2	207-224	215	1.06	100%	1	215.0	
Utility		554	"	2	34 - 40	36.9	1.12	100%	1	36.9	
Millwright		316	"	1	43	43	---	100%	1	43.0	
Welding Tech.		460	"	1	21	21	---	100%	1	21.0	
Paint Sprayer		511	"	2	48 - 82	62.7	1.46	100%	1	62.7	

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UCC 011745

Geometric Mean(GM) = $\sqrt[n]{(x_1)(x_2)\ldots(x_n)}$

where: x_1 = value of first measurement
x_n = value of last measurement
n = the nth root of the product

Geometric Standard Deviation(GSD) = 10^{s1}

$$s_1 = \sqrt{(1/n-1)\left[(y_1^2+y_2^2+\ldots+y_n^2) - n(\bar{y})^2\right]}$$

$y_1, y_2, \ldots, y_n$ = log of each measurement

$\bar{y} = (1/n)(y_1 + y_2 + \ldots + y_n)$

* - Source of Standards:
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3 - UCC-HSEA

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SUMMARY OF JOB EXPOSURES

Division Linde - Cryogenics

Facility Speedway Factory Bldg. No. Report Period 1979

Job Description or Title	ID Code	Dept. a/o Operation	Air Contaminants and/or Physical Hazards	Number of Measurements	Range of Measurements (units)	Geometric Mean (GM)	Geometric Std. Dev. (GSD)	Current TLV (units)	*	Exposure as % of TLV	Comments or Notes
Utility		511	noise	3	% 11 - 68	36.1	2.80	90dbA = 100%	1	36.1	
Assembler lge. cyl.		511	"	2	65 - 67	66.0	1.02	100%	1	66.0	
Crater Packer		341	"	2	20 - 26	22.8	1.20	100%	1	22.8	
Reclaimer Cylinder		513	"	5	59 - 162	105.6	1.46	100%	1	105.6	
Recovery System Operator		513	"	3	6 - 211	24.1	6.72	100%	1	24.1	
Tester, Cryo		521	"	3	30 - 164	53.4	2.64	100%	1	53.4	
Machine Oper. Prod.		523	"	1	86	86	---	100%	1	86.0	
Annealing Furnace Op.		522	"	1	118	118	---	100%	1	118.0	
Autoclave fitter		511	"	1	87	87	---	100%	1	87.0	
Set Up Man		523	"	1	84	84	---	100%	1	84.0	
Welder Lig. Cont.		554	"	2	40 - 56	47.3	1.27	100%	1	47.3	
Pickler-Cleaner		554	"	1	49	49	---	100%	1	49.0	

Geometric Mean(GM) = $\sqrt[n]{(x_1)(x_2)\ldots(x_n)}$
where: x_1 = value of first measurement
x_n = value of last measurement
n = the nth root of the product

Geometric Standard Deviation(GSD) = 10^{s1}

$s_1 = \sqrt{(1/n-1)\left[(y_1^2+y_2^2+\ldots+y_n^2) - n(\bar{y})^2\right]}$

$y_1, y_2, \ldots, y_n$ = log of each measurement

$\bar{y} = (1/n)(y_1 + y_2 + \ldots + y_n)$

* - Source of Standards:
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SUMMARY OF JOB EXPOSURES

Division Linde - Cryogenics

Facility Speedway Factory Bldg. No. Report Period 1979

Job Description or Title	ID Code	Dept. a/o Operation	Air Contaminants and/or Physical Hazards	Number of Measurements	Range of Measurements (units)	Geometric Mean (GM)	Geometric Std. Dev. (GSD)	Current TLV (units)	*	Exposure as % of TLV	Comments or Notes
Oper. Eng.		316	noise	2	% 11 - 73	94.0	1.43	90dBA = 100%	1	94.0	
Shear Roll Operator		554	"	1	82	82	---	100%	1	82.0	
Shear Roll Set Up		554	"	2	27 - 62	40.9	1.80	100%	1	40.9	
Shear Roll Oper.		556	"	1	53	53	---	100%	1	53.0	
Welder Cyro Cont.		521	"	2	53 - 61	56.9	1.10	100%	1	56.9	
Weight Checker		521	"	1	8	8	---	100%	1	8.0	
Machine Welder-Liq.		523	"	2	58 - 73	65.1	1.18	100%	1	65.1	
Assembler Refrig		526	"	1	11	11	---	100%	1	11.0	
Fireman		316	"	1	30	30	---	100%	1	30.0	
Welder-Liq. Cont.		556	"	1	14 - 54	27.5	2.60	100%	1	27.5	
Wrapper		556	"	1	21	21	---	100%	1	21.0	
Acetone Cyl.		511	"	1	16	16	---	100%	1	16.0	

Geometric Mean(GM) = $\sqrt[n]{(x_1)(x_2)\ldots(x_n)}$

where: x_1 = value of first measurement
x_n = value of last measurement
n = the nth root of the product

Geometric Standard Deviation(GSD) = 10^{s1}

$$s_1 = \sqrt{(1/n-1)\left[(y_1^2+y_2^2+\ldots+y_n^2) - n(\bar{y})^2\right]}$$

$y_1, y_2, \ldots, y_n$ = log of each measurement

$\bar{y} = (1/n)(y_1 + y_2 + \ldots + y_n)$

* - Source of Standards:
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SUMMARY OF JOB EXPOSURES

Division Linde - Cryogenics

Facility Speedway Factory Bldg. No. Report Period

Job Description or Title	ID Code	Dept. a/o Operation	Air Contaminants and/or Physical Hazards	Number of Measurements	Range of Measurements (units)	Geometric Mean (GM)	Geometric Std. Dev. (GSD)	Current TLV (units)	*	Exposure as % of TLV	Comments or Notes
Welder A		556	noise	1	% 29	29	---	90dBA = 100%	1	29.0	
Packer Small Cont.		521	"	1	8	8	---	100%	1	8.0	
Magneform Operator		521	"	1	4	4	---	100%	1	4.0	
Repair Liq. Cont.		556	"	1	64	64	---	100%	1	64.0	
Painter		554	"	1	125	125	---	100%	1	125.0	
Brazer		554	"	1	79	79	---	100%	1	79.0	
Assembler Helper		521	"	1	46	46	---	100%	1	46.0	
Painter		521	"	1	79	79	---	100%	1	79.0	
Oper. Assembler		523	"	1	83	83	---	100%	1	83.0	
Utility		523	"	1	35	35	---	100%	1	35.0	
Introduction Brazer		521	"	1	58	58	---	100%	1	58.0	
Cylinder Control Oper.		513	"	2	140-194	164.8	1.26	100%	1	164.8	

A2 1778

UCC 011748

Geometric Mean(GM) = $\sqrt[n]{(x_1)(x_2)\ldots(x_n)}$

where: x_1 = value of first measurement
x_n = value of last measurement
n = the nth root of the product

Geometric Standard Deviation(GSD) = 10^{s_1}

$$s_1 = \sqrt{(1/n-1)\left[(y_1^2+y_2^2+\ldots+y_n^2) - n(\bar{y})^2\right]}$$

$y_1, y_2, \ldots, y_n$ = log of each measurement

$\bar{y} = (1/n)(y_1 + y_2 + \ldots + y_n)$

* - Source of Standards:
1 - OSHA
2 - ACGIH or NIOSH
3 - UCC-HSEA

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SUMMARY OF JOB EXPOSURES

Division Linde - Cryogenics

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Facility Speedway Factory Bldg. No. ___ Report Period 1979

Job Description or Title	ID Code	Dept. s/o Operation	Air Contaminants and/or Physical Hazards	Number of Measurements	Range of Measurements (units)	Geometric Mean (GM)	Geometric Std. Dev. (GSD)	Current TLV (units)	*	Exposure as % of TLV	Comments or Notes
Air Tester		511	noise	1	% 147	147	---	90dBA = 100%	1	147	
Welder Degreaser		522	"	3	91 - 319	172.6	1.87	100%	1	172	
Cleaner-Degreaser		521	"	1	65	65	---	100%	1	65	
Cleaner-Degreaser		523	"	1	136	136	---	100%	1	136	
Repairman		556	"	1	188	188	---	100%	1	188	
Receiving Clerk		211	"	2	34-36	35	1.04	100%	1	35	

A 21780

UCC 011749

Geometric Mean(GM) = $\sqrt[n]{(x_1)(x_2)\ldots(x_n)}$

where: x_1 = value of first measurement
x_n = value of last measurement
n = the nth root of the product

Geometric Standard Deviation(GSD) = 10^{s1}

$$s_1 = \sqrt{(1/n-1)\left[(y_1^2+y_2^2+\ldots+y_n^2) - n(\bar{y})^2\right]}$$

$y_1, y_2, \ldots, y_n$ = log of each measurement

$\bar{y} = (1/n)(y_1 + y_2 + \ldots + y_n)$

* - Source of Standards:
1 - OSHA
2 - ACGIH or NIOSH
3 - UCC-HSEA

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SUMMARY OF JOB EXPOSURES

Division Linde - Cryogenic

Facility Speedway Factory Bldg. No. Report Period 1979

Job Description or Title	ID Code	Dept. a/o Operation	Air Contaminants and/or Physical Hazards	Number of Measurements	Range of Measurements (units)	Geometric Mean (GM)	Geometric Std. Dev. (GSD)	Current TLV (units)	*	Exposure as % of TLV	Comments or Notes
Welding Tech.		460	silver	2	ug/m^3 0.02-0.03	ug/m^3 0.02	1.33	ug/m^3 10	1	0.02	
			cadmium	2	0.08-0.31	0.16	2.61	ug/m^3 40	1	0.4	
Induction Brazer		521	silver	1	0.03	---	---	ug/m^3 10	1	0.03	
			cadmium	1	8.9	---	---	ug/m^3 40	3	22.25	
Welder-Cryo. Cont.		521	chromium	3	2.1-32	6.6	4.40	ug/m^3 50	3	13.2	
			nickel	3	0.74-11	2.7	3.87	ug/m^3 1000	1	0.27	
Union melt Operator		522	copper	2	1.9-3.8	2.7	1.63	ug/m^3 100	1	2.7	
Machine Weld.-Liq. Cont.		523	copper	1	1.7	---	---	ug/m^3 100	1	1.7	
			chromium	1	2.0	---	---	ug/m^3 50	1	4.0	
			nickel	1	0.56	---	---	ug/m^3 1000	1	0.056	
silver brazer		523	silver	1	0.33	---	---	ug/m^3 10	1	3.3	
			cadmium	1	13	---	---	ug/m^3 40	3	32.5	

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UCC 011750

Geometric Mean(GM) = $\sqrt[n]{(x_1)(x_2)\ldots(x_n)}$

where: x_1 = value of first measurement
x_n = value of last measurement
n = the nth root of the product

Geometric Standard Deviation(GSD) = 10^{s1}

$$s_1 = \sqrt{(1/n-1)\left[(y_1^2+y_2^2+\ldots+y_n^2) - n(\bar{y})^2\right]}$$

$y_1, y_2, \ldots, y_n$ = log of each measurement

$\bar{y} = (1/n)(y_1 + y_2 + \ldots + y_n)$

* - Source of Standards:
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3 - UCC-HSEA

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SUMMARY OF JOB EXPOSURES

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Division Linde - Cryogenics

Facility Speedway Factory Bldg. No. Report Period 1979

Job Description or Title	ID Code	Dept. a/o Operation	Air Contaminants and/or Physical Hazards	Number of Measurements	Range of Measurements (units)	Geometric Mean (GM)	Geometric Std. Dev. (GSD)	Current TLV (units)	*	Exposure as % of TLV	Comments or Notes
Assembler-Refrig.		526	copper	1	ug/m^3 13	---	---	ug/m^3 100	1	13.0	
Machine Welder		554	chromium	2	35 - 45	39.7	1.19	ug/m^3 50	3	79.4	
			copper	2	4.4	4.4	---	ug/m^3 100	1	4.4	
			nickel	2	18 - 46	28.8	1.94	ug/m^3 1000	1	2.9	
Liq. Cyl. Welder		554	chromium	3	2.1-24	5.8	3.54	ug/m^3 50	3	11.6	
			copper	1	3.4	---	---	ug/m^3 100	1	3.4	
			nickel	3	.62 - 18	2.9	5.46	ug/m^3 1000	1	0.29	
Assembler		554	silver	2	.02-1.1	.15	17.0	ug/m^3 10	1	1.50	
			cadmium	2	.94-100	9.7	27.1	ug/m^3 40	3	24.3	
Brazer		554	silver	1	.50	.50	---	ug/m^3 10	1	5.0	
			cadmium	1	.49	49	---	ug/m^3 40	3	123.0	
Brazing Furn. Oper.		554	copper	1	6.7	6.7	---	ug/m^3 100	1	6.7	

Geometric Mean(GM) = $\sqrt[n]{(x_1)(x_2)\ldots(x_n)}$

where: x_1 = value of first measurement
x_n = value of last measurement
n = the nth root of the product

Geometric Standard Deviation(GSD) = 10^{s1}

$$s_1 = \sqrt{(1/n-1)\left[(y_1^2+y_2^2+\ldots+y_n^2) - n(\bar{y})^2\right]}$$

$y_1, y_2, \ldots, y_n$ = log of each measurement

$\bar{y} = (1/n)(y_1 + y_2 + \ldots + y_n)$

* - Source of Standards:
1 - OSHA
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3 - UCC-HSEA

UCC 011751

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SUMMARY OF JOB EXPOSURES

Division Linde - Cryogenics

Facility Speedway Factory Bldg. No. Report Period 1979

Job Description or Title	ID Code	Dept. a/o Operation	Air Contaminants and/or Physical Hazards	Number of Measurements	Range of Measurements (units)	Geometric Mean (GM)	Geometric Std. Dev. (GSD)	Current TLV (units)	*	Exposure as % of TLV	Comments or Notes
Welder A		556	chromium	2	ug/m^3 2.6-9.5	5.0	2.50	ug/m^3 50	3	10.0	
			nickel	2	1.0 - 3.6	1.9	2.47	ug/m^3 1000	1	0.19	
Welder - Liq. Cont.		556	copper	3	2.2 - 7.8	3.6	1.96	ug/m^3 100	1	3.6	
			chromium	1	3.2	3.2	---	ug/m^3 50	3	6.4	
			nickel	1	2.5	2.5	---	ug/m^3 1000	1	0.25	
Assembler- Liq. Cyl.		556	silver	1	0.12	0.12	---	ug/m^3 10	1	1.20	
			cadmium	1	3.0	3.0	---	ug/m^3 40	3	7.50	

Geometric Mean(GM) = $\sqrt[n]{(x_1)(x_2)\ldots(x_n)}$

where: x_1 = value of first measurement
x_n = value of last measurement
n = the nth root of the product

Geometric Standard Deviation(GSD) = 10^{s1}

$$s_1 = \sqrt{(1/n-1)\left[(y_1^2+y_2^2+\ldots+y_n^2) - n(\bar{y})^2\right]}$$

$y_1, y_2, \ldots, y_n$ = log of each measurement

$\bar{y} = (1/n)(y_1 + y_2 + \ldots + y_n)$

* - Source of Standards:
1 - OSHA
2 - ACGIH or NIOSH
3 - UCC-HSEA

UCC 011752

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