

CONFIDENTIAL

World Register
of Cases of

ANGIOSARCOMA OF THE
LIVER (ASL)
due to VCM

REVIEW DATE
1st JANUARY 1989

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CMA 010159

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WPX/ASL - ASL ADDRESS,3

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 1989

P R E F A C E : ACKNOWLEDGMENTS, SIGNIFICANT CHANGES, COMMENTS AND REQUESTS

- 1 The 7 new cases in the Register are the following: Canada 13; France 23, 24 and 25; Italy 07; UK 15 and 16.
- 2 There are amendments from the previous Register against the following cases: Canada 11 and 12, UK 14 and US 41.
- 3 I would like to thank the following for information about new cases: Dr Dietz, Dr Contassot, Dr Lagast, Dr Benetta, Dr Williams, Dr Smith, Dr Lee.
- 4 For additional information about other cases I thank also Dr Delorme, Monsieur Bibeau, Dr C A Johnson, Mr Roy N Johnson and Professor Lalbach.
- 5 So far as I know the following people are still alive: cases France 15, 22, 23 and 24; Germany 31 and 32; US 33 and 36. Is this correct? This is important information for the industry world-wide and I would appreciate news, especially regarding the cases in Germany, please.
- 6 Tables 4G and 4H have been enlarged by the addition of the factories at Tavaux (France) and Hillhouse (UK), as each of these has now had 4 cases.
- 7 I should be glad if all recipients of this Register would continue to keep me fully informed of any new cases, or give the name and address of someone who can send me the necessary details. I have again attached a blank sheet at the back of the Register so that information can be supplied under the appropriate headings, so far as possible. Please also send any other relevant information about earlier cases, or about factory changes.
- 8 RESEARCH: (a) May I again ask that all individuals involved in relevant research keep me informed and if possible send me reports. Perhaps recipients of this Register would pass on my request.

(b) Co-factors - I have recently met Professor Carlo Tamburro at the University of Louisville, USA, to assess the data which many of you kindly sent in response to my questionnaire about possible co-factors with Vinyl Chloride. We found there was no correlation within Europe but among the North American cases there was a suggestion of a co-factor effect on latency. In plants where Di-Ethyl Maleate had been used, the latency period seemed to have been shortened.
- 9 There was an excellent response to the circular I sent in June 1988 about the Register mailing list. Thank you. Please continue to keep me up to date with news of retirements, movements and changes of address.

FROM: Dr Brian Bennett, Occupational Health, ICI Chemicals & Polymers Limited
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February 1989
BB/BGS

CMA 010163

LIVER ANGIOSARCOMA CASES (REVIEW DATE - 1 JANUARY 1989)

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BELGIUM

LIVER Angiosarcoma Cases - (Review Date : 1 January 1989)

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
BELGIUM															
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 autoclaves 1968-1972 exposed to 50-200 ppm 8 hrs per day in 25m ³ autoclaves 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 13 yrs Work in glass ind. & chemi- cal industry	Driller in a foundry (2 yrs) Farmer (15 yrs) Work in glass ind. & chemi- cal 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 15 yrs 5 mths Operator 13 yrs 9mths.	Fireman since 10 71. Hepatic tests altered 10.79. Positive echography 11.79. Hepa- tectomy 02.80. Chemotherapy. Information given in letter 12 Nov 1984 from Dr Jk. Schryver.	

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CANADA
Sheet 1

LIVER Angiosarcoma Cases - (Review Date: 1 Jan 1989)

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			SHAWINIGAN												
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.

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LIVER Angiosarcoma Cases - (Review Date: 1 Jan 1989)

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>CANADA</u>															
10		16.05.15			1953	1976	61	23	14	00.04.77	Yes		Reactor cleaner	Furnace op. maintenance, packaging	Ex-smoker
11	LG	13.10.25	Gulf	Shawinigan	1943	Nov 85	60	42	5	05.04.86	Yes	High	1943-47 Operator & Supervisor PVC Plant	Retired 1972 (Age 47)	Letters from Dr Fernand Delorme, Pathologist & M Bibeau, BSc
12	BC	14.09.20	Gulf	Shawinigan	1945	Mar 82	61	37	27	31.03.82	Yes	High	1945-55 Autoclave Operator, PVC Resins	Retired 1972 (Age 52)	Letters from Dr Fernand Delorme, Pathologist & M Bibeau, BSc
												Low	1955-65 PVC Manufacture		
												Medium	1965-72 Autoclave Operator, PVC Resins		
13	SS	10.06.26	BPC	Niagara Welland	1957	1987	60	30	23	26.1.87	Yes	1957-70 High 1970-80 Low	(Poly Cleaner) & Operator Supervisor	Retired 1980 (Age 54)	Information from Dr H W Dietz, BSc, 1988

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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
CZECHOSLO- VAKIA															
01		28.06.28	State Co	Movaky	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	Movaky	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.	

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FRANCE
Sheet 1

LIVER Angiosarcoma Cases - (Review Date: 1 Jan 89)

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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	HN	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. Navier et al Arch. Mal. Prof. 1 30 n° 13 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	12 yrs on monomer 10 yrs on polymer- isation	Italian origin	Ref. G Bonneton et al "Nouvelle Presse Medicale" 15 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 13 yrs	VCM production 16 yrs Italian POW Shepherd, Sawyer, Mason	Ref. Rely et al Arch. Mal. Prof. 1 37 n° 16 June 77 p 551-555
04	MOE	27.01.27	PCUK	Brignoud	19.10.49	16.01.76	49	26	26	04.01.76	Yes	High	Monomer production worker 18 yrs PVC filtration 18 yrs		
05	S	29.01.30	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) (des hopitaux) (angiosarcoma (2)Scintigraphy (found ASL (1)Haemorrhage (from ASL (4)Right (Hepatectomy	Ref. P Goudere et al "Semaine des hopitaux" 10 Septembre 1976 Previously had bone (angiosarcoma Also Pfluhowski et al "La Nouvelle Presse Medicale" 17th July 1979 Page 248

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FRANCE
Sheet 2

LIVER Angiosarcoma Cases - (Review Date: 1 Jan 1989)

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	11	11.09.76 (NIOSH says 12.09.76)	Yes	Moderate	((1958-1960) 12 yrs filtration 110-11 yrs polyworker and works lab)		(This man had AOL prior to AS. Ann. de Mal. Prot. 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 08.07.76	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	Solvey	Tavaux	23.05.57	03.12.75	42	19	19	30.01.77	Yes	Moderate	16 yrs packer 16 autoclave cler 14 yrs autoclave worker		(Had been tunnel worker previously)
09	RFZ	08.10.14	RP	St Fons	10.01.48	26.04.76	63	28	28	25.12.77	Yes	Very High 1948-1966 Lesser Exposure 1966-1976	Polymer- isation operator, autocleaner, autoclave maintenance	110 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 brounchial fistula Paper by Dr Rety et al in Archives de Malades Professionals Vol 50 No 6 1979 pages 1741-1.

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FRANCE
Sheet 3

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	VF	24.05.19	BP	St Fons	00.12.56	10.01.78	50	21	21	10.01.78	Yes	High	Autoclave cleaner	110 yrs in mechanical engineering industry 1946-1956	Died of pulmonary embolism 5 days after surgery	
11	L	15.02.12	BP	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 VCM synthesis HCl & Acetylene Foreman agent de maltrise 1972 retired			
12		16.08.14	PCUR	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	23.09.43	26.06.79	40	16	13	22.08.79	Yes		Autocleaner 12 yrs, Auto- operator 19 yrs, Copolymers 14 yrs	12 yrs as cycle mechanic. 110 yrs as enameller in sanitary ware manufacture	Cigarette smoker until 1974. 111 all of 1977 due to Oesophageal varices. Surgical intervention 25.05.79 right hepatectomy	
14	NJ	05-04-24	Chloe Chimie (Formerly BP)	St Fons	1943	00.07.81	57	38	36	29.07.81	Yes	Very High	1943-1975 1943-1975 and Intermitt- ently 1975-1979 Process	1943-1975 All types of jobs on work manufacture in VCM Poly	1975-1979 maintenance work	

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WPR/ASL - LANGLOISES, J.J.

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LIVER Angiosarcoma Cases - (Review Date: 1 Jan 1989)

FRANCE
Sheet 4

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															Left Hepatectomy (1983)
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 15 10 1983 and 29 7 88.
16	GIN	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	Polymerisat- ion Process Man Maintenance Worker Health & Safety Agent		Retired (Jan 1979. J C Contassot Letter of 15 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 15 10 1983
18	BR	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 recurrence of the disease

CMA 010172

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															
19	MAZ	15.12.32	Atochem	Brignoud	07.04.59	26.10.84	52	25	25	06.11.85	Yes	High	Autoclave operator and cleaner		Myocardial infarction (1980, Coronary bypass 1981). Letter from Dr Contassot 15.4.86
20	BE	02.03.23	Atochem	Brignoud	1951	27.12.85	63	34	22	26.12.85	Yes	High	Autoclave operator and cleaner	In other parts of factory since 1946	Portal fibrosis from 26.04.74. The illness was diagnosed as presumably work related on 20.04.74. Letter from Dr Contassot 05.04.86
21	Pa	01.10.40	BP	SRP Montlucon	1959	03.06.86	45	27	4	28.06.86	Yes	High	Autocleaner 4 years	Maintenance worker	Hepatic test May 84 normal. Hepatic test May 86 showed abnormalities. Letter from Dr Barret 18.07.86.
22	AL	13.08.28	Atochem	St Auban	01.09.58	05.11.87	59	29	26	Alive	Yes	High 1958-70 Low 1970-84	12 years Autoclave worker. 14 years in Control Room		Letters from Dr Contassot, Atochem 12.12.87 and 129.7.88.
23	MA	07.02.27	Atochem	St Fons	1944	1988	63	44	28	Alive	Yes	High	Autoclave Cleaner & all PVC production jobs		Liver transplant May 1988. Information from Dr J C Contassot, Atochem, 1988
24	DO	08.12.26	Atochem	Brignoud	1943	1988	62	45	35	Alive	Yes	High	PVC Production 1- 2 years PCV Detection 1- 3 years PVC Production maintenance 1- 30 years		Partial hepatectomy, Apr 1988, Chemotherap Information from Dr Contassot, Atochem, 1988
25	BB	02.03.30	Solvay	Tavaux	1962	1988	58	26	23	07.05.88	Yes	High (11 years) High) Polyfleece 1- 5 years Polyfleece 1- 6 years Control Room 1- 12 years Low)		Primary Liver Tumor Metastase lung, brain, bone, spleen, kidney. Information from Dr H Lagast, Solvay, November 1988	

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LIVER Angiosarcoma Cases - (Review Date: 1 Jan 1989)

GERMANY
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
GERMANY															
01		00.00.30	4	4	01.10.56	19.09.68	38	12	12	25.01.69	Yes (NIOSH)		Polyworker		
02		00.00.31	4	4	14.10.57	25.09.70	39	13	11	14.12.71	Yes (NIOSH)		Polyworker		
03		00.00.30	12	12	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 VC in his can filling operation?
04		00.00.30	8	8	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 Gokel et al Vichous Arch 1A Path 1976 372 p 195 201

CHA 010174

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Sheet 2

LIVER Angiosarcoma Cases - (Review Date: 1 Jan 1989)

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	11	11	02.04.60	10.12.73	38	13	05	16.12.74	Yes (NIOSH)		IG 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- ization workers in NIOSH list of 11.3.77 and 11.78. I don't think this is a correct classification by NIOSH. The man may have been involved in VCM polymerization in pilot plant or in main plant.
06 (NIOSH gives as Case 05)		00.00.32	7	7	16.12.62	00.00.75	43	13	12	09.01.75	Yes		(PVC - Manu- facture Shift Leader)		
07		00.00.26	8	8	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	4	4	19.07.54	06.04.75	58	20	20	25.12.75	Yes	?	Polyworker	?	

CMA 010175

ICI CHEMICALS & POLYMERS

WPX/ASL - LANGUAGES, 17

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GERMANY
Sheet 3

LIVER Angiosarcoma Cases - (Review Date: 1 Jan 1989)

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 09		00.00.34	2	2	20.02.61	16.06.76	41	15	13	24.03.78	Yes	High peaks	12 yrs poly- worker incl 172 auto- clave cleaning Control room 11 yr		10/78 Confirmed Average exposure first 19 yrs 150 ppm, 1000 1000 ppm, Next 3 yrs av. 175 ppm. Last. 1 yr av 35 ppm
10 (NIOSH gives as Case 11)		00.00.36	2	2	01.01.61	00.01.77	40	16	10	07.03.77	Yes	High peaks	10 yrs poly- worker incl 172 auto- clave cleaning		Average exposure first 19 yrs 150 ppm, 1000 1000 ppm. Last yr av 175 ppm. CMH letter of 21.04.78
11 (NIOSH gives as Case 10)		00.00.29	8	8	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	4	4	00.00.61	00.10.77	39	16	6	07.10.77	Yes	?	PVC Manu- facture Autoclave worker for 16 yrs		

CMA 010176

GERMANY
Sheet 4

LIVER Angiosarcoma Cases - (Review Date: 1 Jan 1989)

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	7	7	00.00.60	08.04.78	63	18	14	19.05.78	Yes				{P 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 "Plattenepi- {thelkarzinom" {Der {"Spätsarcoma" {(a carcinoma {of the {oesophagus) {not attribut- {able to VCH & {not recognised {as an indust- {rial disease			{P W Best {letter of {10th June 1980 {enclosing data {from {H P Friedel of {BG Chemie {withdrawing {this case	
15 (NIOSH given this as Case 13)		00.00.29	8	8	19.10.55	09.10.78	49	25	25	25.10.78	Yes	†	{Autoclave {cleaner and {worker. {Drier {operator. {(later shift {leader		{Angiosarcoma {confirmed {10/79. Some {detail of this {& also cases {9, 13, 15, 16 {& 17 given in {IHRW Report for {1978
16		00.00.23	4	4	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 {IHRW Med Insp {Rep for 1978. {(Different {details given {in "VC {Associated {Disease" by {Leibach and {Matteiler {(1981) p1).

CMA 010177

GERMANY
Sheet 5

LIVER Angiosarcoma Cases - (Review Date: 1 Jan 1989)

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)		00.00.37	4	4	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 after {autopsy.
18		00.00.13	5	5	00.00.55	25.12.79	66	24	21	25.12.79	Yes		Autoclave worker		
19		00.00.25	4	4	18.10.54	00.08.79	54	25	18	22.02.80	Yes {Metastasing {ASL	High	Autoclave worker		{Dr Besche {letter of {11-04-82 to {Dr M G F Adams
20		00.00.15	4	4	14.02.61	00.04.80	65	19	13	19.10.80	Yes {Haemangio {(Endothelioma {of liver with {Metastases	High	Autoclave worker		{Dr Besche {letter of {11-04-82 to {Dr M G F Adams
21		00.00.13	4	4	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 Besche {letter of {11-04-82 to {Dr M G F Adams
22		00.00.21	4	4	15.10.61	28.08.80	59	19	11	06.12.81	Yes {Metastasing {ASL	High	Autoclave worker	Chargehand, {subsequently {Foreman	{Dr Besche {letter of {11-04-82 to {Dr M G F Adams

CMA 010178

ICI CHEMICALS & POLYMERS

WPX/ASL - LANGLOISES, 20

GERMANY
Sheet 6

LIVER Angiosarcoma Cases (Rev Date: 1 Jan 1989)

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	DATE OF DIAGNOSIS	AGE AT DIAGNOSIS	YEARS OF EXPOSURE TO DIAGNOSIS	YEARS OF EXPOSURE	DATE OF DEATH	HISTO- LOGICAL CONFIRM- ATION	ESTIMATED EXPOSURE LEVEL	OCCUPATION	OTHER CAREER HIGHLIGHTS	OTHER COMMENTS
GERMANY 23		00.00.27	8	8	1955	26.03.79	52	24	21	29.09.81	Yes	High (~300 ppm)	Chemistry Worker		Primary hepatocellular carcinoma; proliferation of the sinusoidal cells with sinusoidal ectasia. Friedel letter 23.12.86.
24		00.00.28	8	8	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		00.00.23	8	8	1960	28.09.81	58	21	13	14.01.83	Yes	High	Polyclave Worker and Autoclave Cleaner		Prof Selmaier (Munich) letter 22.08.83. Friedel letter 19.04.85.
26		00.00.22	2	2	1953	14.06.76	54	22	22	22.11.82	Yes	High	Polyworker		Chronic hepatitis, angiomatosis, sinusoidal ectasia. Friedel letter 23.12.86.
27		00.00.28	4	4	1955	18.01.83	55	28	18	02.03.84	Yes	High	Autoclave Cleaner till 1972		Leibach. Friedel letter 19.04.85
28		21.11.23	7	7	01.10.60	11.08.85	61	25	25	25.08.85	Yes	High	Process worker 1947- 84 (01.10.60) -31.03.84 PVC product- ion, agitator (area). Implantation 1984 Pulmonary embolism and pleuropneumonia. Landers letters 18.09.85 and 04.02.87.		Annual VCM screening 24.04.85: no complaint, no abnormality detected. 1970 two-thirds gastrectomy for ulcers. 1971 Coronary thrombosis 1983 Femoral implantation 1984 Pulmonary embolism and pleuropneumonia. Landers letters 18.09.85 and 04.02.87.
29		00.00.22	2	2	1962	15.02.83	61	21	19	15.02.84	Yes	High	Chemistry worker		Haemangiosarcoma. Friedel letter 23.12.86.
30		00.00.17	4	4	1951	07.01.80	62	29	25	25.05.83	Yes	High	Polyworker Shift leader		Haemangiosarcoma. Friedel letter 23.12.86.
31		00.00.23	8	8	1953	30.06.85	61	32	20	Alive?		?	Autoclave Cleaner		Haemangiosarcoma. Friedel letter 23.12.86.
32		00.00.30	8	8	1955	00.04.85	55	30	21	Alive?		?	Polyworker Autoclave Cleaner		Haemangiosarcoma. Friedel letter 23.12.86.

CMA 010179

ITALY
Sheet 1

LIVER Angiosarcoma Cases - (Review Date: 1 Jan 1989)

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 supple- mentary list)	LC	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 homo- geneous with other cases. **
02	SE	13.11.29	Montedison	Porto Marghera	00.00.57	13.12.72	43	15	06	27.12.72	Yes		Polyworker		**
03	VC	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.	**
04	FB	20.07.37	AMIC	Ravenna	00.04.59	00.01.81	43	21	21	30.03.81	Yes	12 yrs - Very High 5 yrs - Medium 4 yrs - Low	11 yr - Monomer operator (See paper by CHIAPPINO et al Med Lavoro Vol 6 (1982) pp 555-563 [other duties] [in suspens- ion polymer- isation. [Area Foreman] [in same Dept] [since 1975.	Never cleaned autoclaves. [Consumed little alcohol. No AOL.	**
05	GC Danesi	19.03.37	PANSAC	Mira Venice	00.00.67	07.03.83	46	16	8	06.04.83	Yes	Medium-7 High	Bag extruder (1967-1975 Commercial Dept 1976- 1983		S Pagitalunga relex of (2 Aug 1983)

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

* Also see Meltoni and Mondinella in Acta Oncologica Vol 1 1980 pages 35 - 49.

CMA 010180

LIVER Angiosarcoma Cases - (Review Date: 1 Jan 1989)

CMA 010181

JAPAN

LIVER Angiosarcoma Cases - (Review Date: 1 Jan 1989)

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>JAPAN</u>															
01	Tomoji Mori	01.08.22	Mitsui Toatsu	Nagoya	00.04.53	24.10.75	53	22	13	24.10.75	Yes	PVC Asaoc [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 [Asaoc letters [of 31.03.78 & [30.11.87
02	SC	02.08.39	Kanegafuchi Chemical	Osaka	00.11.58	10.08.76	37	17	13	10.08.76	Yes	Not known	[In polymer- [ization work [including [autoclave [cleaning		[Japanese PVC [Association [letters of [31.03.78 & [30.11.87
03	YS	01.09.30	Mitsui Toatsu	Nagoya	00.07.65	26.06.85	54	20	5	14.09.85	Yes	High	15 years [autoclave [cleaner		[Letter from [Dr Nakamura, [Japanese PVC [Association [30.11.87

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ICI CHEMICALS & POLYMERS

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NORMAY

LIVER Angiosarcoma Cases - (Review Date: 1 Jan 1989)

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>NORMAY</u> 01	AM	23.12.15	Norsk Hydro	Noroya	00.03.50	21.12.71	56	22	21	04.01.72	Yes	High	Foreman & Autoclave supervisor		Confirmed by Dr Thilo- Evansen of NH. At APME Mtg of 19 June 1978 Mr P Rangnes stated that AM had been a member of a start-up team. IVCM & PVC were made in same building. The IVCM was made from acetylene

CMA 010183

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WPX/ASL - LAMCOCASES, 25

SWEDEN

LIVER Angiosarcoma Cases - (Review Date: 1 Jan 1989)

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	HU	23.06.27	Kemnord	Sundevall	14.08.51	20.10.70	43	19	18	20.10.70	Yes		Polyworker		
02	BL	27.11.11	Kemnord	Sundevall	00.01.45	00.08.72	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	HE	10.06.10	Kemnord	Sundevall	00.05.47	18.03.76	65	29	21	19.03.76	Yes	High	Polyworker		
04	AL	16.11.14	Kemnord	Sundevall	00.00.46	12.05.77	62	31	31	12.05.77	Yes	High	1946-1958 polymer- ization 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 Byten letter 18.8.77 to C&FIC
05		12.03.19	Kemnord	Sundevall	11.05.44	22.11.80	61	16	16	22.11.80	Yes	High - 6 Years Low - 10 Years	1964-1970 centrifuge operator 1970-1980 driller operator		Letter of 2nd Nov 1981 from Dr David Byten

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

CMA 010184

ICI CHEMICALS & POLYMERS

MPX/ASL - LANCIOCASES, 20

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LIVER Angiosarcoma Cases - (Review Date: 1 Jan 1989)

UK
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
UK 01	MJ	20.04.01	ICI	Millhouse	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 Barry Lancet 29-06-74 pages 1316-8)
02															(Doubtful 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 12.66 - 9.69)
04	JSR	23.06.20	ICI	Millhouse	26.04.54	00.06.79	59	25	18	12.10.79	Yes	Medium- high	154-5 Bagging Plant 155-6 Drier Plant 156-58 Autoclave worker 158-61 Chargehand Drier Plant 161-72 Foreman 1C 2/3 Plant	Pre-war fish packer 1939-45 army vehicle maintenance 1945-54 fish packer	

CMA 010185

UK
Sheet 2

LIVER (Angiosarcoma) Cases - (Review Date: 1 Jan 1989)

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	Barry	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	Barry	1962	09.01.80	48/9	18	12	09.01.80			17 yrs Poly Floor Operator 15 yrs Greaser on Poly Floor		
07	RCB	26.04.20	BP	Barry	1963	00.00.80	60	17	8.2	13.06.80			Polycleaner 1963-5 Recovery 1965-1971		
08	WTH	08.05.24	BP	Barry	19.09.50	27.11.81	57	31	24	25.12.81		1950-1958 500 ppm 1968-1974 200 ppm	1950-51 Autoclave operator 1948-1950 Operator on Acetylene Production Plant 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	

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UK

Sheet 3

LIVER Angiosarcoma Cases - (Review Date: 1 Jan 1989)

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	ELGP	07.05.25	BP	Berry	15.02.50	02.03.83	58	33	29	24.02.83	Yes	Medium	Polyworker	12 years on Acrylonitrile Resin Plant. Also prior to 1950. 4 years RAF maintenance. 13 years motor car paintshop. 12 years in Graving Dock.	
10	ICJT	04.06.47	BP	Berry	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). Spray-drier 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	ICLP	08.05.28	BP	Berry	19.12.65	02.06.85	57	19	16	02.06.85	Yes	High - 69 1965-69 Med 69-79 Low 79-82	Polycleaner - 1965-68. Service operator 1968-69. Poly operator 1969-79. Leading Hand 1979-82.		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	Hillhouse	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 16.06.85 Dr F I Lee

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ICI CHEMICALS & POLYMERS

WPR/ASL2 - LAMCLOCASES, B

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UK
Sheet 4

LIVER Angiosarcoma Cases - (Review Date : 1 January 1989)

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	HISTO- LOGICAL (CONFIRM- ATION	(ESTIMATED) EXPOSURE LEVEL	OCCUPATION	OTHER CAREER HIGHLIGHTS	OTHER COMMENTS
UK 13	MJ	02.03.48	BP	Barry	1966	Jan 86	37	18	3	02.06.86	Yes	High Low High	Polycleaner (1968-69) Central Depot (1969-70) Polyfloor (1970-1971)	Moved to Acrylonitrile Plant until (left BP 1983). Manager of JC & SS Ltd at Cardiff Airport (1983-86)	Remained well, working actively, until Jan 1986
14	CS	15.06.42	BP	Barry	07.07.66	27.08.87	45	21	11	01.12.88	Yes	(10 months) High (10 years) constant Medium (but on inter- mittent job)	Polycleaner (1966-67) Polyfloor (constant worker at times) (between 1968-1982)		Letters from Dr DMD Evans, (Pathologist, Penarth, Wales and Dr DMJ Williams, BP, Barry
15	BCP	23.06.21	BP	Barry	1956	1988	66	32	16	01.05.88	Yes	(9 years) High (5 years) Medium (2 years) Low	(Poly cleaner & Operator (Blow & Recovery) Operator (Utility Operator	Exposure periods intermittent	Information from (Dr D M J Williams, BP, and (Dr Paul Smith, Pathologist 1988
16	BT	25.05.22	ICI	Hillhouse	1963	1988	66	25	12	12.11.88	Yes	(1 year) Low (9 years) High (2 years) Low	(Packer ((Autoclave Operator		Hepatic fibrosis 1974 (Oesophageal varices (Porta-caval shunt 1975 Information from Dr B Bennett, (ICI, and Dr F I Lee, Blackpool (Victoria Hospital 1988.

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ICI CHEMICALS & POLYMERS

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WPX/ASL - LANGLOCASES, 79

USA
Sheet 1

LIVER Angiosarcoma Cases - (Review Date: 1 Jan 1989)

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 Parke	17.10.23	BPG	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 Cottine of IOSHA	Rolling Stone Art Ref 1 NY Acad of Sc Symp (1974) Also Block Jama 1.7.74 p 53
02		19.08.33	BPG	Louis- ville	15.11.55	00.05.70	37	14	13	27.09.71 (NIOSH says 28.09.71)	Yes		Pot Cleaner (CE Block)		Ref 1 Also Block JAMA 1.7.74 p 53
03	Edward Dimulddie	25.05.15	BPG	Louis- ville	28.11.45	19.12.73	58	28	28	19.12.73	Yes		Pot Cleaner (CE Block)	Louisville Courier Journal 02-09-80	Ref 1 Also Block
04		15.01.24	BPG	Louis- ville	06.07.52	19.08.67	43	15	15	07.01.68	Yes		Pot Cleaner (CE Block)		Ref 1 Also Block
05		25.01.12	BPG	Louis- ville	19.06.44	09.04.64	52	20	20	09.04.64	Yes		Pot Cleaner (CE Block)		Ref 1 Also Block
06	Ray Austin Jones?	23.11.28	BPG	Louis- ville	17.01.62	00.02.74	45	12	12	24.07.75	Yes		US Air Force Pot Cleaner (CE Block)		Ref 1 + Louisville Times 21.7.75 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

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ICI CHEMICALS & POLYMERS

MPX/ASL_2 - LANGUAGES, 1

USA
Sheet 2

LIVER Angiosarcoma Cases - (Review Date: 1 Jan 1989)

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 (Cattle- Pinger?)	108.11.31	BFG	Louis- ville	28.05.45	01.03.74	43	29	24	11.03.75	Yes	2000 ppm			Ref 1 has wrong figures for first exposure. (Louisville Times 129.10.74, 112.3.75, 110.3.76
10		16.08.13	Goodyear	Niagara	12.04.51	00.05.68	55	17	17	10.05.68	Yes				Ref 1
11		127.05.09	Goodyear	Niagara	14.10.46	00.03.70	61	23	23	16.03.70	Yes				Ref 1
12	Francis A Beckman	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 Park to J T Seawell of MCA
13	Richard Edward Clendenin	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 121.7.75
14															Never diag- nosed as ang- iosarcoma of liver. Inform- ation given in letter 22 May 1984 from J A Selig.
15															Accountant, ASL - no evi- dence of VCH exposure.

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ICI CHEMICALS & POLYMERS

USA
Sheet 3

LIVER Angiosarcoma Cases - (Review Date: 1 Jan 1989)

UK System of dates
DAY - MONTH - YEAR

MPX/ASL_2 - LANGUAGES_2

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	BPC	Louis- ville	08.05.50	00.00.69	41	19	04	27.03.69	Yes		1951-4 VCM polymer- ization	From 1954 onwards in Army and other service. 46-50 Army	Table 4 in Wagoner Testimony to US Senate Confirmed in M N Johnson ltr 07.08.78
17	Prerenboom	06.05.31	BPC	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 N Johnson letter of 24.2.81 con- firmed death 16 years after diagnosis
18	Charlie Arthur	22.04.28	BPC	Avon Lake	15.09.54	00.00.75	46	21	13	02.11.75	Yes	113 yrs autocleaner 18 yrs on Estol plasticizer 14 Carboset operation	Navy Tyre Store		Confirmed in M N Johnson ltr 07.08.78 Also Rolling Stone mag. 15.01.76
19	Virgil Christian	00.00.15	UCC	5 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	UCC	5 Charle- ston	00.12.46	Early 77	67	30	22	02.01.77	Yes				128 yrs with UCC at SC Retired News release 21.2.77

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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	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		102.10.23	BPC	Louis- ville	11.07.47	00.01.76	52	29	28	104.12.76	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 W Johnson confirms this is the case described by Danner Tamburro & Yan in Feb 1980 Am J Medicine Vol 70 p280
23		100.00.23	Great American Chemical Company	Fitchburg Mass.	08.09.58	06.04.73	50	15	14	106.04.73	Yes				
24	Charles Edward Moore	17.05.17	BCC	S. Charles- ton	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 first as filter helper, then shift utility man	1937-39 was off and on labourer 1939-41 may have been exposed as reactor cleaner 1943 became shift filter 1946 became shift utility man	NIOSH will retain on register since this neoplasm may be associ- ated with AS.
(25)															NIOSH will retain on register since this neoplasm may be associ- ated with AS.
															NIOSH will retain on register since this neoplasm may be associ- ated with AS.

Removal from register confirmed in R Kaminski letter of 5 November 1980

USA
Sheet 5

LIVER Angiosarcoma Cases - (Review Date: 1 Jan 1989)

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															
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 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 19/1/79
27	J L Forrest	11.05.16	UCC	Charle- ston	01.07.41	30.11.78	62	37	20 (MIOSM days 27 and C (Daily Mail 25)	25.11.78	Yes	High	Operator to 10.10.76 (dispersion PVC manufacture	Exposure in (bulk and (dispersion PVC manufacture	R N Wheeler letter of 4 Jan 1979 and (Charleston (Daily Mail (30.11.78 and (R Kaminski (26/2/79
28		11.04.17	UCC	Charle- ston	00.08.44	03.11.78	61	34	33	03.11.78	Yes				R Kaminski letter of 16/4/79
29		12.10.07	UCC	Charle- ston	00.05.42	00.03.80	72	38	16	01.03.80	Yes				R Kaminski letters of 19th June 1980 16 5th Nov 1980
30	WVM	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 16 yrs Elsewhere 11 yrs Boiler house Operator 9 yrs		
31		08.11.23	UCC	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)	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 (R N Wheeler (letter of (19.11.81. (Also Dr Dacey (letter of (07.01.81 re (date of death	

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USA
Sheet 6

LIVER Angiosarcoma Cases - (Review Date: 1 Jan 1989)

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
32	C M Giroux	22-02-08	Monasanto	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 and "chemicals autoclaves industry".	1940-1951 Various jobs in polymer manufacture (BUTVAR LUSTREX Various jobs around PVC autoclaves (1964-1973) Various clerical jobs in PVC polymerisation facility/ Retired (01-01-73).		Information given in letter of 24 February 1982 from Dr Walter C Barnes of Monasanto Springfield to Dr A Mann of Monasanto Europe.
33	S Ferguson Jnr	08-10-27	BPG	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 M Johnson letter of 28 Feb 1983.
34	Mr Byrum	29-01-34	BPG	Louisville	1955	03-11-82	48	27	10	04.08.83	Yes		Poly Operator + Autoclave Cleaner (1955-65).	1965 left BPG to become a Clergyman.	Dr M M Johnson letter of 13 Nov 1982, 28 Feb 1983 and 9 Aug 1984.
35		09-03-12	UCC	S Charlie- ston	23-07-44	18-07-83	71	39	14	18-07-83	Yes	High from 1944 to 1955. Medium from 1955-1958			Dr Dacey letter of 15 Sept 1983.
36		27-08-32	The General Tire and Rubber Co	Ashtabula	11-06-56	12-08-83	50	27	27	Alive	Yes	Moderate	1956-56 labourer 1956-57 prod helper 1957-70 operator 1970-75 electrician 1975-present operator		Dr M Laundrie letter of 12 Sept 1981 reported at medical May 1983. Testing commenced May 1983

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USA
Sheet 7

LIVER Angiosarcoma Cases - (Review Date: 1 January 1989)

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	HISTO- LOGICAL CONFIRM- ATION	ESTIMATED EXPOSURE LEVEL	OCCUPATION	OTHER CAREER HIGHLIGHTS	OTHER COMMENTS
USA 37	Mr J Payton	29.08.29	BPG	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 M M Johnson
38	JWB	28.08.22	Air Products	Calvert City	00.02.63	19.01.84	61	20	20	28.10.83	Yes	High 1963-1982	Normal progression from helper to senior operator, cleaned reactors, stripping and recovery areas as well as charging operator.		Thrombo cytopenia and leukopenia since since 1978. Gold treatment for arthritis 1976. Under Dr's care about 6 months before death, had passed standard physical examination 3 months earlier. J Barr letters of 22.10.84 and 23.01.85.
39	J Menice	27.06.18	Pantasote	Pasaeic	1960	March 1984	65	24	23	29.06.84	Yes	Low High Low Low	29.09.60 - May 66 - Vinyl Fabrication Plant May 66 - Aug 70 Utility Resin Operator (Inc Jul 66) 1- Sep 67 Reactor Operator Sep 70-82 Monomer Operator 1982-83 Mill Operator, Calendar Shop, until retirement	Worked before 1960 with US Air Force, United Wool Dyers and Okawite	Never in hospital for any chronic or acute medical problems. Death certificate states cause of death cardio-pulmonary arrest secondary to angiosarcoma of liver. Letter of 15.07.86 from John E Hittel of Pantasote with letter of 24.02.86 from Dr Auerbach, Pathologist.

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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	HISTO- LOGICAL CONFIRM- ATION	ESTIMATED EXPOSURE LEVEL	OCCUPATION	OTHER CAREER HIGHLIGHTS	OTHER COMMENTS
USA 40	P P Gilmer	26.10.14	BPG	Louis- ville	22.05.42	1987	72	45	34	03.01.87	Yes	High 1942-1974 Low 1975-1976	Chemical Worker 1942-45 Foreman 1945-76		Letter from Dr Dietz, BPG, 10.3.87
41	R Buckley	2.02.15	Goodyear	Niagara Falls	1949	1987	72	38	27	20.08.87	Yes	High 1949-65 Chemical Op/ Shift Sup/ Foreman, PVC Resin Production Medium 1965-77 MF Plant Left PVC area for 6 months in 1965	Retired 1977 (Age 62)	Letters from Prof Tamburro University of Louisville, 1987 and Dr C A Johnson, Goodyear, 1988	

YUGOSLAVIA

LIVER Angiosarcoma Cases - (Review Date: 1 Jan 1989)

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	HISTO- LOGICAL CONFIRM- ATION	ESTIMATED EXPOSURE LEVEL	OCCUPATION	OTHER CAREER HIGHLIGHTS	OTHER COMMENTS
YUGOSLAVIA															
01		05.04.14	Jugo Vinil	Split	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	Split	00.00.50	12.07.73	42	23	18	12.07.73	Yes*		VCM Production		*In his letter of 3 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	Split	04.06.54	11.01.76	45	22	22	11.01.76	Yes*		VCM Production		
04		11.06.30	Jugo Vinil	Split	15.12.58	03.09.78	48	20	18	03.09.78	Yes				Rose Kaminaki letter of 19 June 1980 and IARC letter of 1 April 1982

CMA 010197

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	.....	3
3	.....	10
4	.....	7
5	.....	6
6	.....	5
7	.....	3
8	.....	4
Total		<u>137</u>

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 Does not include the following who are still alive, so far as known: Fr15, 22, 23 & 24, G31 & 32, US33 & 36.

Distribution of ASL Cases by Country

USA	38 ***
W Germany	31 ** ***
France	25 ***
UK	15
Canada	13
Sweden	5 *****
Italy	6 *
Yugoslavia	4 *****
Japan	3
Czechoslovakia	2
Belgium	2
Norway	1
Total	145

* Omit It01 - atypical case of PVC bag extruder.

** Includes G03 aerosol can filler.

*** Includes case US 24 which was diagnosed as Cholangiosarcoma; & Fr15, 22, 23 & 24, G31 & 32, US33 & 36, who are still alive, so far as known.

**** Includes one monomer worker.

***** Includes two monomer workers.

i.e	Western Europe	85
	North America	51
	Rest of World	9

Total 145

CMA 010199

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

Of the 85 cases in W Europe, 73 have occurred in clusters at 12 factories. Of the 31 German cases, 28 have occurred in clusters at 4 factories.

	<u>ASL Cases</u>
Dynamit, Troisdorf, Germany	12
BP, Barry, UK	11
Wacker, Burghausen, Germany	9
Atochem (formerly Chloé Chimie, formerly RP), St Fons, France	9
Atochem (formerly PCUK) Brignoud, France	8
Kemanord, Sundsvall, Sweden	5
CWH, Marl, Germany	4
ICI, Hillhouse, UK	4
Solvay, Tavaux, France	4
Lonza, Waldshut, Germany	3
Solvay, Jemeppe, Belgium	2
Atochem, St Auban, France	2
	<u>73</u>

NB: There are 32 pre 1962 PVC plants in W Europe; 19 of these have had ASL cases (Ref Table 8)

(b) N America

Of the 51 cases in N America, 42 have occurred at four factories out of a total of 55 factories. In N America 42 plants have not had ASL cases.

	<u>ASL Cases</u>
BFG, Louisville, US	15
BFG, Shawinigan, Canada	12
UCC, S Charleston, US	10
Goodyear, Niagara Falls, US	5
	<u>42</u>

NB: There are 29 pre 1962 PVC plants in N America; 13 of these have had ASL cases (Ref Tables 9 & 10)

(c) Rest of World

The 9 ASL cases are believed to be in one cluster of 4 and two clusters of 2 cases.

TABLE 4A

Latency 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	25	689	27.56 *	
	Germany	31	632	20.38 *	
	Italy	6	127	21.16	
	Norway	1	22	22	
	Sweden	5	122	24.5	
	UK	<u>15</u>	<u>350</u>	<u>23.33 *</u>	
		<u>85</u>	<u>1977</u>	<u>23.25</u>	W Europe Average
<u>N America</u>	US	38	993	26.13 *	
	Canada	<u>13</u>	<u>314</u>	<u>24.15 *</u>	
		<u>51</u>	<u>1307</u>	<u>25.62</u>	N America Average
<u>Rest of World</u>	Czechoslovakia	2	30	15.0	
	Japan	3	59	19.66	
	Yugoslavia	<u>4</u>	<u>85</u>	<u>21.2</u>	
		<u>9</u>	<u>174</u>	<u>19.33</u>	Rest of World Average
<u>Summary</u>	W Europe	85	1977	23.25	
	N America	51	1307	25.62	
	Rest of World	<u>9</u>	<u>174</u>	<u>19.33</u>	
		<u>145</u>	<u>3458</u>	<u>23.84 *</u>	World Average

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

(Review Date - 1 Jan 1989)

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 (Table 4A)
Belgium			2					2	17.5
Canada		3		5	2	1	2	13	24.15
Czechoslovakia		1	1					2	15.0
France		1	4	3	9	3	5	25	27.56
Germany		5	9	10*	5	2		31	20.38
Italy			2	2	2			6	21.16
Japan			1	2				3	19.66
Norway				1				1	22
Sweden			2		2	1		5	24.5
UK	1		5	1	5	3		15	23.33
USA		2	7	9	8	5	7	38	26.13
Yugoslavia				4				4	21.2
TOTAL	1	12	33	37	33	15	14	145	23.84

* Includes G 03 aerosol can filler

WPX/ASL2 - LANGIOCAS,13

CMA 010202

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	
49	1939	38*		
48	1940		$\frac{289}{8} = 36.12$	
47	1	37,21,37,41		
46	2	32,38,45		
45	3	38,14,32,42,45***		
	4	28,11,24,20,24,34,39, 44***	$\frac{886}{31} = 28.58$	
	5	27,22,28,29,37		
	6	21,29,31,26,28,15,23, 30,35		
41	7	29,24,29,28		
40	8	28,24,34		
	9	30,26,20,38	$\frac{559}{22} = 25.41$	
	1950	26,22,31,19,23,14,33		
	1	19,28,17,28,34,29		
36	2	21**,15		
35	3	25,22,23,22,20,31,22, 32***		
	4	21,21,25,25,21,28***, 22	$\frac{849}{37} = 22.94$	
	5	22,23,24,14,19,21,27 27*** 24,28,30***		
	6	21,12,27***,32		
31	7	19,17,15,13,16,28,30		
30	8	18,18,15,17,20,29***28		
	9	16,21,25,27	$\frac{598}{31} = 19.29$	
	1960	13,18,21,25,24,25		
	1	15,16,16,16,19,19,12		
26	2	13,18,17,12,18,21,26		
25	3	16,17,20,21,25		
	4	16,17	$\frac{246}{14} = 17.57$	
	5	11,19,20		
	6	9,18,21		
21	7	16		
20	8	18		
	9	13	$\frac{31}{2} = 15.5$	
	1970			VIOLA
	1			
16	2			
15	3			MALTONI
	4			GOODRICH
	TOTAL	145 CASES	$\frac{3458}{145} = 23.84$	

- * Cholangiosarcoma
 ** Aerosol can filler
 *** The following are still alive, so far as known Fr15, 22, 23 & 24, G31 and 32,
 US33 and 36

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		ROW
		WESTERN EUROPE	NORTH AMERICA	
49	1939		38*	
48	1940			
47	1	37,41	21,37	
46	2		32,38,45	
45	3	38,45***	14,32,42	
	4	28,44***	11,24,20,24,34,39	
	5	27	22,28,29,37	
	6	21,29,31,33	26,28,15,23,30,35	
41	7	29	24,29,28	
40	8	28,34	24	
	9	30,26	20,38	
	1950	26,22,31	19	23,14
	1	19,28,34,29,	17,28	
36	2	21**	15	
35	3	25,22,22,32***	23,31	22,20
	4	21,21,25,25	21,28***	22
	5	22,23,24,27***24,28	14,19,21,27	
		30***		
	6	21,12,32	27***	
31	7	19,17,15,13,28	30	16
30	8	18,18,29***28	15	17,20
	9	16,21,25,27,		
	1960	13,18,21,25,25	24	
	1	15,16,16,16,19,19	12	
26	2	13,18,17,18,21,26	12	
25	3	16,17,21,25	20	
	4	16	17	
	5	11,19		20
	6	9,18,21		
21	7	16		
20	8	18		
	9	13		
	VIOLA 1970			
	1			
	2			
	MALTONI 3			
	TOTAL CASES	85	51	9

* Cholangiosarcoma

** Aerosol can filler

*** The following are still alive, so far as known Fr15 22, 23 & 24, G31 and 32, US33 and 36

WPX/ASL2 - LANGIOCASES,15

CMA 010204

(Review date 1 January 1989)

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 31,45	15	24.53 years
TROISDORF W GERMANY	1954	12,13,16,16,18,19,19,21,23,25,28,29	12	19.91
SHAWINIGAN CANADA	1943 (1941?)	11,12,14,21,22,23,24,24,26,28,42,37	12	23.66
BARRY UK	1948	9,17,18,28,31,33,18,19,18,21,32	11	22.18
S CHARLESTON USA	1939?	24,30,32,32,34,35,37,38,38,39,	10	33.99

WPX/ASL2 - LANGIOCASES,16

CMA 010205

(Review date 1 January 1989)

TABLE 4F

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

YEAR OF FIRST EXPOSURE	LOUISVILLE USA	TROISDORF W GERMANY	SHAWINIGAN CANADA	BARRY UK	S CHARLESTON USA
1939					38
1940					
1			21		37
2					32,38
3			14,42		32
4	20		11,24		24,34,39
5	28,29,27		22,37		
6			26,28		30,35
7	29,28		24		
8	24				
9					
1950	19			31,33	
1		29		28	
2	15				
3	31		23		
4	28	21,25			
5	14,19	23,28			
6		12		32	
7		13			
8					
9					
1960					
1		16,16,19,19,	12		
2	12	18		18	
3				17	
4					
5				19	
6				9,18,21	
7					
8				18	
9					
1970					
1					
2					

CMA 010206

WPX/ASL2 - LANGIOCASES,17

(Review date 1 January 1989)

TABLE 4G

PLANT	START-UP DATE	LATENCY PERIOD OF ASL CASES IN SPECIFIC PLANTS(4-9 CASES)	NO OF CASES	AVERAGE PERIOD
BURGHAUSEN W GERMANY	1933	17,21,22,25,24,13,21,32,30	9	22.77 years
ST FONS FRANCE	1939	21,28,29,37,38,27,41,34,44	9	33.22
BRIGNOUD FRANCE	1950	11,16,18,26,30,25,34,45	8	25.62
SUNDSVALL SWEDEN	1945	16,19,27,29,31	5	24.4
NIAGARA FALLS USA	1947	15,17,21,23,38	5	22.8
SPLIT YUGOSLAVIA	1950	20,20,22,23	4	21.25
MARL W GERMANY	1948	15,16,22,21	4	18.5
TAVAU FRANCE	1953	19,16,21,26	4	20.5
HILLHOUSE UK	1940	28,25,28,25	4	26.5

CMA 010207

WPX/ASL2 - LANGIOCASES,18

TABLE 4H

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

YEAR OF FIRST EXPOSURE	BURGRAUSEN W GERMANY	ST FONS FRANCE	BRIGNOUD FRANCE	SUNDSVALL SWEDEN	NIAGARA FALLS USA	SPLIT YUGO- SLAVIA	MARL W GERMANY	TAVAU FRANCE	HILLHOUSE UK
1939									
1940									
1		37,41							
2									
3		38	45						
4		44							28
5				27*					
6		29		31	15,23				
7				29					
8		28,34							
9			26,30		38				
1950						23*			
1			34	19	17				
2									
3	125,32					20	22		
4	121					22*			25
5	122,24,30	27			21				
6		21							
7	117							19	28
8			18			20			
9			16,25						
1960	121								
1							15,16		
2							21	26	
3								16,21	25
4				16					
5			11						
6									
7									
8									
9	113								
1970									
1									
2									

*Monomer worker

TABLE 5

Annual 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	2		3	102	
1983	7	3		10	112	
1984	5	2		7	119	
1985	5		1	6	125	
1986	4	1		5	130	
1987		3		3	133	
1988	4			4	137	
TOTAL	79* **	49**	9	137		

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

** Does not include the following who are still alive, so far as known: Fr15 22, 23 & 24, G31 & 32, US33 & 36

CMA 010209

(Review date 1 January 1989)

TABLE 6

ASL CASE NUMBERS BY YEAR OF DEATH AND GEOGRAPHICAL LOCATIONS (EXCLUDING It.01)

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,Y2,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,G21US	US17, US29, US30,US32	
	1	It4,F14,UK8,G22,G23		
	2	G26	US31,C12	
	3	UK09,It5,F17,B2,G24,G25,G30	US35, US34, US38	
	4	UK10, F16, F18, G27,G29	US37,US39	
	5	UK11, UK12,F19,F20,G28		Jap3
	6	F21,UK13,It6,It7	C11	
	7		US40,US41,C13	
	8	F25,UK14,UK15,UK16		
	Total	79***	49***	9

* Cholangiosarcoma

** Aerosol can filler

*** Does not include the following who are still alive, so far as known:
Fr15, 22, 23 & 24, G31 & 32, US33 & 36

CMA 010210

(Review date 1 January 1989)

TABLE 7

ASL CASE NUMBERS BY YEAR OF FIRST EXPOSURE AND GEOGRAPHICAL LOCATION
(EXCLUDING It.01)

KEY EVENTS		WESTERN EUROPE	NORTH AMERICA	REST OF WORLD
	1939		US24*	
	40			
	1	Fr11, Fr16	C3, US27	
	2		US13, US29, US40	
	3	Fr14, Fr24***	C2, US19, C11	
	4	UK1, Fr23***	C1, C5, US5, US7, US28, US35	
	5	Sw2	C4, US3, US9, C12	
	6	Fr1, Fr3, Sw4	C7, C9, US8, US11, US21, US31	
	7	Sw3	C6, US22, US26	
	8	Fr9, Fr17	US1	
	9	Fr12, Fr4	US12, US41	
	50	Fr7, N1, UK8, UK9	US16	Y2, Cz2
	1	Sw1, UK5, Fr20, G30	US10, US32	
	2	G3**	US4	
	3	G15, It3, G26, G31***	C10, US37	Jap1, Y1
	4	G7, G8, UK4, G19	US18, US33***	Y3
	5	G11, G16, G18, Fr15***	US2, US17, US20, US34	
		G23, G28, G32***		
	6	FR10, G1, UK15	US36***	
	7	Fr8, G4, It2, G2, UK12	C13	Cz1
	8	Fr6, B1, Fr22***, It7	US23	Jap2, Y4
	9	Fr2, It4, Fr19, Fr21		
	60	G5, G13, G25, G28, It6	US39	
	1	G9, G10, G12, G17, G20, G22	C8	
	2	G6, UK6, G21, B2, G29, Fr25	US6	
	3	Fr13, UK7, Fr18, UK16	US38	
	4	Sw5	US30	
	5	Fr5, UK11		Jap3
	6	UK3, UK10, UK14		
	7	It5		
	8	UK13		
	9	G24		
Viola	70			
	2			
Maltoni	3			
-	Total	85	51	9

* Cholangiosarcoma (US24)

** Aerosol can filler (G3)

*** Fr15, 22, 23 & 24, G31 & 32, US33 & 36 are still alive, so far as known

CMA 010211

WPX/ASL2 - LANGIOCAS, 22

TABLE 8
WESTERN EUROPE PVC PRODUCERS - START-UP DATES vs ASL CASES (OMITTING 003 & 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 25,31,32	57,54,55,53,55,69,60,53 55
1938	Italy	Montecatini	Acna		
1939	France	Rhone-Poulenc/ Chloe/Atochem	St Fons	03,09,10,11,14 15,16,17,23	46,48,56,41,43, 55,41,48,44
1940	United Kingdom	ICI/EVC	Runcorn (Closed 1948)		
	United Kingdom	ICI/EVC	Hillhouse	01,04,12,16	44,54,57,63
1945	Sweden	Kemanord/Nobel	Sundsvall (Stockvik)	01,02,03,04,05	51,45,47,46,64
1946	France	Rhone-Poulenc	Roussillon	01	46
1948	United Kingdom	BP Chem/ICI/EVC	Barry	03,05,06,07,08,09 10,11,13,14,15	66,51,62,63,50,50 66,65,68,66,56
	West Germany	OWH/Huls	Marl	09,10,26,29	61,61,53,62
1949	Belgium	Solvay	Jemeppe	01,02	58,62
1950	France	PCUK/Atochem	Brignoud	02,04,05,06,12,19 20,24	59,49,65,58,49,59, 51,43
	France	Rhone-Poulenc/ Chloe/Atochem	St Auban	07,22	50,58
	Holland	Shell	Pernis, Rotterdam		
	Norway	Norsk	Heroya, Porsgrunn	01	50
1951	Switzerland	Lonza/ICI/EVC	Sins		
1952	Italy	Montedison/ Moplefan	Terni	07	58
	Italy	Montedison/EVC	Porto Marghera	02,06	57,60
1953	Austria	Halvic/Solvay	Hallein		
	France	Solvay	Tavaux	08,13,18,25	57,63,63,62
	Italy	Solvay	Ferrara	03	53
	Spain	Rio Rodano	Hernani		
	United Kingdom	BXL/BIP/NORSK	Aycliffe		
	West Germany	Hoechst	Gendorf	18	55
1954	West Germany	Dynandit	Troisdorf	01,02,08,12,16,17 19,20,21,22,27,30	56,57,54,61,55,61, 54,61,62,61,55,51
1955	Spain	Monsanto Iberia	Monzon		
1956	Spain	Caifasa	Sabinarigo		
		Hispavic/Solvay	Torrelavega		
1958	West Germany	Solvay	Rheinberg		
1960	Italy	S C Ravenna/EVC	Ravenna	04	59
	West Germany	Lonza/ICI/EVC	Waldshut	06,13,28	62,60,60
1961	Italy	Montedison/EVC	Brindisi		
1962	Portugal	Cires	Oporto		
1965	France	Rhone-Poulenc	Montlucon	21	59
	Italy	Pozzi	Ferrandina		
	Italy	Pensac	Mira, Venice	05	67
	West Germany	Wacker	Cologne		
1966	West Germany	Hoechst	Knapack (Frankfurt)	05*	60
1967	France	Atochem	Balan		
	Spain	Rio Rodano	Miranda de Ebro		
	Greece	Esso Pappas	Diavata Salonika		
1968	Belgium	Badiphil	Antwerp		
1969	United Kingdom	Vinacex/Norsk	Staveley		
	Italy	Rumantica/EVC	Cagliari Sardinia		

Continued

CMA 010212

Table 8 - Continued

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
1970	Italy	SIR	Porto Torres Sar		
	United Kingdom	ICI/EVC	Runcorn		
1971	Spain	Hispavic/Solvay	Martorell		
	Sweden	Kemnorrd/Norsk	Stenungsund		
	United Kingdom	BP Chem	Baglan Bay		
1972	Finland	Pekema	Svartback		
	Holland	DSM	Beek Limburg		
1976	France	Soc Art D'vinyl (CDF)	Mazingarbe		
1977	Spain	Monsanto Iberia	Tarragona		
1982	West Germany	ICI/EVC	Voslapp Wilhelmshaven		

* Laboratory worker in Research Department

WPX/ASL2 - LANGIACASES,24

CMA 010213

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?	*UCC	S Charleston	07,13,19,21,24, 27,28,29,31,35	44,42,43,46,39, 41,44,42,46,44
	Dow	Midland (made Saran copolymer)		
1940?	*BFG	Louisville	01,02,03,04,05, 06,09,16,17,22, 26,33,34,37,40	48,55,45,52,44, 62,45,50,55,47, 47,54,55,53,42
1946	*UCC/Dow	Texas City (Partially closed 1977)		
1947	Goodyear	Niagara Falls	08,10,11,20,41	46,51,46,55,49
1948	Firestone/ Occidental	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	Diamond/BFG	Deer Park		
1954	General Tire/ ** DiversiTech	Ashtabula (Closed 1984. Reopened 1986 by Vygen)	36	56
1956	Air Products	Pensacola (Pace)		
	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)		
	Pantasote	Passaic (Closed 1984)	39	60
1957	Atlantic Tubing	Cranston (Closed 1967)		
	Tenneco/ Occidental	Flemington NJ (Closed 1985)	30	59
1958	Keysor Century	Saugus, Cal		
	Air Products	Calvert City (Paducah) (Closed March 1982 Re-opened October 1983)	38	63
1960	BFG	Long Beach, Cal (No PVC now. Formerly shown as Watson)		
	Borden	Illioopolis		
1962	Tenneco/Occidental	Burlington NJ		
1963	Conoco/Vista	Aberdeen, Miss		
	Stauffer	Long Beach, Cal (Closed 1982)		
1965	Conoco/Olin	Assonet, Mass (Closed by Olin 1975)		
	Ethyl	Baton Rouge (Closed 1984)		
1966	Diamond/Georgia Gulf	Delaware City		
	Gen Tire/Pantasote	Mt Pleasant W Va (Closed 1982)		
	BFG	Henry, Ill		
	Stauffer/Formosa	Delaware City (Sold to Formosa 1981)		
1967	Allied/Robintech/ Georgia Pacific	Painesville, O. (No PVC made by Robintech. GP converted to polystyrene)		
	Hooker/Occidental	Burlington NJ		
1968	Firestone/Occidental	Perryville (Closed 1982)		

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
1969	BFG	Pedricktown NJ		
	Goodyear/BFG	Plaquemine		
1971	Conoco/Vista	Oklahoma City		
1972	Nat Starch	Meredosia, Ill		
1973	Borden	Springfield		
1974	Atlantic Tubing/ Tallyrand	Cranston RI (Closed 1982)		
	Shintech	Freeport, Tex		
1975	Certain-teed	Lake Charles		
	Georgia Pacific/ Georgia Gulf	Plaquemine, La		
	Tenneco/Occidental	Pasadena, Tex		
1979	Firestone/ Occidental	Addis (formerly shown as Plaquemine)		
1983	Formosa	Point Comfort, Tex		
1986	Vygen	** Ashtabula, Ohio		

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

** Refer to same plant at Ashtabula, bought by Vygen from DiversiTech.

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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(Review date 1 January 1989)

TABLE 10

CANADIAN PVC PRODUCERS - START-UP DATES vs ASL CASES

START-UP YEAR	COMPANY NAME	LOCATION	ASL CASE NUMBER	YEAR OF 1st EXPOSURE
1943 (1941?)	Goodrich (Formerly Gulf) (Formerly Shawinigan Chemicals) (Formerly Canadian Resins & Chemicals)	Shawinigan	01,02,03,04,05 06,07,08,09,10, 11,12	44,43,41,45,44, 47,46,61,46,53 43,45
1951	Monsanto	La Salle (Closed 1975)		
1957	Goodrich	Welland (Niagara)	13	57
1966	Esso (Imperial Oil)	Sarnia		
1979	Diamond Shamrock Alb/ BF Goodrich	Fort Saskatchewan		

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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	53,50,54,58
1951	Czechoslovakia	State Comps	Novaky	01,02	57,50
1955	East Germany	State Comps	Bitterfeldt		
1956	Rumania	State Comps	Icechim		
1957	Poland	State Comps	Oswelcim (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	Minamata		
	Kanegafuchi Kag	Osaka	02	58
	Tekkosha	Sakata		
1951	Mitsui Toatsu	Nagoya	01, 03	53, 65
1952	Mitsubishi Mon	Yokkaichi		
	Sumitomo Kag	Kikumoto		
1951	Denki Kagaku	Shibukawa		
	Nippon Zeon	Kambara		
	Toa Gosei	Tckushima		
1955	Ryo-Nichi	Uozu		
1956	Nippon Zeon	Takoaka		
	Nisshin Kagaku	Takeo		
1957	Kureha Kasei	Nishiki		
	Shinetsu Kag	Naoetsu		
1960	Denki Kagaku	Ohmi		
	Kanegafuchi Kag	Takasago		
1964	Chisso Corp	Chiba		
1966	Tokuyama Seksui	Tokuyama		
1967	San Arrow Kagak	Tokuyama		
	Sumitomo Kag	Chiba		
1968	Ryo-Nichi	Mizushima		
	Shinetsu Kag	Tokuyama		
1970	Chisso Corp	Mizushima		
	Denki Kagaku	Goi (Chiba)		
	Kanegafuchi Kag	Kashima		
	Kawasaki Yuki	Kawasaki		
	Mitsui Toatsu	Sakai		
	Nissan Kagaku	Chiba		
	Shinetsu Kag	Kashima		
1971	Tekkosha	Yokkaichi		
1973	Asahi Glass	Hayatsuki		
1974	Toyo Soda	Sakata		
		Yokkaishi		
1975	Central Kagaku	Kawasaki		
	Toyo Soda	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/Solvay	Sao Caetano (Brazil)		
1960	Electrochlor	Capitan Bermudez (Argentina)		
	Viplastic	Mendoz (Argentina)		
1961	Indupa	Cinco Saltos (Argentina)		
1965	PET Columbiana	Cartagena (Colombia)		
1966	Carburo De Col	Medellin (Colombia)		
1967	Plasticos Omega	Mexico		
	SOC Paramonga	Paramonga (Peru)		
1968	Primex	Puebla (Mexico)		
1970	Policasa	Managua (Nicaragua)		
	Petro Dow	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	Cubato (Brazil)		
	Polychem	El Salvador		
	Policyd	Coatzacoalcos (Mexico)		
1979	PET Camacari	Camacari Bahia (Brazil)		

(Review date 1 January 1989)

TABLE 14AUSTRALASIAN PVC PRODUCERSSTART-UP DATES

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		

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TABLE 15MIDDLE EASTERN PVC PRODUCERSSTART-UP DATES

START-UP DATE	COUNTRY NAME	COMPANY NAME	LOCATION
Sept 1986	Saudi Arabia	National Plastic Company (Ibn Hayan)	Arabian Petrochemical Company Madiant Al-Jubail Al-Sinahyah

CMA 010221

0185

ICI CHEMICALS & POLYMERS

LIVER Angiosarcoma Cases

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

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