

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

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REGISTER OF CASES OF ANGIOSARCOMA OF THE LIVER DUE TO EXPOSURE TO VINYL CHLORIDE - REVIEW DATE 1 JANUARY 1987

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

1. The 10 new cases in the Register are the following: France 19, 20, 21; Germany 28, 29, 30, 31, 32; UK 13; USA 39.
2. There are amendments from the previous Register against the following cases: France 15; Germany 23, 26.
3. I would like to thank the following for informing me of new cases - Dr Contassot, Dr Barrat, Dr Landers, Dr Friedel, Dr Williams and Mr John E Ertel.
4. For the case corrections I thank Dr Contassot and Dr Friedel.
5. For other corrections and information thanks to Mr John T Bark, Mr John E Ertel, Mr R T Gottesman, Mr A King and Mr N A Sulaiman.
6. I should be very grateful if all recipients of the Register could continue to keep me fully informed of any new cases or, if they hear of other Companies who have acquired a case of ASL, it would be much appreciated if I could be notified by the appropriate person. It is very helpful if new information is supplied in tabulated form, using the headings in the Register as far as possible. For this purpose I have added a blank form at the back of the Register.
7. I would also be glad of help to keep the mailing list correct, with news of retirements and successors, etc.
8. Research: (a) I am enclosing a letter which explains a research project in which I and Professor Carlo Tamburro hope you will be able to co-operate in the interest of knowledge.
(b) I shall be very grateful if all individuals involved in research or surveys could keep me informed and if possible send me copies when they become available.

From: Dr Brian Bennett
Occupational Health Department
ICI Chemicals & Polymers Group
Hillhouse Site
P O Box 4 Thornton-Cleveleys
Blackpool FY5 4QD England

February 1987

R&S 039850

LIVER ANGIOSARCOMA CASES (REVIEW DATE - 1 JANUARY 1987)Index

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LIVER Angiosarcoma Cases - (Review Date : 1 January 1987)

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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>BELGIUM</u>															
01		12.01.13	Solvay	Jemeppe	00.07.38	00.05.76	63	18	17	29.06.76	Yes	High 14 yrs 1958-1968 exposed to 200 ppm for 8 hrs per day and certainly under 500 ppm in 6 to 9m autoclaves 1968-1972 exposed to 50-200 ppm 8 hrs per day in 25m 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. & chem- ical industry	Driller in a foundry (2 yrs) Former (15 yrs) Work in glass ind. & chem- ical 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 9 mths.	Fireman since 10 71.	1st sign July 79: Thoracic pain 07.79. Hepatic tests altered 10.79. Positive echography 11.79. Hepa- tectomy 02.80. Chemotherapy. Information given in letter 12 Nov 1984 from Dr de Sluiter.

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All dates use UK system
DAY - MONTH - YEAR

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CANADA
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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
CANADA			SHAWINIGAN												
01		15.12.13			1944	1955	41	11	11	02.09.55	Yes		Reactor cleaner	Operator polymerisation	Smoker
02		06.01.14			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	14.09.74	Yes		Furnace op. pipefitter maintenance		Worked overtime Smoker

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

DAY - MONTH - YEAR
All dates use UK system

WPX/ASL - LANC10CAST.S.B

LIVER Angiosarcoma Cases - (Review Date: 1 Jan 1987)

[illegible]

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ČZS CHOSLOVAKIA

LIVER Angiosarcoma Cases - (Review Date: 1 Jan 87)

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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
CZECHOSLO- VAKIA															
01		28.06.28	State Co	Novsky	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	Novsky	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 NTOSH.	

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FRANCE
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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
FRANCE															
01	HM	15.04.24	RP	Rouss- illon	00.01.46	18.02.67	43	21	19	19.02.67	Yes	High	Autoclave worker and cleaner 19 yrs		Ref. Ravier et al Arch. Mal. Prof. 1 30 n° 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. Rety et al Arch. Mal. Prof. 1 37 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 18 yrs PVC filtration 18 yrs		
05	B	29.01.38	PCUK	Brignoud	18.01.65	13.05.76	38	11	11	13.05.76	Yes	High	Polyworker 11 yrs	(1)Thoracotomy 19th Feb 1976 local angiosarcoma (2)Scintigraphy found ASL (3)Haemorrhage from ASL (4)Right Hepatectomy	Ref. P Condere et al "Semaine des hopitaux 110 Septembre 1976 Previously had bone angiosarcoma" Also Plichowski et al "La Nouvelle Presse Medicale" 17th July 1979 Page 2485

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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	13	11.09.76 (NASH says 12.09.76)	Yes	Moderate	(1958-1960) 12 yrs filtration 10-11 yrs polyworker and worker lab?		This man had AOL prior to AS. Ann. de Mal. Prof. July '77 p 645 & 6. AOL was found in 1971 five yrs before ASL.
07	GIR	26.04.27	RP	St Auban	01.07.50	After death NIOSH says 00.07.76	49	26	22	02.07.76	Yes (NIOSH no comment)	High	Plant fore- man in polymer- isation	1972-6 admin section in St Auban	Died of leptiraemia Small liver lesion found after autopsy
08	B	01.04.34	Solvay	Tavaux	23.05.57	03.12.75	42	19	19	30.01.77	Yes	Moderate	16 yrs packer & autoclave clnr 14 yrs autoclave worker		Had been tunnel worker previously
09	ERFX	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, aut :lave maintenance	10 yrs in sulphuric acid factory, storekeeper general servi:za	Operated 4.7h for removal of tumour from liver and died after second surgical operation for bilio bronchial fistula Paper by Dr Rety et al in Archives de Maladies Professionals Vol 40 No 6 1979 pages 741-7.

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LIVER Angiosarcoma Cases - (Review Date: 1 Jan 1987)

FRANCE
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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
France															
10	VP	24.05.19	RP	St Fons	00.12.56	10.01.78	58	21	21	10.01.78	Yes	High	Autoclave (cleaner)	10 yrs in mechanical engineering industry 1946-1956	Died of pulmonary embolism 5 days after surgery
11	L	15.02.12	RP	St Fons	00.01.41	12.08.78	66	37	31	15.11.78	Yes	High	1941-1946 (polymer- isation general purpose worker) 1946-1972 (VCM synthesis (HCl & Acetylene) Foreman (agent de maintenance) 1972 retired		
12		16.08.14	PCUK	Brignoud	09.02.49	00.05.79	65	30	27	23.06.79	Yes	High	Monomer (production and polymer- isation operator		
13		19.01.31	Solvay	Tavaux	23.09.63	26.06.79	40	16	13	22.08.79	Yes		Autocleaner (2 yrs, Auto- operator (10 yrs as operator (Copol) aero (4 yrs	2 yrs as cycle mechanic. (1974, till all of 1977 due to sanitary ware manufacture varices, Surgical intervention 25.05.79 (right hepatectomy)	Cigarette smoker until 1974, till all of 1977 due to Oesophageal varices, Surgical intervention 25.05.79 (right hepatectomy)
14	MI	05-04-24	Chloe Châte (Formerly RP)	St Fons	1943	00.07.81	57	38	36	29.07.81	Yes	Very High	1943-1975 1943-1975 (All types of maintenance and jobs on Intermittent entirely 1975-1979 in VCM Poly Process	1943-1975 1975-1979 (All types of maintenance work manufacture & maintenance in VCM Poly Process	

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LIVER Angiosarcoma Cases - (Review Date: 1 Jan 1987)

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 17 yrs	Autoclave cleaner 1955-1962 autoclave operator 1962-1982		J C Contassot Letter of 15 10 1983
16	GIM	13.07.22	Chloe Chimie (formerly RP)	St Fons	17.10.41	05.01.83	61	41	38	03.04.83	Yes	High-33 yrs Moderate- Low - 5 yrs	Polymerizat- 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 19 8-1971	Other sectors of St Fons Factory 1971- 1978	Retired 01.01.79 J C Contassot Letter of 15 10 1983
18	IR	14.07.42	Solvay	Tavaux	09.09.63	21.03.84	42	21	21	27.12.84	21.03.84	High-12 yrs Low - 9 yrs	Autoclave Cleaner		09.03.84 Right Hepatectomy 05.05.84- 24.09.84 chemotherapy for lung- metastasis : partial remission. 08.84 - liver recurrence. 10.84 - lung: evolution of the disease

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LIVER Angiosarcoma Cases - (Review Date: 1 Jan 1987)

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	HAZ	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	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	RP	SEP 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 Barrat 18.07.86.

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GERMANY
Sheet 1

LIVER Angiosarcoma Cases - (Review Date: 1 Jan 1987)

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 can with VC		Reported under (non polymer- isation workers in NIOSH list of 31.3.77. This of course is strictly correct. However I wonder whether this man had high exposure to VCM in his can filling operation?
04		00.00.30	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 for 1 yr	1958 was autocleaner	Clinical details in (paper by Cokel et al Virchows Arch A Path 1976 172 p 195-201)

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LIVER Angiosarcoma Cases - (Review Date: 1 Jan 1987)

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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
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 131.1.77 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	?	

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LIVER Angiosarcoma Cases - (Review Date: 1 Jan 1987)

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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
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 |1 yr		10/78 |Confirmed |Average |exposure first |9 yrs 150 ppm, |occ 1000 ppm, |Next 3 yrs av, |75 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- |work: incl |172 auto- |clave |cleaning		|Average |exposure first |9 yrs 150 ppm, |occ 1000 ppm, |Last yr av |75 ppm. CMI |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	13 yrs auto- |clave |cleaner |19 yrs |filter |operator		
12		00.00.38	4	4	00.00.61	00.10.77	39	16	6	01.7.77	Yes	1	PVC Manu- facture Autoclave worker for 6 yrs		

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LIVER Angiosarcoma Cases - (Review Date: 1 Jan 1987)

MPX/ASL - LANGLOCASES, LR

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 AGNOSIS	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 30th June 1986 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- theliarkarzinom (Der Speiserohre" (a carcinoma of the oesophagus) not attribut- able to VCM & not recognised as an indust- rial disease				F W Best letter of 30th 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	18.10.53	09.10.78	49	25	25	23.10.78	Yes	†	Autoclave cleaner and worker. Drier operator. Later shift leader		Angiosarcoma confirmed 10/79. Some detail of this & also cases 19, 17, 15, 16 & 17 given in INRW 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 1977 given in INRW Med Insp Rep for 1978. Different details given in "VC Associated Disease" by Leibach and Harstetter (1981) p21.

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LIVER Angiosarcoma Cases - (Review Date: 1 Jan 1987)

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>GERMANY</u>															
17 (NIOSH given as Case 15)		100.00.37	A	A	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 347-377 (gives full details. Vinyl chloride disease (diagnosed (02-02-73). (Oesophageal varices. (Radiologically confirmed aro osteolytic.
18		100.00.13	S	S	00.00.55	25.12.79	66	24	21	25.12.79	Yes		Autoclave Worker		
19		100.00.25	A	A	18.10.54	00.08.79	54	25	18	22.12.80	Yes (Metastasing ASL)	High	Autoclave Worker		Dr Besche letter of 13-04-82 to Dr W G F Adams
20		100.00.15	A	A	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 13-04-82 to Dr W G F Adams
21		100.00.13	A	A	01.01.62	00.04.79 (pronounced clinical liver syndrome)	5	18	13	19.05.80	Yes (Haemangio Endothelioma of liver with Metastases	High	Autoclave Worker and worked in drying shop		Dr Besche letter of 13-04-82 to Dr W G F Adams
22		100.00.21	A	A	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 13-04-82 to Dr W G F Adams

GERMANY
Sheet 6

LIVER Angiosarcoma Cases (Rev Date: 1 Jan 19)

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		100.00.27	8	8	1955	26.03.79	54	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		100.00.28	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		100.00.23	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		100.00.22	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		100.00.28	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	23	25.08.85	Yes	High	Process worker 1947- 1984 (01.10.60 -31.03.84 PVC product- ion, agitator tanks).		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		100.00.22	2	2	1962	15.02.83	61	21	19	15.02.84	Yes	High	Chemistry worker		Haemangiosarcoma. Friedel letter 23.12.86.
30		100.00.17	4	4	1951	07.01.80	62	29	25	25.05.83	Yes	High	Polyworker (Shift leader)		Haemangiosarcoma. Friedel letter 23.12.86.
31		100.00.23	8	8	1953	30.06.85	61	32	20	Alive		?	Autoclave Cleaner		Haemangiosarcoma. Friedel letter 23.12.86.
32		100.00.30	8	8	1955	00.04.85	55	30	21	Alive		?	Polyworker Autoclave		Haemangiosarcoma. Friedel letter 23.12.86.

R&S 039866

ITALY

LIVER Angiosarcoma Cases - (Review Date: 1 Jan 1987)

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)	LG	15.06.34	PANSAC	Mira Venice	00.00.65	19.04.71	36	06	03	16.04.71	Yes		PVC Bag test. Jder		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	VG	14.03.20	Solvay	Ferrara	00.01.53	10.07.75	55	22	21	10.07.75	Yes	High	Autocleaner 18 yrs (1953- 61) Autoclave operator 12 yrs (1961- 72)	1972-5 did a variety of jobs including PVC packing.	**	
04	FB	20.07.37	ANIC	Ravenna	00.04.59	00.01.81	43	21	21	30.03.81	Yes	12 yrs - Very High 5 yrs - Medium 4 yrs - Low	11 yr - Monomer operator 20 yrs - Autoclave operator & other duties in suspen- sion polym r- tiation. Area Foreman in same Dept since 1975.	Never cleaned autoclaves. See paper by CHIAPPINO et al Med Lavoro Vol 6 (1982) pp 555-563	Non-smoker. Consumed little alcohol. No AOL.	**
05	GC Danesi	19.03.37	PANSAC	Mira Venice	00.00.67	07.03.83	46	16	8	06.04.83	Yes	Medium-H High	Bag extruder (1967-1975 Commercial Dept 1976- 1983)		15 Paglia- Lunga letter of 12 Aug 1981	

* See Mattioli Med di Lavoro 65 p445, 1974. Further details in letter from Dr Montedison of IARC on April 1st 1982.

** Also see Mattioli and Rundinella in Acta Oncologica Vol 1 1980 pages 35 - 49.

ICI CHEMICALS & POLYMERS GROUP

MPX/ASL - LANGUAGES, 22

JAPAN

LIVER Angiosarcoma Case - (Review Date: 1 Jan 1987)

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	Traso Mori	01.08.22	Mitsui Toatsu (no comment by Jap PVC Assoc)	Nagoya	00.04.53	24.10.74	53	22	13	24.10.75	Yes	PVC Assoc says not known. A Japan Times indicated on 25.10.75 exposures often at 3000 ppm up to 1974	13 yrs auto- clave cleaner 1964 - assigned to different work since had ill health		Japan Times 25.10.75 & Japanese PVC Assoc letter of 31.03.78
02	SO	02.08.39			00.11.58	10.08.76	37	17	13	10.08.76	Yes	Not known	In polymer- isation work including autoclave cleaning		Japanese PVC Association letter of 31.03.78

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

Date of diagnosis - 21-08-74

Age of diagnosis - 52

Years of exposure - 22

R&S 039868

NEURWAY

LIVER Angiosarcoma Cases - (Review Dates: 1 Jan 1987)

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 REF TO DIAGNOSIS	YEARS OF EXPOSURE	DATE OF DEATH	HISTOLOGICAL CONFIRMATION	ESTIMATED EXPOSURE LEVEL	OCCUPATION	OTHER CAREER HIGHLIGHTS	OTHER COMMENTS
NORWAY															
01	AH	23.12.15	Norsk Hydro	Heroya	00.03.50	21.12.71	56	22	21	04.01.72	Yes	High	Foreman & Autoclave supervisor		Confirmed by Dr Thilla- Evansen of NH. At APHE Mtg of 19 June 1978 Mr P Rangnes stated that AH had been a member of a start-up team. VCM & PVC were made in same building. The VCM was made from acetylene

LIVER Angiosarcoma Cases - (Review Date: 1 Jan 1987)

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
SWEDEN															
01	NU	23.06.27	Kemanord	Sundavall	14.08.51	20.10.70	43	19	18	20.10.70	Yes		Polyworker		
02	HL	27.11.11	Kemanord	Sundavall	00.01.45	00.08.72	61	27	27	16.08.72	Yes	High	VCM production		Mr Sjorlin's letter of 28 March 1978 confirms HL was a monomer worker who was heavily exposed, probably even more so than a normal reactor cleaner
03	HE	10.06.10	Kemanord	Sundavall	00.05.47	18.03.76	65	29	21	19.03.76	Yes	High	Polyworker		
04	AL	16.11.14	Kemanord	Sundavall	00.00.46	12.05.77	62	31	31	12.05.77	Yes	High	1946-1958 polymer- isation worker (12 yrs) & 1958- 1977 foreman (19 yrs)		In first 12 yrs of employment had been heavily exposed. In 1974, liver abnormality and necrosis diagnosed. Data confirmed in Dr D Byren letter 18.8.77 to CEFIC
05		12.03.19	Kemanord	Sundavall	11.05.64	22.11.80	61	16	16	22.11.80	Yes	High - 6 Years Low - 10 Years	1964-1970 centrifuge operator 1970-1980 drier operator		Letter of 22nd Nov 1981 from Dr David Hyren

* In his letter of 1st April 1982, Dr Montesano of IARC says in Sweden's Natl:

12-70 as date of diagnosis for Case 01 and 15-05-72 for Case 02.

R&S 039870

LIVER Angiosarcoma Cases - (Review Date: 1 Jan 1987)

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	20.04.01	ICI	Hillhouse	04.04.44	03.12.72 (Fox & Collier paper says 23.12.72)	71	28	22	03.12.72 (Fox & Collier paper says (23.12.72))	Yes	500 ppm	1944-7 VCM 1947-8 Drier 1948-61 Autoclave operator 1961-66 Drier		Lee and Harry Lancet 29-06-74 pages 1316-6
02															Dubious fabrication case
03	BJ	02.06.37	BP	Barry	00.02.66	00.12.74	37	09	3.5	24.12.74	Yes	High	Autoclave cleaner		Exposure limited to 2.66 - 9.69
04	JSR	23.06.20	ICI	Hillhouse	26.04.54	00.06.79	59	25	18	12.10.79	Yes	Medium- high	54-5 Bagging Plant 55-6 Drier Plant 56-58 Autoclave worker 58-61 Chargehand Drier Plant 61-72 Foreman C 2/3 Plant	Pre-war fish packer 1939-45 army vehicle maintenance 1945-54 fish packer	

pt 2

LIVER Angiosarcoma Cases - (Review Date: 1 Jan 1987)

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
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			7 yrs Poly Floor Operator 15 yrs Greener on Poly Floor Polycleaner 1961-5 Recovery 1965-1971		
07	RGR	26.04.20	BP	Barry	1963	00.06.80	50	17	8.2	13.0.80			Polycleaner 1961-5 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 Autoclave Production Plant 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	

R&S 039872

LIVER Angiosarcoma Cases - (Review Date: 1 Jan 1987)

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	07.05.25	BP	Barry	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	GJT	04.04.47	BP	Barry	27.04.66	01.05.84	37	18	4.2	16.05.84	Yes	High - 11 months (500 ppm). Low - 18 months (50 ppm). Medium - 121 months (200 ppm)	Polycleaner 1966-67. Spray-dryer bagger 15.7- 168. Blow-down stripper operator 1968-70.	Heavy goods vehicle driver (until final) linea. 18.06.84 from Dr D M J Williams	Information given in letter 18.06.84 from Dr D M J Williams
11	GLP	08.05.28	BP	Barry	19.12.65	02.06.85	57	19	16	02.06.85	Yes	High 1965-69 Med 69-79 Low 79-82	Polycleaner 1965-68. Service operator 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 J 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 26.06.85 Dr F I Lee

Re 23

PLASTICS DIVISION

rel 4

LIVER Angiosarcoma Cases - (Review Date : 1 January 1987)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
COUNTRY AND REFERENCE ID	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	1968	Jan 86	37	18	3	02.06.86	Yes	High Low High	Polycleaner 1968-69 Central Depot 1969-70 Polyfloor 1970-71	Moved to Acryloni- trile Plant until left BP 1983. Manager of IC & SS Ltd at Cardiff Airport 1983-86	Remained well, working actively, until Jan 1986

R&S 039874

R&S 039875

ICI CHEMICALS & POLYMERS GROUP

WPX/ASL - LANGUAGES, 2M

USA

LIVER Angiosarcoma Cases - (Review Date: 1 Jan 1987)

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	En. I Parks	17.10.23	BFG	Louis- ville	09.12.48	03.03.73	49	24	21	03.07.73	Yes		Pot Cleaner (Block Jan 1974) p 5	History given in Annals NY ACAD SCIENCES Vol 329 (1979) page 190 in 1974 Paper by B R Cottine of OSHA	Rolling Stone Art Ref 1 NY Acad of Sc Symp Also Block JAMA 1.7.74 p 53
02		19.08.33	BFG	Louis- ville	15.11.55	00.05.70	37	14	13	27.09.71 (NIOSH says 28.09.71)	Yes		Pot Cleaner (Cf Block)		Ref 1 Also Block JAMA 1.7.74 p 53
03	Edward Dinwiddle	25.05.15	BFG	Louis- ville	28.11.45	19.12.73	58	28	28	19.12.73	Yes		Pot Cleaner (Cf Block)	Louisville Courier Journal 02-09-80	Ref 1 Also Block
04		15.01.24	BFG	Louis- ville	06.07.52	19.08.67	43	15	15	07.01.68	Yes		Pot Cleaner (Cf Block)		Ref 1 Also Block
05		25.01.12	BFG	Louis- ville	19.06.44	09.04.64	52	20	20	09.04.64	Yes		Pot Cleaner (Cf Block)		Ref 1 Also Block
06	Ray Austin Jones?	23.11.28	BFG	Louis- ville	17.01.62	00.02.74	45	12	12	24.07.75	Yes		US Air Force Pot Cleaner (Cf Block)		Ref 1 + Louisville Times 23.7.75 Retired April 1974 Also Block
07	Charles T Smart	03.05.22	UCC	S Charle- ston	27.08.44	00.00.68	45	24	17	23.03.68	Yes				Ref 1
08		06.05.20	Goodyear	Niagara	07.10.46	00.08.61	41	15	15	29.08.61	Yes				Ref 1

ICI CHEMICALS & POLYMERS GROUP

WPX/ASL 2 - LANGDOCASES.1

LIVER Angiosarcoma Cases - (Review Date: 1 Jan 1987)

UK system of dates
DAY - MONTH - YEAR

2

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
CRY 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
09	Raymond Cottle- Finger?	08.11.31	BPC	Louis- ville	28.05.45	01.03.74	43	29	24	11.03.75	Yes	2000 ppm			Ref 1 has wrong figure for first exposure. Louisville Times 129.10.74, 112.3.75, 110.3.76
10		16.08.13	Goodyear	Niagara	12.06.51	00.03.68	55	17	17	10.05.68	Yes				Ref 1
11		27.05.09	Goodyear	Niagara	14.10.46	00.03.70	61	23	23	16.03.70	Yes				Ref 1
12	Francis A Bachman	17.11.18	Pirestone	Pottstown Pa	13.07.49	02.05.69	50	20	19	02.05. .	Yes	High 10 yrs	10 yrs as reactor op. (not cleaner - separate crew cleaned autoclaves)	Utility & Service op. Bagger Dryer op. Stripping op. 13 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	03.02.74	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 J A Saig.
15															Accountant; ASL - No evi- dence of VCM exposure.

R&S 039876

ICI CHEMICALS & POLYMERS GROUP

WPK/ASL 2 - LANGTLOCASES, 2

USA
Sheet 3

LIVER Angiosarcoma Cases - (Review Date: 1 Jan 1987)

UK System of dates
DAY - MONTH - YEAR

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
COUNTRY AND REFERENCE NO	NAME OR INITIALS	DATE OF BIRTH	COMPANY	FACTORY	FIRST VC EXPOSURE	DATE OF DIAGNOSIS	AGE AT DIAGNOSIS	YEARS OF EXPOSURE TO DIAGNOSIS	YEARS OF EXPOSURE	DATE OF DEATH	HISTOLOGICAL CONFIRMATION	ESTIMATED EXPOSURE LEVEL	OCCUPATION	OTHER CAREER HIGHLIGHTS	OTHER COMMENTS
USA															
16	James Howard	04.11.27	BPC	Louis- ville	08.05.50	00.00.69	41	19	04	27.03.69	Yes		1951-4 VCM polymer- isation	From 1954 onwards in Army and other service. 146-50 Army	Table 4 in Wagner Testimony to US Senate Confirmed in J M N Johnson ltr 07.08.78
17	Peerenboom	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	13 yrs autocleaner 8 yrs on Etanol plasticiser 4 Carbonet operation	Navy Tyre Store		Confirmed in J M N Johnson ltr 07.08.78 Also Rolling Stone mag. 15.01.76
19	Virgil Christian	00.00.15	UCC	S Charle- ston	00.00.43	19.06.75	60	32	32	06.04.76	Yes	2000 ppm			Williamsport Sun Gazette 21 June 1974 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	Chenter Winkle	02.09.09	UCC	S Charle- ston	00.12.46	Early 77	67	30	22	02.01.77	Yes				28 yrs with UCC at SC Retired News release 23.2.77

LIVER Angiosarcoma Cases - (Review Date: 1 Jan 1987)

WPX/AS1, 2 ~ LANCETOCASES, 1

R&S 039878

ICI CHEMICALS & POLYMERS GROUP

WPX/ASL2 - LANCIOCAS/5,6

LIVER Angiosarcoma Cases - (Review Date: 1 January 1987)

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	BFG	Louis- ville	1953	06.08.84	54	31	22	06.08.84	Yes	High	Worked regularly in PVC area in the early days was a reactor cleaner 1953-75.		Information given in letter 09.08.84 from Dr M N Johnson
38	JWB	28.08.22	Air Products	Calvert City	00.02.63	19.01.84	61	20	20	28.10.83	Yes	High	[Normal progression] [from helper] [to senior operator, cleaned reactors, stripping and recovery areas as well as charging operator.		Thrombocytopenia and leukopenia since since 1978. Gold 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 21.01.85.
39	J Hewice	27.06.18	Pantasote	Panasite	1960	March 1984	65	24	23	29.06.84	Yes	Low	29.09.60 - May 66 Vinyl Fabrication Plant May 66 - Aug 70 Utility Resin Operator (inc Jul 66) - Sep 67 Reactor Operator Sep 70-82 Monomer Operator 1982-87 Mill Operator, Calendar Shop, until retirement	Worked before 1960 with US Air Force, United Wool Dyers and Okonite	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 Ertel of Pantasote with letter of 24.02.86 from Dr Auerbach, Pathologist.

ICI CHEMICALS & POLYMERS GROUP

WPK/ASL 2 - LANGUAGES, 1

LIVER Angiosarcoma Cases - (Review Date: 1 Jan 1987)

UK system of dates
DAY - MONTH - YEAR

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
ENTRY 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	
22		02.10.23	BFG	Louisville	11.07.47	00.01.76	52	29	28	04.12.76	Yes				Louisville Times 26.1.76 said he was the 10th AS victim at Belle Lane of whom 8 had died by 26.1.76 In his letter of 18.09.81 Dr M N Johnson confirms this is the case described by Dannaher Tombarro & Yan in Feb 1980 Am J Medicine Vol 70 p280	
23		00.00.23	Great American Chemical Company	Fitchburg Mass.	08.09.58	06.04.73	50	15	14	06.04.73	Yes					
24	Charles Edward Moore	17.05.17	DCC	18 Charleston	1959	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 fitter (helper, then shift utility man	1937-39 was off and on labourer 1939-41 may have been exposed as reactor cleaner 1943 became shift fitter 1946 became shift utility man	1941-65 non-solvent (vinyl resin unit and dispersion (vinyl resins) unit first as fitter (helper, then shift utility man	1937-39 was off and on labourer 1939-41 may have been exposed as reactor cleaner 1943 became shift fitter 1946 became shift utility man
(25)															Removal from register confirmed in R Kaminski letter of 5 November 1980	

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LIVER CHEMICALS & POLYMERS GROUP D

WPX/ASL_2 - LARGO/ASES, V

USA
Sheet 6

LIVER Angiosarcoma Cases - (Review Date: 1 Jan 1987)

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
US 12	C M Giroux	22-02-08	Monsanto	Springfield Mass	15-10-51	00-07-79	71	28	14 (in PVC autoclave area)	17-05-80	An autopsy was done and immediate cause of death given as "Angiosarcoma"	The death certificate gave "Mr Giroux" usual occupation as "kettle operator" in and "chemicals around PVC autoclaves industry".	1940-1951 Various jobs in polymer manufacture BUTVAR LUSTREX 1951-1964 Various jobs in and around PVC autoclaves 1964-1973 Various clerical jobs in PVC polymerisation facility/ Retired 01-03-73.		Information given in letter of 24 February 1982 from Dr Walter C Barnes of Monsanto Springfield to Dr A Mann of Monsanto Europe.
US 13	IS Ferguson Jnr	08-10-27	BFG	Louisville	09-09-54	11-05-82	54	28	28	Alive	Yes		Multiple jobs including Poly Operator + Polycleaner.		Prof Tamburro letter of 12 Aug 1982 + Dr H M Johnson letter of 28 Feb 1981.
US 14	Mr Byrum	19-01-34	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 H M Johnson letter of 11 Nov 1982, 28 Feb 1983 and 9 Aug 1984.
US 15		09-03-12	HCC	St Charles Istn	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 1981.
U. 16		27-08-32	The General Tire and Rubber Co	Ashtab Ohio	11-06-46	12-08-81	50	27	27	Alive	Yes	Moderate	1956-56 labours 1956-57 prod helper 1957-70 operator 1970-75 electrician 1975-present operator		Dr W Landrie letter of 12 Sept 1981: spotted at medical May 1981. Testing - commented May 1981

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MPX/ASL 2 - LANGUAGES, 4

USA
Sheet 5

LIVER Angiosarcoma Cases - (Review Date: 1 Jan 1987)

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	Louisville	03.10.47	00.00.77 (up to 2 years after death)	52 (death)	28 (death)	18	11.02.75	Yes	Exposed in (some degree) (to 22 (chemicals (but main (exposure (was to VCM, (probably (high	Various jobs in PVC plants from cold room to paste recovery to PVC charging operator to paste charging. 111 August 1965. Terminated employment Jan 1966		R Kaminski letter of 26/2/79 and Prof. Tamburini letter of 19/1/79
27	J L Forrest	11.05.16	UCC	S Charleston	01.07.41	30.11.78	62	37	20 (NIOSH (says 27 (and C (Daily Mail (25)	25.11.78	Yes	High	Operator to 10.10.76 (disoperation PVC manufacture	Exposure in bulk and (disoperation 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	S Charleston	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	S Charleston	00.05.42	00.03.80	72	38	16	01.03.80	Yes				R Kaminski Letters of 19th June 1980 & 5th Nov 1980
30	WVN	22.07.22	Tenneco Chemicals	Flemington	11.06.64	30.12.80	58	17	15	30.12.80	Yes	6 - Unknown 9 - Minimal	Maintenance Mechanic 16 yrs Elsewhere 11 yrs Boiler house Operator 19 yrs		
31		08.11.23	UCC	S Charleston	12.05.46	01.08.81	57	35	33	02.04.82	Yes	High (But not as high (as reactor (cleaner (would (experience) (Worked as (labourer (from (June 1941 (to May 1946) (and may (have (cleaned (reactors in (that time	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 07.03.81 re (date of death.	

ICI CHEMICALS & POLYMERS GROUP

WPX/ASL 2 - LANGHOUSS, 1

LIVER Angiosarcoma Cases - (Review Date: 1 Jan 1987)

UK system of dates
DAY - MONTH - YEAR

e 27

et 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
SA 22		02.10.23	BFG	Louisville	11.07.47	00.01.76	52	29	28	04.12.76	Yes				Louisville Times 26.1.76 said he was the 10th AS victim at Bells Lane of whom 8 had died by 26.1.76. In his letter of 16.09.81 Dr M H Johnson confirms this is the case described by Daunaher Tamburro & Yam in Feb 1980 Am J Medicine Vol 70 p280
23		00.00.23	Great American Chemical Company	Fitchburg Mass.	08.09.58	06.04.73	50	15	14	06.04.73	Yes				
24	Charles Edward Monroe	17.05.17	UCC	S Charleston	1939	27.05.77	60	38	24 (NIOSH says 26)	27.05.77	Cholangio-sarcoma (R Kaminski 26/2/79)	Medium to high for 124 yrs	1941-65 non-solvent 1937-39 was off and on labourer 1939-41 may have been vinyl resin exposed as unit first reactor low fitter cleaner helper, then shift fitter utility man	1946 became shift utility loan reginter since employment was terminated	N H Wheeler letter of 18.8.77 to J Stafford gives details Rose Kaminski letter of 26/2/79 R Kaminski (5 Nov 1980) suggests that NIOSH will retain on 26.04.65 this neoplasm may be associated with ASL.
(25)															R H Wheeler letter of 20/2/79 and Rose Kaminski letters of 26/2/79 and 15/1/80

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

R&S 00878

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
COUNTRY AND REFERENCE	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 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 Perspectives 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.
04		11.06.30	Jugo Vinil	Split	15.12.58	03.09.78	48	20	18	03.09.78	Yes				[Rose Kaminski letter of 19 June 1980 and [IARC letter of 1 April 1982

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Incidence of ASL Cases Per AnnumBy date of death

1955		1
6		0
7		1
8		0
9		0
1960		0
1		1
2		1
3	.....	0
4	.....	2
5	.....	0
6	.....	0
7	.....	1
8	.....	5
9	.....	3
1970	.....	2
1	.....	3
2	.....	5
3	.....	8
4	.....	5
5	.....	11
6	.....	11
7	.....	9
8	.....	10
9	.....	5
1980	.....	10
1	.....	5
2	.....	2
3	.....	10
4	.....	7
5	.....	5
6	.....	2
Total		125

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

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

3 The total does not include US 33 and 36, F 15 and G31 and 32 who are alive.

Distribution of ASL Cases by Country

USA	36 ***
W Germany	31 ** ***
France	21 ***
UK	12
Canada	10
Sweden	5 ****
Yugoslavia	4 *****
Italy	4 *
Czechoslovakia	2
Japan	2
Belgium	2
Norway	1
Total	130

* Omit It01 - atypical case of PVC bag extruder.

** Includes G03 aerosol can filler.

*** Includes case US 24 which was diagnosed as Cholangiosarcoma; & US 33 and 36, F 15 and G 31 and 32, who are alive.

**** Includes one monomer worker.

***** Includes two monomer workers.

i.e Western Europe	76
North America	46
Rest of World	8

Total 130

R&S 039884

TABLE 3

Pattern of ASL Cases by Factory(a) W Europe

Of the 76 cases in W Europe, 65 have occurred in clusters at 11 factories. Of the 31 German cases, 28 have occurred in clusters at 4 factories.

ASL Cases

Dynamit, Troisdorf, Germany	12
BP, Barry, UK	9
Wacker, Burghausen, Germany	9
Chloe Chimie (Formerly RP), St Fons, France	8
PCUK, Brignoud, France	7
Kemanord, Sundsvall, Sweden	5
CWH, Marl, Germany	4
ICI, Hillhouse, UK	3
Solvay, Tavaux, France	3
Lonza, Waldshut, Germany	3
Solvay, Jemeppe, Belgium	2
	<u>65</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 46 cases in N America, 38 have occurred at four factories out of a total of 54 factories:- In N America 42 plants have not had ASL cases.

ASL Cases

BFG, Louisville, US	14 15
BFG, Shawinigan, Canada	10
UCC, S Charleston	10
Goodyear, Niagara	4
	<u>38</u> 39

NB: There are 28 pre 1962 PVC plants in N America; 12 of these have had ASL cases (Ref Tables 9 & 10)

(c) Rest of World

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

TABLE 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	21	545	25.95 *	
	Germany	31	632	20.38 *	
	Italy	4	74	18.5	
	Norway	1	22	22	
	Sweden	5	122	24.5	
	UK	<u>12</u> <u>76</u>	<u>272</u> <u>1702</u>	<u>22.66 *</u> <u>22.39</u>	W Europe Average
<u>N America</u>	US	36	910	25.27 *	
	Canada	<u>10</u> <u>46</u>	<u>204</u> <u>1114</u>	<u>20.4 *</u> <u>24.21</u>	N America Average
<u>Rest of World</u>	Czechoslovakia	2	30	15.0	
	Japan	2	39	19.5	
	Yugoslavia	<u>4</u> <u>8</u>	<u>85</u> <u>154</u>	<u>21.2</u> <u>19.2</u>	Rest of World Average
<u>Summary</u>	W Europe	76	1702	22.39	
	N America	46	1114	24.21	
	Rest of World	<u>8</u> <u>130</u>	<u>154</u> <u>2970</u>	<u>19.2</u> <u>22.84</u>	World Average

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

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(Review Date - 1 Jan 1987)

DISTRIBUTION OF LATENCY PERIODS TABLE 4B

	0-9 yrs	10-14 yrs	15-19 yrs	20-24 yrs	25-29 yrs	30-34 yrs	35+ yrs	Total	Average Latency Period
Belgium			2					2	17.5
Canada		3		5	2			10	20.4
Czechoslovakia		1	1					2	15.0
France		1	4	3	7	3	3	21	25.95
Germany		5	9	10*	5	2		31	20.38
Italy			2	2				4	18.5
Japan			1	1				2	19.5
Norway				1				1	22
Sweden			2		2	1		5	24.5
UK	1		5		4	2		12	21.66
USA		2	7	9	8	5	5	36	25.27
Yugoslavia			1	4				4	21.2
TOTAL	1	12	33	35	28	13	8	130	22.84

* Includes G 03 aerosol can filler

TABLE 4C
LATENCY PERIOD OF ASL CASES TABULATED BY YEAR OF FIRST EXPOSURE

MAX POSSIBLE LATENCY PERIOD	YEAR OF FIRST EXPOSURE	LATENCY PERIOD (NO OF YEARS)	ARITHMETIC MEAN OF LATENCY PERIODS	
47	1939	38*		
46	1940		$\frac{244}{7} = 34.86$	
45	1	37,21,37,41		
44	2	32,38		
43	3	38,14,32		
	4	28,11,24,20,24,34,39	$\frac{718}{27} = 26.59$	
	5	27,22,28,29		
	6	21,29,31,26,28,15,23, 30,35		
39	7	29,24,29,28		
38	8	28,24,34		
	9	30,26,20	$\frac{521}{21} = 24.80$	
	1950	26,22,31,19,23,14,33		
	1	19,28,17,28,34,29		
34	2	21**,15		
33	3	25,22,23,22,20,31,22, 32***		
	4	21,21,25,25,21,28***, 22	$\frac{787}{35} = 22.48$	
	5	22,23,24,14,19,21,27 27*** 24,28,30***		
	6	21,12,27***		
29	7	19,17,15,13,16,28		
28	8	18,18,15,17,20		
	9	16,21,25,27	$\frac{490}{27} = 18.14$	
	1960	13,18,21,25,24		
	1	15,16,16,16,19,19,12		
24	2	13,18,17,12,18,21		
23	3	16,17,20,21		
	4	16,17	$\frac{180}{11} = 16.36$	
	5	11,19		
	6	9,18		
19	7	16		
18	8	18		
	9	13	$\frac{31}{2} = 15.5$	
	1970			VIOLA
	1			
14	2			
13	3			MALTONI
	4			GOODRICH
	TOTAL	130 CASES	$\frac{2971}{130} = 22.85$	

* Cholangiosarcoma
** Aerosol can filler
*** US33 and 36; F15 and G31 and G32 still alive.

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	
47	1939		38*	
46	1940			
45	1	37,41	21,37	
44	2		32,38	
43	3	38	14,32	
	4	28	11,24,20,24,34,39	
	5	27	22,28,29	
	6	21,29,31,33	26,28,15,23,30,35	
39	7	29	24,29,28	
38	8	28,34	24	
	9	30,26	20	
	1950	26,22,31	19	23,14
	1	19,28,34,29,	17,28	
34	2	21**	15	
33	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***	
29	7	19,17,15,13,28		16
28	8	18,18	15	17,20
	9	16,21,25,27		
	1960	13,18,21,25	24	
	1	15,16,16,16,19,19	12	
24	2	13,18,17,18,21	12	
23	3	16,17,21	20	
	4	16	17	
	5	11,19		
	6	9,18		
19	7	16		
18	8	18		
	9	13		
	VIOLA 1970			
	1			
	2			
	MALTONI 3			
	TOTAL CASES	76	46	8

* Cholangiosarcoma

** Aerosol can filler

*** US33 and 36; F15 and G31 and 32 still alive

(Review date 1 January 1987)

TABLE 4E

PLANT	START UP DATE	LATENCY PERIODS OF ASL CASES IN SPECIFIC PLANTS (10 OR MORE CASES)	NO OF CASES	AVERAGE LATFNCY PERIOD
LOUISVILLE USA	1940?	12,14,15,19,19,20,24,27,28,28,28,29,29 31	14	23.07
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

R&S 039890

(Review date 1 January 1987)

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
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			
1		29		
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		

R&S 039891

(Review date 1 January 1987)

TABLE 4G

PLANT	START-UP DATE	LATENCY PERIOD OF ASL CASES IN SPECIFIC PLANTS(4-9 CASES)	NO OF CASES	AVERAGE PERIOD
BARRY UK	1948	9,17,18,28,31,33,18,19,18	9	21.22 years
BURCHAUSEN W GERMANY	1933	17,21,22,25,24,13,21,32,30	9	22.77
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

R&S 039892

(Review date 1 January 1987)

TABLE 4H

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

YEAR OF FIRST EXPOSURE	BARRY UK	BURGHAUSEN W GERMANY	ST FONS FRANCE	BRIGNOUD FRANCE	SUNDSVALL SWEDEN	NIAGARA USA	SPLIT YUGO-SLAVIA	MAR 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	31,33						23*	
1	28			34	19	17		
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	18							21
3	17							
4					16			
5	19			11				
6	9,18							
7								
8	18							
9		13						
1970								
1								
2								

*Monomer worker

R&S 039893

(Review Date - 1 Jan 1987)

TABLE 5

Annual Incidence of A^SL Cases (Date of Death) by Geographical Area

	Western Europe	North America	Rest of World	Annual Total	Cumulative Total	Key Events
1955		1		1	1	
7		1		1	2	
1961		1		1	3	
2		1		1	4	
4		1	1	2	6	
7	1			1	7	
8		5		5	12	
9	1	2		3	15	
1970	1	1		2	17	Viola
1	1	2		3	20	
2	4	1		5	25	
3	1	4	3	8	33	Maltoni
4	3	2	-	5	38	Goodrich
5	6	4	1	11	49	
6	6	3	2	11	60	
7	6	3		9	69	
8	7	2	1	10	79	
9	5	-	-	5	84	
1980	6	4	-	10	94	
1	5	0	-	5	99	
2	1	1		2	101	
1983	7	3		10	111	
1984	5	2		7	118	
1985	5			5	123	
1986	2			2	125	
TOTAL	73* **	44**	8	125		

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

** Does not include US33, and 36, F15, G31 and 32. All still alive.
WPX/AS1.2 - LANGILOCASES,19

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TABLE 6

ASL CASE NUMBERS BY YEAR OF DEATH AND GEOGRAPHICAL LOCATIONS (EXCLUDING IT01)

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	
	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		
	6	F21,UK13		
	Total	73***	44***	8

* Cholangiosarcoma

** Aerosol can filler

*** Does not include US33 and 36, F15 and G31 and 32. All still alive.

(Review date 1 January 1987)

TABLE 7

ASL CASE NUMBERS BY YEAR OF FIRST EXPOSURE AND GEOGRAPHICAL LOCATION
(EXCLUDING IT01)

KEY EVENTS		WESTERN EUROPE	NORTH AMERICA	REST OF WORLD
	1939		US24*	
	40			
	1	Fr11, Fr16	C3, US27	
	2		US13, US29	
	3	Fr14	C2, US19	
	4	UK1	C1, C5, US5, US7, US28, US35	
	5	Sw2	C4, US3, US9	
	6	Fr1, Fr3, Sw4	C7, C9, US8, US11, US21, US31	
	7	Sw3	C6, US22, US26	
	8	Fr9, Fr17	US1	
	9	Fr12, Fr4	US12	
	50	Fr7, N1, UK8, UK9	US16	Y2, Cz2
	1	Sw1 UK5, 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	US23	Jap2, Y4
	9	Fr2, It4, Fr19, Fr21		
	60	G5, G13, G25, G28	US39	
	1	G9, G10, G12, G17, G20, G22	C8	
	2	C6, UK6, G21, B2, G29	US6	
	3	Fr15, UK7, Fr18	US38	
	4	Sw5	US30	
	5	Fr5, UK11		
	6	UK7, UK10		
	7	Ir5		
	8	UK13		
	9	G24		
Viola	70			
	1			
	2			
Maltoni	3			
	Total	76	46	8

* Cholangiosarcoma (US24)

** Aerosol can filler (G3)

*** US33 and 36, Fr15 and G31 and 32 are still alive.

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(Review date 1 January 1987)

TABLE 8
WESTERN EUROPE PVC PRODUCERS - START-UP DATES vs ASL CASES (OMITTING G03 & It.01)

START-UP YEAR	COUNTRY NAME	COMPANY NAME	LOCATION	ASL CASE NUMBER	YEAR OF 1st Exposure
1931	West Germany	BASF	Ludwigshafen		
1933	West Germany	Wacker	Burghausen	04,07,11,15,23,24	57,54,55,53,55,69,60, 125,31,32 155
1938	Italy	Montecatini	Acna		
1939	France	Rhone Poulenc/ Atochem	St Fons	03,09,10,11,14 15,16,17	46,48,56,41,43, 55,41,48
1940	United Kingdom	ICI	Runcorn		
	United Kingdom	ICI	Hillhouse	01,04,12	44,54,57
1945	Sweden	Kemanord	Sundsvall (Stockvik)	01,02,03,04,05	51,45,47,46,64
	Switzerland	Lonza/ICI since 1982	Sins		
1946	France	Rhone-Poulenc	Rousillon	01	46
1947	Italy	Montedison	Porto Marghera	02	57
1948	United Kingdom	BP Chem/ICI since 1982	Barry	03,05,06,07,08,09 10,11,13	66,51,62,63,50,50 66,65,68
	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	59,49,65,58,49,59,51
				20	
	France	Rhone-Poulenc	St Auban	07	50
	Holland	Shell	Pernis		
	Norway	Norsk	Heroya	01	50
1951	Italy	Montedison	Brindisi		
1952	Italy	Montedison	Terni		
1953	Austria	Halvic	Hallein		
	France	Solvay	Tavaux	08,13,18	57,63,63
	Italy	Solvay	Ferrara	03	53
	Spain	Rio Rodano	Hernani		
	United Kingdom	BIP	Aycliffe		
	West Germany	Hoechst	Gendorf	18	55
1954	West Germany	Dynamit	Troisdorf	01,02,08,12,16,17	56,57,54,61,55,61, 19,20,21,22,27,30 54,61,62,61,55,51
1955	Spain	Monsanto Iberia	Monzon		
1956	Spain	Caiqsa	Sabinanigo		
		Hispanic	Torrelavega		
1958	West Germany	Solvay	Rheinberg		
1960	Italy	S C Ravenna	Ravenna	04	59
	West Germany	Lonza/ICI since 1982	Waldshut	06,13,28	62,60,60
1962	Portugal	Cires	Oporto		
1965	France	Rhone-Poulenc	Montlucon	21	59
	Italy	Pozzi	Ferrandina		
	West Germany	Wacker	Cologne		
1966	West Germany	Hoechst	Knapsack (Frankfurt)	05*	60
1967	France	ATO Chimie	Balan		
	Spain	Rio Rodano	Miranda de Ebro		
	Greece	Esso Pappas	Diavata Salonika		
1968	Belgium	Badiphil	Antwerp		
1969	United Kingdom	Vinatex	Staveley		
	Italy	Rumianca	Cagliari Sardinia		
1970	Italy	SIR	Porto Torres Sar		
	United Kingdom	ICI	Runcorn		
1971	Italy	S C Ravenna	Ravenna		
	Spain	Hispanic	Martorell		
	Sweden	Kemanord	Stenungsund		
	United Kingdom	BP Chem	Baglan Bay		
1972	Finland	Pekema	Svartback		
	Holland	DSM	Beek Limburg		
1976	France	Soc Art D'vinyl	Mazingarbe		
1977	Spain	Monsanto Iberia	Tarragona		

* Laboratory worker in Research Department

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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
1940?	*BFG	Louisville	01,02,03,04,05, 06,09,16,17,22, 26,33,34,37	48,55,45,52,44, 62,45,50,55,47, 47,54,55,53
1946?	*UCC	Texas City (Partially closed 1977)		
1947	Goodyear	Niagara Falls	08,10,11,20	46,51,46,55
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	BFG	Deer Park (Formerly Diamond)		
1954	General Tire	Ashtabula (Closed 1984)	36	56
1956	Air Products	Pensacola		
	Atlantic Refining	Brooklyn (Closed late 1960s)		
	Borden	Leominster (Closed 1984)		
	Conoco	Hebronville (Closed 1975)		
	BFG	Niagara		
	Great American Plastics	Fitchburg (Closed 1983)	23	58
	Hooker	Hicksville (Closed 1980-81)		
	Pantasote	Passaic (Closed 1984)	39	60
1957	Atlantic Tubing	Cranston (Closed 1967)		
	Tenneco	Flemington NJ (Closed 1985)	30	59
1958	Keysor Century	Saugus, Cal		
1960	BFG	Watson, Cal		
	Air Products	Calvert City (closed March 1982 Re-opened October 1983)	38	63
	Borden	Illioopolis		
1962	Tenneco/Occidental	Burlington NJ		
1963	Conoco/Vista	Aberdeen, Miss		
	Stauffer	Long Beach, Cal (Closed 1982)		
1965	Conoco	** Assonet, Mass (Closed by Olin 1975, see below)		
	Ethyl	Baton Rouge (Closed 1984)		
1966	Georgia Gulf	Delaware City (Formerly Diamond)		
	Gen Tire/Pantasote	Mt Pleasant W Va (Closed 1982)		
	BFG	Henry, Ill		
	Stauffer	Delaware City (Sold to Formosa 1983)		
1967	Allied	*** Painesville, O (sold to Robintech)		
	Hooker/Occidental	Burlington NJ		
1968	Firestone	Perryville (Closed 1982)		
1969	BFG	Pedrickton NJ		
	Goodyear	Plaquemine		
	Olin	** Assonet, Mass (Closed 1975) (See above) (Formerly Conoco)		
1971	Conoco/Vista	Oklahoma City		

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TABLE 9 (Continued)

USA PVC PRODUCERS - START-UP DATES vs ASL CASES

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

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

** Refers to same plant at Assonet

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

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

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(Review date 1 January 1987)

TABLE 10

CANADIAN PVC PRODUCERS - START-UP DATES vs ASL CASES

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

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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	53,50,54,48
1951	Czechoslovakia	State Comps	Novaky	01,02	57,50
1955	East Germany	State Comps	Bitterfeldt		
1956	Rumania	State Comps	Icechim		
1957	Poland	State Comps	Osweicim (Dwory)		
	Rumania	State Comps	Tirnaveni		
			Turda		
1958	Rumania	State Comps	Risnov		
1959	Hungary	State Comps	Berente Borsod		
1961	Rumania	State Comps	Borzesti		
1963	Yugoslavia	Ohis	Skopje		
1965	Bulgaria	State Comps	Varna		
1967	Poland	State Comps	Tarnow		
1969	Russia	State Comps	Djerjinsk		
1970	Rumania	State Comps	Rimnicu Vilcea		
	Russia	State Comps	Volgograd		
1972	Yugoslavia	Vinilplastika	Zadar		
1975	Czechoslovakia	State Comps	Neratovice		
	Russia	State Comps	Kalush Area		
1976	Yugoslavia	Hip	Pancevo		
1977	Rumania	State Comps	Rimnicu Vilcea		

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(Review date 1 January 1987)

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		
	Tekkosha	Sakata		
1951	Mitsui Toatsu	Nagoya	01, 02	53, 58
1952	Mitsubishi Mon	Yokkaichi		
	Sumitomo Kag	Kikumoto		
1951	Denki Kagaku	Shibukawa		
	Nippon Zeon	Kambara		
	Toa Gosei	Tokushima		
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 Saksui	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	Sao Caetano (Brazil)		
1960	Electrochlor	Capitan Bermudez (Argentina)		
	Viplastic	Mendoz (Argentina)		
1961	Indupa	Cinco Saltos (Argentina)		
1965	(SOC Paramanga	Paramonga (Peru)		
	(1967 start up	)		
	PET Columbian	Cartagena (Colombia)		
1966	Carburo De Col	Medellin (Colombia)		
1967	Plasticos Omega	Mexico		
1968	Imex	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)		

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(Review date 1 January 1987)

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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(Review date 1 January 1987)

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

R&S 039905

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