

CONFIDENTIAL

W O R L D R E G I S T E R
O F C A S E S O F

A N G I O S A R C O M A O F T H E

L I V E R (A S L)

REVIEW DATE

1 JANUARY 1988

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R&S 001711

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 1988

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

- 1 The 8 new cases in the Register are the following: Canada 11 and 12; France 22; Italy 06; Japan 03; UK 14; US 40 and 41.
- 2 There are amendments from the previous Register against the following cases: Japan 01 and 02.
- 3 I would like to thank the following for informing me of new cases: Dr Delorme, Dr Contassot, Dr Chiozzini, Dr Nakamura, Dr Evans, Dr Williams, Dr Dietz, and Professor Tamburro.
- 4 For the case corrections I thank Dr Nakamura.
- 5 It will be noted that there are gaps in our knowledge of several cases, notably Canada 11 and 12 and US 41. Also, so far as we know the following people are still alive: cases Canada 11, France 15 and 22, Germany 31 and 32, UK 14, US 33, 36, 41. Is this correct? This is important information for the industry world-wide and we would appreciate news.
- 6 I should be glad if all recipients of the Register would continue to keep me fully informed of any new cases, or give the name and address of someone who can give 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.
- 7 As a result of the request sent with last year's Register, regarding Co-factors, we received a great deal of information about PVC Plants, which has resulted in many amendments to Tables 8, 9, 10 and 13. Further corrections will be appreciated, bearing in mind that the Tables are confined to PVC.
- 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: In response to the questionnaire enclosed with the 1987 Register, regarding possible co-factors with Vinyl Chloride, I received replies from 26 Companies, covering 61 factories. This material is now being analysed by Professor Carlo Tamburro at the University of Louisville, Kentucky, USA, and we shall report on the results as soon as possible. We are extremely grateful to all who took the trouble to give this information. If any Company has not yet completed the Co-factor questionnaire I should be grateful if it could be completed and sent back to me as soon as possible.
- 9 I would also be glad of help to keep the mailing list correct and up to date, with news of retirements, etc.

FROM: Dr Brian Bennett, Occupational Health Department, ICI Chemicals and Polymers Limited
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February 1988
BB/BGS

R&S 001712

ICI CHEMICALS & POLYMERS

WPX/ASO - LANCIOCASES, 4

LIVER ANGIOSARCOMA CASES (REVIEW DATE - 1 JANUARY 1988)

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REF: 1100

LIVER Angiosarcoma Cases - (Review Date: 1 January 1988)

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
BRITAIN															
01		12.01.11	Solvay	Jeneppe	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 1974-1980 ppm 1975- 50 ppm RETIRED 1 Feb 1975	Autocleaner 14 yrs foundry (2 yrs) Polymer (15 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 gross details are given in a paper by (Mabius et al in Arch. Belg. Med. Soc., Hyg. Med., Toxic. Med., Surg., 1977 pages 601-622
02	SR	29 09 40	Solvay	Jeneppe	20 08 62	00.10.79	39	17	9	21 10 83	Yes	118.62-03, 67 01.67 -10.75 - 200 ppm 8h/day 04.63-12, 46 - 200 ppm	Autocleaner 15 yrs 5 mths Operator 13 yrs 9 mths.	Fireman since 10.71. Therapy 11.79. Hepa- tectomy 02.84. Chemotherapy, infusion given in letter 12 Nov 1984 from Dr de Stuyver.	

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LIVER Angiosarcoma Cases - (Review Dates: 1 Jan 1988)

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			SHAWMUT CAN												
01		15.12.13			1944	1955	41	11	11	02.09.55	Yes		Reactor cleaner	Operator polymerization	Smoker
02		06.03.14			1943	1957	43	14	14	21.12.57	Yes		Maintenance, millwright, pipefitter	Operator	Worked inert line Smoker
03		26.08.19			1941	1962	42	21	20	23.03.62	Yes		Operator, foreman		Worked inert line Non-smoker
04		05.04.19			1945	1967	48	22	22	21.01.68	Yes		Reactor cleaner	Operator, foreman, water cooling unit	Worked inert line Smoker
05		07.05.11			1944	1968	57	24	05	05.07.68	Yes		Reactor cleaner	Water cooling unit	Worked inert line Smoker
06		15.12.19			1947	1971	51	24	23	10.04.71	Yes		Reactor cleaner	Maintenance, millwright	Worked inert line Smoker
07		09.11.19			1946	1972	53	26	25	24.12.72	Yes		Reactor cleaner	Machine shop operator and poly unit	Worked inert line 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	51	28	26	04.09.74	Yes		Foreman op. pipefitter maintenance		Worked inert line 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.

CANADA
Sheet 2

LIVER Angiosarcoma Cases - (Review Date: 1 Jan 1988)

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															
10		16.05.13			1953	1976	61	23	14	10.04.77	Yes		Reactor cleaner	Furnace op. maintenance, packaging	See worker
11	LC	25.10.13	Gulf	Shawinigan		Dec 85	72			17 Alive	Yes				Letter from Dr Vernon DeLoraine, Pathologist
12	BC	28.09.14	Gulf	Shawinigan		Mar 82	67			Mar 82	Yes				Letter from Dr Vernon DeLoraine, Pathologist

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ICI CHEMICALS & POLYMERS

WPK/ASL - LANCIOCASES,9

LIVER Angiosarcoma Cases - (Review Date: 1 Jan 88)

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	Novaký	01.07.57	24.12.73	45	16	16	24.12.73	Yes		Autoclave Cleaner	IARC letter of 3-4-82 giving details from Prof JA David of Centra Inst Hygiene and Occ diseases.	
02		06.07.27	State Co	Novaký	01.11.50	27.11.64	37	14	15	26.11.64	Yes		Autoclave Cleaner	IARC letter of 11-4-87 gave somewhat altered dates (for this case.) I have accepted the changes since the dates come from Prof JA David of the Centra of Industrial Hygiene and Occupational Diseases. My dates come originally from NIOSH.	

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MPE/ASL - LANGUOCASES, 10

Page 3

LIVER Angiosarcoma Cases - (Review Date: 1 Jan 88)

FRANCE
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
FRANCE															
01	HM	15.04.24	RP	Reunion -1110	00.01.46	18.02.67	43	21	19	19.02.67	Yes	High	Autoclave worker and cleanser 19 yrs		Ref. Navier et al Arch. Mal. Prof. 1 10 n° 13 Nov 75 p 171-177
02	SHM	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- ization	Italian origin	Ref. JC Bonneton et al "Nouvelle Presse Medicale" 15 Nov 1977 p 725
03	HAV	06.01.20	RP	St Fons	00.00.46	15.01.75	55	29	29	29.06.75	Yes	High	Polymer 10 yrs as autoclave cleanser Compounding 13 yrs	VCM production 16 yrs Italian PGW Shepherd, Sewyer, Mason	Ref. Rety et al Arch. Mal. Prof. 1 17 n° 16 June 77 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 16 yrs PVC filtration 16 yrs		
05	H	29.01.38	PCUK	Brignoud	18.01.65	13.05.76	38	11	11	13.05.76	Yes	High	Polymer 11 yrs	1)Thuracutony 19th Feb 1976 local angiosarcoma 2)Scintigraphy 1976 found ASL. 3)Hemorrhage bone fine ASL 4)Right Hepatectomy	Ref. P Couderc et al "Semaine Medicale" 10e Septembre 1976 Previously had bone angiosarcoma" Also Pissichowski et al "La Nouvelle Presse Medicale" 17th July 1979 Page 2485

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MPH/ASL - LANGUAGES, 11

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FRANCE
Sheet 2

LIVER Angiosarcoma Cases - (Review Date: 1 Jan 1988)

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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															
06	Pa	14.04.34	PCUK	Brignoud	01.03.58	12.08.76	42	18	17	11.09.76 (NIOSH says 12.09.76)	Yes	Moderate	(1958-1960) 12 yrs (filtration 10-11 yrs (polymer land works 11ab)		This man had [AOL prior to [AS. Ann. de [Mal. Prof. [July '77 [p 645 & 6. [AOL was found [in 1977] five [yrs before [ASL
07	CIR	26.04.27	RP	St Auban	01.07.50	After death NIOSH says 08.07.76	49	24	22	02.07.76	Yes (NIOSH no comment)	High	Plant fore- man in polymer- ization	1972-6 admin location in St Auban	Died of leptococemia [Small liver tissue found after autopsy
08	B	01.04.34	Solvay	Tavern	23.05.57	03.12.75	42	19	19	30.01.77	Yes	Moderate	16 yrs pecher 14 autoclave 14 yrs autoclave worker		[Had been tunnel worker previously
09	RYZ	08.10.14	RP	St Pons	10.01.48	26.04.76	63	28	28	25.12.77	Yes	Very High 1948-1966 Lesser Exposure 1966-1976	[Polymer- ization operator, [autoclave [general [maintenance	110 yrs in sulphuric acid factory, [interkeeper & [general [services	Operated 4.76 [for removal of [tumors from [liver and [died after [surgical [operation for [bilio [bronchial [tubercu [Paper by [Mr Ruy et al [in Archives de [Medecine [Professionnelle [Vol 40 No 6 [1979 pages [1-1.

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VPR/ASL - LANGUAGES.12

FRANCE
Sheet 3

LIVER Angiosarcoma Cases - (Review Date: 1 Jan 1988)

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) 3 days after surgery
11	L	15.03.11	RP	St Fons	00.01.61	12.08.78	66	37	31	13.11.78	Yes	High	1941-1966 polymer- ization (general) (purpose worker) 1946-1972 VCN synthesis (HCl & Acetylene) (Foreman (agent (a maltrine) 1972 retired		
12		16.08.14	PCUK	Brignoud	09.01.49	00.05.79	65	30	27	23.06.79	Yes	High	Monomer production (and polymer- ization operator		
13		19.01.31	Salvey	Passau	23.09.63	26.06.79	40	16	13	22.08.79	Yes		Autoclave 12 yrs, Auto- operator 19 yrs, Capolymers 14 yrs	17 yrs as cycle mechanic, 110 yrs as operator in sanitary ware manufacture	Cigarette toothbrush 1974, ill all of 1977 due to (Osteophages) liver disease, (Surgical intervention (25.05.79 (right (hepatocarcinoma)
14	MI	05-06-24	Chlor Chloro (Formerly RP)	St Fons	1963	01.07.81	57	18	16	29.07.81	Yes	Very High	1963-1975 All types of maintenance and work intermittent only 1975-1979 in VCN Poly Process	1963-1975 1975-1979 All types of maintenance and work intermittent only 1975-1979 in VCN Poly Process	

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MPE/ASL - LANGUAGES, 13

FRANCE
Sheet 4

LIVER Angiosarcoma Cases - (Review Date: 1 Jan 1988)

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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
<u>France</u>															
15	DEP	03.01.37	Chloe Chiale (Formerly RP)	St Fons	07.07.55	28.09.82	45	27	27	Alive	Yes	High-20 yr (Moderate 17 yrs)	Autoclave cleaner (1955-1962) Autoclave operator (1962-1982)		(Left Hepatectomy (1983) (J C Contassot Letter of (5 10 1983)
16	GIN	13.07.22	Chloe Chiale (Formerly RP)	St Fons	17.10.41	05.01.83	61	41	38	03.04.83	Yes	High-33 yrs (Moderate- Low - 5 yrs)	Polymerizat- ion Process Man Maintenance Worker Health & Safety Agent		(Retired Jan 1979. (J C Contassot Letter of (5 10 1983) and (25 7 84.
17	HAR	22.02.23	Chloe Chiale (Formerly RP)	St Fons	17.06.48	03.04.83	60	34	28	03.04.83	Yes	High - 23 yrs	Autoclave Cleaner (1948-1971) Factory 1971- 1978	Other sectors of St Fons Factory 1971- 1978	(Retired 01.01.79 (J C Contassot Letter of (5 10 1983)
18	JA	14.07.42	Solvay	Tavaux	09.09.61	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 (03.03.84- (24.09.84 (chemotherapy (for lung- (metastasis (partial (remission. (08.84 - liver (transfusion. (10.84 - lung (metastasis (remission

FRANCE
Sheet 3

LIVER Angiosarcoma Cases - (Review Date: 1 Jan 1988)

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	HAX	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	BR	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	Local 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	RP	SEP (Montluçon)	1959	03.06.86	45	27	4	28.06.86	Yes	High	Autocleaner 14 years	Maintenance worker	Hepatic test May 84 normal. Hepatic test May 86 showed abnormalities. Letter from Dr Barot 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		Letter from Dr Contassot, Alouba 2.12.87

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ICI CHEMICALS & POLYMERS

MPE/ASL - 1AMTUCABE,15

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GERMANY
Sheet 1

LIVER Angiosarcoma Cases - (Review Date: 1 Jan 1988)

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	A	A	01.10.56	19.09.66	38	12	12	25.01.69	Yes (NIOSH)		Polymerizer		
02		00.00.31	A	A	14.10.57	25.09.70	39	13	11	14.12.71	Yes (NIOSH)		Polymerizer		
03		00.00.30	12	12	09.06.52	00.03.71	43	21	16	10.10.73	Yes (NIOSH)		Filling (pesticide [arsonal] cans) with VC		Reported under non polymer- ization workers in NIOSH list of (31.3.77). This of course is strictly incorrect. However I wonder whether this man had high exposure to VC in his can filling operation?
04		00.00.30	B	B	16.04.57	26.11.74	44	17	17	23.11.74	Yes (NIOSH)	200-500 ppm (but high temporary during 1 yr autocleaner)	Polymerizer & autocleaner for 1 yr	1958 was autocleaner	(Clinical details in paper by Gohel et al (Virchows Arch A Path 1976 172 p 193-201)

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MPE/ASL - LAM:10CASES,16

GERMANY
Sheet 2

LIVER Angiosarcoma Cases - (Review Date: 1 Jan 1988)

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 given as Case 06)		00.00.36	11	11	02.04.60	10.12.73	36	13	05	16.12.74	Yes (NIOSH)		NO 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 workshop in NIOSH list of (31.3.77) and 31.78. I don't think this is a correct classification by NIOSH. The man may have been involved in VCH polymerization in pilot plant for in main plant.
06 (NIOSH given 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 112 yrs (1954-64) (Foreman Tech) (Rev 8 yrs (1967-1975))		
08		00.00.17	4	4	19.07.54	00.04.75	58	20	20	25.12.75	Yes	2	(Polymerker	1	

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ICI CHEMICALS & POLYMERS

WPE/ASL - LANGUAGES, 17

GERMANY
Sheet 3

LIVEN Angiosarcoma Cases - (Review Date: 1 Jan 1988)

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	1	2	20.02.61	18.04.76	41	15	13	24.03.78	Yes	High peaks	12 yrs poly- worker incl 172 auto- clave cleaning Control room 11 yr		18/78 Confirmed Average exposure first 19 yrs 150 ppm, last 1000 ppm. Next 3 yrs av. 175 ppm. Last 1 yr av 35 ppm
10 (NIOSH given as Case 11)		00.00.36	2	2	01.01.61	00.01.77	40	16	10	07.03.77	Yes	High peaks	18 yrs poly- worker incl 172 auto- clave cleaning		Average exposure first 19 yrs 150 ppm, last 1000 ppm. Last yr av 175 ppm. CUM total of 21.04.78
11 (NIOSH given as Case 10)		00.00.29	8	8	10.10.55	28.06.77	47	21	22	28.06.77	Yes	High	13 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	1	PVC Manu- facture Autoclave worker incl 16 yrs		

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MPS/ASL - LAMCUCASES, 18

GERMANY
Sheet 6

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 13		00.00.14	7	7	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 "Plattenepi- thelkarzinom Der Speiseröhre" (a carcinoma of the oesophagus) not attribut- able to VCM & not recognised as an indust- rial disease				(F 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)		00.00.19	8	8	19.10.55	09.10.78	49	25	25	23.10.78	Yes	1	Autoclave (cleaner and worker, Drier operator, later shift leader		Angiosarcoma (confirmed 10/79. Some detail of this is also given 19, 13, 15, 16 16 17 given in NIOSH Report for 1978)
16		00.00.21	4	4	10.01.55	07.08.78 (Leibach suspected ASL at Feb 1975 (liverotomy))	55	23	10	07.08.78	Yes (ASL and Hepatocellular Carcinoma)	High	Autoclave (worker till 1964, Leader and master		Angiosarcoma (confirmed, full details of illness given March 1977 given in NIOSH Med Insp Rep for 1978. Different details given in "VC Associated Illnesses" by Leibach and Maretzler (1981) (2).

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GERMANY
Sheet 3

LIVER Angiosarcoma (Liver) - (Review Date: 1 Jan 1988)

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	26.08.78	Yes	High	Autoclave worker	No	(Angiosarcoma confirmed. (Annual report of the North Rhine (Westphalia (Medical (Inspectorate for 1978 (pages 141-177 (gives full (details. Vinyl (chloride (disease (diagnosed (07-02-73). (Omnophagous (varices. (Radiologically (confirmed as (metastasis.
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	11.01.80	Yes (Metastasing (ASL	High	Autoclave (Worker		(Dr. Busche (letter of (11-04-82 to (Dr W G F Adams
20		00.00.13	4	4	14.02.61	00.04.80	65	19	11	19.10.80	Yes (Haemangio (Endothelioma (of liver with (Metastases	High	Autoclave (Worker		(Dr. Busche (letter of (11-04-82 to (Dr W G F Adams
21		00.00.13	4	4	01.01.62	00.09.79 (pronounced (diffuse (liver (symptoms)	66	18	11	19.06.80	Yes (Haemangio (Endothelioma (of liver with (Metastases	High	Autoclave (Worker and (washed in (drying shop		(Dr. Busche (letter of (11-04-82 to (Dr W 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. Busche (letter of (11-04-82 to (W G F Adams

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WPK/ASL - LANGUAGES, 70

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GERMANY
Sheet 8

LIVER Angiosarcoma Cases (Rev Date: 1 Jan 1988)

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
GERMANY 23		00.00.27	B	B	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	B	B	1969	11.10.82	54	13	12	28.05.87	Yes	High (~300 ppm)	Autoclave Cleaner		Prof Eder (Munich) letter 22.08.83. Friedel letter 19.04.85.
25		00.00.29	B	B	1960	28.09.81	58	21	13	14.01.85	Yes	High	Polyclave Worker and Autoclave Cleaner		Prof Seelzer (Munich) letter 22.08.83. Friedel letter 19.04.85
26		00.00.23	2	2	1953	14.06.76	54	22	22	22.11.82	Yes	High	Polyworker		Chronic hepatitis, angiolipoma, sinusoidal ectasia. Friedel letter 23.12.86.
27		00.00.28	4	4	1955	18.01.85	55	28	18	02.03.84	Yes	High	Autoclave Cleaner (111) 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) 1-31.03.84 (PVC product- ion, agitator area).		Annual VCN screening 24.04.85: no complaint, no abnormality detected. 1970 two-thirds gastroctomy for ulcers. 1971 Coronary thrombosis 1980 Femoral implantation 1984 Pulmonary embolism and pleurapneumonia. Henderson letters 18.09.85 and 04.02.87.
29		00.00.22	2	2	1962	15.02.85	61	21	19	15.02.84	Yes	High	Chemistry Worker		Hemangiosarcoma. 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 loader		Hemangiosarcoma. Friedel letter 23.12.86.
31		00.00.23	B	B	1953	10.06.85	61	32	20	Active		?	Autoclave Cleaner		Hemangiosarcoma. Friedel letter 23.12.86.
32		00.00.30	B	B	1955	00.04.85	55	30	21	Active		?	Polyworker Autoclave Cleaner		Hemangiosarcoma. Friedel letter 23.12.86.

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WFE/ABL - LAMIOCASB, 71

ITALY
Sheet 1

LIVER Angiosarcoma Cases - (Review Date: 1 Jan 1988)

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 HIGHN supple- mentary list)	LD	15.06.34	PANSAC	Mira Verice	00.00.65	19.04.71	36	06	01	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	14.03.28	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	FS	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 (CHIAPPINO at 28 yrs - (Autoclave operator & other duties) (in suspen- (ion polymer- ization. (Area Foreman) (in same Dept) (since 1975.	(Never cleaned autoclaves. (See paper by (CHIAPPINO et (al) Med Lavore (Vol 6 (1982) (pp 555-563 (alcohol. No (AOL.	**
05	U Donesin	19.03.37	PANSAC	Mira Verice	(N), (M), 67	07.03.83	46	16	8	06.04.83	Yes	Medium-H High	Bag extruder (1967-1975 (Commercial (Dept 1976- (1983)		13 Paglia- Lunga taken at (2 Aug 1983)

* See M. J. Med di Lavore 23 p445, 1974. Further details in letter from Dr Montedison of on April 1st 1982.

** Also see Altini and Rondinella in Acta Oncologica Vol 1 1980 pages 35 - 49.

ITALY
Sheet 2

LIVER Angiosarcoma Cases - (Review Date: 1 Jan 1988)

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															
06	CZ	21.06.36	Montedison	Porto Marghera, Venice	01.10.60	06.12.85	49	25	25	13.02.86	Yes	High 1960-71 Medium 1971-74 Low 1975-85	PVC manifecture 11 years as Autodiave cleaner 1960-71. 14 years in Control Room 1971-85		Letters from Dr Chiossini, Venice, 22.09.87 and 11.01.88

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WPX/ASL - LANGUOCARES, 73

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JAPAN

LIVER Angiosarcoma Case - (Review Date: 1 Jan 1988)

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	(Tanu) Marl	01.08.22	Mitsui Toatsu	Nagoya	00.04.53	24.10.75	33	22	13	24.10.75	Yes	PVC Assoc says not known. In 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 then ill health		Japan Times (25.10.75 & Japanese PVC Assoc letters of 31.07.76 & 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- isation work including autoclave cleaning		Japanese PVC Association letters of (31.07.76 & 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)

* In his letter of 1st April 1982, Dr Montauant of IARC says Japanese Ministry of Labour give

Date of diagnosis - 21-08-74

Age at diagnosis - 32

Years of exposure - 22

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WPI/ASL - LANGTICASES, 24

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NORWAY

LIVER Angiosarcoma Cases - (Review Date: 1 Jan 1988)

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>NORWAY</u> 01	AM	23.12.15	Norsk Hydra	Noroya	00.03.50	21.12.71	56	22	21	04.01.72	Yes	High	Foreman & Autoclave supervisor		(Confirmed by (Dr Thilo- (Evanson of NH. (At APHE Mtg of (9 June 1978 (Mr P Rangnes (stated that AM (had been a (member of a (start-up team. (VCH & PPC were (made in same (building. The (VCH was made (from acetylene

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MPX/ASL - LANGUOCASES, 23

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SWEDEN

LIVER Angiosarcoma Cases - (Review Date: 1 Jan 1988)

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	43	19	18	20.10.70	Yes		Polymerworker		
02	BL	27.11.11	Kemanord	Sundevall	00.01.45	00.08.72	61	27	27	16.08.72	Yes	High	VCM [production]		Mr Sjostin's letter of 28 March 1978 [confirms BL was a man who worked who was heavily exposed, probably even more so than is normal [reactor cleaner]
03	NE	10.06.10	Kemanord	Sundevall	00.05.47	18.01.76	55	29	21	19.03.76	Yes	High	Polymerworker		
04	JAL	16.11.14	Kemanord	Sundevall	00.00.46	12.05.77	62	31	31	12.05.77	Yes	High	1946-1950 [polymer- [reaction [worker (13 [years) & 1950- [1977 [European [19 yrs]		In first 12 [yrs of [employment had [been heavily [exposed. In [1974, liver [abnormality [and necrosis [diagnosed. [Data confirmed [in Dr B Byron [letter 18.8.77 [see 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 [defect [operator		Letter of 22nd Nov 1981 [from [Dr David Byron

* In his letter of 1st April 1982, Dr Montaudou of IARC says in Sweden's National Board of Health: "I give 20-07-70 as date of diagnosis for Case 01 and 15-05-77 for Case 02."

UK

LIVER Angiosarcoma Cases - (Review Date: 1 Jan 1988)

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	WJ	30.04.01	ICI	Millhouse	04.04.44	03.12.72 (Fox & Collier paper says: 23.12.72)	71	26	22	01.12.72 (Fox & Collier paper says: 23.12.72)	Yes	540 ppm	1944-7 VCM 1947-8 Driver 1948-81 Autoclave operator 1961-66 Driver		(see and Harry Lancet 29-06074 pages 1316-8)
02															(Dublino Fabrication team)
03	BIM	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	Millhouse	26.04.54	00.06.79	59	25	18	12.10.79	Yes	Medium- high	54-5 Bagging Plant 55-6 Vehicle Driver Plant 56-58 Autoclave worker 58-61 Chargehand Driver Plant 61-72 Foreman C 2/3 Plant	Pre-war fish packer 1938-45 army vehicle maintenance 1945-51 fish packer	

R&S 001734

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 1952-53 Latus 1955-60 Polyflour 1960-64 Poly Chargeman 1964-70 Charging operator 1970-72 Orler operator		
06	CEP	1931	BP	Barry	1962	09.01.80	48/9	18	12	09.01.80			17 yrs Poly Flour Operator 15 yrs Crescent on Poly Flour Polycleaner		
07	RCS	26.04.20	BP	Barry	1963	00.00.80	60	17	8.7	11.06.80			1963-5 Recovery 1965-1971		
08	LYN	08.05.24	BP	Barry	19.09.50	27.11.81	57	31	24	25.12.81		1950-1958 300 ppm 1960-1974 200 ppm	1950-51 Autoclave operator 1951-1957 Chargeman Autoclave building 1957-1974 Shift Superviser Autoclave building - Haver cleaned Autoclaves Shift Supervisor's Job entitled entering Autoclaves to inspect them	1958-1968 Motor Mechanic 1968-1970 Operator on Acetylene Production Plant	

UK

Sheet 3

LIVER Angiosarcoma Cases - (Review Date: 1 Jan 1988)

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	EIGP	07.03.25	BP	Barry	15.02.50	02.03.83	58	33	29	24.02.83	Yes	Medium	Polymarker	12 years on Acrylonitrile Beata Plant. Also prior to 1950. 4 years RAF maintenance. 13 years motor car paintshop. 12 years in Craving Dock.	
10	CJT	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. Spray-drier bagger 1967- 68. Blow-down stripper operator 1968-70.	Heavy goods vehicle driver until final illness. 18.04.84 from Dr B N J Williams	Information given in letter 18.04.84 from Dr B N 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 1968-69. Poly operator 1969-79. Loading Hand 1979-82.	- Letter of 04.06.85 Dr Paul Smith and letter of 04.06.85 Dr B N J Evans Oesophageal haemorrhage due to oesophageal varices due to Angiosarcoma of liver	
12	IT	24.01.37	ICI	Hillhouse	16.09.57	07.06.85	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 L Lee	

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ICI CHEMICALS & POLYMERS

WY/ASL2 - LANGLOCASES,8

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UK
Sheet 4

LIVER Angiosarcoma Cases - (Review Date : 1 January 1988)

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	03.03.48	BP	Barry	1968	Jan 86	37	18	3	02.06.86	Yes	High Low High	Polycleaner (1966-69 (Central (Bopal (1969-70 (Polyfleur (1970-1971	Moved to (Acrylonitrile (Plant until (left BP 1983). (Manager of (IC & 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	Alive	Yes	10 months (High (1966-67 10 years (Polyfleur (constant (rather at times (Medium (but on (inter- (mittent (jobs	Polycleaner (1966-67 Polyfleur (constant (rather at times (Medium (but on (1968-1983	Letters from Dr DMD Evans, (Pathologist, Penarth, Wales (and Dr DMJ Williams, BP, Barry	

ICI CHEMICALS & POLYMERS

WPX/ASL - LANGHANS, 29

USA

LIVER Angiosarcoma Cases - (Review Date: 1 Jan 1988)

UK system of dates
DAY - MONTH - YEAR

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
USA															
01	Earl Parke	17.10.23	BFG	Louis- ville	09.12.48	03.03.73	49	24	21	01.03.73	Yes		Pat Cleaner (Black Book 1974) p 53	History given (in Annals NY ACAD SCIENCES Vol 129 (1979) page 190 in Paper by B R Cottine of OSMA	Rolling Stone Art Ref 1 NY Acad of Sc Symp 1974 Also Black Book 1.7.74 p 53
02		19.08.33	BFG	Louis- ville	15.11.55	00.05.70	37	14	13	27.09.71 (HISOM says 28.09.71)	Yes		Pat Cleaner (CI Black)		Ref 1 Also Black Book 1.7.74 p 53
03	Edward Dinviddie	25.03.15	BFG	Louis- ville	28.11.45	19.12.73	38	28	28	19.12.73	Yes		Pat Cleaner (CI Black)	Louisville Courier (Journal 02-09-80)	Ref 1 Also Black
04		15.01.24	BFG	Louis- ville	06.07.52	19.08.67	43	15	15	07.01.68	Yes		Pat Cleaner (CI Black)		Ref 1 Also Black
05		25.01.12	BFG	Louis- ville	19.06.44	09.04.64	52	20	20	09.04.64	Yes		Pat Cleaner (CI Black)		Ref 1 Also Black
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 Pat Cleaner (CI Black)		Ref 1 Louisville Times 23.7.75 Retired April 1974 Also Black
07	Charles T Smart	03.05.22	UCC	St Charles- ton	27.08.44	00.00.68	45	24	17	23.03.68	Yes				Ref 1
08		04.05.20	Goodyear	Niagara	07.10.46	00.08.61	41	15	15	29.08.61	Yes				Ref 1

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WPK/ASL 2 - LANGIACASES,1

USA
Sheet 3

LIVER Angiosarcoma Cases - (Review Date: 1 Jan 1988)

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 CASEH HIGHLIGHTS	OTHER COMMENTS
USA															
09	Raymond Cottle- Finger?	08.11.31	BFG	Louis- ville	28.03.43	01.03.74	43	29	24	11.03.75	Yes	2000 ppm			[Ref 1 has wrong figures for first exposure. [Louisville Times 29.10.74, 12.3.75, 10.3.76
10		16.08.13	Goodyear	Niagara	12.06.51	00.03.68	55	17	17	10.03.68	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	Pirastone	Pottstown Pa	13.07.49	02.05.69	50	20	19	02.05.69	Yes	[High 10 yrs [10 yrs as [reactor op. [Service op. [not cleaner] [Bagger [separate] [Dryer op. [crew cleaned] [Stripping op. [autoclaves] [3 yrs prior [service in [tyre plant	[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 Sewell [of MCA	
13	Richard Edward Clendenin	01.12.21	UCC	8 Charle- ston	11.12.42	00.05.74	52	32	26	07.06.74	Yes	2000 ppm			[Charleston [Daily Mail [21.7.75
14															[Never diag- [nosed as ang- [iosarcoma of [liver. Informa- [tion given in [letter 22 May [1984 from [J A Selig.
15															[Accountant; [ASL - No evi- [dence of VGN [exposure.

ICI CHEMICALS & POLYMERS

WPH/ABL_2 - LANGUAGES,2

USA

LIVER Angiosarcoma Cases - (Review Date: 1 Jan 1988)

UK System of dates
DAY - MONTH - YEAR

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
USA															
16	James Howard	04.11.27	BFG	Louis- ville	08.05.50	00.00.69	41	19	04	27.03.69	Yes		1951-4 VCM polymer- ization	From 1954 forward in Army and other service, 146-50 Army	Table 4 in Magoner Testimony to US Senate Confirmed in M H Johnson 11/07.08.78
17	Peerenboom	06.05.31	BFG	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 H Johnson letter of 24.2.81 con- firmed death 16 years after diagnosis
18	Charlie Arthur	22.04.28	BFG	Avon Lake	15.09.54	00.00.75	46	21	13	02.11.75	Yes	13 yrs autoclave 18 yrs on Ethyl plasticizer (6 Carbasol operation	Navy Tyre Store		Confirmed in M H Johnson 11/07.08.78 Also Bulling Stone mag. 15.01.76
19	Virgil Christian	00.00.15	UCC	8 Charle- ston	00.00.43	19.06.75	60	32	32	06.04.76	Yes	2000 ppm			Militiaman San Carotte (21 June 1975) Charleston Daily Mail (21.7.75)
20		31.08.17	Cooley	Niagara	00.00.55	30.01.76	58	21	18	30.01.76	Yes				MHJH letter 10/25.10.79
21	Chester Ninkto	02.09.09	UCC	8 Charle- ston	00.12.46	Early 77	63	30	22	02.01.77	Yes				(28 yrs with UCC) at SC Bullied News release (23.2.77)

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WPE/ASL_2 - LAMINICASES,3

USA
Sheet 4

LIVER Angiosarcoma Cases - (Review Date: 1 Jan 1988)

IM 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	APC	Louis- ville	11.07.47	00.01.76	52	29	28	04.12.76	Yes				Louisville Times 26.1.76 said he was the 18th AS victim at Bell's Lane of whom 8 had died by 26.1.76 in his letter of 16.09.81 Dr H N Johnson confirm this is the case described by Gannacher Tanburro & Yan in Feb 1980 Am J Medicine Vol 70 p200
23		00.00.21	Great American Chemical Company	Pittsburg Mass.	08.08.38	06.04.73	50	15	14	06.04.73	Yes				
24	Charles Edward Moore	17.05.17	UCC	Charle- ston	1939	17.05.77	60	38	24 (NIOSH says 26)	17.05.77	Cholangio- sarcoma (R Kaminaki 26/2/79)	Medium to high for 24 yrs	1941-45 non- solvent 1945-47 vinyl resin unit and disposition have been vinyl resin unit first reactor fan filter helper, then shift utility man 1941-45 non- solvent 1945-47 vinyl resin unit and disposition have been vinyl resin unit first reactor fan filter helper, then shift utility man 1941-45 non- solvent 1945-47 vinyl resin unit and disposition have been vinyl resin unit first reactor fan filter helper, then shift utility man	1937-39 was self and an labourer 1939-41 may have been disposition 1941-45 non- solvent 1945-47 vinyl resin unit and disposition have been vinyl resin unit first reactor fan filter helper, then shift utility man 1941-45 non- solvent 1945-47 vinyl resin unit and disposition have been vinyl resin unit first reactor fan filter helper, then shift utility man	Dr H Wheeler letter of 18.0.77 to J Stelfox given details Rene Kaminaki letter of 26/2/79 R Kaminaki 15 Nov 1980 suggests that NIOSH will retain an regulator since employment was terminated may be associ- ated with ASL
(25)															Dr H Wheeler letter of 20/2/79 and Rene Kaminaki letter of 27/79 and 2/11/80

Removal from register confirmed in R Kaminaki letter of 5 November 1985

USA

Sheet 5

LIVER Angiosarcoma Cases - (Review Date: 1 Jan 1988)

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	BPD	Louisville	05.10.47	01.10.77 (up to 2 years after death)	52 (death)	28 (death)	18	11.02.75	Yes	Exposed to some degree to 22 chemicals that were exposed from 1940 to 1945, PVC charging probably operator to high charging. 111 August 1965. Terminated employment Jan 1968	Various jobs in PVC plants from cold room to plant recovery to PVC charging operator to plant charging. 111 August 1965. Terminated employment Jan 1968		R Kaminohi letter of 26/2/79 and Prof. Tombarro letter of 19/1/79
27	J L Turrent	11.05.18	UCC	Charleston	01.07.41	30.11.78	62	37	20 (HIGH says 27 and C Daily Mail (25))	25.11.78	Yes	High	Operator to 10.10.76	Exposure in bulk and disposition PVC manufacture	R H Wheeler letter of 4 Jan 1979 and Charleston Daily Mail (30.11.78 and R Kaminohi 26/2/79)
28		11.06.17	UCC	Charleston	00.08.44	03.11.78	61	34	33	03.11.78	Yes				R Kaminohi letter of 16/4/79
29		12.10.07	UCC	Charleston	00.05.42	00.03.80	72	38	16	01.03.80	Yes				R Kaminohi letters of 19th June 1980 14 2th Nov 1980
30	WVH	22.07.22	Fenneco Chemicals	Flemington	11.06.64	30.12.80	58	17	15	30.12.80	Yes	16 - Unknown 19 - Minimal	Maintenance Mechanic 16 yrs 18 months 15 yrs 16000 hours Operator 19 yrs		
31		08.11.23	UCC	Charleston	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 1942 and may have been	From 1938 to 1976 Aliphatic Chemicals operator and operator and from July 1976 to date Foreman Aliphatic Chemical operation	Dr Boney letter 16.10.81 and R H Wheeler letter of 19.11.81. Also Dr Boney letter of 07.03.81 re date of death.	

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ICI CHEMICALS & POLYMERS

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USA
Sheet 6

LIVER Angiosarcoma Cases - (Review Date: 1 Jan 1988)

UK system of dates
DAY - MONTH - YEAR

MPX/ASL_2 - LAMCLOCASES.5

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	Monanto	Springfield Mass	15-10-51	00-07-79	71	28	34 (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 "hitter" (operator) in and "chemicals (autoclaves industry".	1940-1951 Various jobs in polymer manufacture BUTVAR LUSTREX 1951-1964 Various jobs in and "chemicals (autoclaves industry". 1964-1972 Various (clerical jobs in PVC polymerisation facility/ Retired 01-07-71.		Information given in letter of 24 February 1982 from Dr Walter C Barnes of Monanto Springfield to Dr A Mann of Monanto 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.		Paul Tombarra letter of 12 Aug 1982 + Dr M H Johnson letter of 20 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 H Johnson letter of 13 Nov 1982, 20 Feb 1983 and 9 Aug 1984.
US 35		09-03-12	UCC	S Charlie- ston	23-07-44	18-07-81	71	39	14	18-07-81	Yes	High from 1944 to 1955. Medium from 1955-1958			Mr Bucy letter of 15 Sept 1981.
US 36		27-08-32	The General Tire and Rubber Co	Ashland Ohio	11-06-56	21-08-81	50	27	27	Alive	Yes	Moderate	1956-56 labourer 1956-57 prod helper 1957-70 operator 1970-75 substation 1975-present operator		Mr W Loundrie letter of 12 Sept 1983; submitted as medical May 1981, setting announced May 1981

LIVER Antagonism Cases - (Review Date) 1 January 1960)

UK system of dates
DAY - MONTH - YEAR

1	2	3	4	5	6	7	8	9	10	11		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	YEARS OF EXPOSURE	DATE OF DEATH	HISTO-LOGICAL CONFIRMATION	ESTIMATED EXPOSURE LEVEL	OCCUPATION	OTHER CAREER HIGHLIGHTS	UTHER COMMENTS
USA 37	Mr J Payton	29.08.29	BFG	Louisville	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 N Johnson
38	JWS	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 before as well as charging operator.		Thrombo cytopenia and leukopenia since June 1978. Cold treatment for arthritis 1978. 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 Hemick	27.06.18	Pantacote	Pasadena	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 (line Jul bathhouse) Sep 67 Reactor Operator Sep 70-82 Monomer Operator 1982-1984 Mill Operator Calendar Shop, until 1984	(Worked before 1960 with US Air Force, United Steel Dyers and Washers) (Letter of 15.07.86 from John E Kriel of Pantacote with letter of 24.02.86 from Dr Amerbach, Pathologist.)	

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VPI/ASL2 - LAMUCASES, J

USA
Sheet 8

LIVER Angiosarcoma Cases - (Review Date) 1 January 1988

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 40	P P Gilmer	26.10.14	BFG	Louis- ville	22.05.42	1987	72	45	34	03.01.87	Yes	High (1942-1974) Low (1975-1978)	Chemical Worker (1942-45) Foreman (1945-76)		Letter from Dr Dietz, BFG, 10.3.87
41	A Buckley	2 1915	Goodyear	Niagara	late 1940's	1987	72	1 40+	1 30 approx	Alive	Yes				Letter from Prof Tenburge University of Louisville

YUGOSLAVIA

LIVER Angiosarcoma Cases - (Review Date: 1 Jan 1988)

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
<u>YUGOSLAVIA</u>															
01		05.04.14	Jugo Vinil	Spilic	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	Spilic	00.00.50	12.07.73	42	23	18	12.07.73	Yes*		VCM Production		*In his letter of 3 Oct 1978, Dr Spilic of NIDOSH changed the status of Case 02 to VCM production employee. Dr Spilic also notified a new Case 03 also a VCM production worker.
04		11.06.30	Jugo Vinil	Spilic	15.12.58	03.09.78	48	20	18	03.09.78	Yes				[Bose Kaminski letter of 19 June 1980] and [IARC letter of 1 April 1982]

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(Review Date - 1 Jan 1988)

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TABLE 1

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	3
7	1

Total 129

N.B. 1 Does not include Italian 01 but does include German 03.

2 The 1977 total includes US case 24 which is a Cholangiocarcinoma.

3 Does not include the following who are still alive, so far as known: Cn011, Pr15 & 22, G31 & 32, HK14, US33, 15 & 41.

Distribution of ASL Cases by Country

USA	38 ***
W Germany	31 ** ***
France	22 ***
UK	13 ***
Canada	12 ***
Sweden	5 ****
Italy	5 *
Yugoslavia	4 *****
Japan	3
Czechoslovakia	2
Belgium	2
Norway	1
Total	138

* Omit It01 - atypical case of PVC bag extruder.

** Includes G03 aerosol can filler.

*** Includes case US 24 which was diagnosed as Cholangiosarcoma; & Can11, Fr15 & 22, G31 & 32, UK14, US33, 36 & 41, who are still alive, so far as known.

**** Includes one monomer worker.

***** Includes two monomer workers.

i.e Western Europe	79
North America	50
Rest of World	9

Total 138

R&S 001748

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

Of the 79 cases in W Europe, 68 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	10
Wacker, Burghausen, Germany	9
Atochem (formerly Chloa Chimie, formerly RP), St Fons, France	8
PCUK, Brignoud, France	7
Kemanord, Sundevall, Sweden	5
CWH, Marl, Germany	4
ICI, Hillhouse, UK	3
Solvay, Tavaux, France	3
Lonza, Waldshut, Germany	3
Solvay, Jemeppe, Belgium	2
Atochem, St Auban, France	2
	<u>68</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 50 cases in N America, 42 have occurred at four factories out of a total of 55 factories. In N America 43 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; 12 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	22	574	26.09 *	
	Germany	31	632	20.38 *	
	Italy	5	99	19.8	
	Norway	1	22	22	
	Sweden	5	122	24.5	
	UK	<u>13</u> <u>79</u>	<u>293</u> <u>1777</u>	<u>22.53</u> *	W Europe Average
				<u>22.49</u>	
<u>N America</u>	US	37	955	25.81 *	
	Canada	<u>10</u> <u>47</u>	<u>205</u> <u>1160</u>	<u>20.5</u> *	N America Average
				<u>24.68</u>	
<u>Rest of World</u>	Czechoslovakia	2	30	15.0	
	Japan	3	59	19.66	
	Yugoslavia	<u>4</u> <u>9</u>	<u>85</u> <u>174</u>	<u>21.2</u>	Rest of World Average
				<u>19.33</u>	
<u>Summary</u>	W Europe	79	1777	22.49	
	N America	47	1160	24.68	
	Rest of World	<u>9</u> <u>174</u>	<u>174</u> <u>1111</u>	<u>19.33</u>	* World Average
				<u>23.04</u>	

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

NB: Does not include Can11 or 12, or US41: details not known.

R&S 001750

(Review Date - 1 Jan 1988)

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			10	20.5
Czechoslovakia		1	1					2	15.0
France		1	4	3	8	3	3	22	26.09
Germany		5	9	10*	5	2		31	20.38
Italy			2	2	1			5	19.8
Japan			1	2				3	19.66
Norway				1				1	22
Sweden			2		2	1		5	24.5
UK	1		5	1	4	2		13	22.53
USA **		2	7	9	8	5	6	37	25.81
Yugoslavia				4				4	21.2
TOTAL **	1	12	33	37	30	13	9	135	23.04

* Includes G 03 aerosol can filler

** Does not include Can11 or 12, or US41: details not known

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	
48	1939	38*		R&S 001752
47	1940		289 = 36.12	
46	1	37,21,37,41	8	
45	2	32,38,45		
44	3	38,14,32		
	4	28,11,24,20,24,34,39	718 = 26.59	
	5	27,22,28,29	27	
	6	21,29,31,26,28,15,23,30,35		
40	7	29,24,29,28		
39	8	28,24,34		
	9	30,26,20	521 = 24.80	
	1950	26,22,31,19,23,14,33	21	
	1	19,28,17,28,34,29		
35	2	21**,15		
34	3	25,22,23,22,20,31,22,32***		
	4	21,21,25,25,21,28***,22	787 = 22.48	
	5	22,23,24,14,19,21,27,27***,24,28,30***	35	
	6	21,12,27***		
30	7	19,17,15,13,16,28		
29	8	18,18,15,17,20,29***		
	9	16,21,25,27	544 = 18.75	
	1960	13,18,21,25,24,25	29	
	1	15,16,16,16,19,19,12		
25	2	13,18,17,12,18,21		
24	3	16,17,20,21		
	4	16,17	221 = 17.0	
	5	11,19,20	13	
	6	9,18,21***		
20	7	16		
19	8	18		
	9	13	31 = 15.5	VIOLA
	1970		2	
	1			MALTONI
15	2			
14	3			GOODRICH
	4			
	TOTAL	135 CASES	3111 = 23.04	
			135	

* Cholangiosarcoma

** Aerosol can filler

*** The following are still alive, so far as known Fr15 and 22, G31 and 32, UK14, US33 and 36

NB: Does not include Can11 or 12, US41: details not known

TABLE 40

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	
48	1939		38*	
47	1940			
46	1	37,41	21,37	
45	2		32,38,45	
44	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	
40	7	29	24,29,28	
39	8	28,34	24	
	9	30,26	20	
	1950	26,22,31	19	23,14
	1	19,28,34,29,	17,28	
35	2	21**	15	
34	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	27***	
30	7	19,17,15,13,28		16
29	8	18,18,29***	15	17,20
	9	16,21,25,27,		
	1960	13,18,21,25,25	24	
	1	15,16,16,16,19,19	12	
25	2	13,18,17,18,21	12	
24	3	16,17,21	20	
	4	16	17	
	5	11,19		20
	6	9,18,21***		
20	7	16		
19	8	18		
	9	13		
	VIOLA 1970			
	1			
	2			
	MALTONI 3			
	TOTAL CASES	79	47	9

* Cholangiosarcoma

** Aerosol can filler

*** The following are still alive, so far as known Fr15 and 22, G31 and 32, UK14, US33 and 36

NB: Does not include Can11 or 12, or US41: details not known

(Review date 1 January 1988)

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 yea
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	10	20.5
S CHARLESTON USA	1939?	24,30,32,32,34,35,37,38,38,39,	10	33.99
BARRY UK	1948	9,17,18,28,31,33,18,19,18,21	10	21.20

NB: Does not include cases Can11 and 12 at Shawinigan: details not known

R&S 001764

(Review date 1 January 1988)

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	S CHARLESTON USA	BARRY UK
1939				38	
1940					
1			21	37	
2				32,38	
3			14	32	
4	20		11,24	24,34,39	
5	28,29,27		22		
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			
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					

NB: Does not include cases Can11 and 12 at Shawinigan: details not known

R&S 001755

(Review date 1 January 1988)

TABLE 4G

PLANT	START-UP DATE	LATENCY PERIOD OF ASL CASES IN SPECIFIC PLANTS(4-9 CASES)	NO OF CASES	AVERAGE PERIOD
BURCHAUSEN 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	8	31.88
BRIGNOUD FRANCE	1950	11,16,18,26,30,25,34	7	22.85
SUNDSVALL SWEDEN	1945	16,19,27,29,31	5	24.4
NIAGARA USA	1947	15,17,21,23	4	19
SPLIT YUGOSLAVIA	1950	20,20,22,23	4	21.25
MARL W GERMANY	1948	15,16,22,21	4	18.5

NB: Does not include US41 (Niagara): details not known

R&S 001756

(Review date 1 January 1988)

TABLE 4H

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

YEAR OF FIRST EXPOSURE	BURGHAUSEN W GERMANY	ST FONS FRANCE	BRIGNOUD FRANCE	SUNDSVALL SWEDEN	NIAGARA USA	SPLIT YUGO-SLAVIA	MARL W GERMANY
1939							
1940							
1		37,41					
2							
3		38					
4							
5				27*			
6		29		31	15,23		
7				29			
8		28,34					
9			26,30				
1950			34	19	17	23*	
1							
2							
3	25,32					20	22
4	21					22*	
5	22,24,30	27			21		
6		21					
7	17						
8			18			20	
9			16,25				
1960	21						
1							15,16
2							21
3							
4				16			
5			11				
6							
7							
8							
9	13						
1970							
1							
2							

*Monomer worker

NB: Does not include US41 (Niagara): details not known

WPX/ASL2 - LANGIOCASES,19

R&S 001757

(Review Date - 1 Jan 1988)

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	3			3	128	
1987		1		1	129	
TOTAL	74* **	46**	9	129		

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

** Does not include the following who are still alive, so far as known: Can11, Fr15 and 22, G31 & 32, UK14, U933, 36 & 41

R&S 001758

(Review date 1 January 1988)

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	C1	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	C4, 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		
	7		US40	
	Total	74***	46***	9

* Cholangiosarcoma

** Aerosol can filler

*** Does not include the following who are still alive, so far as known: Can11, Frl5 & 22, G31 & 32, UK14, US33, 36 & 41

(Review date 1 January 1988)

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	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, 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	US36***	
	7	Fr8, G4, It2, G2, UK12		Cz1
	8	Fr6, B1, Fr22***	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	US6	
	3	Fr13, UK7, Fr18	US38	
	4	Sw5	US30	
	5	Fr5, UK11		Jap3
	6	UK3, UK10, UK14***		
	7	It5		
	8	UK13		
	9	G24		
Viola	70			
	1			
	2			
Maltoni	3			
	Total	79	47****	19

* Cholangiosarcoma (US24)

** Aerosol can filler (G3)

*** Fr15 & 22, G31 & 32, UK14, US33 & 36 are still alive, so far as known

**** Does not include Can11 or 12, or US41: details not known

TABLE 8
WESTERN EUROPE PVC PRODUCERS - START-UP DATES vs ASL CASES (OMITTING CO3 & 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	104,07,11,15,23,24,57,54,55,53,55,69,60,53, 125,31,32	155
1938	Italy	Montecatini	Acna		
1939	France	Rhone-Poulenc/ Chloe/Atochem	St Fons	103,09,10,11,14 115,16,17	146,48,56,41,43, 155,41,48
1940	United Kingdom	ICI/EVC	Runcorn (Closed 1948)		
	United Kingdom	ICI/EVC	Hillhouse	101,04,12	144,54,57
1945	Sweden	Kemnord/Nobel	Sundsvall (Stockvik)	101,02,03,04,05	151,45,47,46,64
1946	France	Rhone-Poulenc	Roussillon	101	146
1948	United Kingdom	BP Chem/ICI/EVC	Barry	103,05,06,07,08,09, 110,11,13,14	166,51,62,63,50,50 166,65,68,66
	West Germany	OH/Huls	Marl	109,10,26,29	161,61,53,62
1949	Belgium	Solvay	Jemeppe	101,02	158,62
1950	France	PCUK/Atochem	Brignoud	102,04,05,06,12,19, 120	159,49,65,58,49,59,51
	France	Rhone-Poulenc/ Chloe/Atochem	St Auban	107,22	150,58
	Holland	Shell	Pernis, Rotterdam		
	Norway	Norsk	Herova, Porsgrunn	101	150
1951	Switzerland	Lonza/ICI/EVC	Sins		
1952	Italy	Montedison	Terni		
	Italy	Montedison/EVC	Porto Marghera	102,06	157,60
1953	Austria	Halvic/Solvay	Hallein		
	France	Solvay	Tavaux	108,13,18	157,63,63
	Italy	Solvay	Ferrara	103	153
	Spain	Rio Rodano	Hernand		
	United Kingdom	BCL/BIP/NORSK	Aycliffe		
	West Germany	Hoechst	Gerndorf	118	155
1954	West Germany	Dynalac	Troisdorf	101,02,08,12,16,17, 119,20,21,22,27,30	156,57,54,61,55,61, 154,61,62,61,55,51
1955	Spain	Monsanto Iberia	Monzon		
1956	Spain	Celquesa	Sabinadigo		
		Hispanvic/Solvay	Torrelavega		
1958	West Germany	Solvay	Rheinberg		
1960	Italy	IS C Ravenna/EVC	Ravenna	104	159
	West Germany	Lonza/BCL/EVC	Waldshut	106,13,28	162,60,60
1961	Italy	Montedison/EVC	Scindiaf		
1962	Portugal	Clus	Oporto		
1965	France	Rhone-Poulenc	Monclouon	121	159
	Italy	Pozzi	Ferrandina		
	Italy	Pensac	Mira, Venice	105	167
	West Germany	Wacker	Cologne		
1966	West Germany	Hoechst	Knapsack (Frankfurt)	105*	160
1967	France	Atochem	Balan		
	Spain	Rio Rodano	Miranda de Ebro		
	Greece	Esso Pappas	Diavata Salonika		
1968	Belgium	Bediphil	Antwerp		
1969	United Kingdom	Vinatex/Norsk	Scaveley		
	Italy	Rumicla/EVC	Cagliari Sardinia		

Continued

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	Hispanvic/Salvay	Martorell		
	Sweden	Kemnord/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

(Review date 1 January 1988)

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	107,13,19,21,24,144,42,43,46,39,127,28,29,31,35	141,44,42,46,44
	Dow	Midland (made Saran copolymer)		
1940?	*BFG	Louisville	101,02,03,04,05,106,09,16,17,22,126,33,34,37,40	148,55,45,52,44,162,45,50,55,47,147,54,55,53,42
1946	*UCC/Dow	Texas City (Partially closed 1977)		
1947	Goodyear	Niagara Falls	108,10,11,20,41	146,51,46,55,?
1948	Firestone/Occidental	Pottstown	112	149
	Uniroyal	Painesville (closed 1975)		
1950	Monsanto	Springfield (Closed 1975)	132	151
1952	Dow	Midland (No PVC since c 1975)		
	BFG	Avon Lake	118	154
1953	Diamond/BFG	Deer Park		
1954	General Tire/ DiversiTech	Ashtabula (Closed 1984. Reopened 1986 by Vvgen)	136	156
1956	Air Products	Pensacola (Pace)		
	Atlantic Refining	Brooklyn (Closed late 1960s)		
	Borden	Leominster (Closed 1984)		
	Conoco	Hebronville (Closed 1975)		
	BFG	Niagara		
	Great American	Fitchburg (Closed 1983)	123	158
	Hooker	Hicksville (Closed 1980-81)		
	Pantasote	Passaic (Closed 1984)	39	160
1957	Atlantic Tubing	Cranston (Closed 1967)		
	Tenneco/Occidental	Flemington NJ (Closed 1985)	130	159
1958	Keysor Century	Saugus, Cal		
	Air Products	Calvert City (Paducah) (Closed March 1982 Re-opened October 1983)	38	163
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	Delaware City		
	Gulf			
	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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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)	Shawinigan	01,02,03,04,05 06,07,08,09,10, 11,12	44,43,41,45,44, 47,46,61,46,53 ?,?
1951	Monsanto	La Salle (Closed 1975)		
1957	Goodrich	Welland (? Niagara)		
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	101,02,03,04	153,50,54,48
1951	Czechoslovakia	State Comps	Novaky	101,02	157,50
1955	East Germany	State Comps	Bitterfeldt		
1956	Rumania	State Comps	Icechim		
1957	Poland	State Comps	Osveicim (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	Vinilplastica	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	Kanbara		
	Toa Gosei	Tckushima		
1955	Ryo-Nichi	Uozu		
1956	Nippon Zeon	Takosaka		
	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	Havatsuki		
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	Mendez (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 1988)

TABLE 14
AUSTRALASIAN PVC PRODUCERS
START-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 15
MIDDLE EASTERN PVC PRODUCERS
START-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

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[illegible]