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Chemicals and
Polymers
Group

Hillhouse
Site

DLS
File Vinyl Chloride
EVS

To all recipients of
the ASL Register

RECEIVED

MAR 09 1987

INDUSTRIAL TOXICOLOGY

Your ref

Our ref

BB/BGS

Date

Feb 1987

Dear Colleague

RESEARCH INTO ASL

I am enclosing the latest edition of the ASL Register, dated February 1987, and am writing to ask for your co-operation with some research into ASL.

While in the States recently, I visited Professor Carlo Tamburro, Professor of Medicine & Community Health; Acting Chairman, Department of Community Health; Chief, Division of Occupational Health; Director, Liver Research Centre, University of Louisville, Kentucky. We discussed VC clustering, and why some particular Plants, which have been manufacturing VCM/PVC pre-1962, have never had a case of ASL.

As a result of our discussions, we had the feeling that, for ASL to develop, certain circumstances are required, and that a co-factor may be needed.

I was wondering if you would be prepared to help in identifying such a factor?

I am enclosing a pro-forma with certain chemicals mentioned, and I should be very grateful - if you are willing - if you would tick off the years in which any of the chemicals listed was used, if in fact they were used at all, and return the form to me. I would definitely communicate back to you with any results obtained, and with what conclusions Professor Tamburro and I have made. Before, however, releasing any information with reference to any of the completed questionnaires, I will contact the individual who is responsible for that questionnaire, in order to discuss that information further, and to seek an appropriate, acceptable way forward.

It should be remembered that this exercise is purely a research topic, and therefore may yield no positive results.

I look forward to hearing from you and receiving your comments.

Yours sincerely

Bennett

B BENNETT

M.A.

M.B., B.Ch., B.a.O.

D.Obst.R.C.O.G. D.I.H., M.F.O.M.

The ICI Chemicals and Polymers Group is part of Imperial Chemical Industries PLC
Registered in England No. 218019 Registered Office Imperial Chemical House Millbank London SW1P 3JF

URL 02139

RESEARCH INTO ASL

Name of Company*:
.....

(*If Company ownership has changed, please give name of previous Company and date of change.)

Address:
.....

Site Location:

Form completed by:..... Date
(Block capitals, please)

YEAR	VINYL CHLORIDE	VINYL ACETATE	HEXANE	DIETHYL MALEATE	PHENOL	BUTADIENE	TOLUENE	ACRYLATES
1939								
1940								
1941								
1942								
1943								
1944								
1945								
1946								
1947								
1948								
1949								
1950								
1951								
1952								
1953								
1954								
1955								
1956								
1957								
1958								
1959								

/Continued

YEAR	VINYL CHLORIDE	VINYL ACETATE	HEXANE	DIETHYL MALEATE	PHENOL	BUTADIENE	TOLUENE	ACRYLATES
1960								
1961								
1962								
1963								
1964								
1965								
1966								
1967								
1968								
1969								
1970								
1971								
1972								
1973								
1974								
1975								
1976								
1977								
1978								
1979								
1980								
1981								
1982								
1983								
1984								

Please return to: Dr Brian Bennett
Occupational Health Department
ICI Chemicals & Polymers Group
Hillhouse Site
PO Box 4 Thornton-Cleveleys
BLACKPOOL FY5 4QD ENGLAND

WPX/ASL - RESEARCH,2

URL 02141

CONFIDENTIAL

LIVER ANGIOSARCOMA CASES

CIRCULATION OF REGISTER

BAGSHAW Dr I M M	Norsk Hydro, Newton Aycliffe, UK
BAND Dr P R	Cancer Control Agency of British Columbia, Vancouver, Canada
BARNES Jnr W C	Monsanto, St Louis, Missouri, USA
BARR Dr J T	Air Products, Allentown, Pa, USA
BARRAT Dr G	AECOP, Commeny, France
BAKIER Dr Peter	University of Cambridge, UK
BAYLAC Dr	Atochem, Chauny, France
BEAUPRE M	Government of Quebec Cancer Registry, Canada
BELLE Dr	Rhone Poulenc, Aubervilliers, France
BENECH Dr M	Naphtachimie, Lavera, France
BENNETT Dr B	ICI Hillhouse, UK
BERIAZZI Dr P	Inst of Occupational Health, Milan University, Italy
BESCHE Dr	Dynamit Nobel, Troisdorf, Germany
BISHOP Dr C	EMAS, Cardiff, UK
BORRELLI F E	Georgia Gulf, Delaware City, USA
BOYER R W	Formosa Plastics, Delaware City, USA
BRYSON Dr D D	ICI Billingham, UK
BURGESS Mr David	ICI Americas, Wilmington, Delaware USA
EYREN Dr David	Kemanord, Stockholm, Sweden
CARTER Dr J T	EMAS, London, UK
CELLA Mr C	Enichem Polimeri, Milan, Italy
CHANCE Mr M	ICI Runcorn, UK
CLAUS Mr P G	APME, Brussels, Belgium
CLAYTON Mr H	Norsk Hydro, Newton Aycliffe, UK
CONTISSOT Dr J C	Atochem, Saint-Fons, France
DAVIES Mr J G	ICI, Everberg, Belgium
DEPLAN Dr	Atochem, Jarrie, France
DE VOS Mr A J	EVC, Welwyn Garden City, UK
DIETZ Dr H W	B F Goodrich, Akron, Ohio, USA
DOLL Sir Richard	Imperial Cancer Research Fund, Oxford University, UK
DOMBROWSKI S L	Dow Chemical, Midland, Michigan, USA
DUPONT Mr G	APME, Brussels, Belgium
EMMINGER Mr H	VKE, Frankfurt, Germany
ERNST Dr W	Berufsgenossenschaft der Chemischen Industries, Nurnberg, Germany
EVANS Dr A E J	Lever Bros, Warrington, UK
FAIK, Dr H	Chronic Diseases Div, US Dept of Health & Human Services, Atlanta, USA
FAVRE Dr	Atochem, Montluel, France
FERGUSON Dr D M	ICI Americas, Wilmington, Delaware, USA
FORMAN Dr D	Imperial Cancer Research Fund, Oxford University, UK
FRASE R W	DiversiTech General, Akron, Ohio, USA
FRIEDEL Dr H P	Berufsgenossenschaft der Chemischen Industries, Heidelberg, Germany
GOLBERG Prof L	Duke Univ Medical Center, Durham, North Carolina, USA
GOSZTONYI Jnr Dr	R E Tenneco Chemicals, Piscataway, New Jersey, USA
GOTTESMAN R T	The Vinyl Institute, Wayne, NJ, USA
HARRIS Dr W D	Uniroyal Inc, Middlebury, Connecticut, USA
HILL Dr G B	Alberta Cancer Board, Edmonton, Canada
HILLMAN Dr D W	Diamond Shamrock Corp, Dallas, Texas, USA
HINDERER Dr R K	BF Goodrich, Cleveland, Ohio, USA
HOGG Dr W A	Imperial Oil Ltd, Sarnia, Ontario, Canada
HOWARD Dr J K	University of Otago School of Medicine, Wellington, New Zealand
HUMPHRY Dr N F	ICI Australia, Melbourne, Australia
JAUVERT Mr J	Chloe Chimie, Paris, France
JERVIS Mr H R	ICI Millbank, London UK
JONES Dr R D	EMAS, Bootle, UK

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KARRH Dr Bruce	Dupont, Wilmington, Delaware USA
KORSGAARD Dr K J	Norsk Hydro, Porsgrunn, Norway
KREUGER Dr R A	BF Goodrich, Akron, Ohio, USA
LAGAST Dr H	Solvay, Brussels, Belgium
LALOINE Dr J P	Solvay, Brussels, Belgium
LANHAM Dr John	Dow Chemical, Midland, Michigan, USA
LANOUZIERE Dr	Solvay, Tavaux, France
LAWRENCE Mr J	SPI, New York, USA
LAWRENCE-JONES	Sir Christopher, Chief Medical Officer, ICI, London UK
LEE Dr F I	Victoria Hospital, Blackpool, Lancs, UK
LELBACH Prof WK	University of Bonn, West Germany
LEVEQUE Dr G	ODF Chimie, AZF, Bully-les-Mines, France
LEVISON Dr D A	St Bartholomew's Hospital, London, UK
LEWIS Dr P	Chemical Industries Association, London, UK
LOLIVIER Mr	Solvay, Brussels, Belgium
LUSSATO Dr J	Atochem, France
MAILLARD Dr J M	Suva, Luzern, Switzerland
MALHOTRA Anna	Statistics Canada, Ottawa
MALTONI Prof C	Institute di Oncologia, Bologna, Italy
MARGETTS, Mr R J	ICI Directorate, Wilton HQ, UK
MATIRE Prof Lo	Medil-Aric-S, Milan, Italy
MATTIUSI Dr R	Montedison, Milan, Italy
MIDDLETON D	Norsk Hydro, Newton Aycliffe, UK
MOKKA Mr	Neste Oy, Espoo, Finland
MONTESANO Dr R	IARC, Lyons, France
MOTTI Dr A A	Duperial SAIC, Buenos Aires, Argentina
MUNOZ MOUTON Dr M	Rio Rodano, Madrid, Spain
MacSWEN Prof RNM	Western Infirmary, Glasgow, Scotland
NAKAMURA S	Japanese PVC Association, Tokyo
OLSON H G	VC Safety Association, Louisiana, USA
OWEN Dr R	Trades Union Congress, London, UK
PADDE Dr G M	ICI Central Medical Group, Alderley Park, UK
PAGLIAALINGA Dr S	Montedison, Novara, Italy
PAQUET Dr	Atochem, Serquigny, France
PATERSON Dr J C	ICI Runcorn, UK
PIRASTU Dr Roberta	Istituto Superiore di Sanita, Rome, Italy
POPPER Dr Hans	Mount Sinai Medical Center, New York, USA
POSSBERG Dr J	Wacker-Chemie, Munich, Germany
FUECH Dr A M	Atochem, Brignoud, France
PURDHAM Dr J	Canadian Centre for Occupational Health & Safety, Hamilton, Canada
RAMBAUD Dr J	RP Recherches, Antony, France
RANGES P	Norsk Hydro, Porsgrunn, Norway
RICHARD Dr P	Rhone Poulenc, Roussillon, France
ROBSON Mrs D	Saskatchewan Cancer Foundation, Regina, Canada
RODRIGUES Dr MJF	ICI, Sao Paulo, Brazil
ROUSH Dr G	Monsanto, St Louis, Missouri, USA
RUTY Dr J	Atochem, St Auban, France
SALG Dr J	NIOSH, Cincinnati, USA
SARACCI Dr R	IARC, Lyons, France
SCHIEFFERS Dr M L	DSM/CVMD, Geleen, Holland
SCHILPPER Dr H	University of Manitoba, Winnipeg, Canada
SERONNE Dr D	Diamond Shamrock, Dallas, USA
SHAH Dr Has	CMA, Washington DC, USA
SIGRIST Dr J	Shell Chimie, Berre L'Etang, France
SMITH Dr E	Division of Environmental Health, World Health Organisation, Geneva, Switzerland
SMITH Dr P M	Llandough Hospital, Penarth, UK
SMITH Prof Allan H	University of California, Berkeley, USA
SMITH Mr J S	ICI Hillhouse, UK
SPIRTAS Dr R	NCI/NIH, Bethesda, Maryland, USA
STAFFORD Dr J	Somerset, UK
STAHLNECKER Mr	BASF, Ludwigshafen, Germany

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UPL 02143

TAMBURRO Prof CH	University of Louisville, USA
ten BERGE Dr W F	DSM, Geleen, Holland
TENKHOFF Dr N	Huls AG, Marl, Germany
TER HAAR Dr Gary	Ethyl Corporation, Baton Rouge, Louisiana, USA
TERWIESCH Dr B	Chemische Werke Huls, Kreis Recklinghausen, Germany
THERIAULT Dr Gilles	McGill University, Montreal, Canada
THIESS Prof Dr A M	BASF, Ludwigshafen, Germany
THILS-EVENSEN Dr E	Norsk Hydro, Porsgrunn, Norway
THOMSON Dr D H	Cancer Treatment & Research Foundation, Halifax, NS, Canada
TORDOIR Dr W	Shell, An Den Haag, Holland
VAN DER MERWE Dr	H J AECI, Sasolburg, South Africa
WALLACE J R	Esso, Sarnia, Ontario, Canada
WALTEMATE H	BF Goodrich, Cleveland, Ohio, Usa
WEJDLING S O	Norsk Hydro, Stenungsund, Sweden
WHEELER Dr D J	ICI Hillhouse, UK
WHEELER R N	Union Carbide, South Charleston, USA
WHITE K H	Duperial, Buenos Aires, Argentina
WILINSKI O	Electrochemical Industries, Acre, Israel
WILLIAMS Dr DMJ	BP Chemicals, Penarth, UK
WILSON Prof R	Harvard University, Cambridge, Massachusetts, USA
WRIGHT Dr A P	ICI Wilton, UK
YORK J	ICI Everberg, Belgium

From: Dr B Bennett, Occupational Health Department, ICI Chemicals & Polymers Group,
Hillhouse Site, PO Box 4, Thornton-Cleveleys, Blackpool FY5 4QD, England

February 1987

URL 02144

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 Barr, Mr John E Ertel, Mr R T Gottesman, Mr A King and Dr 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

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

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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
<u>BELGIUM</u>															
01		12.01.13	Solvay	Jemeppe	00.07.58	00.05.76	63	18	17	29.06.76	Yes	High 1958-1968 exposed to 200 ppm for 8 hrs per day and certainly under 500 ppm in 6 to 9m ³ 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 Polyworker 13 yrs	Driller in a foundry (2 yrs) Former (15 yrs) Work in glass ind. & chemi- cal industry	Hepatic tests (in Oct 1974 (were normal. (Retired (Feb 1975 (Hospitalised (May 1976 (Complete (Clinical and (career details (are given in a (paper by (Hublet et al (in Arch. Belg. (Med. Soc., (Hyg. Med. (Trav. Med. (Leg. (1977 pages (601-622
02	SR	29 09 40	Solvay	Jemeppe	20 08 62	00.10.79	39	17	9	23 10 83	Yes	08.62-03. 63 01.67 -10.71 > 200 ppm 8h/day 04.63-12. 66 < 200 ppm	Autocleaner 15 yrs 5 mths Operator 13 yrs 9mths	Fireman since 10.71.	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 Sloover.

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
CANADA			SHAWINIGAN												
01		15.12.13			1944	1955	41	11	11	02.09.55	Yes		Reactor cleaner	Operator (polymerisation)	Smoker
02		06.03.14			1943	1957	43	14	14	21.12.57	Yes		Maintenance, millwright, pipefitter	Operator	Worked overtime Smoker
03		26.08.19			1941	1962	42	21	20	23.03.62	Yes		Operator, foreman		Worked overtime Non-smoker
04		05.04.19			1945	1967	48	22	22	21.01.68	Yes		Reactor cleaner	Operator, foreman, water cooling unit	Worked overtime Smoker
05		07.05.11			1944	1968	57	24	05	05.07.68	Yes		Reactor cleaner	Water cooling unit	Worked overtime Smoker
06		15.12.19			1947	1971	51	24	23	10.04.71	Yes		Reactor cleaner	Maintenance, millwright	Worked overtime Smoker
07		09.11.19			1946	1972	53	26	25	24.12.72	Yes		Reactor cleaner	Machine shop operator and poly unit	Worked overtime Smoker
08		13.05.20			1961	1973	53	12	05	12.06.73	Yes		Reactor cleaner	Maintenance machine shop	In plant 25 yrs! Smoker
09		19.07.21			1946	1974	53	28	26	04.09.74	Yes		Furnace op. pipefitter maintenance		Worked overtime Smoker

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

ICI CHEMICALS & POLYMERS GROUP

WPX/ASL - LANGTUCASES, H

Page 3

CANADA
Sheet 2

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

[illegible]

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

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	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	Novaky	01.11.50	27.11.64	37	14	15	26.11.64	Yes		Autoclave Cleaner	IARC letter of 1-4-82 gave somewhat altered dates for this case. I have accepted the changes since the dates come from Prof A David of the Centre of Industrial Hygiene and Occupational Diseases. My dates come originally from NIOSH.	

FRANCE
Sheet 1

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

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	IM	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	103.06.11	PCUK	Brignoud	06.07.59	15.01.75	63	16	12	24.01.75	Yes (WDSH 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	106.01.20	RP	St Vena	00.00.46	15.01.75	55	29	29	29.06.75	Yes	High	Polyworker (10 yrs as autoclave cleaner Compounding (3 yrs)	VCM production (16 yrs Italian POW Shepherd, Sawyer, Mason	Ref. Rety et al Arch. Mal. Prof. 1 37 n° 16 June 71 p 551-555
04	MOR	127.01.27	PCUK	Brignoud	19.10.49	16.01.76	49	26	26	04.01.76	Yes	High	Monomer production worker (8 yrs PVC filtration (18 yrs)		
05	B	129.01.38	PCUK	Brignoud	18.01.65	13.05.76	38	11	11	13.05.76	Yes	High	Polyworker (11 yrs)	(1) Thoracotomy (9th Feb 1976 (costal angiosarcoma (10 Septembre (2) Scintigraphy (1976 (found ASL (3) Haemorrhage (bone (from ASL (4) Right Hepatectomy	Ref. P Coudere et al "Semaine des hopitaux angiosarcoma (10 Septembre (1976 (Previously had (bone angiosarcoma" Also Piltchowski et al "La Nouvelle Presse Medicale (7th July 1979 Page 2485

FRANCE
Sheet 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
FRANCE 06	Pa	14.04.34	PCUK	Brignoud	01.03.58	12.08.76	42	18	13	11.09.76 (NIOSH says 12.09.76)	Yes	Moderate	((1958-1960) 12 yrs filtration 10-11 yrs polyworker and works lab?		This man had IAOL prior to IAS. Ann. de Mal. Prof. July '77 p 645 & 6. IAOL was found in 1971 five yrs before IASL
07	GIR	26.04.27	RP	St Auban	01.07.50	After death NIOSH says 00.07.76	49	26	22	02.07.76	Yes (NIOSH no comment)	High	Plant fore- man in polymer- isation	1972-6 admin section in St Auban	Died of septicaemia Small liver lesion found after autopsy
08	S	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	RFX	08.10.14	RP	St Fons	10.01.48	26.04.76	63	28	28	25.12.77	Yes	Very High 1948-1966 Lesser Exposure 1966-1976	Polymer- isation operator, autocleaner, autoclave maintenance	10 yrs in sulphuric acid factory, storekeeper & general services	Operated 4.76 for removal of tumour from liver and died after second surgical operation for bilio bronchial fistula Paper by Dr Rety et al in Archives de Maladen Professionals Vol 40 No 6 1979 pages 1741-1.

FRANCE
Sheet 3

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															
10	VP	24.05.19	RP	St Fons	00.11.56	10.01.78	58	21	21	10.01.78	Yes	High	Autoclave cleaner	10 yrs in mechanical engineering industry 1946-1956	Died of pulmonary embolism 5 days after surgery
11	L	15.02.12	RP	St Fons	00.01.41	12.08.78	66	37	31	13.11.78	Yes	High	1941-1946 polymer- isation (general purpose worker 1946-1972 VCM (synthesis (HCl & (Acetylene) Foreman (agent (de maltrise) 1972 retired		
12		16.08.14	PCUR	Brignoud	09.02.49	00.05.79	65	30	27	23.06.79	Yes	High	Monomer production and polymer- isation operator		
13		19.01.31	Solvay	Tavaux	23.09.63	26.06.79	40	16	13	22.08.79	Yes		Autocleaner 12 yrs, Auto- operator 19 yrs, Copolymers 14 yrs	12 yrs as cycle mechanic. 10 yrs as canneller in sanitary ware manufacture	Cigarette smoker until 1974. Ill all of 1977 due to oesophageal varices. Surgical intervention 25.05.79 (right hepatectomy)
14	HU	05-04-24	Chloe Chiale (Formerly RP)	St Fons	1943	00.07.81	57	38	36	29.07.81	Yes	Very High	1943-1975 1943-1975 and Intermitt- ently 1975-1979 Process	1943-1975 All types of maintenance and work 1975-1979 in VCM Poly Process	

FRANCE
Sheet 4

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 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		Left Hepatectomy 1983 J C Contassot Letter of 15 10 1983
16	GIN	13.07.22	Chloe Chimie (Formerly RP)	St Fons	17.10.41	05.01.83	61	41	38	03.04.83	Yes	High-33 yrs Moderate- Low - 5 yrs	Polymerizat- ion Process Man Maintenance Worker Health & Safety Agent		Retired Jan 1979. J C Contassot Letters of 15 10 1983 and 25 7 84.
17	HAR	22.02.23	Chloe Chimie (Formerly RP)	St Fons	17.06.48	03.04.83	60	34	28	03.04.83	Yes	High - 23 yrs	Autoclave Cleaner 1948-1971	Other sectors of St Fons Factory 1971- 1978	Retired 01.01.79 J C Contassot Letter of 15 10 1983
18	R	14.07.42	Soivay	Taveaux	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

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	Atochen	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	Atochen	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.

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 cans) with VC		Reported under (non polymer- flation workers in NIOSH list of 31.1.77. (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 (for 1 yr)	Clinical details in paper by Gokel et al Virchows Arch A Path 1976 372 p 195-203

GERMANY
Sheet 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
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)		BC Chemie (says "chemistry laboratorian) in the Techno- logical Research Department" (NIOSH says assistant factory chemist (which may be) wrong translation))		(Confirmed Reported under non-polymer- isation workers in NIOSH list of 131.3.77 and 11.78. I don't think this is a correct classification by NIOSH. The man may have been involved in VCM polymerisation in pilot plant or in main plant.
06 (NIOSH gives as Case 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	?	

GERMANY
Sheet 3

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 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 17% auto- clave cleaning Control room 1 yr		110/78 Confirmed Average exposure first 19 yrs 150 ppm, to cc 1000 ppm. Next 3 yrs av, 175 ppm. Last 1 yr av 35 ppm
10 (NIOSH gives as Case 11)		00.00.36	2	2	01.01.61	00.01.77	40	16	10	07.03.77	Yes	High peaks	10 yrs poly- worker incl 17% auto- clave cleaning		Average exposure first 19 yrs 150 ppm, to cc 1000 ppm. Last yr av 175 ppm. CMI letter of 121.04.78
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	07.10.77	Yes	7	PPVC Manu- facture Autoclave worker for 16 yrs		

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
COUNTRY AND REFERENCE NO	NAME OR INITIALS	DATE OF BIRTH	COMPANY	FACTORY	FIRST VC EXPOSURE	DATE OF DIAGNOSIS	AGE AT DIAGNOSIS	YEARS OF EXPOSURE TO DIAGNOSIS	YEARS OF EXPOSURE	DATE OF DEATH	HISTOLOGICAL CONFIRMATION	ESTIMATED EXPOSURE LEVEL	OCCUPATION	OTHER CAREER HIGHLIGHTS	OTHER COMMENTS
GERMANY															
13		00.00.14	7	7	00.00.60	08.04.78	63	18	14	19.05.78	Yes				P W Best letter of 130th 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 Speiserohre" (a carcinoma of the oesophagus) not attribut- able to VCM & not recognised as an indust- rial disease				P W Best letter of 130th June 1980 enclosing data from H P Friedel of BG Chemie withdrawing this case
15		00.00.29	8	8	19.10.53	09.10.78	49	25	25	23.10.78	Yes	?	Autoclave cleaner and worker. Drier operator. Later shift leader		Angiosarcoma confirmed 10/9/79. Some detail of this & also cases 19, 13, 15, 16 & 17 given in INRW Report for 1978
(NIOSH given this as Case 13)															
16		00.00.23	4	4	10.01.55	07.08.78 (Leibach suspected ASL at Feb 1975 (laparotomy)	55	23	20	07.08.78	Yes ASL and Hepatocellular Carcinoma	High	Autoclave worker till 1964. Leader and master		Angiosarcoma confirmed, full details of illness since March 1973 given in INRW Med Insp Rep for 1978. Different details given in "VC Associated Disease" by Leibach and Marsteller (1981) p71.

GERMANY
Sheet 5

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 17 (NIOSH gives as Case 15)		00.00.37	4	4	01.11.61	14.08.78	41	16	11	28.08.78	Yes	High	Autoclave worker	No	Angiosarcoma confirmed. Annual report of the North Rhine Westphalia Medical Inspectorate for 1978 pages 347-377 gives full details. Vinyl chloride disease diagnosed 02-02-73. Oesophageal varices. Radiologically confirmed atero osteolysis.
18		00.00.13	5	5	00.00.55	25.12.79	66	24	21	25.12.79	Yes		Autoclave Worker		
19		00.00.25	4	4	18.10.54	00.08.79	54	25	18	22.02.80	Yes Metastasing ASL	High	Autoclave Worker		Dr Beache letter of 13-04-82 to Dr W G F Adams
20		00.00.15	4	4	14.02.61	00.04.80	65	19	13	19.10.80	Yes Haemangio Endothelioma of liver with Metastases	High	Autoclave Worker		Dr Beache letter of 13-04-82 to Dr W G F Adams
21		00.00.13	4	4	01.01.62	00.09.79 (pronounced clinical liver syndrome)	66	18	13	19.06.80	Yes Haemangio Endothelioma of liver with Metastases	High	Autoclave Worker and worked in drying shop		Dr Beache letter of 13-04-82 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 Beache letter of 13-04-82 to Dr W G F Adams

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	52	24	21	29.09.81	Yes	High (>300 ppm)	Chemistry Worker		Primary hepatocellular carcinoma; proliferation of the sinusoidal cells with sinusoidal ectasia. Friedel letter 23.12.86.
24		00.00.28	8	8	1969	11.10.82	54	13	12	28.05.83	Yes	High (>300 ppm)	Autoclave Cleaner		Prof Eder (Munich) letter 22.08.83. Friedel letter 19.04.85.
25		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	25	25.08.85	Yes	High	Process worker 1947- 84 (01.10.60) -31.03.84 PVC product- ion, agitator (area).		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		100.00.21	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 cleaner		Haemangiosarcoma. Friedel letter 23.12.86.

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 extruder		Primary tumour (may have been pericardium. Not homo- genous with other cases. * **
02	SE	11.11.29	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 suspens- ion polymer- isation. Area Foreman in same Dept since 1975.	Never cleaned autoclaves. See paper by CHIAPIANO et al Med Lavoro Vol 6 (1982) pp 555-563	** Non-smoker. Consumed little alcohol. No AOL.
05	IG Danesin	19.03.37	PANSAC	Mira Venice	00.00.67	07.03.83	46	16	8	06.04.83	Yes	Medium-? High	Bag extruder 1967-1975 Commercial Dept 1976- 1983		15 Paglia- Lunga telex of 12 Aug 1981

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

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

JAPAN

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>JAPAN</u>															
01	Tomoji Mori	01.08.22	Mitsui Toatsu (no comment by Jap PVC Assoc)	Nagoya	00.04.53	24.10.75	53	22	13	24.10.75	Yes	PVC Assoc says not known. * 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

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
NORWAY															
01	AH	23.12.15	Norsk Hydro	Nerøya	00.03.50	21.12.71	36	22	21	04.01.72	Yes	High	Foreman & Autoclave supervisor		Confirmed by Dr Thils- Evansen of NH. At APME Mtg of 19 June 1978 Mr P Rangnes stated that AH had been a member of a start-up team. VCN & PVC were made in same building. The VCN was made from acetylene

SWEDEN

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	Sundevall	14.08.51	20.10.70	43	19	18	20.10.70	Yes		Polyworker		
02	BL	27.11.11	Kemanord	Sundevall	00.01.45	00.08.72	61	27	27	16.08.72	Yes	High	VCM production		Mr Sjoelin's letter of 28 March 1978 confirms BL was a monomer worker who was heavily exposed, probably even more so than a normal reactor cleaner
03	NE	10.06.10	Kemanord	Sundevall	00.05.47	18.03.76	63	29	21	19.03.76	Yes	High	Polyworker		
04	AL	16.11.14	Kemanord	Sundevall	00.00.46	12.05.77	62	31	31	12.05.77	Yes	High	1946-1958 polymer- 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 B Byren letter 18.8.77 to CEPIC
05		12.03.19	Kemanord	Sundevall	11.05.64	22.11.80	61	16	16	22.11.80	Yes	High - 6 Years Low - 10 Years	1964-1970 centrifuge operator 1970-1980 drier operator		Letter of 2nd Nov 1981 from Dr David Byren

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

UK

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

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	20.04.01	ICI	Hillhouse	04.04.44	03.12.72 (Fox & Collier paper says 23.12.72)	71	28	22	03.12.72 (Fox & Collier paper says 23.12.72)	Yes	500 ppm	1944-7 VCM 1947-8 Drier 1948-61 Autoclave operator 1961-66 Drier		Lee and Harry Lancet 29-06074 pages 1316-8
02															Dubious fabrication case
03	BJW	02.08.37	BP	Barry	00.02.68	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	

UK

Sheet 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
UK 05	JK	30.03.14	BP	Barry	08.01.51	00.10.79	65	28	21	19.11.79			1951-52 1 Polycleaner 1952-55 1 latex 1955-60 1 Polyfloor 1960-64 1 Poly 1 Chargehand 1964-70 1 Charging operator 1970-72 1 Drier operator		
06	CEP	1931	BP	Barry	1962	09.01.80	48/9	18	12	09.01.80			7 yrs 1 Poly Floor operator 15 yrs 1 Greaser on 1 Poly Floor		
07	RGB	26.04.20	BP	Barry	1963	00.00.80	60	17	8.2	13.06.80			1 Polycleaner 1963-5 1 Recovery 1965-1971		
08	WTH	08.05.24	BP	Barry	19.09.50	27.11.81	57	31	24	25.12.81		1950-1958 1500 ppm 1960-1974 1200 ppm	1950-51 1 Autoclave operator 1951-1957 1 Chargeman 1 Autoclave building 1957-1974 1 Shift 1 Supervisor 1 Autoclave building - 1 Never cleaned 1 Autoclaves 1 but 1 Supervisor's 1 job entailed 1 entering 1 Autoclaves 1 to inspect 1 them	1938-1948 1 Motor Mechanic 1948-1950 1 Operator on 1 Acetylene 1 Production 1 Plant	

UK

Sheet 3

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	07.03.25	BP	Barry	15.02.50	02.03.83	58	33	28	24.02.83	Yes	Medium	Polyworker	12 years on Acrylonitrile Resin Plant. Also prior to 1950, 4 years RAP 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-drier bagger 1967- 68. Blow-down stripper operator 1968-70.	Heavy goods vehicle driver until final illness. 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 D Evans Oesophageal haemorrhage due to oesophageal varices due to Angiosarcoma of liver
12	JT	24.01.37	ICI	Millhouse	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

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	PH	02.03.48	BP	Barry	1968	Jan 86	37	18	3	02.06.86	Yes	High Low High	Polycleaner 1966-69 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

USA
Sheet 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
COUNTRY AND REFERENCE NO	NAME OR INITIALS	DATE OF BIRTH	COMPANY	FACTORY	FIRST VC EXPOSURE	DATE OF DIAGNOSIS	AGE AT DIAGNOSIS	YEARS OF EXPOSURE TO DIAGNOSIS	YEARS OF EXPOSURE	DATE OF DEATH	HISTOLOGICAL CONFIRMATION	ESTIMATED EXPOSURE LEVEL	OCCUPATION	OTHER CAREER HIGHLIGHTS	OTHER COMMENTS
USA															
01	Earl Parke	17.10.23	BPG	Louis- ville	09.12.48	03.03.73	49	24	21	03.03.73	Yes		Pot Cleaner (Block Jama 1974) p 53	History given in Annals NY ACAD SCIENCES (Vol 329 (1979)) of Sc Symp page 190 in 1974 Paper by B R Cottine of OSHA	Rolling Stone Art Ref 1 NY Acad of Sc Symp 1974 Also Block Jama 1.7.74 p 53
02		19.08.33	BPG	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	BPG	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	RPG	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	BPG	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	RPG	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

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
COUNTRY AND REFERENCE NO	NAME OR INITIALS	DATE OF BIRTH	COMPANY	FACTORY	FIRST VC EXPOSURE	DATE OF DIAGNOSIS	AGE AT DIAGNOSIS	YEARS OF EXPOSURE TO DIAGNOSIS	YEARS OF EXPOSURE	DATE OF DEATH	HISTOLOGICAL CONFIRMATION	ESTIMATED EXPOSURE LEVEL	OCCUPATION	OTHER CAREER HIGHLIGHTS	OTHER COMMENTS
USA 09	Raymond Cottle- Finger?	08.11.31	BFG	Louis- ville	28.05.45	01.03.74	43	29	24	11.03.75	Yes	2000 ppm			Ref 1 has wrong figures for first exposure. Louisville Times 29.10.74, 12.3.75, 10.3.76
10		16.08.13	Goodyear	Niagara	12.06.51	00.05.68	35	17	17	10.05.68	Yes				Ref 1
11		27.05.09	Goodyear	Niagara	14.10.46	00.03.70	61	23	23	16.03.70	Yes				Ref 1
12	Francis A Bachman	17.11.18	Firestone	Pottstown Pa	13.07.49	02.05.69	50	20	19	02.05.69	Yes	High 10 yrs	10 yrs as reactor op. (not cleaner) - separate crew cleaned autoclaves)	Utility & Service op. Bagger Dryer op. Stripping op. 3 yrs prior service in tyre plant	Ref 1 + letter of 26 April 1978 from Russell A Park to J T Seawell of MCA
13	Richard Edward Clendenin	01.12.21	UCC	S Charle- ston	11.12.42	00.05.74	52	32	26	07.04.74	Yes	2000 ppm			Charleston Daily Mail 21.7.75
14															Never diag- nosed as ang- iosarcoma of liver. Inform- ation given in letter 22 May 1984 from J A Saig.
15															Accountant; ASL - No evi- dence of VCM exposure.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
COUNTRY AND REFERENCE NO	NAME OR INITIALS	DATE OF BIRTH	COMPANY	FACTORY	FIRST VC EXPOSURE	DATE OF DIAGNOSIS	AGE AT DIAGNOSIS	YEARS OF EXPOSURE TO DIAGNOSIS	YEARS OF EXPOSURE	DATE OF DEATH	HISTOLOGICAL CONFIRMATION	ESTIMATED EXPOSURE LEVEL	OCCUPATION	OTHER CAREER HIGHLIGHTS	OTHER COMMENTS
USA															
16	James Howard	04.11.27	BPG	Louis- ville	08.05.50	00.00.69	41	19	04	27.03.69	Yes		1951-4 VCH polymer- isation	From 1954 onwards in Army and other service. 146-50 Army	Table 4 in Wagoner Testimony to US Senate Confirmed in M N Johnson ltr 07.08.78
17	Peerenboom	06.05.31	BPG	Louis- ville	23.06.55	11.10.74	43	19	19	16.10.80	Yes on 11.10.74 but no post-mortem 16.10.80				Dr M N Johnson letter of 24.2.81 con- firmed death 16 years after diagnosis
18	Charlie Arthur	22.04.28	BPG	Avon Lake	15.09.54	00.00.75	46	21	13	02.11.75	Yes	13 yrs autocleaner 18 yrs on Estol plasticiser 16 Carboset operation	Navy Tyre Store		Confirmed in M N Johnson ltr 07.08.78 Also Rolling Stone mag. 15.01.76
19	Virgil Christian	00.00.15	UCC	S Charle- ston	00.00.43	19.06.75	60	32	32	06.04.76	Yes	2000 ppm			Williamsport Sun Gazette 21 June 1975 Charleston Daily Mail 21.7.75
20		11.08.17	Goodyear	Wingero	00.00.55	30.01.76	58	21	18	30.01.76	Yes				NIOSH letter of 25.10.79
21	Chester Hinkle	02.09.09	UCC	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

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	BPG	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 Bella Lane of whom 8 had died by 126.1.76. In his letter of 16.09.81 Dr M N Johnson confirms this is the case described by Dannaher Tamburro & Yan in Feb 1980. Am J Medicine Vol 70 p280
23		00.00.23	Great American Chemical Company	Pitchburg Mass.	08.09.58	06.04.73	50	15	14	06.04.73	Yes				
24	Charles Edward Moore	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 24 yrs	1941-65 non-solvent vinyl resin unit and dispersion (exposed as unit fitter, gas fitter, helper, then shift utility man)	1937-39 was off and on labourer (1939-41 way have been exposed as reactor cleaner, 1943 became shift fitter, 1946 became shift utility man)	IN 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 register since this neoplasm may be associated with ASL.
(25)															R N Wheeler letter of 20/2/79 and Rose Kaminski letters of 26/2/79 and 15/11/80
															Removal from register confirmed in R Kaminski letter of 5 November 1980

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		IR Kaminski letter of 26/2/79 and Prof. Tamburro letter of 19/1/79
27	J L Forrest	11.05.16	UCC	S Charle- ston	01.07.41	30.11.78	62	37	20 (NIOSH says 27 and C Daily Mail 25)	25.11.78	Yes	High	Operator to 10.10.76	Exposure in bulk and dispersion PVC manufacture	IR N Wheeler ltr of 4 Jan 1979 and Charleston Daily Mail 30.11.78 and IR Kaminski 26/2/79
28		11.04.17	UCC	S Charle- ston	00.08.44	03.11.78	61	34	33	03.11.78	Yes				IR Kaminski letter of 6/4/79
29		12.10.07	UCC	S Charle- ston	00.05.42	00.03.80	72	38	16	01.03.80	Yes				IR Kaminski letters of 19th June 1980 & 5th Nov 1980
30	MVR	22.07.22	Fenneco Chemicals	Flemington	11.06.64	30.12.80	58	17	15	30.12.80	Yes	6 - Unknown 9 - Minimal	Maintenance Mechanic 16 yrs Elsewhere 11 yrs Boiler house Operator 9 yrs		
31		08.11.23	UCC	S Charle- ston	12.05.46	01.08.81	57	35	13	02.04.82	Yes	High (but not as high as reactor cleaner would (experience) Worked as labourer from June 1941 to May 1946) and may have cleaned reactors in that time	Chemical Operator in charge reactor From 1959 to 1976 Aliphatic Chemicals operator and From July 1976 to date Foreman Aliphatic Chemical Operation	From 1959 to 1976 Aliphatic Chemicals operator and From July 1976 to date Foreman Aliphatic Chemical Operation	Dr Dacey letter 16.10.81 and IR N Wheeler letter of 19.11.81. Also Dr Dacey letter of 07.01.81 re date of death.

USA

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

UK system of dates
DAY - MONTH - YEAR

Sheet 6

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
COUNTRY AND REFERENCE NO	NAME OR INITIALS	DATE OF BIRTH	COMPANY	FACTORY	FIRST VC EXPOSURE	DATE OF DIAGNOSIS	AGE AT DIAGNOSIS	YEARS OF EXPOSURE TO DIAGNOSIS	YEARS OF EXPOSURE	DATE OF DEATH	HISTOLOGICAL CONFIRMATION	ESTIMATED EXPOSURE LEVEL	OCCUPATION	OTHER CAREER HIGHLIGHTS	OTHER COMMENTS
US 32	C W Giroux	22-02-08	Monsanto	Springfield Mass	15-10-51	00-07-79	71	28	14 (in PVC autoclave area)	17-05-80	An autopsy was done and immediate cause of death given as "Angiosarcoma"	The death certificate gave "Mr Giroux" usual occupation as "kettle operator" in and "chemicals industry".	1940-1951 Various jobs in polymer manufacture (BUTVAR LUSTREX 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 Munn of Monsanto Europe.
US 33	S Ferguson Jnr	08-10-27	BFG	Louisville	09-09-54	11-05-82	54	28	28	Alive	Yes		Multiple jobs including Poly Operator + Polycleaner.		Prof Tamburro letter of 12 Aug 1982 + Dr M N Johnson letter of 28 Feb 1983.
US 34	Mr Byrum	29-01-34	BFG	Louisville	1955	03-11-82	48	27	10	04.08.83	Yes		Poly Operator + Autoclave Cleanser 1955-65.	1965 left BFG to become a Clergyman.	Dr M N Johnson letter of 3 Nov 1982, 28 Feb 1983 and 9 Aug 1984.
US 35		09-03-12	UCC	S Charlie- ston	23-07-44	18-07-83	71	39	14	18-07-83	Yes	High from 1944 to 1955. Medium from 1955-1958			Dr Dacey letter of 15 Sept 1981.
US 36		27-08-32	The General Tire and Rubber Co	Ashtab Ula	11-06-56	21-08-83	50	27	27	Alive	Yes	Moderate	1956-56 labourer 1956-57 prod helper 1957-70 operator 1970-75 electrician 1975-present operator		Dr W Landrie letter of 12 Sept 1983: spotted at medical May 1981. Testing commenced May 1981

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	BPC	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 (1963-1982) (progression (from helper (to senior (operator, (cleaned (reactors, (stripping (and (recovery (areas as (well as (charging (operator.		Thrombo cytopenia and leukopenia since since 1978. Gold treatment for arthritis 1976. Under Dr's care about 6 months before death, had passed standard physical examination 3 months earlier. J Barr letters of 22.10.84 and 23.01.85.
39	J Hemice	27.06.18	Pentacote	Pasadic	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 (1982-83 (Mill (Operator, (Calender (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 Pentacote with letter of 24.02.86 from Dr Auerbach, Pathologist.

YUGOSLAVIA

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	HISTO- LOGICAL CONFIRM- ATION	(ESTIMATED) EXPOSURE LEVEL	OCCUPATION	OTHER CAREER HIGHLIGHTS	OTHER COMMENTS
YUGOSLAVIA															
01		05.04.14	Jugo Vinil	Split	100.00.53	08.04.73	59	20	20	08.04.73	Yes				(SARIC et al paper Env Health Perspective Vol 17. pp 189-192 1976
02		15.11.31	Jugo Vinil	Split	100.00.50	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

Incidence of ASL Cases Per Annum

	By date of death	UJRL 02178
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

URL 02179

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

URL 02180

TABLE 3Pattern 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.

	<u>ASL Cases</u>
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.

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

NB: There are 28 pre 1962 PVC plants in N America; 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>272</u>	22.66 *	
		<u>76</u>	<u>1702</u>	<u>22.39</u>	W Europe Average
<u>N America</u>	US	36	910	25.27 *	
	Canada	<u>10</u>	<u>204</u>	20.4 *	
		<u>46</u>	<u>1114</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>85</u>	21.2	
		<u>8</u>	<u>154</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>154</u>	19.2	
		<u>130</u>	<u>2970</u>	<u>22.84</u>	World Average

France, and USA have an average latency period above world average, Germany, UK and Canada

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			
	1			
14	2			
13	3			
	4			
	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 LATENCY 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

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(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		

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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
BURGHAUSEN 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

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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	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	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								

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*Monomer worker

TABLE 5

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

	Western Europe	North America	Rest of World	Annual Total	Cumulative Total	Key Events
1955		1		1	1	
7		1		1	2	
1961		1		1	3	
2		1		1	4	
4		1	1	2	6	
7	1			1	7	
8		5		5	12	
9	1	2		3	15	
1970	1	1		2	17	Viola
1	1	2		3	20	
2	4	1		5	25	
3	1	4	3	8	33	Maltoni
4	3	2	-	5	38	Goodrich
5	6	4	1	11	49	
6	6	3	2	11	60	
7	6	3		9	69	
8	7	2	1	10	79	
9	5	-	-	5	84	
1980	6	4	-	10	94	
1	5	0	-	5	99	
2	1	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.
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(Review date 1 January 1987)

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.

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(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	G6,UK6,G21,B2,G29	US6	
	3	Fr13, UK7,Fr18	US38	
	4	Sw5	US30	
	5	Fr5,UK11		
	6	UK3, UK10		
	7	It5		
	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.

TABLE 8
WESTERN EUROPE PVC PRODUCERS - START-UP DATES vs ASL CASES (OMITTING GO3 & It.01)

START-UP YEAR	COUNTRY NAME	COMPANY NAME	LOCATION	ASL CASE NUMBER	YEAR OF 1st Exposure
1931	West Germany	BASF	Ludwigshafen		
1933	West Germany	Wacker	Burghausen	04,07,11,15,23,24, 25,31,32	57,54,55,53,55,69,60,53, 55
1938	Italy	Montecatini	Acna		
1939	France	Rhone Poulenc/ 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	CWH/Huls	Marl	09,10,26,29	61,61,53,62
1949	Belgium	Solvay	Jeneppe	01,02	58,62
1950	France	POUK/Atochem	Brignoud	02,04,05,06,12,19 20	59,49,65,58,49,59,51 50
	France	Rhone-Poulenc	St Auban	07	50
	Holland	Shell	Pernis		
	Norway	Norsk	Heroya	01	50
1951	Italy	Montedison	Brindisi		
1952	Italy	Montedison	Terni		
1953	Austria	Halvic	Hallein		
	France	Solvay	Tavaux	08,13,18	57,63,63
	Italy	Solvay	Ferrara	03	53
	Spain	Rio Rodano	Hernani		
	United Kingdom	BIP	Aycliffe		
	West Germany	Hoechst	Gendorf	18	55
1954	West Germany	Dynamit	Troisdorf	01,02,08,12,16,17, 19,20,21,22,27,30	56,57,54,61,55,61, 54,61,62,61,55,51
1955	Spain	Monsanto Iberia	Monzon		
1956	Spain	Caiqsa Hispavic	Sabinanigo 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	Rudanca	Cagliari Sardina		
1970	Italy	SIR	Porto Torres Sar		
	United Kingdom	ICI	Runcorn		
1971	Italy	S C Ravenna	Ravenna		
	Spain	Hispavic	Martorell		
	Sweden	Kemanord	Sterungsund		
	United Kingdom	BP Chem	Baglan Bay		
1972	Finland	Pekema	Svartback		
	Holland	DSM	Beek Limburg		
1976	France	Soc Art D'vinyl	Mazingarbe		
1977	Spain	Monsanto Iberia	Tarragona		

* Laboratory worker in Research Department
PANSAC, Mira Verice, case not included (It 05), due not knowing start up date of the Plant.

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(Review date 1 January 1987)

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 ** (Formerly Conoco)	Assonet, Mass (Closed 1975) (See above)		
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

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

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

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TABLE 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	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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(Review date 1 January 1987)

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	Tckushima		
1955	Ryo-Nichi	Uozu		
1956	Nippon Zeon	Takoaka		
	Nisshin Kagaku	Takeo		
1957	Kureha Kasei	Nishiki		
	Shinetsu Kag	Naoetsu		
1960	Denki Kagaku	Ohmi		
	Kanegafuchi Kag	Takasago		
1964	Chisso Corp	Chiba		
1966	Tokuyama Seksui	Tokuyama		
1967	San Arrow Kagak	Tokuyama		
	Sumitomo Kag	Chiba		
1968	Ryo-Nichi	Mizushima		
	Shinetsu Kag	Tokuyama		
1970	Chisso Corp	Mizushima		
	Denki Kagaku	Goi (Chiba)		
	Kanegafuchi Kag	Kashima		
	Kawasaki Yuki	Kawasaki		
	Mitsui Toatsu	Sakai		
	Nissan Kagaku	Chiba		
	Shinetsu Kag	Kashima		
1971	Tekkosha	Yokkaichi		
1973	Asahi Glass	Hayatsuki		
1974	Toyo Soda	Sakata		
		Yokkaishi		
1975	Central Kagaku	Kawasaki		
	Toyo Soda	Yokkaichi		
1977	Unknown	Kashima		

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(Review date 1 January 1987)

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 Columbiana	Cartagena (Colombia)		
1966	Carburo De Col	Medellin (Colombia)		
1967	Plasticos Omega	Mexico		
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)		

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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

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LIVER Angiosarcoma Cases - (Review Date: 1 Jan 19.)

[illegible]