



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

Date August 18, 1980

Originating Dept.

Floor Number

Copy to

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

SUMMARY OF JOB EXPOSURES

UCC IH-3-77-D

Division Linde - Cryogenics

Page 1 of 10

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	
Stamps		---	"	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 exceed- ed unity for 1/5 samples
		---	diacetone alcohol	2	11.1-19.6	14.7	1.49	ppm 50	1 29.4	
		---	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) = $\sqrt[n]{(x_1)(x_2)...(x_n)}$ where: x_1 = value of first measurement x_n = value of last measurement n = the nth root of the productGeometric Standard Deviation(GSD) = 10^{s1}

$$s1 = \sqrt{\frac{1}{n-1} \left[(y_1^2 + y_2^2 + \dots + y_n^2) - n(\bar{y})^2 \right]}$$

 $y_1, y_2, \dots, y_n$ = log of each measurement $\bar{y} = (1/n)(y_1 + y_2 + \dots + y_n)$

* - Source of Standards:

1 - OSHA

2 - ACGIH or NIOSH

3 - UCC-HSEA

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UCC 011743

SUMMARY OF JOB EXPOSURES

UCC IH-3-77-D

Division Linde - Cryogenics

Page 2 of 10

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/m ³ 0.50-2.84	1.19	3.42	mg/m ³ 10	3	11.9
Millwright		316	"	1	0.39	0.39	---	mg/m ³ 10	3	3.9
Repairer Liq. Containers		556	"	1	2.75	2.75	---	mg/m ³ 10	3	27.5
Machine Oper. Prod.		523	"	2	0.38-0.56	0.46	1.32	mg/m ³ 10	3	4.6
Paint Sprayer		511	"	3	0.29-1.12	0.51	2.03	mg/m ³ 10	3	5.1
Fork Truck Metal Blast		513	"	1	0.35	0.35	---	mg/m ³ 10	3	3.5
Packer Small Cont.		521	"	1	0.50	0.50	---	mg/m ³ 10	3	5.0
Pickler-Cleaner		554	"	1	0.27	0.27	---	mg/m ³ 10	3	5.6
Painter		554	"	1	0.56	0.56	---	mg/m ³ 10	3	5.6
Utility		523	"	1	0.16	0.16	---	mg/m ³ 10	3	1.6
Set Up Oper.		523	"	1	0.13	0.13	---	mg/m ³ 10	3	1.3

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

Geometric Standard Deviation (GSD) = 10^{s1}
 $s1 = \sqrt{(1/n-1) [(y_1^2 + y_2^2 + ... + y_n^2) - n(\bar{y})^2]}$
 $y_1, y_2, ..., y_n$ = log of each measurement
 $\bar{y} = (1/n)(y_1 + y_2 + ... + y_n)$

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 1 - OSHA
 2 - ACGIH or NIOSH
 3 - UCC-HSEA

UCC 011744

SUMMARY OF JOB EXPOSURES

UCC IH-3-77-D

Division Linde - Cryogenics

Page 3 of

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	90dB = 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

Geometric Mean(GM) = $\sqrt[n]{(x_1)(x_2)...(x_n)}$
 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}
 $s_1 = \sqrt{(1/n-1) [(y_1^2+y_2^2+...+y_n^2) - n(\bar{y})^2]}$

$y_1, y_2, ..., y_n$ = log of each measurement
 $\bar{y} = (1/n)(y_1 + y_2 + ... + y_n)$

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

UCC 011745

Division Linde - CryogenicsPage 4 of 10Facility 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 Assembler lge. cyl.		511	noise	3	11 - 68	36.1	2.80	90dba = 100%	1	36.1
Crater Packer		511	"	2	65 - 67	66.0	1.02	100%	1	66.0
Reclaimer Cylinder		341	"	2	20 - 26	22.8	1.20	100%	1	22.8
Recovery System Operator		513	"	5	59 - 162	105.6	1.46	100%	1	105.6
Tester, Cryo Machine		513	"	3	6 - 211	24.1	6.72	100%	1	24.1
Oper. Prod.		521	"	3	30 - 164	53.4	2.64	100%	1	53.4
Annealing Furnace Op.		523	"	1	86	86	---	100%	1	86.0
Autoclave fitter		522	"	1	118	118	---	100%	1	118.0
Set Up Man		511	"	1	87	87	---	100%	1	87.0
Welder		523	"	1	84	84	---	100%	1	84.0
Liq. 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) = $\sqrt[n]{(x_1)(x_2)...(x_n)}$

where: x_1 = value of first measurement

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n = the nth root of the product

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

$$s1 = \sqrt{(1/n-1) \left[\frac{(y_1^2 + y_2^2 + \dots + y_n^2)}{n} - \bar{y}^2 \right]}$$

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

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

* - Source of Standards:

1 - OSHA

2 - ACGIH or NIOSH

3 - UCC-HSEA

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SUMMARY OF JOB EXPOSURES

UCC IR-3-77-D

Division Linde - Cryogenics

Page 5 of 10

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
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		521	"	2	53 - 61	56.9	1.10	100%	1	56.9
Weight Checker		521	"	1	8	8	---	100%	1	8.0
Machine		523	"	2	58 - 73	65.1	1.18	100%	1	65.1
Welder-Liq.		526	"	1	11	11	---	100%	1	11.0
Assembler		316	"	1	30	30	---	100%	1	30.0
Refrigerator		556	"	1	14 - 54	27.5	2.60	100%	1	27.5
Fireman		556	"	1	21	21	---	100%	1	21.0
Welder-Liq. Cont.		511	"	1	16	16	---	100%	1	16.0
Wrapper										
Acetone Cyl.										

Geometric Mean (GM) = $\sqrt[n]{(x_1)(x_2)...(x_n)}$
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Geometric Standard Deviation (GSD) = 10^{s1}
 $s1 = \sqrt{\frac{1}{n-1} [(y_1^2 + y_2^2 + ... + y_n^2) - n(\bar{y})^2]}$
 $y_1, y_2, ..., y_n$ = log of each measurement
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* - Source of Standards:
 1 - OSHA
 2 - ACGIH or NIOSH
 3 - UCC-HSEA

UCC 011747

SUMMARY OF JOB EXPOSURES

UCC IH-3-77-D

Division Linde - Cryogenics

Page 6 of 10

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)	* TLV as % of TLV	Exposure as % of TLV	Comments of 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											

Geometric Mean (GM) = $\sqrt[n]{(x_1)(x_2)...(x_n)}$
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Geometric Standard Deviation (GSD) = 10^{s_1}
 $s_1 = \sqrt{(1/n-1) [(y_1^2+y_2^2+...+y_n^2) - n(\bar{y})^2]}$

$y_1, y_2, ..., y_n$ = log of each measurement
 $\bar{y} = (1/n)(y_1 + y_2 + ... + y_n)$

* - Source of Standards:
 1 - OSHA
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UCC IH-3-77-D

Division Linde - Cryogenics

Page 7 of 7

Facility Speedway Factory

Bldg. No.

Report Period

1979

[illegible]

Geometric Mean (GM) = $\sqrt[n]{(x_1)(x_2)...(x_n)}$
 where: x_1 = value of first measurement
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$$s_1 = \sqrt{\frac{1}{n-1} (y_1^2 + y_2^2 + \dots + y_n^2 - n(\bar{y})^2)}$$
 $y_1, y_2, \dots, y_n = \log \text{ of each measurement}$
$$\bar{y} = (1/n)(y_1 + y_2 + \dots + y_n)$$

**** - Source of Standards:**

1 - OSHA

2 - ACCIH or NIOSH

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SUMMARY OF JOB EXPOSURES

UCC IH-3-77-D

Division Linde - Cryogenic

Page 8 of 10

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) (ug/m ³)	Geometric Std. Dev. (GSD)	Current TLV (units)	* Exposure as % of TLV	Comments or Notes
Welding Tech.		460	silver	2	0.02-0.03	0.02	1.33	10	1	0.02
Induction Brazing			cadmium	2	0.08-0.31	0.16	2.61	40	1	0.4
		521	silver	1	0.03	---	---	10	1	0.03
Welder-Cryo. Cont.			cadmium	1	8.9	---	---	40	3	22.25
		521	chromium	3	2.1-32	6.6	4.40	50	3	13.2
Union melt Operator			nickel	3	0.74-11	2.7	3.87	1000	1	0.27
Machine Weld.-Liq. Cont.		522	copper	2	1.9-3.8	2.7	1.63	100	1	2.7
		523	copper	1	1.7	---	---	100	1	1.7
			chromium	1	2.0	---	---	50	1	4.0
			nickel	1	0.56	---	---	1000	1	0.056
silver brazer		523	silver	1	0.33	---	---	10	1	3.3
			cadmium	1	13	---	---	40	3	32.5

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

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Division Linde - Cryogenics

Page 9 of 10

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) = $\sqrt[n]{(x_1)(x_2) \dots (x_n)}$
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Geometric Standard Deviation(GSD) = 10^{s_1}
 $s_1 = \sqrt{(1/n-1) [(y_1^2 + y_2^2 + \dots + y_n^2) - n(\bar{y})^2]}$

$y_1, y_2, \dots, y_n$ = log of each measurement
 $\bar{y} = (1/n)(y_1 + y_2 + \dots + y_n)$

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

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

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$$s_1 = \sqrt{\frac{\text{Geometric Standard Deviation (GSD)} = 10^{s_1}}{(1/n-1) [(y_1^2 + y_2^2 + \dots + y_n^2) - n(\bar{y})^2]}}$$
$$\bar{y} = (1/n)(y_1 + y_2 + \dots + y_n)$$

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1 - OSHA
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