



THE DOW CHEMICAL COMPANY

MIDLAND, MICHIGAN 48674

November 25, 1986

Ms. Carol Stack
CHEMICAL MANUFACTURERS ASSOCIATION
2501 M. Street, N.W.
Washington, DC 20037

Dear Ms. Stack:

Attached is a copy of a letter I received from Mr. Bennett regarding the Vinyl Chloride Study. Dr. Ted Torkelson requested that I send you a copy of the letter. If you should have any question, please contact:

Dr. Ted Torkelson
3865 John Ln
Midland, MI 48640
Phone: (517) 835-1354

Sincerely,

A handwritten signature in cursive script, appearing to read "Angie".

Angie Grzegorzcyk
Epidemiology, H&ES
1803 Building
Midland, MI 48674
Phone: (517) 636-2718

Attachment

CMA 006421

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Imperial
Chemical
Industries
PLC

Medical Department

Mrs Angie Grzegorzczuk
Epidemiology, H & ES
The Dow Chemical Company
1803 Building
MIDLAND
Michigan 48674
U S A

Your ref

Our ref

BB/MO

Date 19 Nov 86

Dear Mrs. Grzegorzczuk,

FINAL REPORT ON CMA UPDATE OF VINYL CHLORIDE STUDY

Thank you very much for sending me a copy of the above report, together with a copy for Sir Richard Doll. I have posted Sir Richard's copy on to him.

I very much appreciate receiving this report, in which I am very interested.

Yours sincerely,

B BENNETT
M.A.
M.B., B.Ch., B.a.O.
D.Obst.R.C.O.G.
D.I.H., M.F.O.M.

CMA 006422

CIRCULATION OF REGISTER

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BAGSHAW Dr I M M Norsk Hydro, Newton Aycliffe, UK
BAND Dr P R Cancer Control Agency of British Columbia, Vancouver, Canada
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CELLA Mr C Enichem Polimeri, Milan, Italy
CHANCE Mr M ICI Runcorn, UK
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 OLSON H G VC Safety Association, Louisiana, USA
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 POSSEBERG Dr J Wacker-Chemie, Munich, Germany
 FUECH Dr A M Atochem, Brignoud, France
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 SALG Dr J NIOSH, Cincinnati, USA
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 WHEELER R N Union Carbide, South Charleston, USA
 WHISTON Dr J ICI Hillhouse, UK
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 WILINSKI O Electrochemical Industries, Acre, Israel
 WILLIAMS Dr DMJ BP Chemicals, Penarth, UK
 WILSON Prof R Harvard University, Cambridge, Massachusetts, USA
 WRIGHT Dr A P ICI Wilton, UK
 YORK J ICI Everberg, Belgium

From: Dr B Bennett, Medical Department, Imperial Chemical Industries Plc
 Hillhouse Site, PO Box 4, Thornton-Cleveleys, Blackpool FY5 4QD, UK.

CMA 006424

February 1986

C O N F I D E N T I A L

REGISTER OF CASES OF ANGIOSARCOMA OF THE LIVER DUE TO EXPOSURE TO VINYL CHLORIDE - REVIEW DATE 1 JANUARY 1986

P R E F A C E : Acknowledgments, significant changes and comments

1. The new cases in the Register are the following :

France	18
Germany	23, 24, 25, 26, 27
UK	11, 12
2. There are amendments from the previous Register against the following cases: Germany 21, 22 US 36, 38
3. I would like to thank Dr De Sloover, Dr D M J Williams and Dr Friedel for informing me of new cases.
4. For the case corrections I would like to thank Dr Friedel, Mr J T Barr and Mr R W Frase.
5. For other corrections and information, thanks to Dr D Forman, Mr J T Barr, Mr T H Sutherland and Mr N F Humphry.
6. I should be very grateful if all recipients of the Register could continue to keep me fully informed of any new cases, or, if they should hear of other Companies who have acquired a case of ASL, it would be much appreciated if I could be notified by the appropriate person.

It is extremely helpful if new information is supplied in tabulated form, using the headings in the Register as far as possible.
7. I would like to thank the many people who have suggested research topics, and should be grateful if I could be kept up to date.
8. I shall be happy to supply to any recipient of the Register a copy of the Paper "Exposure to Vinyl Chloride and Angiosarcoma of the Liver: a report of the Register of cases" by Dr David Forman, myself, Dr John Stafford and Sir Richard Doll, published in the British Journal of Industrial Medicine, November 1985 (42: 750-753)

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February 1986

CMA 006425

LIVER ANGIOSARCOMA CASES (REVIEW DATE - 1 JANUARY 1986)

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CMA 006426

IMPERIAL CHEMICAL INDUSTRIES PLC

MPX/ASL 2 - LUNG/CASES, 6

BELGIUM

LIVER Angiosarcoma Cases - (Review Date : 1 January 1986)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
COUNTRY AND REFERENCE NO	NAME OR INITIALS	DATE OF BIRTH	COMPANY	FACTORY	FIRST VC EXPOSURE	DATE OF DIAGNOSIS	AGE AT DIAGNOSIS	YEARS OF EXPOSURE TO DIAGNOSIS	YEARS OF EXPOSURE	DATE OF DEATH	HISTOLOGICAL CONFIRMATION	ESTIMATED EXPOSURE LEVEL	OCCUPATION	OTHER CAREER HIGHLIGHTS	OTHER COMMENTS
<u>BELGIUM</u>															
01		12.01.13	Solvay	Jemeppe	00.07.58	00.05.76	63	18	17	29.06.76	Yes	High 1958-1968 exposed to 200 ppm for 8 hrs per day and certainly under 500 ppm in 6 to 9m ³ autoclave 1968-1972 exposed to 50-200 ppm 8 hrs per day in 25m ³ autoclave 1972-1974 exposed to 50-200 ppm in auto- clave room 1974-100 ppm 1975- 50 ppm RETIRED 1 Feb 1975	Autocleaner 14 yrs Polyworker 3 yrs	Drillist in a foundry (2 yrs) Farmer (15 yrs) Work in glass ind. & chemical industry	Hepatic tests in Oct 1974 were normal. Retired Feb 1975 Hospitalised May 1976 Complete Clinical and career details are given in a paper by Hublet et al in Arch. Belg. Med. Soc., Hyg. Med. Trav. Med. Leg. 1977 pages 601-622
02	SR	29 09 40	Solvay	Jemeppe	20 08 62	00.10.79	39	17	9	23 10 83	Yes	08.62-03. 63 01.67 -10.71 > 200 ppm 8h/day 04.63-12. 66 < 200 ppm	Autocleaner 5 yrs 5 mths Operator 3 yrs 9mths.	Fireman since 10 71.	1st sign July 79: Thoracic pain 07.79. Hepatic tests altered 10.79. Positive echography 11.79. Hepa- rectomy 02.80. Chemotherapy. Information given in letter 12 Nov 1984 from Dr De Sloover.

CMA 006427

Page

CANADA
Sheet 1

IMPERIAL CHEMICAL INDUSTRIES PLC

LIVER Angiosarcoma Cases - (Review Date: 1 Jan 1986)

All dates use UK system
DAY - MONTH - YEAR

WPX/ASL 2 - LANGUOCASES,7

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
COUNTRY AND REFERENCE NO	NAME OR INITIALS	DATE OF BIRTH	COMPANY	FACTORY	FIRST VC EXPOSURE	DATE OF DIAGNOSIS	AGE AT DIAGNOSIS	YEARS OF EXPOSURE TO DIAGNOSIS	YEARS OF EXPOSURE	DATE OF DEATH	HISTOLOGICAL CONFIRMATION	ESTIMATED EXPOSURE LEVEL	OCCUPATION	OTHER CAREER HIGHLIGHTS	OTHER COMMENTS
CANADA			SHAMINIGAN												
01		15.12.13			1944	1955	41	11	11	02.09.55	Yes		Reactor cleaner	Operator polymerisation	Smoker
02		06.03.14			1943	1957	43	14	14	21.12.57	Yes		Maintenance, millwright, pipefitter	Operator	Worked overtime Smoker
03		26.08.19			1941	1962	42	21	20	23.03.62	Yes		Operator, foreman		Worked overtime Non-smoker
04		05.04.19			1945	1967	48	22	22	21.01.68	Yes		Reactor cleaner	Operator, foreman, water cooling unit	Worked overtime Smoker
05		07.05.11			1944	1968	57	24	05	05.07.68	Yes		Reactor cleaner	Water cooling unit	Worked overtime Smoker
06		15.12.19			1947	1971	51	24	23	10.04.71	Yes		Reactor cleaner	Maintenance, millwright	Worked overtime Smoker
07		09.11.19			1946	1972	53	26	25	24.12.72	Yes		Reactor cleaner	Machine shop operator and poly unit	Worked overtime Smoker
08		13.05.20			1961	1973	53	12	05	12.06.73	Yes		Reactor cleaner	Maintenance machine shop	In plant 25 yrs Smoker
09		19.07.21			1946	1974	53	28	26	04.09.74	Yes		Furnace op. pipefitter maintenance		Worked overtime Smoker

* Paper by Dr F DELORME in Annales d'Anatomie pathologique Paris, 1978 Vol 23 No 2 pp105-114 claims this case had both a hepatoma and ASL simultaneously.

CMA 006428

LIVER Angiosarcoma Cause - (Review Date: 1 Jan 1986)

[illegible]

CMR 006429

IMPERIAL CHEMICAL INDUSTRIES PLC

WPX/ASL_2 - LANGTUCASES,9

CZECHOSLOVAKIA

LIVER Angiosarcoma Cases - (Review Date: 1 Jan 86)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
COUNTRY AND REFERENCE NO	NAME OR INITIALS	DATE OF BIRTH	COMPANY	FACTORY	FIRST VC EXPOSURE	DATE OF DIAGNOSIS	AGE AT DIAGNOSIS	YEARS OF EXPOSURE TO DIAGNOSIS	YEARS OF EXPOSURE	DATE OF DEATH	HISTOLOGICAL CONFIRMATION	ESTIMATED EXPOSURE LEVEL	OCCUPATION	OTHER CAREER HIGHLIGHTS	OTHER COMMENTS
<u>CZECHOSLO- VAKIA</u> 01		28.06.28	State Co	Novaky	01.07.57	24.12.73	45	16	16	24.12.73	Yes		Autoclave Cleaner	IARC letter of 1-4-82 giving details from Prof A David of Centre Ind Hygiene and Occ diseases.	
02		06.07.27	State Co	Novaky	01.11.50	27.11.64	37	14	15	26.11.64	Yes		Autoclave Cleaner	IARC letter of 1-4-82 gave somewhat altered dates for this case. I have accepted the changes since the dates come from Prof A David of the Centre of Industrial Hygiene and Occupational Diseases. My dates come originally from NIOSH.	

CMA 006430

IMPERIAL CHEMICAL INDUSTRIES PLC

WX/ASL 2 - LANGIOCASES, 10

FRANCE
Sheet 1

LIVEN Angiosarcoma Cancer - (Review Date: 1 Jan 86)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
COUNTRY AND REFERENCE NO	NAME OR INITIALS	DATE OF BIRTH	COMPANY	FACTORY	FIRST VC EXPOSURE	DATE OF DIAGNOSIS	AGE AT DIAGNOSIS	YEARS OF EXPOSURE TO DIAGNOSIS	YEARS OF EXPOSURE	DATE OF DEATH	HISTOLOGICAL CONFIRMATION	ESTIMATED EXPOSURE LEVEL	OCCUPATION	OTHER CAREER HIGHLIGHTS	OTHER COMMENTS
FRANCE															
01	M	15.04.24	RP	Roussillon	00.01.46	18.02.67	43	21	19	19.02.67	Yes	High	Autoclave worker and cleaner 19 yrs		Ref. Ravier et al Arch. Mal. Prof. 1 30 n° 3 Nov 75 p 171-177
02	SIM	03.06.11	PCUK	Brignoud	06.07.59	15.01.75	63	16	12	24.01.75	Yes (NIOSH no comment)	High	2 yrs on monomer 10 yrs on polymerisation	Italian origin	Ref. G Bonneton et al Nouvelle presse medicale - 5 Nov 1977 p 735
03	NAV	06.01.20	RP	St Fons	00.00.46	15.01.75	55	29	29	29.06.75	Yes	High	Polyworker 10 yrs as autoclave cleaner Compounding 3 yrs	VCM production 16 yrs Italian POW Shepherd, Sawyer, Mason	Ref. Bely et al Arch. Mal. Prof. 1 37 n° 6 June 71 p 551-555
04	MOR	27.01.27	PCUK	Brignoud	19.10.49	16.01.76	49	26	26	04.01.76	Yes	High	Monomer production worker 8 yrs PVC filtration 18 yrs		
05	B	29.01.38	PCUK	Brignoud	18.01.65	13.05.76	38	11	11	13.05.76	Yes	High	Polyworker 11 yrs	1) Thoracotomy 9th Feb 1976 costal angiosarcoma 2) Scintigraphy found ASL 3) Haemorrhage from ASL 4) Right Hepatectomy	Ref. P Couderc et al Semaine des hopitaux 10 Septembre 1976 Previously had bone angiosarcoma Also Vilchowski et al La Nouvelle Presse Medicale 11th July 1979 Page 766

CMA 006431

FRANCE
Sheet 2

LIVER Angiosarcoma Cases - (Review Date: 1 Jan 1986)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
COUNTRY AND REFERENCE NO	NAME OR INITIALS	DATE OF BIRTH	COMPANY	FACTORY	FIRST VC EXPOSURE	DATE OF DIAGNOSIS	AGE AT DIAGNOSIS	YEARS OF EXPOSURE TO DIAGNOSIS	YEARS OF EXPOSURE	DATE OF DEATH	HISTOLOGICAL CONFIRMATION	ESTIMATED EXPOSURE LEVEL	OCCUPATION	OTHER CAREER HIGHLIGHTS	OTHER COMMENTS
FRANCE 06	Pa	14.04.34	PCUK	Brignoud	01.03.58	12.08.76	42	18	13	11.09.76 (NIOSH says 12.09.76)	Yes	Moderate	(1958-1960) 2 yrs filtration 10-11 yrs polymeriser and works lab?		This man had AOL prior to AS. Ann. de Mal. Prof. July '77 p. 645 & 6. AOL was found in 1971 five yrs before ASL.
07	GIR	26.04.27	RP	St Auban	01.07.50	After death NIOSH says 00.07.76	49	26	22	02.07.76	Yes (NIOSH no comment)	High	Plant fore- man in polymer- isation	1972-6 admin section in St Auban	Died of septicaemia Small liver lesion found after autopsy
08	B	01.04.34	Bolvay	Taveux	23.05.57	03.12.75	42	19	19	30.01.77	Yes	Moderate	6 yrs packer & autoclave clnr 14 yrs autoclave worker		Had been tunnel worker previously
09	WPX	08.10.14	RP	St Fons	10.01.48	26.04.76	63	28	28	25.12.77	Yes	Very High 1948-1966 Lower Exposure 1966-1976	Polymer- isation operator, autocleaner, autoclave maintenance	10 yrs in sulphuric acid factory, storekeeper & general services	Operated 4.76 for removal of tumour from liver and died after second surgical operation for bilio bronchial fistula Paper by Dr Bety et al in Archives de Maladies Professionales Vol 40 No 6 1979 pages 741-3.

CMA 006432

FRANCE
Sheet 3

LIVER Angiosarcoma Cases - (Review Date: 1 Jan 1986)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
COUNTRY AND REFERENCE NO	NAME OR INITIALS	DATE OF BIRTH	COMPANY	FACTORY	FIRST VC EXPOSURE	DATE OF DIAGNOSIS	AGE AT DIAGNOSIS	YEARS OF EXPOSURE TO DIAGNOSIS	YEARS OF EXPOSURE	DATE OF DEATH	HISTOLOGICAL CONFIRMATION	ESTIMATED EXPOSURE LEVEL	OCCUPATION	OTHER CAREER HIGHLIGHTS	OTHER COMMENTS
France															
10	VP	24.05.19	RP	St Fons	00.12.56	10.01.78	58	21	21	10.01.78	Yes	High	Autoclave cleaner	10 yrs in mechanical engineering industry 1946-1956	Died of pulmonary embolism 5 days after surgery
11	L	15.02.12	RP	St Fons	00.01.41	12.08.78	66	37	31	13.11.78	Yes	High	1941-1946 polymer- isation general purpose worker 1946-1972 VCN synthesis (HCl & Acetylene) Foreman (agent de maitrise) 1972 retired		
12		16.08.14	PCUK	Brignoud	09.02.49	00.05.79	65	30	27	23.06.79	Yes	High	Monomer production and polymer- isation operator		
13		19.01.31	Solvay	Tavaux	21.09.63	26.06.79	40	16	13	22.08.79	Yes		Autocleaner 2 yrs, Auto- operator 9 yrs, Copolymers 4 yrs	2 yrs as cycle mechanic. 10 yrs as engineer in sanitary ware manufacture	Cigarette smoker until 1974. Ill all of 1977 due to Oesophageal varices. Surgical intervention 25.05.79 (right hepatectomy)
14	HJ	05-04-24	Chloe Chimie (Formerly RP)	St Fons	1943	00.07.81	57	38	36	29.07.81	Yes	Very High 1943-1975 and Intermitt- ently 1975-1979	1943-1975 All types of jobs on manufacture & maintenance in VCN Poly Process	1975-1979 maintenance work	

CMA 006433

FRANCE
Sheet 4

LIVER Angiosarcoma Cases - (Review Date: 1 Jan 1986)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
COUNTRY AND REFERENCE NO	NAME OR INITIALS	DATE OF BIRTH	COMPANY	FACTORY	FIRST VC EXPOSURE	DATE OF DIAGNOSIS	AGE AT DIAGNOSIS	YEARS OF EXPOSURE TO DIAGNOSIS	YEARS OF EXPOSURE	DATE OF DEATH	HISTOLOGICAL CONFIRMATION	ESTIMATED EXPOSURE LEVEL	OCCUPATION	OTHER CAREER HIGHLIGHTS	OTHER COMMENTS
<u>France</u> 15	DEP	03.01.37	Chloe Chimie (formerly RP)	St Fons	07.07.55	28.09.82	45	27	27	Alive	Yes	High-20 yr Moderate 7 yrs	Autoclave cleaner 1955-1962 autoclave operator 1962-1982		J C Contassot Letter of 5 10 1983
16	GIM	13.07.22	Chloe Chimie (formerly RP)	St Fons	17.10.41	05.01.83	61	41	38	03.04.83	Yes	High-33 yrs Moderate- Low - 5 yrs	Polymeriza- tion Process Man Maintenance Worker Health & Safety Agent		Retired Jan 1979. J C Contassot Letters of 5 10 1983 and 25 7 84.
17	HAR	22.02.23	Chloe Chimie (formerly RP)	St Fons	17.06.48	03.04.83	60	34	28	03.04.83	Yes	High - 23 yrs	Autoclave Cleaner 1948-1971	Other sectors of St Fons Factory 1971- 1978	Retired 01.01.79 J C Contassot Letter of 5 10 1983
18	R	14.07.42	Solvay	Tavaux	09.09.63	21.03.84	42	21	21	27.12.84	21.03.84	High-12 yrs Low - 9 yrs	Autoclave Cleaner		09.03.84 Right Hepatectomy 05.05.84 - 24.09.84 chemotherapy for lung- metastasis : partial remission. 08.84 - liver recurrence. 10.84 - lung: evolution of the disease

CMA 006434

IMPERIAL CHEMICAL INDUSTRIES PLC

WPX/ASL 2 - LAMCLOCASES, 14

GERMANY
Sheet 1

LIVER Angiosarcoma Cases - (Review Date: 1 Jan 1986)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
COUNTRY AND REFERENCE NO	NAME OR INITIALS	DATE OF BIRTH	COMPANY	FACTORY	FIRST VC EXPOSURE	DATE OF DIAGNOSIS	AGE AT DIAGNOSIS	YEARS OF EXPOSURE TO DIAGNOSIS	YEARS OF EXPOSURE	DATE OF DEATH	HISTOLOGICAL CONFIRMATION	ESTIMATED EXPOSURE LEVEL	OCCUPATION	OTHER CAREER HIGHLIGHTS	OTHER COMMENTS
GERMANY															
01		00.00.30	Dynanitt	Trolsdorf	01.10.56	19.09.68	38	12	12	25.01.69	Yes (NIOSH)		Polyworker		
02		00.00.31	Dynanitt	Trolsdorf	14.10.57	25.09.70	39	13	11	14.12.71	Yes (NIOSH)		Polyworker		
03		00.00.30	Dynanitt	Rheinfel- den	09.06.52	00.03.73	43	21	16	10.10.73	Yes (NIOSH)		Filling pesticide aerosol cans with VC		Reported under non polymer- ization workers in NIOSH list of 31.3.77. This of course is strictly correct. However I wonder whether this man had high exposure to VCM in his can filling operation!
04		00.00.30	Wacker	Burg- hausen	16.04.57	26.11.74	44	17	17	25.11.74	Yes (NIOSH)	200-500 ppm but high during 1 yr autocleaner	Polyworker & temporary autocleaner	1958 was autocleaner for 1 yr	Clinical details in paper by Gukel et al Virchows Arch A Path 1976 372 p 195-203

CMA 006435

GERMANY
Sheet 2

LIVER Angiosarcoma Cases - (Review Date: 1 Jan 1986)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
COUNTRY AND REFERENCE NO	NAME OR INITIALS	DATE OF BIRTH	COMPANY	FACTORY	FIRST VC EXPOSURE	DATE OF DIAGNOSIS	AGE AT DIAGNOSIS	YEARS OF EXPOSURE TO DIAGNOSIS	YEARS OF EXPOSURE	DATE OF DEATH	HISTOLOGICAL CONFIRMATION	ESTIMATED EXPOSURE LEVEL	OCCUPATION	OTHER CAREER HIGHLIGHTS	OTHER COMMENTS
GERMANY 05 (NIOSH gives as Case 06)		00.00.36	Noechal	Frankfurt	02.04.60	10.12.73	38	13	05	16.12.74	Yes (NIOSH)		BC Chemie says "chemistry laboratorian in the Techno- logical Research Department (NIOSH says assistant factory chemist which may be wrong translation)		Confirmed Reported under non-polymer- isation workers in NIOSH list of 31.3.77 and 1.78. I don't think this is a correct classification by NIOSH. The man may have been involved in VCM polymerisation in pilot plant or in main plant.
06 (NIOSH gives as Case 03)		00.00.32	Lonza	Waldshut	16.12.62	00.00.75	43	13	12	09.01.75	Yes		PVC - Manu- facture Shift Leader		
07		00.00.26	Wacker	Burg- hausen	15.04.54	12.11.75	49	21	21 (NIOSH says 12)	13.11.75	Yes		PVC Manu- facture and all work incl auto- cleaning 12 yrs (1954-66) Foreman Tech Dev 8 yrs (1967-1975)		
08		00.00.17	Dynalit	Troisdorf	19.07.54	06.04.75	58	20	20	25.12.75	Yes	1	Polyworker	1	

CMA 006436

GERMANY
Sheet 3

LIVER Angiosarcoma Cases - (Review Date: 1 Jan 1986)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
COUNTRY AND REFERENCE NO	NAME OR INITIALS	DATE OF BIRTH	COMPANY	FACTORY	FIRST VC EXPOSURE	DATE OF DIAGNOSIS	AGE AT DIAGNOSIS	YEARS OF EXPOSURE TO DIAGNOSIS	YEARS OF EXPOSURE	DATE OF DEATH	HISTOLOGICAL CONFIRMATION	ESTIMATED EXPOSURE LEVEL	OCCUPATION	OTHER CANCER HIGHLIGHTS	OTHER COMMENTS
GERMANY 09		00.00.34	CWH	Harl	20.02.61	16.06.76	41	15	13	24.03.78	Yes	High peaks	12 yrs poly- worker incl 17X auto- clave cleaning Control room 1 yr		10/78 Confirmed Average exposure first 9 yrs 150 ppm, occ 1000 ppm. Next 3 yrs av. 75 ppm. Last yr av 35 ppm
10 (NIOSH gives as Case 11)		00.00.36	CWH	Harl	01.01.61	00.01.77	40	16	10	07.03.77	Yes	High peaks	10 yrs poly- worker incl 17X auto- clave cleaning		Average exposure first 9 yrs 150 ppm, occ 1000 ppm. Last yr av 75 ppm. CWH letter of 21.04.78
11 (NIOSH gives as Case 10)		00.00.29	Macker	Burg- hausen	10.10.55	28.06.77	47	21	22	28.06.77	Yes	High	3 yrs auto- clave cleaner 19 yrs filter operator		
12		00.00.38	Dynamit	Troisdorf	00.00.61	00.10.77	39	16	6	07.10.77	Yes	1	PVC Manu- facture Autoclave worker for 6 yrs		

CMA 006437

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
COUNTRY AND REFERENCE NO	NAME OR INITIALS	DATE OF BIRTH	COMPANY	FACTORY	FIRST VC EXPOSURE	DATE OF DIAGNOSIS	AGE AT DIAGNOSIS	YEARS OF EXPOSURE TO DIAGNOSIS	YEARS OF EXPOSURE	DATE OF DEATH	HISTOLOGICAL CONFIRMATION	ESTIMATED EXPOSURE LEVEL	OCCUPATION	OTHER CAREER HIGHLIGHTS	OTHER COMMENTS
GERMANY															
13		00.00.14	Lowza	Maldenham	00.00.60	08.04.78	63	18	14	19.05.78	Yes				F W Best letter of 10th June 1980 enclosing data from Mr H P Friedel of BG Chemie
14											Not an Angiosarcoma in his letter of 21.12.81, Mr Friedel said this was a Piattonopl- thelkarzinom Der Speiserohre (a carcinoma of the oesophagus) not attribut- able to VCM & not recognised as an industr- ial disease				F W Best letter of 10th June 1980 enclosing data from H P Friedel of BG Chemie withdrawing this case
15 (MOSH gives this as Case 13)		00.00.29	Wacker	Burghausen	19.10.53	09.10.78	49	25	25	23.10.78	Yes	?	Autoclave cleaner and worker. Drier operator. Later shift leader		Angiosarcoma confirmed 09/79. Some detail of this & also cases 9, 13, 15, 16 & 17 given in MNH Report for 1978
16		00.00.21	Dynamit	Troisdorf	10.01.55	07.08.78 (Leibach suspected ASL at Feb 1975 laparotomy)	55	23	20	07.08.78	Yes ASL and Hepatocellular Carcinoma	High	Autoclave worker till 1964. Leader and master		Angiosarcoma confirmed, full details of illness since March 1973 given in MNH Med Insp Rep for 1978. Different details given in VC Associated Disease by Leibach and Marsteller (1981) p.71.

CMA 006438

LIVER Angiosarcoma Cases - (Review Date: 1 Jan 1986)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
COUNTRY AND REFERENCE NO	NAME OR INITIALS	DATE OF BIRTH	COMPANY	FACTORY	FIRST VC EXPOSURE	DATE OF DIAGNOSIS	AGE AT DIAGNOSIS	YEARS OF EXPOSURE TO DIAGNOSIS	YEARS OF EXPOSURE	DATE OF DEATH	HISTOLOGICAL CONFIRMATION	ESTIMATED EXPOSURE LEVEL	OCCUPATION	OTHER CAREER HIGHLIGHTS	OTHER COMMENTS
GERMANY 17 (NIOSH gives as Case 15)		00.00.17	Dynamin	Troisdorf	01.11.61	14.08.78	41	16	11	28.08.78	Yes	High	Autoclave worker	No	Angiosarcoma confirmed. Annual report of the North Rhine Westphalia Medical Inspectorate for 1978 pages 147-177 gives full details. Vinyl chloride disease diagnosed 02-02-73. Oesophageal varices. Radiologically confirmed aro osteolysis.
18		00.00.13	Boechat	Gendorf	00.00.55	25.12.79	66	24	21	25.12.79	Yes		Autoclave Worker		
19		00.00.25	Dynamin	Troisdorf	18.10.54	00.08.79	54	25	18	22.02.80	Yes Metastasing ASL	High	Autoclave Worker		Dr Beuche letter of 13-04-82 to Dr W G F Adams
20		00.00.15	Dynamin	Troisdorf	14.02.61	00.04.80	65	19	13	19.10.80	Yes Haemangio Endothelioma of liver with Metastases	High	Autoclave Worker		Dr Beuche letter of 13-04-82 to Dr W G F Adams
21		00.00.13	Dynamin	Troisdorf	01.01.62	00.09.79 pronounced clinical liver symptoms)	66	18	13	19.06.80	Yes Haemangio Endothelioma of liver with Metastases	High	Autoclave Worker and worked in drying shop		Dr Beuche letter of 13-04-82 to Dr W G F Adams
22		00.00.21	Dynamin	Troisdorf	15.10.61	28.08.80	59	19	11	06.12.81	Yes Metastasing ASL	High	Autoclave Worker	Chargehand, subsequently Foreman	Dr Beuche letter of 13-04-82 to Dr W G F Adams

CMA 006439

IMPERIAL CHEMICAL INDUSTRIES PLC

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MPX/ASL 2 - LANCLOCASES, 19

GERMANY
Sheet 6

LIVER Angiosarcoma Cases (Rev Date: 1 Jan 1986)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
COUNTRY AND REFERENCE NO	NAME OR INITIALS	DATE OF BIRTH	COMPANY	FACTORY	FIRST VC EXPOSURE	DATE OF DIAGNOSIS	AGE AT DIAGNOSIS	YEARS OF EXPOSURE TO DIAGNOSIS	YEARS OF EXPOSURE	DATE OF DEATH	HISTOLOGICAL CONFIRMATION	ESTIMATED EXPOSURE LEVEL	OCCUPATION	OTHER CAREER HIGHLIGHTS	OTHER COMMENTS
GERMANY															
23	HF	00.00.27	Wacker	Burg- hausen	1955	26.03.79	52	24	21	29.09.81	Yes	High (~300 ppm)	Chemistry Worker	-	Prof Gedighi status metastasised. Friedel letter 19.04.85
24	HL	00.00.28	Wacker	Burg- hausen	1969	11.10.82	54	13	12	28.05.83	Yes	High (~300 ppm)	Autoclave Cleaner	-	Prof Eder (Munich) letter 22.08.83. Friedel letter 19.04.85
25	E.Bch	00.00.23	Wacker	Burg- hausen	1960	28.09.81	58	21	13	14.01.83	Yes	High	Polyclave Worker and Autoclave Cleaner	-	Prof Selmair (Munich) Friedel letter 19.04.85
26	FM	00.00.22	CWH	Harl	1953	14.06.76	54	22	22	22.11.82	Yes	High	Polysworker	-	Chronic Hepatitis (Ielbach). Friedel letter 19.04.85
27	VR	00.00.28	Dynamic	Trotladorf	1955	18.01.83	55	28	18	02.03.84	Yes	High	Autoclave Cleaner till 1972	-	Ielbach. Friedel letter 19.04.85

CMA 006440

ITALY

LIVER Angiosarcoma Cases - (Review Date: 1 Jan 1986)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
COUNTRY AND REFERENCE NO	NAME OR INITIALS	DATE OF BIRTH	COMPANY	FACTORY	FIRST VC EXPOSURE	DATE OF DIAGNOSIS	AGE AT DIAGNOSIS	YEARS OF EXPOSURE TO DIAGNOSIS	YEARS OF EXPOSURE	DATE OF DEATH	HISTOLOGICAL CONFIRMATION	ESTIMATED EXPOSURE LEVEL	OCCUPATION	OTHER CAREER HIGHLIGHTS	OTHER COMMENTS
ITALY															
01 (On NIOSH supplementary list)	LG	15.06.34	PANSAC	Mira Venice	00.00.65	19.04.71	36	06	03	16.04.71	Yes		PVC Bag extruder		Primary tumour may have been pericardium. Not homogeneous with other cases. a aa
02	SR	13.11.29	Montedison	Porto Marghera	00.00.57	13.12.72	43	15	06	27.12.72	Yes		Polymarker		a aa
03	VG	14.03.20	Solvay	Ferrara	00.01.53	10.07.75	55	22	21	10.07.75	Yes	High	Autocleaner 8 yrs (1953-61) Autoclave operator 12 yrs (1961-72)	1972-5 did a variety of jobs including PVC packing.	aa
04	FB	20.07.37	ANIC	Ravenna	00.04.59	00.01.81	43	21	21	30.03.81	Yes	12 yrs - Very High 5 yrs - Medium 4 yrs - Low	1 yr - Monomer operator 20 yrs - Autoclave operator & other duties in suspension polymerisation. Area Foreman in same Dept since 1975.	Never cleaned autoclaves. See paper by CHIAPPINO et al Med Lavoro Vol 6 (1982) pp 555-563	Non-smoker. Consumed little alcohol. No AOL.
05	G Danesin	19.03.37	PANSAC	Mira Venice	00.00.67	07.03.83	46	16	8	06.04.83	Yes	Medium-High	Bag extruder 1967-1975 Commercial Dept 1976-1983		S Paglia-Lunga taken at 2 Aug 1983

a See Maltoni Med di Lavoro 65 p445, 1974. Further details in letter from Dr Montesano of IARC on April 1st 1982.

aa Also see Maltoni and Rondinella in Acta Oncologica Vol 1 1980 pages 35 - 49.

JAPAN

LIVER Angiosarcoma Cases - (Review Date: 1 Jan 1986)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
COUNTRY AND REFERENCE NO	NAME OR INITIALS	DATE OF BIRTH	COMPANY	FACTORY	FIRST VC EXPOSURE	DATE OF DIAGNOSIS	AGE AT DIAGNOSIS	YEARS OF EXPOSURE TO DIAGNOSIS	YEARS OF EXPOSURE	DATE OF DEATH	HISTOLOGICAL CONFIRMATION	ESTIMATED EXPOSURE LEVEL	OCCUPATION	OTHER CAREER HIGHLIGHTS	OTHER COMMENTS
JAPAN 01	Tomoji Mori	01.08.22	Mitsui Toatsu (no comment by Jap PVC Assoc)	Nagoya	00.04.53	24.10.75 ^a	53 ^a	22 ^a	13	24.10.75	Yes	PVC Assoc. says not known. ^a Japan Times indicated on 25.10.75 exposures often at 3000 ppm up to 1974	13 yrs auto- clave cleaner 1964 - assigned to different work since had ill health		Japan Times 25.10.75 & Japanese PVC Assoc letter of 31.03.78
02	SO	02.08.39			00.11.58	10.08.76	37	17	13	10.08.76	Yes	Not known	In polymer- isation work including autoclave cleaning		Japanese PVC Association letter of 31.03.78

^a In his letter of 1st April 1982, Dr Montecano of IARC says Japanese Ministry of Labour give

Date of diagnosis - 21-08-74

Age of diagnosis - 52

Years of exposure - 22

CMA 006442

LIVE# Angiosarcoma Cases - (Review Date: 1 Jan 1986)

WPX/ASL_2 - LANGLOCASES,22

[illegible]

CHN 006443

SWEDEN

LIVER Angiosarcoma Cases - (Review Date: 1 Jan 1986)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
COUNTRY AND REFERENCE NO	NAME OR INITIALS	DATE OF BIRTH	COMPANY	FACTORY	FIRST VC EXPOSURE	DATE OF DIAGNOSIS	AGE AT DIAGNOSIS	YEARS OF EXPOSURE TO DIAGNOSIS	YEARS OF EXPOSURE	DATE OF DEATH	HISTOLOGICAL CONFIRMATION	ESTIMATED EXPOSURE LEVEL	OCCUPATION	OTHER CAREER HIGHLIGHTS	OTHER COMMENTS
<u>SWEDEN</u>															
01	NU	23.06.27	Kemanord	Sundevall	14.08.51	20.10.70 ^a	43	19	18	20.10.70	Yes		Polyworker		
02	BL	27.11.11	Kemanord	Sundevall	00.01.45	00.08.72 ^a	61	27	27	16.08.72	Yes	High	VCM production		Mr Sjoelin's letter of 28 March 1978 confirms BL was a monomer worker who was heavily exposed, probably even more so than a normal reactor cleaner
03	NE	10.06.10	Kemanord	Sundevall	00.05.47	18.03.76	65	29	21	19.03.76	Yes	High	Polyworker		
04	AL	16.11.14	Kemanord	Sundevall	00.00.46	12.05.77	62	31	31	12.05.77	Yes	High	1946-1958 polymer- reaction worker (12 yrs) & 1958- 1977 foreman (19 yrs)		In first 12 yrs of employment had been heavily exposed. In 1974, liver abnormality and necrosis diagnosed. Data confirmed in Dr D Byren letter 18.8.77 to CEFIC
05		12.03.19	Kemanord	Sundevall	11.05.64	22.11.80	61	16	16	22.11.80	Yes	High - 6 Years Low - 10 Years	1964-1970 centrifuge operator 1970-1980 drier operator		Letter of 2nd Nov 1981 from Dr David Byren

^a In his letter of 1st April 1982, Dr Montesano of IARC says in Sweden's National Board of OS Health gives 20-02-70 as date of diagnosis for Case 01 and 15-05-72 for Case 02.

CMA 006444

JK

LIVER Angiosarcoma Cases - (Review Date: 1 Jun 1986)

Sheet 1

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
COUNTRY AND REFERENCE NO	NAME OR INITIALS	DATE OF BIRTH	COMPANY	FACTORY	FIRST VC EXPOSURE	DATE OF DIAGNOSIS	AGE AT DIAGNOSIS	YEARS OF EXPOSURE TO DIAGNOSIS	YEARS OF EXPOSURE	DATE OF DEATH	HISTOLOGICAL CONFIRMATION	ESTIMATED EXPOSURE LEVEL	OCCUPATION	OTHER CAREER HIGHLIGHTS	OTHER COMMENTS
<u>UK</u> 01	WJ	20.04.01	ICI	Hillhouse	04.04.44	03.12.72 (Fox & Collier paper says 23.12.72)	71	28	22	03.12.72 (Fox & Collier paper says 23.12.72)	Yes	500 ppm	1944-7 VCM 1947-8 Drier 1948-61 Autoclave operator 1961-66 Drier		Lee and Harry Lancet 29-06074 pages 1316-8
02															Dubious fabrication case
03	BJM	02.06.37	BP	Barry	00.02.66	00.12.74	37	09	3.5	24.12.74	Yes	High	Autoclave cleaner		Exposure limited to 2.66 - 9.69
04	JSR	23.06.20	ICI	Hillhouse	26.04.54	00.06.79	59	25	18	12.10.79	Yes	Medium- high	54-5 Bagging Plant 55-6 Drier Plant 56-58 Autoclave worker 58-61 Chargehand Drier Plant 61-72 Foreman C 2/3 Plant	Pre-war fish packer 1939-45 army vehicle maintenance 1945-54 fish packer	

CHA 006445

UK

Sheet 2

LIVER Angiosarcoma Cases - (Review Date: 1 Jan 1986)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
COUNTRY AND REFERENCE NO	NAME OR INITIALS	DATE OF BIRTH	COMPANY	FACTORY	FIRST VC EXPOSURE	DATE OF DIAGNOSIS	AGE AT DIAGNOSIS	YEARS OF EXPOSURE TO DIAGNOSIS	YEARS OF EXPOSURE	DATE OF DEATH	HISTOLOGICAL CONFIRMATION	ESTIMATED EXPOSURE LEVEL	OCCUPATION	OTHER CAREER HIGHLIGHTS	OTHER COMMENTS
UK 05	JK	30.03.14	BP	Berry	08.01.51	00.10.79	65	28	21	19.11.79			1951-52 Polycleaner 1952-55 Latex 1955-60 Polyfloor 1960-64 Poly Chargehand 1964-70 Charging operator 1970-72 Drier operator		
06	CEP	1931	BP	Berry	1962	09.01.80	48/9	18	12	09.01.80			7 yrs Poly Floor Operator 5 yrs Greaser on Poly Floor		
07	RGB	26.04.20	BP	Berry	1963	00.00.80	60	17	8.2	13.06.80			Polycleaner 1963-5 Recovery 1965-1971		
08	WTH	08.05.24	BP	Berry	19.09.50	27.11.81	57	31	24	25.12.81		1950-1958 500 ppm 1968-1974 200 ppm	1950-51 Autoclave operator 1951-1957 Chargeman autoclave building 1957-1974 Shift supervisor autoclave building - Never cleaned autoclaves but supervisor's job entailed entering autoclaves to inspect them	1938-1948 Motor Mechanic 1948-1950 Operator on Acetylene Production Plant	

CMA 006446

UK
Sheet 3

LIVER Angiosarcoma Cases - (Review Date: 1 Jan 1986)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
COUNTRY AND REFERENCE NO	NAME OR INITIALS	DATE OF BIRTH	COMPANY	FACTORY	FIRST VC EXPOSURE	DATE OF DIAGNOSIS	AGE AT DIAGNOSIS	YEARS OF EXPOSURE TO DIAGNOSIS	YEARS OF EXPOSURE	DATE OF DEATH	HISTOLOGICAL CONFIRMATION	ESTIMATED EXPOSURE LEVEL	OCCUPATION	OTHER CAREER HIGHLIGHTS	OTHER COMMENTS
UK 09	KIGP	07.05.25	BP	Barry	15.02.50	02.03.83	58	33	29	24.02.83	Yes	Medium	Polyworker	4 years on Acrylonitrile Resin Plant. Also prior to 1950. 4 years RAF maintenance. 3 years motor car paintshop. 2 years in Graving Dock.	
10	GJT	04.04.47	BP	Barry	27.04.66	01.05.84	37	18	4.2	16.05.84	Yes	High - 11 months (500 ppm). Low - 18 months (50 ppm). Medium - 21 months (200 ppm)	Polycleaner 1966-67. Spraydriller bagger 1967- 68. Blow- down stripper operator 1968-70.	Heavy goods vehicle driver until final illness.	Information given in letter 18.06.84 from Dr D M J Williams
11	GLP	08.05.28	BP	Barry	19.12.65	02.06.85	57	19	16	02.06.85	Yes	High 1965-69 Med 69-79 Low 79-82	Polycleaner 1965-68. Service operator 68-69. Poly Operator 69-79. Leading Hand 79-82.	-	Letter of 04.06.85 Dr Paul Smith and letter of 04.06.85 Dr D M D Evans Oesophageal haemorrhage due to oesophageal varices due to Angiosarcoma of liver
12	JT	24.01.37	ICI	Willhouse	16.09.57	03.06.85	48	28	28	06.12.85	Yes	Low 1957-59 High 59-74 Low 74-85	Spare man, bagging floor 1957-59. Autoclave Operator 1959-85	-	Letter 26.06.85 Dr F I Lee

CMA 006447

USA
Sheet 1

LIVER Angliowarcoma Cases - (Review Date: 1 Jan 1986)

UK system of dates
DAY - MONTH - YEAR

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
COUNTRY AND REFERENCE NO	NAME OR INITIALS	DATE OF BIRTH	COMPANY	FACTORY	FIRST VC EXPOSURE	DATE OF DIAGNOSIS	AGE AT DIAGNOSIS	YEARS OF EXPOSURE TO DIAGNOSIS	YEARS OF EXPOSURE	DATE OF DEATH	HISTOLOGICAL CONFIRMATION	ESTIMATED EXPOSURE LEVEL	OCCUPATION	OTHER CAREER HIGHLIGHTS	OTHER COMMENTS
USA 01	Earl Parks	17.10.23	BFG	Louis- ville	09.12.48	03.03.73	49	24	21	03.03.73	Yes		Pot Cleaner (Block Jama 1974) p 53	History given in Annals NY ACAD SCIENCES Vol 329 (1979) page 190 in Paper by B R Collins of OSHA	Rolling Stone Art Ref 1 NY Acad of Sc Symp 1974 Also Block Jama 1.7.74 p 53
02		19.08.33	BFG	Louis- ville	15.11.55	00.05.70	37	14	13	27.09.71 (NIOSH says 28.09.71)	Yes		Pot Cleaner (Cf Block)		Ref 1 Also Block JAMA 1.7.74 p 53
03	Edward Dinviddie	25.05.15	BFG	Louis- ville	28.11.45	19.12.73	58	28	28	19.12.73	Yes		Pot Cleaner (Cf Block)	Louisville Courier Journal 02-09-80	Ref 1 Also Block
04		15.01.24	BFG	Louis- ville	06.07.52	19.08.67	43	15	15	07.01.68	Yes		Pot Cleaner (Cf Block)		Ref 1 Also Block
05		25.01.12	BFG	Louis- ville	19.06.44	09.04.64	52	20	20	09.04.64	Yes		Pot Cleaner (Cf Block)		Ref 1 Also Block
06	Ray Austin Jones?	23.11.28	BFG	Louis- ville	17.01.62	00.02.74	45	12	12	24.07.75	Yes		US Air Force Pot Cleaner (Cf Block)		Ref 1 + Louisville Times 23.7.75 Retired April 1974 Also Block
07	Charles T Smart	03.05.22	UCC	S Charle- ston	27.08.44	00.00.68	45	24	17	23.03.68	Yes				Ref 1
08		06.05.20	Goodyear	Niagara	07.10.46	00.08.61	41	15	15	29.08.61	Yes				Ref 1

CMA 006448

USA
Sheet 2

LIVER Angiosarcoma Cases - (Review Date: 1 Jan 1986)

UK system of dates
DAY - MONTH - YEAR

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
COUNTRY AND REFERENCE NO	NAME OR INITIALS	DATE OF BIRTH	COMPANY	FACTORY	FIRST VC EXPOSURE	DATE OF DIAGNOSIS	AGE AT DIAGNOSIS	YEARS OF EXPOSURE TO DIAGNOSIS	YEARS OF EXPOSURE	DATE OF DEATH	HISTOLOGICAL CONFIRMATION	ESTIMATED EXPOSURE LEVEL	OCCUPATION	OTHER CAREER HIGHLIGHTS	OTHER COMMENTS
USA 09	Raymond Cottle- Fingerl	08.11.31	RPG	Louis- ville	28.05.45	01.03.74	43	29	24	11.03.75	Yes	2000 ppm			Ref 1 has wrong figures re first exposure. Louisville Times 29.10.74, 12.3.75, 10.3.76
10		16.08.13	Goodyear	Niagara	12.06.51	00.05.68	55	17	17	10.05.68	Yes				Ref 1
11		27.05.09	Goodyear	Niagara	14.10.46	00.03.70	61	23	23	16.03.70	Yes				Ref 1
12	Francis A Bachman	17.11.18	Firestone	Pottstown Pa	13.07.49	02.05.69	50	20	19	02.05.69	Yes	High 10 yrs	10 yrs as reactor op. (not cleaner - separate crew cleaned autoclaves)	Utility & Service op. Bagger Dryer op. Stripping op. 3 yrs prior service in tyre plant	Ref 1 + letter of 26 April 1978 from Russell A Paik to J T Seawell of MCA
13	Richard Edward Clendenen	01.12.21	UCC	S Charle- ston	11.12.42	00.05.74	52	32	26	07.04.74	Yes	2000 ppm			Charleston Daily Mail 21.7.75
14															Never diag- nosed as ang- iosarcoma of liver. Infor- mation given in letter 22 May 1984 from J A Saig.
15															Accountant; ASL - No evi- dence of VCH exposure.

CMA 006449

IMPERIAL CHEMICAL INDUSTRIES PLC

WPX/ASL_2 - LAMCIOCASB,29

USA
Sheet 3

LIVER Angiosarcoma Cases - (Review Date: 1 Jan 1986)

UK System of dates
DAY - MONTH - YEAR

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
COUNTRY AND REFERENCE NO	NAME OR INITIALS	DATE OF BIRTH	COMPANY	FACTORY	FIRST VC EXPOSURE	DATE OF DIAGNOSIS	AGE AT DIAGNOSIS	YEARS OF EXPOSURE TO DIAGNOSIS	YEARS OF EXPOSURE	DATE OF DEATH	HISTOLOGICAL CONFIRMATION	ESTIMATED EXPOSURE LEVEL	OCCUPATION	OTHER CAREER HIGHLIGHTS	OTHER COMMENTS
USA 16	James Howard	04.11.27	BPG	Louis- ville	08.05.50	00.00.69	41	19	04	27.03.69	Yes		1951-4 VCM polymer- isation	From 1954 onwards in Army and other service. 46-50 Army	Table 4 in Wagoner Testimony to US Senate Confirmed in M M Johnson ltr 07.08.78
17	Peerenboom	06.05.31	BPG	Louis- ville	23.06.55	11.10.74	43	19	19	16.10.80	Yes on 11.10.74 but no post-mortem 16.10.80				Dr M M Johnson letter of 24.2.81 con- firmed death 6 years after diagnosis
18	Charlie Arthur	22.04.28	BPG	Avon Lake	15.09.54	00.00.75	46	21	13	02.11.75	Yes	13 yrs autocleaner 8 yrs on Estol plasticiser & Carboset operation	Navy Tyre Store		Confirmed in M M Johnson ltr 07.08.78 Also Rolling Stone mag. 15.01.76
19	Virgil Christian	00.00.15	NCC	S Charle- ston	00.00.43	19.06.75	60	32	32	06.04.76	Yes	2000 ppm			Williamsport Sun Gazette 21 June 1975 Charleston Daily Mail 21.7.75
20		31.08.17	Goodyear	Niagara	00.00.55	30.01.76	58	21	18	30.01.76	Yes				NIOSH letter of 25.10.79
21	Chester Hinkle	02.09.09	NCC	S Charle- ston	00.12.46	Early 77	67	30	22	02.01.77	Yes				28 yrs with NCC at SC Retired News release 23.2.77

CMA 00645

USA
Sheet 4

LIVER Angiosarcoma Cases - (Review Date: 1 Jan 1986)

UK system of dates
DAY - MONTH - YEAR

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
COUNTRY AND REFERENCE NO	NAME OR INITIALS	DATE OF BIRTH	COMPANY	FACTORY	FIRST VC EXPOSURE	DATE OF DIAGNOSIS	AGE AT DIAGNOSIS	YEARS OF EXPOSURE TO DIAGNOSIS	YEARS OF EXPOSURE	DATE OF DEATH	HISTOLOGICAL CONFIRMATION	ESTIMATED EXPOSURE LEVEL	OCCUPATION	OTHER CAREER HIGHLIGHTS	OTHER COMMENTS
USA 22		02.10.23	BPC	Louis- ville	11.07.47	00.01.76	52	29	28	04.12.76	Yes				Louisville Times 26.1.76 said he was the 10th AS victim at Bella Lane of whom 8 had died by 26.1.76 In his letter of 16.09.81 Dr M M Johnson confirms this is the case described by Dannaher Tamburro & Yam in Feb 1980 Am J Medicine Vol 70 p280
23		00.00.23	Great American Chemical Company	Fitchburg Mass.	08.09.58	06.04.73	50	15	14	06.04.73	Yes				
24	Charles Edward Moore	17.05.17	BCC	S Charle- ston	1939	27.05.77	60	38	24 (NIOSH says 26)	27.05.77	Cholangio- sarcoma (R Kaminski 26/2/79)	Medium to high for 24 yrs	1941-65 non- solvent vinyl resin unit and dispersion vinyl resins unit fitter as fitter helper, then shift utility man	1937-39 was off and on labourer 1939-41 may have been exposed as reactor cleaner 1943 became shift fitter 1946 became shift utility man 26.04.65 employment was terminated	N H Wheeler letter of 18.8.77 to J Stafford gives details Rose Kaminski letter of 26/2/79 R Kaminski (5 Nov 1980) suggests that NIOSH will re-take on register since this neoplasm may be associ- ated with ASL.
(25)															R N Wheeler letter of 20/2/79 and Rose Kaminski letter of 26/2/79 and 5/11/80
Removal from register confirmed in R Kaminski letter of 5 November 1980															

CMA 006451

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
COUNTRY AND REFERENCE NO	NAME OR INITIALS	DATE OF BIRTH	COMPANY	FACTORY	FIRST VC EXPOSURE	DATE OF DIAGNOSIS	AGE AT DIAGNOSIS	YEARS OF EXPOSURE TO DIAGNOSIS	YEARS OF EXPOSURE	DATE OF DEATH	HISTOLOGICAL CONFIRMATION	ESTIMATED EXPOSURE LEVEL	OCCUPATION	OTHER CAREER HIGHLIGHTS	OTHER COMMENTS
USA 26	John Berry	07.07.23	BPC	Louis- ville	03.10.47	00.00.77 (up to 2 years after death)	52 (death)	28 (death)	18	11.02.75	Yes	Exposed in some degree to 22 chemicals but main exposure was to VCM, probably high	Various jobs in PVC plants from cold room to paste recovery to PVC charging operator to paste charging. 111 August 1965. Terminated employment Jan 1966		R Kaminski letter of 26/2/79 and Prof. Tamburro letter of 9/1/79
27	J L Forrest	11.05.16	UCC	S Charle- ston	01.07.41	30.11.78	62	37	20 (NIOSH says 27 and C Daily Mail 25)	25.11.78	Yes	High	Operator to 10.10.76	Exposure to bulk and dispersion PVC manufacture	R N Wheeler ltr of 4 Jan 1979 and Charleston Daily Mail 30.11.78 and R Kaminski 26/2/79
28		11.04.17	UCC	S Charle- ston	00.08.44	03.11.78	61	34	33	03.11.78	Yes				R Kaminski letter of 6/4/79
29		12.10.07	UCC	S Charle- ston	00.05.42	00.03.80	72	38	16	01.03.80	Yes				R Kaminski Letters of 19th June 1980 6 Sep Nov 1981
30	WVN	22.07.22	Tenneco Chemicals	Flemington	11.06.64	30.12.80	58	17	15	30.12.80	Yes	6 - Unknown 9 - Minimal	Maintenance Mechanic 6 yrs Elsewhere 14 yrs Boiler house Operator 9 yrs		
31		08.11.23	UCC	S Charle- ston	12.05.46	01.08.81	57	35	13	02.04.82	Yes	High (But not as high as reactor cleaner would experience) Worked as labourer from June 1941 to May 1946 and may have cleaned reactors in that time	Chemical Operator in charge reactor	From 1959 to 1976 Aliphatic Chemicals operator and from July 1976 to date Foreman Aliphatic Chemical Operation	Dr Dacey letter 16.10.81 and M N Wheeler letter of 9.11.81. Also Dr Dacey letter of 07.03.83 re date of death.

IMPERIAL CHEMICAL INDUSTRIES LIMITED

USA
Sheet 6

LIVER Angiosarcoma Cases - (Review Date: 1 Jan 1986)

UK system of dates
DAY - MONTH - YEAR

WPX/ASL 2 - LANCIOCASES.32

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
COUNTRY AND REFERENCE NO	NAME OR INITIALS	DATE OF BIRTH	COMPANY	FACTORY	FIRST VC EXPOSURE	DATE OF DIAGNOSIS	AGE AT DIAGNOSIS	YEARS OF EXPOSURE TO DIAGNOSIS	YEARS OF EXPOSURE	DATE OF DEATH	HISTOLOGICAL CONFIRMATION	ESTIMATED EXPOSURE LEVEL	OCCUPATION	OTHER CAREER HIGHLIGHTS	OTHER COMMENTS
US 32	C W Giroux	22-02-08	Monsanto	Springfield Mass	15-10-51	00-07-79	71	28	14 (in PVC autoclave area)	17-05-80	An autopsy was done and immediate cause of death given as 'Angiosarcoma	The death certificate gave Mr Giroux' usual occupation as kettle operator in 'chemicals industry'.	1940-1951 Various jobs in polymer manufacture BUTVAR LUSIREX 1951-1964 Various jobs in and around PVC autoclaves 1964-1973 Various clerical jobs in PVC polymerisation facility/ Retired 01-03-73.		Information given in letter of 24 February 1982 from Dr Walter C Bernes of Monsanto Springfield to Dr A Munn of Monsanto Europe.
US 33	S Ferguson Jnr	08-10-27	BFG	Louisville	09-09-54	11-05-82	54	28	28	Alive	Yes		Multiple jobs including Poly Operator + Polycleaner.		Prof Tamburro letter of 12 Aug 1982 + Dr M N Johnson letter of 28 Feb 1983.
US 34	Mr Byrum	29-01-34	BFG	Louisville	1955	03-11-82	48	27	10	04.08.83	Yes		Poly Operator + Autoclave Cleaner 1955-65.	1965 left BFG to become a Clergyman.	Dr M N Johnson letter of 3 Nov 1982, 28 Feb 1983 and 9 Aug 1984.
US 35		09-03-12	UCC	S Charle- ston	23-07-44	18-07-83	71	39	14	18-07-83	Yes	High from 1944 to 1955. Medium from 1955-1958			Dr Bacey letter of 5 Sept 1983.
US 36		27-08-32	The General Tire and Rubber Co	Ashtab Ula	11-06-56	21-08-83	50	27	27	Alive	Yes	Moderate	1956-56 Labourer 1956-57 prod helper 1957-70 operator 1970-75 electrician 1975-present operator		M W Laundry letter of 12 Sept 1983; spotted at medical May 1983. Teatling commenced May 1983

CMA 006453

USA
Sheet 7

LIVER Angiosarcoma Cases - (Review Date: 1 Jan 1986)

UK system of date
DAY - MONTH - YEAR

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
COUNTRY AND REFERENCE NO	NAME OR INITIALS	DATE OF BIRTH	COMPANY	FACTORY	FIRST VC EXPOSURE	DATE OF DIAGNOSIS	AGE AT DIAGNOSIS	YEARS OF EXPOSURE TO DIAGNOSIS	YEARS OF EXPOSURE	DATE OF DEATH	HISTOLOGICAL CONFIRMATION	ESTIMATED EXPOSURE LEVEL	OCCUPATION	OTHER CAREER HIGHLIGHTS	OTHER COMMENTS
US 37	Mr J Payton	29 08 29	BFG	Louis- ville	1953	06 08 84	54	31	22	06.08.84	Yes	High	Worked regularly in PVC area. In the early days was a reactor cleaner 1953-75.		Information given in letter 09.08.84 from Dr H M Johnson.
US 38	JWR	28 08 22	Air Products	Calvert City	00.02.63	19.01.84	61	20	20	28.10.83	Yes	High 1963-1982	Normal pro- gression from helper to senior operator, cleaned reactors, stripping and recovery areas as well as charging operator.		Thrombo- cytopenia and leukopenia since 1978. Gold treatment for arthritis 1976. Under Dr's care about 6 months before death, had passed standard physical exam- ination 3 months earlier. J Ware letter of 22.10.84 & 23/01/85.

CMA 006454

YUGOSLAVIA

LIVER Angiosarcoma Cases - (Review Date: 1 Jan 1986)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
COUNTRY AND REFERENCE NO	NAME OR INITIALS	DATE OF BIRTH	COMPANY	FACTORY	FIRST VC EXPOSURE	DATE OF DIAGNOSIS	AGE AT DIAGNOSIS	YEARS OF EXPOSURE TO DIAGNOSIS	YEARS OF EXPOSURE	DATE OF DEATH	HISTOLOGICAL CONFIRMATION	ESTIMATED EXPOSURE LEVEL	OCCUPATION	OTHER CAREER HIGHLIGHTS	OTHER COMMENTS
<u>YUGOSLAVIA</u>															
01		05.04.14	Jugo Vinil	Splitc	00.00.53	08.04.73	59	20	20	08.04.73	Yes				SARIC et al paper Env Health Perspective Vol 17, pp 189-192 1976
02		15.11.31	Jugo Vinil	Splitc	00.00.50	12.07.73	42	23	18	12.07.73	Yes*		VCM Production		*In his letter of 1 Oct 1978, Dr Spirtas of NIOSH changed the status of Case 02 to VCM production employee. Dr Spirtas also notified a new Case 03 also a VCM production worker
03		21.12.31	Jugo Vinil	Splitc	04.06.54	11.01.76	45	22	22	11.01.76	Yes*		VCM Production		
04		11.06.30	Jugo Vinil	Splitc	15.12.58	03.09.78	48	20	18	03.09.78	Yes				Ross Kaminski Letter of 19th June 1980 and IARC letter of 1 April 1982

CMA 006455

(Review Date - 1 Jan 1986)

Incidence of ASL Cases Per AnnumBy date of death

1955	.....	1
6	.....	0
7	.....	1
8	.....	0
9	.....	0
1960	.....	0
1	.....	1
2	.....	1
3	.....	0
4	.....	2
5	.....	0
6	.....	0
7	.....	1
8	.....	5
9	.....	3
1970	.....	2
1	.....	3
2	.....	5
3	.....	8
4	.....	5
5	.....	11
6	.....	11
7	.....	9
8	.....	10
9	.....	5
1980	.....	10
1	.....	5
2	.....	2
3	.....	9
4	.....	5
5	.....	2
Total		117

- N.B. 1 Does not include Italian 01 but does include German 03.
- 2 The 1977 total includes US case 24 which is a Cholangiosarcoma.
- 3 The 1982 total does not include US 33 and F 15 who are alive.
- 4 The 1983 total does not include US 36 who is alive.

Distribution of ASL Cases by Country

USA	35 ***
W Germany	26 **
France	18 ***
UK	11
Canada	10
Sweden	5 *****
Yugoslavia	4 *****
Italy	4 *
Czechoslovakia	2
Japan	2
Belgium	2
Norway	1
Total	120

* Omit It01 - atypical case of PVC bag extruder.

** Includes GE03 aerosol can filler.

*** Includes case US 24 which was diagnosed as Cholangiosarcoma & US 33, and 36; and F 15 who are alive.

**** Includes one monomer worker.

***** Includes two monomer workers.

1.e Western Europe	67
North America	45
Rest of World	8

Total 120

CHA 006457

TABLE 3Pattern of ASL Cases by Factory(a) W Europe

Of the 67 cases in W Europe, 57 have occurred in clusters at 11 factories. Of the 26 German cases, 23 have occurred in clusters at 4 factories.

	<u>ASL Cases</u>
Dynamit, Troisdorf, Germany	11
Chloe Chimie (Formerly RP), St Fons, France	8
BP, Barry, UK	8
Wacker, Burghausen, Germany	7
Kemanord, Sundsvall, Sweden	5
PCUK, Brignoud, France	5
CWH, Marl, Germany	3
ICI, Hillhouse, UK	3
Solvay, Tavaux, France	3
Lonza, Waldshut, Germany	2
Solvay, Jemeppe, Belgium	2
	<u>57</u>

NB: There are 32 pre 1962 PVC plants in W Europe; 18 of these have had ASL cases (Ref Table 8)

(b) N America

Of the 45 cases in N America, 38 have occurred at four factories out of a total of 54 factories:- In N America 43 plants have not had ASL cases.

	<u>ASL Cases</u>
BFG, Louisville, US	14
BFG, Shawinigan, Canada	10
UCC, S Charleston	10
Goodyear, Niagara	4
	<u>38</u>

NB: There are 28 pre 1962 PVC plants in N America; 11 of these have had ASL cases (Ref Tables 9 & 10)

(c) Rest of World

The 8 ASL cases are believed to be in 1 cluster of 4 and 2 clusters of 2 cases.

TABLE 4ALatency Periods (Years from first Exposure to Diagnosis)

	<u>Country</u>	<u>No of Cases</u>	<u>Total Years</u>	<u>Average</u>
<u>W Europe</u>	Belgium	2	35	17.5
	France	18	459	25.5 *
	Germany	26	495	19.04 *
	Italy	4	74	18.5
	Norway	1	22	22
	Sweden	5	122	24.5
	UK	<u>11</u> <u>67</u>	<u>254</u> <u>1461</u>	23.09 * 21.80
<u>N America</u>	US	35	886	25.31 *
	Canada	<u>10</u> <u>45</u>	<u>204</u> <u>1090</u>	20.4 * 24.22
<u>Rest of World</u>	Czechoslovakia	2	30	15.0
	Japan	2	39	19.5
	Yugoslavia	<u>4</u> <u>8</u>	<u>85</u> <u>154</u>	21.2 19.2
<u>Summary</u>	W Europe	67	1461	21.80
	N America	45	1090	24.22
	Rest of World	<u>8</u> <u>120</u>	<u>154</u> <u>2705</u>	19.2 22.54

* Of the countries with > 10 cases, France, UK and USA have an average latency period above world average, Germany and Canada below world average.

(Review Date - 1 Jan 1986)

DISTRIBUTION OF LATENCY PERIODS TABLE 4B

	0-9 yrs	10-14 yrs	15-19 yrs	20-24 yrs	25-29 yrs	30-34 yrs	35+ yrs	Total	Average Latency Period
Belgium			2					2	17.5
Canada		3		5	2			10	20.4
Czechoslovakia		1	1					2	15.0
France		1	4	3	5	2	3	18	25.5
Germany		5	9	9*	3			26	19.04
Italy			2	2				4	18.5
Japan			1	1				2	19.5
Norway				1				1	22
Sweden			2		2	1		5	24.5
UK	1		4		4	2		11	23.09
USA		2	7	8	8	5	5	35	25.31
Yugoslavia				4				4	21.2
TOTAL	1	12	32	33	24	10	8	120	22.54

* Includes G 03 aerosol can filler

CMA 006460

(Review date 1 January 1986)

TABLE 4C

LATENCY PERIOD OF ASL CASES TABULATED BY YEAR OF FIRST EXPOSURE

MAX POSSIBLE LATENCY PERIOD	YEAR OF FIRST EXPOSURE	LATENCY PERIOD (NO OF YEARS)	ARITHMETIC MEAN OF LATENCY PERIODS	
47	1939	38*		
46	1940		$\frac{244}{7} = 34.86$	
45	1	37,21,37,41		
44	2	32,38		
43	3	38,14,32		
	4	28,11,24,20,24,34,39	$\frac{718}{27} = 26.59$	
	5	27,22,28,29		
	6	21,29,31,26,28,15,23, 30,35		
39	7	29,24,29,28		
38	8	28,24,34		
	9	30,26,20	$\frac{458}{19} = 24.11$	
	1950	26,22,31,19,23,14,33		
	1	19,28,17,28		
34	2	21**,15		
33	3	25,22,23,22,20,31,22		
	4	21,21,25,25,21,28***, 22	$\frac{725}{33} = 21.97$	
	5	22,23,24,14,19,21,27		
	6	27*** 24,28		
	7	21,12,27***		
29	8	19,17,15,13,16,28		
28	9	18,18,15,17,20		
	1960	16,21	$\frac{368}{22} = 16.73$	
	1	13,18,21		
24	2	15,16,16,16,19,19,12		
23	3	13,18,17,12,18		
	4	16,17,20,21		
	5	16,17	$\frac{180}{11} = 16.36$	
	6	11,19		
19	7	9,18		
18	8	16		
	9	13	13	
	1970			VIOLA
	1			
14	2			
13	3			MALTONI
	4			GOODRICH
	TOTAL	120 CASES	$\frac{2706}{120} = 22.55$	

* Cholangiosarcoma

** Aerosol can filler

*** US33 and 36; and F15 still alive.

WPX/ASL_2 - LANGIOCASES,40

CMA 006461

TABLE 4D

LATENCY PERIODS OF ASL CASES TABULATED BY YEAR OF FIRST EXPOSURE AND GEOGRAPHICAL LOCATION

MAX POSSIBLE LATENCY PERIOD	YEAR OF FIRST EXPOSURE	LATENCY PERIODS IN		
		WESTERN EUROPE	NORTH AMERICA	ROW
47	1939		38*	
46	1940			
45	1	37,41	21,37	
44	2		32,38	
43	3	38	14,32	
	4	28	11,24,20,24,34,39	
	5	27	22,28,29	
	6	21,29,31,33	26,28,15,23,30,35	
39	7	29	24,29,28	
38	8	28,34	24	
	9	30,26	20	
	1950	26,22,31	19	23,14
	1	19,28	17,28	
34	2	21**	15	
33	3	25,22,22	23,31	22,20
	4	21,21,25,25	21,28***	22
	5	22,23,24,27***24,28	14,19,21,27	
	6	21,12	27***	
29	7	19,17,15,13,28		16
28	8	18,18	15	17,20
	9	16,21		
	1960	13,18,21		
	1	15,16,16,16,19,19	12	
24	2	13,18,17,18	12	
23	3	16,17,21	20	
	4	16	17	
	5	11,19		
	6	9,18		
19	7	16		
18	8			
	9	13		
	VIOLA 1970			
	1			
	2			
	MALTONI 3			
	TOTAL CASES	67	45	8

* Cholangiosarcoma

** Aerosol can filler

*** US33 and 36; and F15 still alive

WPX/ASL_2 - LANGIOCAS,41

CMA 006462

(Review date 1 January 1986)

TABLE 4E

PLANT	START UP DATE	LATENCY PERIODS OF ASL CASES IN SPECIFIC PLANTS (10 OR MORE CASES)	NO OF CASES	AVERAGE LATENCY PERIOD
LOUISVILLE USA	1940?	12,14,15,19,19,20,24,27,28,28,28,29,29 31	14	23.07
SHAWINIGAN CANADA	1941?	11,12,14,21,22,23,24,24,26,28	10	20.5
S CHARLESTON USA	1939?	24,30,32,32,34,35,37,38,38,39	10	33.9
TROISDORF W GERMANY	1954	12,13,16,16,18,19,19,21,23,25,28	11	19.09

WPX/ASL_2 - LANGIOCUSES,42

CMA 006463

(Review date 1 January 1986)

TABLE 4FLATENCY PERIOD OF ASL CASES TABULATED BY YEAR OF FIRST EXPOSURE
AND SPECIFIC PLANT (10 OR MORE CASES)

YEAR OF FIRST EXPOSURE	S CHARLESTON USA	LOUISVILLE USA	SHAWINIGAN CANADA	TROISDORF W GERMANY
1939	38			
1940				
1	37		21	
2	32,38			
3	32		14	
4	24,34,39	20	11,24	
5		28,29,27	22	
6	30,35		26,28	
7		29,28	24	
8		24		
9				
1950		19		
1				
2		15		
3		31	23	
4		28		21,25
5		14,19		23,28
6				12
7				13
8				
9				
1960				
1			12	16,16,19,19,
2		12		18

WPX/ASL_2 - LANGIOCASES,43

CMA 006464

(Review date 1 January 1986)

TABLE 4G

PLANT	START-UP DATE	LATENCY PERIOD OF ASL CASES IN SPECIFIC PLANTS(4-9 CASES)	NO OF CASES	AVERAGE PERIOD
SUNDSVALL SWEDEN	1945	16,19,27,29,31	5	24.4 years
BRIGNOUD FRANCE	1950	11,16,18,26,30	5	20.2
ST FONS FRANCE	1939	21,28,29,37,38,27,41,35	8	31.88
BARRY UK	1948	9,17,18,28,31,33,18,19	8	21.62
BURGHAUSEN W GERMANY	1933	17,21,22,25,24,13,21	7	20.43
NIAGARA USA	1947	15,17,21,23	4	19
SPLIT YUGOSLAVIA	1941	20,20,22,23	4	21.25

WPX/ASL_2 - LANGIOCASES,44

CMA 006465

(Review date 1 January 1986)

TABLE 4H

LATENCY PERIOD OF ASL CASES TABULATED BY YEAR OF FIRST EXPOSURE AND SPECIFIC PLANT
(4-9 CASES)

YEAR OF FIRST EXPOSURE	SUNDSVALL SWEDEN	BRIGNOUD FRANCE	ST FONS FRANCE	BARRY UK	BURGHAUSEN W GERMANY	NIAGARA USA	SPLIT YUGO SLAVI
1939							
1940							
1			37				
2							
3			38				
4							
5	27*						
6	31		29			15,23	
7	29						
8			28,34				
9		26,30					
1950				31,33			23*
1	19			28		17	
2							
3					25		20
4					21		22*
5					22,24	21	
6			21				
7					17		
8		18					20
9		16					
1960					21		
1							
2				18			
3				17			
4	16						
5		11		19			
6				18			
7							
8					13		
9							
1970							
1							
2							

* Monomer workers

TABLE 5Annual Incidence of ASL Cases (Date of Death) by Geographical Area

	Western Europe	North America	Rest of World	Annual Total	Cumulative Total		Key Events
1955		1		1	1		
7		1		1	2		
1961		1		1	3		
2		1		1	4		
4		1	1	2	6		
7	1			1	7		
8		5		5	12		
9	1	2		3	15		
1970	1	1		2	17		Viola
1	1	2		3	20		
2	4	1		5	25		
3	1	4	3	8	33		Maltoni
4	3	2	-	5	38		Goodrich
5	6	4	1	11	49		
6	6	3	2	11	60		
7	6	3		9	69		
8	7	2	1	10	79		
9	5	-	-	5	84		
1980	6	4	-	10	94		
1	5	0	-	5	99		
2	1	1		2	101		
1983	6	3		9	110		
1984	4	1		5	115		
1985	2			2	117		
TOTAL	66* **	43**	8	117			

* Includes G03 aerosol can filler but omits It 01 bag extruder

** Does not include US33, and 36; and F 15. All still alive.

CMA 006467

(Review date 1 January 1986)

TABLE 6

ASL CASE NUMBERS BY YEAR OF DEATH AND GEOGRAPHICAL LOCATIONS (EXCLUDING ITO1)

KEY EVENTS		WESTERN EUROPE	NORTH AMERICA	REST OF WORLD
	1955		C1	
	6			
	7		C2	
	8			
	9			
	1960			
	1		US8	
	2		C3	
	3			
	4		US5	Cz2
	5			
	6			
	7	F1		
	8		C4, C5, US4, US7, US10	
	9	G1	US12, US16	
Viola	1970	Sw1	US11	
	1	G2	C6, US2	
	2	N1, Sw2, UK1, It2	C7	
Maltoni	3	G3**	C8, US1, US3, US23	Y1, YZ, Cz1
Goodrich	4	G4, G5, UK3	C9, US13	
	5	F2, F3, G6, G7, G8, It3	US6, US9, US18, US26	Jap1
	6	B1, F4, F5, F6, F7, Sw3	US19, US20, US22,	Jap2, Y3
	7	F8, F9, G10, G11, G12, Sw4	C10, US21, US24*	
	8	F10, F11, G9, G13, G15	US27, US28	Y4
		G16, G17		
	9	F12, F13, UK4, UK5, G18		
	1980	UK6, UK7, G19, Sw5, G20, G21	US17, US29, US30, US32	
	1	It4, F14, UK8, G22, G23		
	2	G26	US31	
	3	UK09, It5, F17, B2, G24, G25	US35, US34, US38	
	4	UK10, F16, F18, G27	US37	
	5	UK11, UK12		
	Total	66	43***	8

* Cholangiosarcoma

** Aerosol can filler

*** Does not include US33, and 36; and F15. All still alive.

(Review date 1 January 1986)

TABLE 7

ASL CASE NUMBERS BY YEAR OF FIRST EXPOSURE AND GEOGRAPHICAL LOCATION
(EXCLUDING ITO1)

KEY EVENTS		WESTERN EUROPE	NORTH AMERICA	REST OF WORLD
	1939		US24*	
	40			
	1	Fr11, Fr16	C3, US27	
	2		US13, US29	
	3	Fr14	C2, US19	
	4	UK1	C1, C5, US5, US7, US28, US35	
	5	Sw2	C4, US3, US9	
	6	Fr1, Fr3, Sw4	C7, C9, US8, US11, US21, US31	
	7	Sw3	C6, US22, US26	
	8	Fr9, Fr17	US1	
	9	Fr12, Fr4	US12	
	50	Fr7, N1, UK8, UK9	US16	Y2, Cz2
	1	Sw1, UK5	US10, US32	
	2	G3**	US4	
	3	G15, It3, G26	C10, US37	Jap1, Y1
	4	G7, G8, UK4, G19	US18, US33***	Y3
	5	G11, G16, G18, Fr15***	US2, US17, US20, US34	
		G23, G28		
	6	FR10, G1	US36***	
	7	Fr8, G4, It2, G2, UK12		Cz1
	8	Fr6, B1	US23	Jap2, Y4
	9	Fr2, It4		
	60	G5, G13, G25		
	1	G9, G10, G12, G17, G20, G22	C8	
	2	G6, UK6, G21, B2	US6	
	3	Fr13, UK7, Fr18	US38	
	4	Sw5	US30	
	5	Fr5, UK11		
	6	UK3, UK10		
	7	It5		
	8			
	9	G24		
Viola	70			
	1			
	2			
Maltoni	3			
	Total	67	45	8

* Cholangiosarcoma (US24)

** Aerosol can filler (G3)

*** US33 and 36; and Fr 15 are still alive.

(Review date 9 January 1986)

TABLE 8

WESTERN EUROPE PVC PRODUCERS - START-UP DATES vs ASL CASES (OMITTING G03 & It.01)

START-UP YEAR	COUNTRY NAME	COMPANY NAME	LOCATION	ASL CASE NUMBER	YEAR OF 1st Exposure
1931	West Germany	BASF	Ludwigshafen		
1933	West Germany	Wacker	Burghausen	04,07,11,15,23,24	25,57,54,55,53,55,69,60
1938	Italy	Montecatini	Acna		
1939	France	Rhone Poulenc	St Fons	03,09,10,11,14,15,16,17	46,48,56,41,43,55,41,48
1940	United Kingdom	ICI	Runcorn		
1940	United Kingdom	ICI	Hillhouse	01,04,12	44,54,57
1945	Sweden	Kemanord	Sundsvall(Stockvik)	01,02,03,04,05	51,45,47,46,64
	Switzerland	Lonza	Sins		
1946	France	Rhone-Poulenc	Rousillon	01	46
1947	Italy	Montedison	Porto Marghera	02	57
1948	United Kingdom	BP Chem	Barry	03,05,06,07,08,09	66,51,62,63,50,50
				10,11	66,65
	West Germany	Huls	Marl	09,10,26	61,61,53
1949	Belgium	Solvay	Jemeppe	01,02	58,62
1950	France	Fuk	Brignoud	02,04,05,06,12	59,49,65,58,49
	France	Rhone-Poulenc	St Auban	07	50
	Holland	Shell	Pernis		
	Norway	Norsk	Heroya	01	50
1951	Italy	Montedison	Brindisi		
1952	Italy	Montedison	Terni		
1953	Austria	Halvic	Hallein		
	France	Solvay	Tavaux	08,13,18	57,63,63
	Italy	Solvay	Ferrara	03	53
	Spain	Rio Rodano	Hernani		
	United Kingdom	BIP	Aycliffe		
	West Germany	Hoechst	Gendorf	18	55
1954	West Germany	Dynamit	Troisdorf	01,02,08,12,16,17,19,20,21,22,27	56,57,54,61,55,61,54,61,62,61,55
1955	Spain	Monsanto Iberia	Monzon		
1956	Spain	Caiqsa	Sabinanigo		
		Hispavic	Torrelavega		
1958	West Germany	Solvay	Rheinberg		
1960	Italy	S C Ravenna	Ravenna	04	59
1960	West Germany	Lonza	Waldshut	06,13	62,60
1962	Portugal	Cires	Oporto		
1965	France	Rhone-Poulenc	Montlucon		
	Italy	Pozzi	Ferrandina		
	West Germany	Wacker	Cologne		
1966	West Germany	Hoechst	Knapsack(Frankfurt)	05*	60
1967	France	ATO Chimie	Balan		
	Spain	Rio Rodano	Miranda de Ebro		
	Greece	Esso Pappas	Diavata Salonika		
1968	Belgium	Badiphil	Antwerp		
1969	United Kingdom	Vinatex	Staveley		
	Italy	Rumianca	Cagliari Sardinia		
1970	Italy	SIR	Porto Torres Sar		
	United Kingdom	ICI	Runcorn		
1971	Italy	S C Ravenna	Ravenna		
	Spain	Hispavic	Martorell		
	Sweden	Kemanord	Sterungsund		
	United Kingdom	BP Chem	Baglan Bay		
1972	Finland	Pekema	Svartback		
	Holland	DSM	Beek Limburg		
1976	France	Soc Art D'vinyl	Mazingarbe		
1977	Spain	Monsanto Iberia	Tarragona		

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* Laboratory worker in Research Department

PANSAC, Mira Venice, case not included (It 05), due not knowing start up date of the Plant.

(Review date 1 January 1986)

TABLE 9

USA PVC PRODUCERS - START-UP DATES vs ASL CASES

START-UP YEAR	COMPANY NAME	LOCATION	ASL CASE NUMBER	YEAR OF 1st EXPOSURE
1939?	*UOC	S Charleston	07,13,19,21,24,27,28,29,31,35	44,42,43,46,39,41,44,42,46,44
1940?	*BFG	Louisville	01,02,03,04,05,06,09,16,17,22,26,33,34,37	48,55,45,52,44,62,45,50,55,47,47,54,55,53
1946?	*UOC	Texas City (Partially closed 1977)		
1947	Goodyear	Niagara Falls	08,10,11,20	46,51,46,55
1948	Firestone	Pottstown	12	49
	Uniroyal	Painesville (closed 1975)		
1950	Monsanto	Springfield (Closed 1975)	32	51
1952	Dow	Midland (No PVC since c 1975)		
	BFG	Avon Lake	18	54
1953	BFG	Deer Park (Formerly Diamond)		
1954	General Tire	Ashtabula (Closed 1984)	36	56
1956	Air Products	Pensacola		
	Atlantic Refining	Brooklyn (Closed late 1960s)		
	Borden	Leominster (Closed 1984)		
	Conoco	Hebronville (Closed 1975)		
	BFG	Niagara		
	Great American Plastics	Fitchburg (Closed 1983)	23	58
	Hooker	Hicksville (Closed 1980-81)		
	Pantosoto	Passiac (Closed 1984)		
1957	Atlantic Tubing	Cranston (Closed 1967)		
	Tenneco	Flemington NJ	30	59
1958	Keysor Century	Saugus, Cal		
1960	BFG	Watson, Cal		
	Air Products	Calvert City (closed March 1982 Re-opened October 1983)	38	63
	Borden	Illioopolis		
1962	Tenneco	Burlington NJ		
1963	Conoco	Aberdeen, Miss		
	Stauffer	Long Beach, Cal (Closed 1982)		
1965	Conoco **	Assonet, Mass (Closed by Olin 1975, see below)		
	Ethyl	Baton Rouge (Closed 1984)		
1966	Georgia Gulf	Delaware City (Formerly Diamond)		
	General Tire/Pantas	Mt Pleasant W Va (Closed 1983)		
	BFG	Henry, Ill		
	Stauffer	Delaware City (Sold to Formosa 1983)		
1967	Allied ***	Painesville, O (sold to Robintech)		
	Hooker	Burlington NJ		
1968	Firestone	Perryville (Closed 1982)		
1969	BFG	Pedrickton NJ		
	Goodyear	Plaquemine		
	Olin ** (Formerly Conoco)	Assonet, Mass (Closed 1975) (See above)		
1971	Conoco	Oklahoma City		

TABLE 9 (Continued)

USA PVC PRODUCERS - START-UP DATES vs ASL CASES

START-UP YEAR	COMPANY NAME	LOCATION	ASL CASE NUMBER	YEAR OF 1st EXPOSURE
1972	Nat Starch	Meredosia, Ill		
1973	Borden	Springfield		
	Robintech ***	Painesville, O (sold to Georgia Pacific who converted to polystyrene)		
1974	Atlantic Tubing/ Tallyrand	Cranston RI (Closed 1982)		
	Shintech	Freeport, Tex		
1975	Certain-teed	Lake Charles		
	Georgia Pacific	Plaquemine, La		
	Tenneco	Pasadena, Tex		
1979	Firestone	Plaquemine		
1983	Formosa	Point Comfort, Tex		

* My databank has no information on UCC before 1946 or BFG before 1950

** Refers to same plant at Assonet

***Refer to same plant at Painesville. Allied plant never operated again for PVC after it was sold to Robintech.

NB Some of the plants in this list were closed down, some have changed ownership over the years, some have changed their product.

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TABLE 10CANADIAN PVC PRODUCERS - START-UP DATES vs ASL CASES

START-UP YEAR	COMPANY NAME	LOCATION	ASL CASE NUMBER	YEAR OF 1st EXPOSURE
1943 (1941?)	Goodrich	Shawinigan	01,02,03,04,05 06,07,08,09,10	44,43,41,45,44, 47,46,61,46,53
1951	Monsanto	La Salle (Closed 1975)		
1957	Goodrich	Welland		
1966	Esso	Sarnia		
1979	Diamond Shamrock Alb	Fort Saskatchewan		

(Review date 1 January 1986)

TABLE 11

EASTERN BLOC PVC FACTORIES - START-UP DATES vs ASL CASES

START-UP YEAR	COUNTRY NAME	COMPANY NAME	LOCATION	ASL CASE NUMBER	YEAR OF 1st Exposure
Pre 1939	East Germany	State Company	Schopau		
1941	Russia	State Comps	Vladimir et al		
1950	Yugoslavia	Jugo Vinil	Split	01,02,03,04	53,50,54,48
1951	Czechoslovakia	State Comps	Novaky	01,02	57,50
1955	East Germany	State Comps	Bitterfeldt		
1956	Rumania	State Comps	Icechim		
1957	Poland	State Comps	Osweicim (Dwory)		
	Rumania	State Comps	Tirnaveni Turda		
1958	Rumania	State Comps	Risnov		
1959	Hungary	State Comps	Berente Borsod		
1961	Rumania	State Comps	Borzesti		
1963	Yugoslavia	Ohis	Skopje		
1965	Bulgaria	State Comps	Varna		
1967	Poland	State Comps	Tarnow		
1969	Russia	State Comps	Djerjinsk		
1970	Rumania	State Comps	Rimnicu Vilcea		
	Russia	State Comps	Volgograd		
1972	Yugoslavia	Vinilplastika	Zadar		
1975	Czechoslovakia	State Comps	Neratovice		
	Russia	State Comps	Kalush Area		
1976	Yugoslavia	Hip	Pancevo		
1977	Rumania	State Comps	Rimnicu Vilcea		

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TABLE 12

JAPANESE PVC PRODUCERS - START-UP DATES vs ASL CASES

START-UP YEAR	COMPANY NAME	LOCATION	ASL CASE NUMBER	YEAR OF 1st EXPOSURE
1950	Chisso Corp Kanegafuchi Kag Tekkosha	Minamata Osaka Sakata		
1951	Mitsui Toatsu	Nagoya	01, 02	53, 58
1952	Mitsubishi Mon Sumitomo Kag	Yokkaichi Kikumoto		
1951	Denki Kagaku Nippon Zeon Toa Gosei	Shibukawa Kambara Tckushima		
1955	Ryo-Nichi	Uozu		
1956	Nippon Zeon Nisshin Kagaku	Takoaka Takeo		
1957	Kureha Kasei Shinetsu Kag	Nishiki Naoetsu		
1960	Denki Kagaku Kanegafuchi Kag	Ohmi Takasago		
1964	Chisso Corp	Chiba		
1966	Tokuyama Seksui	Tokuyama		
1967	San Arrow Kagak Sumitomo Kag	Tokuyama Chiba		
1968	Ryo-Nichi Shinetsu Kag	Mizushima Tokuyama		
1970	Chisso Corp Denki Kagaku Kanegafuchi Kag Kawasaki Yuki Mitsui Toatsu Nissan Kagaku Shinetsu Kag	Mizushima Goi (Chiba) Kashima Kawasaki Sakai Chiba Kashima		
1971	Tekkosha	Yokkaichi		
1973	Asahi Glass	Hayatsuki		
1974	Toyo Soda	Sakata Yokkaishi		
1975	Central Kagaku Toyo Soda	Kawasaki Yokkaichi		
1977	Unknown	Kashima		

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TABLE 13

SOUTH AND CENTRAL AMERICAN PVC PRODUCERS

START-UP YEAR	COMPANY NAME	LOCATION	ASL CASE NUMBER	YEAR OF 1st EXPOSURE
1953	Monsanto Mexica	Lecheria (Mexico)		
1954	Policyd	Mexico City (Mexico)		
1955	Geon Do Brazil	Sao Paulo (Brazil)		
1956	Elchlor	Sao Caetano (Brazil)		
1960	Electrochlor Viplastic	Capitan Bermudez (Argentina) Mendoz (Argentina)		
1961	Indupa	Cinco Saltos (Argentina)		
1965	(SOC Paramanga (1967 start up PET Columbiana	Paramonga (Peru)) Cartagena (Colombia)		
1966	Carburo De Col	Medellin (Colombia)		
1967	Plasticos Omega	Mexico		
1968	Primex	Puebla (Mexico)		
1970	Policasa Petro Dow	Managua (Nicaragua) Conception (Chile)		
1971	Polimeros Mex	St Martin Puebla (Mexico)		
1975	Rico Chemicals	Guyanilla (Puerto Rico)		
1976	Petroplas	EL Tablazo (Venezuela)		
1977	Indust Resistoc	Tlaxcala (Mexico)		
1978	Huls Brasil Polychem Policyd	Cubato (Brazil) El Salvador Coatzacoalcos (Mexico)		
1979	PET Camacari	Camacari Bahia (Brazil)		

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TABLE 14AUSTRALASIAN PVC PRODUCERS

START-UP YEAR	COMPANY NAME	LOCATION	ASL CASE NUMBER	YEAR OF 1st EXPOSURE
Mid 1950s	ICI Australia	Botany, Sydney		
1960s	B F Goodrich	Melbourne		
Late 1970s	ICI Australia	Laverton Melbourne		