Z-47 REV. 1-80

Complainant's Exhibit No. 72

AR226-1607

E. I. DU PONT DE NEMOURS & COMPANY
INCORPORATED
P. O. BOX 1217
PARKERSBURG, W. VA. 26101

POLYMER PRODUCTS DEPARTMENT

CC: J. H. Todd
G. T. Rosenlund
R. J. Burger
J. F. Doughty
Dr. Y. L. Power
G. H. Stoltz
R. N. Taylor
P. Thistleton

December 1, 1981

PERSONAL AND CONFIDENTIAL

J. W. Raines
Polymer Products Department
Wilmington - M 5625

C-8 BLOOD LEVELS IN FEMALES TRANSFERRED OUT OF THE TEFLON® DIVISIONS WASHINGTON WORKS

The attached Table contains C-8 in blood data on eighteen females transferred out of the TEFLON® Divisions at Washington Works around April 1, 1981. The following observations can be made:

- There is an overall downward trend in blood C-8 levels. This trend is statistically significant at 0.05 level using the paired-t test.
- Blood C-8 levels dropped an average 15% over an average 129-day period.
- Rate of C-8 elimination varies greatly by individual.

Joseph G. Loschiavo

Joseph G. Loschiavo

AJP001277

JGL/nsw
0337W

EID080677

C-8 BLOOD LEVELS IN FEMALES TRANSFERRED OUT OF TEFLON®

AGE	C-8 LEVEL WHEN LEAVING TEFLON®	C-8 LEVEL AFTER LEAVING TEFLON®	NUMBER OF DAYS BETWEEN SAMPLES	% CHANGE IN C-8 BLOOD LEVELS
32	0.140	0.086	143	-38.6
27	0.192	0.120	127	-37.5
27	0.570	0.390	140	-31.6
33	1.300	0.980	126	-24.6
24	0.110	0.086	128	-21.8
27	0.110	0.091	133	-17.3
27	0.078	0.065	148	-16.7
37	2.400	2.000	139	-16.7
27	5.100	4.400	126	-13.7
23	0.061	0.053	128	-13.1
29	0.270	0.240	130	-11.1
31	0.190	0.170	127	-10.5
26	0.045	0.041	96	- 8.9
32	0.450	0.410	127	- 8.9
27	0.230	0.210	127	- 8.7
25	0.092	0.092	126	0.0
33	0.019	0.019	133	0.0
28	2.500	2.600	126	+ 4.0
			360 days	-18.2 ± 11.8
		AVERAGE =	129 days	-15.3 ± 11.7*

* The downward trend is statistically significant at 0.05 level using the paired-t test.

12/1/81
0337W

EID080678

Technical - Engineers and Chemists

1.) Teflon Polymers

Number of Continuous Teflon® Polymer Technical Workdays Before Latest Blood Sample Collected	Number of Continuous Teflon® Workdays Immediately Before Starting As Teflon® Polymer Technical	Age	Sex	C-8 In Blood (ppm)
564	1205	35	M	0.400
570	0	32	M	0.062
726	765	28	M	0.210
1108	0	50	M	0.077
1582	1096	48	M	0.330
2175	7244	60	M	0.400
3151	0	49	M	0.530
8719	0	56	M	0.190

Range : 0.062 to 0.530 ppm: Mean: 0.275 ppm

2.) Teflon Copolymers

EID080679

1	0	23	M	<0.007
200	0	32	M	0.046
465	0	23	M	0.190
733	0	31	M	0.180
753	0	26	M	0.400
770	0	24	M	0.210
952	0	47	M	0.480
1198	0	40	M	0.026

Range : <0.007 to 0.480 ppm Mean: 0.192 ppm

AJP001279

Fine Powder/Dispersion

1.) Teflon® TFE Service Operator Fine Powder – (Zone 4 Operators - includes Dryer Op., Moisture Checker, Sump Op., Dispersion P/O Op., Fine Powder P.O. Op's)

Number of Continuous Fine Powder/Dispersion Workdays Before Latest Blood Sample Collected	Number of Continuous Teflon® Workdays Immediately Before Starting As Service Operator Fine Powder	Age	Sex	C-8. In Blood (ppm)
67	0	35	F	0.200
73	0	31	M	0.760
95	0	25	M	0.610
121	0	38	M	0.610
124	0	25	M	0.650
192	0	45	M	3.600
245	92	40	F	0.620
317	0	32	M	1.100
437	0	25	M	4.100
500	0	32	F	2.100
601	0	51	F	1.500
603	0	40	F	4.000
725	0	44	F	4.800
871	0	34	F	3.500
1065	0	34	F	1.700
7302	0	50	M	2.900

Range: 0.200 to 4.800 ppm Mean: 2.047 ppm [.0.90 ppm/year = Rate of accumulation]

2.) Teflon® TFE Process Operator Fine Powder – (Zone 6 Operators – includes Autoclave Operators and Dispersion Processors)

EID080680

Number of Continuous Fine Powder/Dispersion Work Days Before Latest Blood Sample Collected	Number of Continuous Teflon® Work Days Immed. Before Beginning As Process Operator Fine Powder	Age	Sex	C-8 In Blood (ppm)
142	8278	48	M	0.760
144	1520	52	M	1.250
152	942	29	M	5.600
220	0	30	M	0.340
465	393	38	M	4.200
666	1887	36	M	4.900
1070	1035	38	M	32.000
1115	547	38	M	0.220
1122	547	44	M	4.100
1589	790	44	M	9.400
2720	2932	43	M	2.500
5226	2131	55	M	7.600
6361	2130	49	M	10.600
6410	2436	52	M	24.000
6716	2313	62	M	21.000
8510	1216	62	M	29.000

Range: 0.220 to 32.000 ppm Mean: 9.842 ppm

AJP001281

EID080681

Monomer

1.) Teflon Monomer Operator

Number of Continuous Monomer Workdays Before Latest Blood Sample Collected	Number of Continuous Teflon® Workdays Immediately Before Starting As Monomer Operator	Age	Sex	C-8 In Blood (ppm)
249	7388	50	M	0.760
510	57	28	M	0.420
563	1178	26	M	3.300
690	8340	51	M	8.200
693	5540	45	M	7.200
872*	0	34	M	0.430
1206	?	45	M	6.400
1550*	798	46	M	0.710
2006	9315	58	M	0.250
2304	3591	39	M	0.520
6205*	1645	47	M	0.220
6388	3346	54	M	0.780
7357*	1338	55	M	0.100
11,321*	153	58	M	0.640

Range: 0.100 to 8.200 ppm Mean: 2.138 ppm

*C-8 accumulation rate (Based only on 5 data points) = 0.03 ppm/year

J. G. Koschiavo
11/3/81

AJP001282

EID080682

Granular

1. TFE Service Operator Granular

Number Of Continuous Granular Workdays Before Latest Blood Sample Collected	Number Of Continuous Teflon® Workdays Immediately Before Starting As Service Operator Granular	Age	Sex	C-8 In Blood (ppm)
3	0	30	M	0.034
57	67	36	M	0.340
101	0	31	M	0.120
102	0	35	M	0.052
116	0	25	M	0.076
123	0	25	M	0.027
126	319	29	M	0.920
140	0	26	M	0.038
228	0	31	M	0.310
768	0	29	F	0.810
1050	4570	39	M	4.800
1391	0	36	M	2.000
1418	0	31	M	0.430
2003	0	35	M	1.200

Range: 0.034 to 4.800 ppm ~~Mean: 0.800 ppm~~

Rate of increase: 0.29 ppm/year

AJP001283

EID080683

Granular

2.) TFE Process Operator Granular

Number Of Continuous Granular Workdays Before Latest Blood Sample Collected	Number Of Continuous Teflon® Workdays Immediately Before Starting As Process Operator Granular	Age	Sex	C-8 In Blood (ppm)
533*	0	45	M	0.150
1263	407	39	M	2.800
2027	2953	39	M	3.000
2827	3501	49	M	4.500
2828	5905	50	M	1.900
2888	3075	37	M	9.100
2912	3396	42	M	5.000
3903	5390	58	M	0.670
9580*	14	58	M	3.000

Range: 0.150 to 9.100 ppm. Mean: 3.347 ppm.

* Rate of C-8 accumulation (based only on 2 data points) = 0.11 ppm/year

AJP001284

EID080684

Teflon Mechanics

1. Mechanic Teflon

Number Of Continuous Teflon Mechanic Workdays Before Latest Blood Sample Collected	Number of Continuous Teflon® Workdays Immediately Before Starting As Teflon® Mechanics	Age	Sex	C-8 In Blood (ppm)
134	0	35	M	0.059
452	?	40	M	0.150
1548	?	43	M	0.320
1628	0	39	M	0.049
1635	722	38	M	0.170
1792	0	44	M	0.650
2120	4442	46	M	0.630
2377	0	50	M	0.200
3042	?	39	M	0.790
3061	?	38	M	0.170
3244	?	39	M	0.520
3512	?	38	M	0.630
3704	0	42	M	0.250
4095	0	38	M	0.780
4236	680	38	M	1.200
4284	0	41	M	0.900
4694	0	38	M	0.600
4700	0	44	M	0.240
6195	0	42	M	0.750
6267	0	45	M	0.092
6442	0	47	M	0.170
8351	?	51	M	0.210

Range: 0.049 to 1.200 ppm Mean: 0.433 ppm

EID080685

AJP001285

11/3/81

Supervision

1.) Teflon Maintenance Supervision

Number of Continuous Teflon® Maintenance Supervision Workdays Before Latest Blood Sample Collected	Number of Continuous Teflon® Workdays Immediately Before Starting As Teflon Maintenance Supervisor	Age	Sex	C-8 In Blood (ppm)
252	0	39	M	0.270
1312	0	55	M	0.080
4860	?	58	M	0.190

2.) Teflon Production Supervision - Production Foremen

Number Of Continuous Teflon® Production Foreman Workdays Before Latest Blood Sample Collected	Number Of Continuous Teflon® Workdays Immediately Before Starting As Teflon® Production Foreman	Age	Sex	C-8 In Blood (ppm)
465	4002	37	M	2.400
573	1778	41	M	0.490
1295	0	45	M	1.200
1809	3406	39	M	0.810
2448	0	54	M	1.100
3889	4141	52	M	0.880
5967	3118	51	M	0.460

Range: 0.460 to 2.400 ppm ..... Mean: 1.049 ppm

AJP001286

EID080686

Supervision, Cont'd.

3.) Teflon® Production Supervision - Supervision Above Foreman

Number Of Continuous Teflon® Supervision Above Foreman Workdays Before Latest Blood Sample Collected	Number Of Continuous Teflon® Workdays Immediately Before Starting As Teflon® Supervision Above Foreman	Age	Sex	C-8 In Blood (ppm)
85	0	26	M	0.120
208	0	27	M	0.094
289	0	25	M	0.140

AJP001287

EID080687

FEP Copolymers

1.) **FEP Service Operator** – Zone 4 Operators: Wet Finishing, Oven, Packout, Shredder, and Dispersi

Number of Continuous FEP Workdays Before Latest Blood Sample Collected	Continuous Teflon Days Outside FEP Immed. prior to FEP work.	Age	Sex	C-8 In Blood (ppm)
87	43	27	M	0.096
124	0	39	M	0.300
126	0	43	F	0.072
129	831	35	F	1.600 *
135	0	26	M	0.053
220	125	35	M	1.200
395	0	25	M	0.170
571	0	33	M	0.540
732	0	29	F	1.250
781	0	25	M	0.610

Range: 0.096 to 1.600 ppm Mean: 0.589 ppm

* This Operator spent several years in other Teflon® areas before working in FEP.

2.) **Poly FEP Operator** – Zone 6 Operators: Polykettle and Extruder Operators

Number of Continuous FEP Workdays Before Latest Blood Sample Collected		Age	Sex	C-8 In Blood (ppm)
102	8169	55	M	9.600 **
1708	7748	52	M	4.200
2766	6301	47	M	2.700
3194	3652	50	M	4.000
3408	2071	43	M	1.300
3993	1765	44	M	5.300
4324	3775	49	M	1.200
4462	3632	63	M	7.800
5778	3501	51	M	5.800
5902	2054	44	M	1.900

EID080688

AJP001288

Range: 1.200 to 9.600 ppm Mean: 4.380 ppm

** This Operator spent several years in other Teflon areas before working in FEP.

FEP Supervision

Number of Continuous FEP Workdays Before Latest Blood Sample Collected	Age	Sex	C-8 In Blood (ppm)
514	37	M	0.068
615	44	M	0.047
632	49	M	0.150
1705	56	M	0.330
4304 (ex wet finishing operator?)	51	M	2.100
8081	52	M	0.510

Range: 0.047 to 2.100 ppm Mean: 0.534 ppm

Summary:

① Rates of C-8 accumulation are as follows:

These accumulation rates reflect exposure levels since the FEP Service Operators are exposed to higher C-8 level than the Poly FEP Operators

- FEP Service Operators — 0.50 ppm per year of FEP work
- Poly FEP Operators — 0.35 ppm per year of FEP work
- FEP Supervision — 0.07 ppm per year of FEP work

② C-8 In Blood Levels Are Beginning To Trend Downward (See Attached)

AJP001289

EID080689

C-8 In Blood (ppm)	Date of Sample	C-8 In Blood (ppm)	Date of Sample	% C-8 Change
4.900	8/20/80	5.800	8/27/81	+18
1.200	8/18/80	1.300	4/1/81	+8*
1.700	4/7/81	1.600	8/18/81	-6*
6.600	8/26/80	5.300	8/7/81	-20
1.500	8/29/80	1.200	8/3/81	-20
5.500	8/26/80	4.200	8/5/81	-24
3.700	9/2/80	2.100	5/19/81	-43

* Due to the ± 10% error in the C-8 analysis, these two changes should be taken out since it's uncertain if the change actually occurred or is due to analytical error. Therefore, 4 out of 5 of the 1981 resamples show a downward trend in FEP workers.

Average decrease in C-8 blood levels is 23% over an average period of almost 10 months.

AJP001290

EID080690

10/29/81

Employee No.	Sex	Age	C-8 Level Before (ppm in Blood)	C-8 Level After (ppm in Blood)	No. of Days Betw. Samples	% Change In C-8 Level
2	F	~~23~~	0.061	0.053	128	-13.1
2	F	~~27~~	0.590	0.390	140	-31.6
2 1	F	~~31~~	0.190	0.170	127	-10.5
2 9	F	~~27~~	0.078	0.065	148	-16.7
2 3	F	~~37~~	2.400	2.000	139	-16.7
2 0	F	~~32~~	0.450	0.410	127	-8.9
2 4	F	~~29~~	0.270	0.240	130	-11.1
2 8	F	~~32~~	0.140	0.086	143	-38.6
2 0	F	~~24~~	0.110	0.086	128	-21.8
2 8	F	~~27~~	5.100	4.400	126	-13.7
2 8	F	~~27~~	0.110	0.091	133	-17.3
2 6	F	~~33~~	0.019	0.019	133	0.0
2 6	F	~~33~~	1.300	0.980	126	-24.6
3 1	F	~~27~~	0.192	0.120	127	-37.5
3 4	F	~~27~~	0.230	0.210	127	-8.7
3 2	F	~~28~~	2.500	2.600	126	+4.0
4 2	F	~~25~~	0.092	0.092	126	0.0
5 0	F	~~26~~	0.045	0.041	96	-8.9
2 8	M	45	0.920	0.640	66	-30.4

(For female data only)

~~Avg. change is decrease by 16% over an avg. of 121 days~~

decreases 1.0 to 9.9%	decreases 10.0 to 19.9%	decreases 20.0 to 29.9
0.450	0.061	0.110
0.230	0.190	1.300
0.045	0.078	
	2.400	
	0.270	
	5.100	
	0.110	

AJP001291

EID080691

decreases 30.0 to 39.9%	no net movement	increases
0.140	0.019	2.500
0.192	0.092	
~~0.920~~		

(3) decreases from 0 to 10% – levels all below 0.5 ppm (.045 – .450)

(3) decreases from 30 to 40% (highest decreases) – levels all below ~~1.0 ppm~~ 0.2 (0.140 – ~~0.920~~ .192)

(7) decreases from 10 to 20% – 0.061 – 5.100

(2) " " 20 to 30% – 0.11 – 1.300

	age	avg.
decreases 1.0 to 10%	32, 27, 26	28.3
" 10 to 20%	23, 31, 27, 37, 29, 27, 27	28.7
" 20 to 30%	24, 33,	28.5
" 30 to 40%	27, 32, 27, ~~AF~~	28.7 ~~27.8~~
no decrease	33, 28, 25	28.7
		no age

AJP001292

EID080692