[redacted]

APR 5 1988

[redacted]

OFFICE MEMORANDUM

TO: Robert A. Bunda, Esq.

FROM: Marcia A. Haase

RE: Dendinger/Wallace PVC Litigation/
Sales Percentages of Defendants to Chrysler

Per your request, I have completed the summaries of defendants Stauffer, Diversitech, Shintech and Schulman answers to plaintiffs' interrogatories and requests to produce documents, and have computed all defendants' percentage of sales to Chrysler.

Attached are three charts as follows:

1. Nine defendants we represent;

2. Our nine defendants plus Stauffer, Diversitech, Schulman and Shintech; and

3. Our nine defendants plus Stauffer, Schulman and Diversitech.

Marcia A. Haase

February 2, 1988
MAH:em
3861-1
Attachments
cc: Peggy A. Whipple, Esq.

Illegally Obtained
Document (Infante)

PRIVILEGED AND
"CONFIDENTIAL MATERIAL
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SUMMARY OF DISCOVERY RESPONSES

	Stauffer	Shintech	A. Schulman	Diversitech
Period of manufacture of PVC resin (Inter. 1, 2, 3, 5) (Shintech 1, 2, 3)	1946-1981	10/2/74 - present	Not manufacturer	Presently not manufacturer; first began 1954
1967 PVC percentage: a) suspension b) emulsion c) bulk d) solution (Inter. 4)	99% (95% bagged, 5% bulk) 1% bagged	N/A; see Inter. 2 response	N/A	100% suspension
Subsequent to 1967, changes in percentages: a) suspension b) emulsion c) bulk d) solution Stauffer's Western facility did not ship product east of Colorado (Inter. 5)	1968: 98% / 2% / 0 / 0 1976: 95% / 5% / 0 / 0 1981 ceased production	Manufacturing process of PVC suspension; never changed	N/A	Never changed
Year of sales of PVC resin to Chrysler, (Bendinger exposure 8-9-68 to 10-80; Wallace exposure 10-9-72 to 4-19-78) (Inter. 6)	1967-1977 no records 1978, 1979 no records; believes sales occurred 1980 no records	1967-1973 N/A 1974-1976 no sales 1977 1978 no sales 1979-1980	1967-1975 no sales 1976- 1977 no sales 1978-1980	1972- 1974- 1977- 1976 no sales 1978-1980 no sales
Volume of sales of PVC resin to Chrysler in lbs. (total known at this time, see separate chart for breakdown of sales per year (Inter. 7)	3,020	3,517,650	363,522	7,653,504

	Stauffer	Shintech	A. Schulman	Diversitech
Annual sales to Chrysler, percentage of suspension, emulsion, bulk and solution (Inter. 8)	Sus / Emul 1978 Unk. / -0- 1979 -0- / Unk.	1977 184,440 lbs. 1978 -0- 1979 361,820 lbs. 1980 2,971,390 lbs. 100% suspension	1976 3,307 lbs. homopolymer 1978 211,642 lbs. copolymer 1979 88,184 lbs. copolymer 1980 48,297 lbs. - 2,205 lbs. homopolymer -44,092 lbs. copolymer 100% emulsion all four years	100% suspension
Testing to determine concentration of RVCM in PVC resin after manufacture (Inter. 9, 10, 16)	Yes; monomer testing done in 1966-1981; specific testing results unknown	Yes; testing program established 1976; records of testing retained and available; typically show less than five parts of RVCM per million	No testing conducted; see Inter. 13 answer	Yes; testing done in slur form for residual v.c. at Control Lab., Ashtabula; trace to approx. 1,000 p RVCM in slurrage
Annual sales to Chrysler, percentage of homopolymer, copolymer, terpolymer (Inter. 11)	No records available; believes PVC resin sold 1978 copolymer; 1979 sales homopolymer	100% homopolymer	1976 100% homopolymer 1978-1979 100% copolymer 1980 (a) 2,205 lbs. homopolyer (b) 44,092 lbs. copolymer (c) terpolymer - none	100% homopolymer
Dates of manufacture of PVC and shipment to Chrysler (Inter. 12)	No records; believes sales in 1978, 1979	See attachment regarding shipment; manufacture dates believed within seven days prior to shipment	Dates of manufacture unknown Shipment dates: 5/04/76, 3/08/78, 5/10/78, 8/09/78, 10/18/78 12/30/78, 3/22/79, 10/31/79, 2/29/80, 3/17/80	Within 30-90 days; spec records no longer avail
Notification to Chrysler that VCM hazardous or suspected carcinogen (Inter. 13, 14, 18)	Warnings on products from 1974; late 1970's, no warnings required, PVC resin below OSHA trigger level; no other records available	Yes; bill of lading contained warning; warning placed above unloading spout on rail cars; technical data sheet regarding resin	Have not found written notification; 1974-VCM emerged as challenge plastics industry; was well known and publicized thru industry; Chrysler should have known due to its membership in Society of Plastics Industry	Yes; 12/2/71 - 1st MSDS available to Chrysler; revised 1975; available Chrysler, 5/75 "A Revie OSHA and EPA Actions on Exposure to VC" sent to Chrysler; no written re of Chrysler requests fc information
First aware that VCM hazardous or suspected carcinogen (Inter. 15, 17)	Will supplement answer; tested PVC resin, determined level VC monomer	When construction began on plant; medical studies not performed to determine whether carcinogenic	See answer to 13 and 16	1973; no steps taken

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	Stauffer	Shintech	A. Schulman	Diversitech
Efforts to reduce concentration of RVCM in PVC manufactured (Inter. 19)	Subsequent to 1/67, improved process regarding VC monomer	1977 - installed stripper columns and nitrogen purges; results: reduced amount RVCM released drying process; finished resin some grades RVCM reduced	N/A	Improved resin slurry and testing
Name and address of knowledgeable employee (Inter 20)	Conducting further discovery	John J. Yonge 137 Basswood Lake Jackson, TX 77566 Business Address Shintech, Inc. 5618 East Highway 332 Freeport, TX 77541	N/A	Joseph Rudd S. Grandview P.O. Box 2032 Odessa, TX 79760
Records of sales of PVC to Chrysler from 1-1-67 to 12-31-80 (Req. 1)	No records available	Attachment behind Answ. 1 to Requests for Production; discovery ongoing		Didn't submit Request Production
Records of sales of suspension, emulsion, bulk or solution PVC to Chrysler (Req. 2)	No records available	100% suspension; see Inter. 4 and 8 answer		
Records of sales of homopolymer, copolymer, or terpolymer PVC to Chrysler (Req. 3)	No records available	All resin homopolymer; see Inter. 11 answer, attachment No. 3 to Request for Production		
Records of size of PVC sold to Chrysler (Req. 4)	No records available	Attachment Document No. 4 to Request for Production		
Records of results of testing for concentration of RVCM (Req. 5,)	No records available	Req. 5 - Records available/ objection; attachment Req. 8 - Request for Production		
Material Safety Data Sheets (Req. 6)	No records available	Attachment No. 6 Request for Production		

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INDEX OF DEPOSITION
OF
ROSCOL NICHOLAS WHEELER

Taken December 9, 1987

CASE: Mary A. Dandinger v. Chrysler Plastic Products, et al., Case No. C87-7117 United States District Court for the Northern District of Ohio, Western Division

F&H FILE NO.: 3861-1

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8	RESPONSIBILITIES:
	1. 1943-1944 - Gas analyst, primarily butadiene styrene;
	2. 1944-1945 - Technical Ass't.; Styrene Mfg. portion;
11-12	3. 1945-1947 - Production Supervisor/Tech. Project work regarding solvent polymerization of V.C. using solution process.
9	Union Carbide never produced PVC at West Virginia Institute.
9-10	Union Carbide produced PVC at:
9	1. South Charleston;
10	2. Texas City.
13	Not familiar with monomer recovery method used during 1945 and 1946 in emulsion process.
13	Regarding solution process:
	1. Monomer recovery method used was distillation operation;
14	2. Process still in use though modified about 1974:
15, 16	a. flash tank added after distillation column approx. 1947,
15	b. doubled number of distillation trays,
16-18, 34, 35, 87	c. some testing done between 1947 and 1974; doesn't recall when or how; does recall methods of analysis not accurate during early years,
	d. prior to 1970, doesn't recall whether testing done or not,
	e. V.C. monomer polymerized into PVC was 40-45%;
19, 20	3. Polymerization process started about 1952;
19	4. Does not know whether customers provided with testing results after 1970 regarding PVC resin for V.C. monomer content.
29	5. Only makes copolymers; does not make homopolymers;
29	6. Lower in molecular weight than suspension resin;
	7. Soluble in many solvents.

20, 21	Agrees: V.C. used for polymerization processes both acetylene and ethylene derived.
21	In 1970's Union Carbide stopped manufacturing V.C.; purchased it from Dow Chemical.
24, 25	Approx. 1960, Union Carbide purchased suspension technology from Walker Chems, Federal Republic of Germany.
24, 25	Began manufacture of suspension PVC at South Charleston plant; used only few years.
25, 26, 33	Process transferred to Texas City plant; explosion at plant in 1977; not enough money made on process to justify expenditure to replace.
27	Most expensive process is solution vinyl process.
27	Least expensive suspension process.
29	1965 - Became involved in dispersion process.
29	Batch vacuum stripping operation used during dispersion process to remove residual monomer from resin.
30	1968 - Residual monomer removed from resin produced by bulk/nonsolvent process by insertion of slurry into tank of hot water which boils unconverted monomer from polymer.
30, 31	Regarding: Size of resin particles produced in four processes:
31	1. Suspension polymerization process - 60 microns to 150 microns, 100 median;
31	2. Solvent process - 75 microns as median;
31, 32	3. Dispersion process - 5 microns in diameter;
32	4. Nonsolvent bulk process - 60 microns;
32	Regarding: Porosity of four processes:
32	1. Emulsion - fairly dense particle, but small;
32	2. Solution - snowflake-like, very porous;
32	3. Nonsolvent - very porous;

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32	4. Suspension - large particle; porosity was problem.
35	Regarding RVCM in resin prior to 1974 (relative terms):
35	1. Solution process - extremely low (2 or 3 ppm);
35	2. Dispersion process - doesn't recall ever seeing data;
36, 37, 82, 85	3. Suspension process - quite high (1,000 ppm):
39	a. produced homopolymer primarily;
39	b. do produce some copolymers.
40, 41	Agrees: Prior to 1974 ACGIH had regulations regarding permissible exposure levels to V.C. which were lowered:
41	1. Doesn't know when lowered or how much;
42	2. Doesn't know whether customers informed prior to 1974 regarding exposure levels of humans to V.C.;
43	3. Prior to 1974, Union Carbide furnished material safety data sheets to its PVC customers; believes responsibility fell under Research and Development Dept.
43-44	Knows:
43	1. Dr. Darmahl - Associated Medical Director, Union Carbide;
44	2. Dr. K. S. Lane - was in Corporate Medical Dept., Union Carbide;
44	3. C. P. Carpenter - Industrial Hygiene Fellowship, Mellon Institute.
45	Union Carbide hired Mellon Institute to investigate effects of chemicals on living organisms.
46-48, 53, 54	Results furnished Union Carbide and published in Toxicology and Applied Pharmacology, 1966, by Smyth & Weil: "Chronological Oral Toxicity to Rats of Vinyl Chloride-Vinyl Acetate Copolymer."
49	Mellon Institute didn't provide any additional data after 1966 regarding toxicity of V.C. and its adverse health effects in humans.
49, 50, 51, 52	Does not recall manufacturing process used in 1966 when Mellon Institute prepared article; work done much earlier than 1966.

53, 54, 55 Mellon Institute performed a lot of testing for acute toxicity for skin sensitivity; has no knowledge whether results published; results indicate PVC resin inert material which had no generalized effect on animals or humans.

55 1966 - MCA acro-osteolysis - epidemiological study done due to BF Goodrich reaction cleaners identified as having this condition:

57 1. Was Union Carbide representative in planning, coordinating study;

56, 57 2. Union Carbide received report of study about 1969, published in series of three articles at University of Michigan by Derman around 1970;

58, 59, 60 3. Study failed to identify V.C. as cause of acro-osteolysis; same study done in Europe by Dr. LaFevre; Europeans could not determine cause either;

61 4. Doesn't know whether this information passed on to resin customers; none had reactor cleaners.

62, 63 Has testified before regarding:

64, 65 1. New Jersey personal lawsuit about 1978:

64 a. involved carcinogenicity,

64 b. employee of Amboy Terminaling Company,

65 c. plaintiff's attorney Levinson,

d. deposition taken by Bitney, Harden & Kipp, near Newark,

e. case settled.

66 2. Ohio lawsuit about 1984:

67 a. involved exposure to PVC,

67 b. plaintiff had progressive multiple sclerosis.

71 Exhibit 3 - Response of Union Carbide to Plaintiffs' Requests for Production of Documents.

71, 72 Told Union Carbide where to look for documents regarding responses to requests for documents; viewed responses one week ago.

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71	Doesn't think supplemental documents provided today constitute complete responses to document requests.
72	Told Mr. Davey that he should look for additional documents.
73, 74, 171, 172	Early 1974, Union Carbide began doing residual monomer analysis on all batches of resins sold; believes these would be responsive to request; originally kept records of where batches sold; have since been destroyed.
75	Doesn't know whether these results furnished Chrysler.
76	Believes Union Carbide answers to interrogatories complete and accurate; when answered, Union Carbide bulk process discussed, not bulk process in general use at that time.
77	Explanation of Union Carbide's nonsolvent/bulk process:
77	1. Low convention continuous polymerization process;
77	2. Stripped of free monomer by boiling in hot water;
	3. Resin particle relatively small, extremely porous.
76, 77	Has impression of nonsolvent/Bulk process of others:
77	1. Two step batch process;
77	2. V. C. monomer converted to about 90%;
77	3. Free monomer removed by vacuum operation;
77	4. Particles larger, more dense than Union Carbide's.
77, 78	Never discussed health effects of V.C. exposure with Chrysler; doesn't know if anyone else did.
78	Agrees: Union Carbide started commercial production of solution PVC resin in 1933.
78	Union Carbide started bulk process about 1936; started emulsion process about 1942.
79	Doesn't know if Union Carbide made technical changes in RVCM recovery prior to 1974.
79, 148	Regarding changes made:
80	1. Vacuum stripping systems installed 1967 or 1968 created second string step in production operation which reduces residual monomer; never furnished with data as was before his time as production manager.

81	2. Additional dryer time reduced volatiles, i.e. reduction of unconverted free monomer; doesn't have knowledge of testing.
81, 82	3. Air blown into resin bins which swept residual monomer out of resin.
82, 83	After 1974 homopolymer member resin significantly lower, 500-600 ppm as opposed to 1,000 ppm before 1974.
83-84	Texas City storage:
83	1. Resin dried, put into bins which were screened;
83	2. Placed next in ship containers;
83	3. Stored on dock up to 28 days;
83	4. Deck loaded on tanker;
84	5. Carried to Perth Amboy where stored in storage yard.
84	Bag resin stored in warehouse when in demand; when warehouse stock depleted, boxes were taken from storage yard, additional resin bagged for warehouse use.
84, 85	Texas City shipped PVC resin in bulk and bag.
85, 86, 87	Mid-1970's, RVCM content in [redacted] for Union Carbide [redacted] produced in Texas City; testing data reported by Texas City Quality Control Laboratory.
87	[redacted] resin process shut down at time of explosion at Texas City; not enough profit.
87, 88	[redacted] process production cut to 80,000,000 lbs. in 1980; Union Carbide still manufactures product today.
89, 90	1981 article does not accurately describe suspension polymerization process utilized by Union Carbide in 1977 as Union Carbide had [redacted]
90, 91, 148	[redacted]
91	Agrees: V.C. is neither absorbed nor adsorbed by PVC.
91	Agrees: RVCM is a gas encapsulated by solid PVC particl .
92	Residual V.C. monomer content of various types resin made by suspension process varied widely.

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92	Increased porosity not a goal of aeration; goal was to sweep away V.C. monomer.
93, 94	1974 - technology regarding reduction of RVCM content in suspension produced resin available to everyone in industry.
95	From personal knowledge, would say no connection existed between human health and V.C. prior to NIOSH/Goodrich report of angiosarcoma in early 1974.
96	Was aware of Viola's work in 1970 and 1971; passed information along to superiors at Union Carbide.
96	Was surprised high dosage of 30,000 ppm given rats for Viola study didn't kill them.
97-99	Plaintiff's [redacted] not same paper as seen by witness at meeting in Texas; has seen since then.
99, 100	In 1971, knew reports where alterations in skeletons of workers exposed to V.C. existed; knew nothing about alterations in nervous system or hepatic function then.
101, 103, 104	Plaintiff's [redacted] - identified as Viola report given at Texas meeting; personally did not attend; has copy received at general industry meeting of Manufacturing Chemists Association.
96, 102	Agrees: 1971 - knew Viola study showed 65% of rats exposed to V.C. dosage of 30,000 ppm developed skin tumors.
102, 103	States: If article says type of cancer being developed by rats was either epidermoid or mucoepidermoid carcinomas, then he saw it; is not knowledgeable about neoplasms.
103	Also saw section regarding site where tumors located as being region where subimaxilary and carotid gland located.
104	Does not know whether Union Carbide made attempts to notify customers or Manufacturing Chemists Association meeting in 1971 of Dr. Viola's study.
104, 105, 111, 112	Plaintiff's Exhibit 7 - identified as Viola article received by him about 1973.
105	Agrees: Union Carbide representative met with Dr. Viola in 1971; article appeared in Cancer Research in May, 1971.
106, 107	After learning of Viola's work, Union Carbide concentrated its efforts on determining whether V.C. exposure was cause of cancer in humans.
107, 197	His opinion: Exposure to V.C. causes hepatic angiosarcoma.

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108, 109	Plaintiff's Exhibit 6 - identified as Wheeler memo to Union Carbide associates dated 11/23/71 regarding results of Manufacturing Chemists Association called because of Viola paper; memo was not intended for circulation outside Union Carbide; Union Carbide would take lead in toxicity testing of V.C., in getting funds to get program off ground.
109, 110	Memo discusses results of Viola's work based on Viola's paper presented in Houston and his impressions of others' input at meeting.
111, 112	At time memo of 11/23/71 written had not seen Plaintiff's Exhibit 7.
112	Explanation: Had seen original Viola paper and word of mouth transmittal heard secondhanded from various people at time 11/23/71 memo written.
112, 113	Although article available in 1971 to Union Carbide and him, and he referred to it, cannot say actually had paper in hand.
113, 115	11/23/71 memo regarding unpublished data refers to information obtained when Viola came to Washington, D.C. 5/71 to meet with Union Carbide's Dr. Lane and other medical men.
114	Agrees: Unrecorded data contained in 11/23/71 memo regarding tumors in rats shows concentrations substantially less than 30,000 ppm.
115	Agrees: Data above 30,000 ppm available previously; data below 30,000 ppm not available.
115, 116, 117	States: [redacted]
115, 116	Doesn't think he saw second Viola article before 5/71 meeting.
116	[redacted]
116	States reason for meeting was to try and decide what Viola had seen and what sort of problems might arise from that.
116	Personally has never met Viola.
117	Does not know what steps Union Carbide took towards its customers after obtaining Viola published and unpublished data.
117	Has no knowledge as to efforts Union Carbide made to notify OSHA of Viola's published and unpublished data.

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118	States: Up to about 1974, OSHA had a 500 ppm limit for employees exposed to V.C.
118	States: Industry met with Dr. Marcos Key in 1973 to review information we had and ongoing program regarding testing.
118	Didn't disclose Viola unpublished data or Dr. LeFevre's information to Dr. Key in 1973 as had additional data at that time.
119	11/23/71 portion of memo regarding ~~serious~~ problems that could arise should Viola's work be published in United States reiterated; admits authenticated same.
120	Didn't receive criticism from Union Carbide supervisors regarding his positions in 11/23/71 memo; received support for toxicity testing program.
121	Agrees: These were Dr. LeFevre's theories in 1971:
121	1. Informed MCA Romanian work showed 10% liver enlargement, as well as acro-osteolysis;
121	2. Indicated workers in Spain showed unnatural weariness possibly indicating liver involvement;
121	3. Had seen lesions in knees and pelvic area of back;
122, 123	As result of meeting with Dr. Viola, Occupation Health Committee of Manufacturing Chemists Association dealing with Union Carbide formed; was chairman.
123, 124, 125, 126, 132	Plaintiff's Exhibit 8 introduced - confidential internal memo written by Wheeler to Union Carbide associates dated 7/19/73 regarding NIOSH meeting he attended on July 11, 1973; agrees: wrote document and signed same.
127	Agrees: Generally known data was to be provided to NIOSH; were to review everything known up to the date of the meeting.
127, 128	Doesn't remember whether Dr. LeFevre data received in 1971 furnished to NIOSH in 1973.
128, 129	Recalls Dr. Rowe and Dr. Duffield going into everything known up to date of meeting with NIOSH.
130	States: While Dr. Viola commissioned to study acro-osteolysis, discovered link between V.C. exposure and cancer in rats; purpose of study was to study possible causes, make connections between V.C. and acro-osteolysis.

131	Could find out nothing about Dr. Maltoni's toxicity work until Dr. Duffield came over in 1973.
131, 132, 133	Dr. Duffield employed by Imperial Chemical Industries, a European PVC manufacturer.
132	Representatives attending NIOSH meeting 7/11/73:
132	1. Ethyl Corporation, PVC manufacturer;
133	2. Union Carbide PVC manufacturer;
133	3. Manufacturing Chemists Association - is industry trade association; refused to participate in lobbying;
133, 134	4. Doesn't know whether Mr. Barackman present at meeting.
134, 135	To his knowledge, [redacted] not provided for distribution to [redacted].
135	[redacted]
135	Personally didn't tell anyone about Dr. Viola or Dr. LaFevre studies as of 7/11/73.
136	Was aware of articles connecting V.C. exposure to acro-osteolysis in 1967; aware of articles regarding disturbance in liver function among V.C. workers in 1971.
137	States: Wheeler Exhibit 7 and 8 were incorporated in his files at Union Carbide; doesn't know if they exist in Union Carbide files.
138	[redacted]; was not part of Occupational Health Committee.
138, 139	Believes all PVC manufacturers participated in task force.
139	Whole industry invited to meeting with Dr. LaFevre; meeting of Viola attended by small group, not sure who - knows Dr. Lane, Union Carbide present.
139, 140	Has no knowledge whether Viola information distributed to other United States V.C. manufacturers in 1971.
140	Regarding: PVC industry's awareness of Dr. Viola's and Dr. LaFevre's work in early 1972:

140	1. Was chairman of committee formed which needed $350,000 for research;
140-144	2. Believes every member in industry told so they could contribute.
144, 145, 146	Exhibit 9 - attended meeting discussed in exhibit; doesn't know where document came from; has no memory of seeing before.
146, 147	States: Lower residual levels brought on by connection of V.C. with angiosarcoma.
147	Improvements in monomer stripping technology occurred somewhere between 1975 and 1981; has no knowledge what these improvements were as Union Carbide out of the business.
148, 149	Union Carbide performed testing in 1977 or 1978 regarding:
148	1. Heat accelerating escape of PVC monomer to ambient air;
148, 150	2. Amount of residual monomer lost in bulk container.
149, 150	Testing performed about same time as Union Carbide able to reduce RVOM concentrations in suspension resin; cannot be exact as to what happened first.
149, 150	States: V.C. comes out of resin more readily when product porous; Union Carbide was able to make more porous suspension product to some extent.
150	Changes happen slowly; is process development.
151	Prior to 1977 and after end of 1973, Union Carbide conducted tests regarding rate at which suspension resin lost residual monomer.
152	Agrees: In PVC fabricating plant probable exposure to VC monomer would be first looked for in area where PVC heated, i.e., dry blending step.
152, 153	Regarding: Union Carbide fabricating plants in Bound Brook, New Jersey and Ottawa, Illinois:
153	1. Doesn't know whether ambient air monitoring done prior to 1974;
153	2. Doesn't remember seeing data regarding ambient air monitoring;
154, 170, 171	3. Thinks epidemiological study done at Bound Brook; doesn't know who did or results.

154, 155 Exhibit 2 - Answers to Interrogatories: Regarding: Response to No. 6: Has never noticed difference in RVCM content between VCM, VCH and VMCH.

155 Professional organizations/memberships Union Carbide involved with:

1. American Institute of Chemical Engineers;

156, 159, 160 2. Resource Counselors; member about 1974-1978:

159, 160 a. worked with OSHA regarding preparation of V.C. standards in 1974,

160 b. members were fabricators or manufacturers of PVC and/or V.C.,

160 c. doesn't know whether Chrysler a member.

156, 157 3. Polyvinyl Chloride Fabricating Industry Epidemiological Steering Committee formed about 1974:

157 a. members consisted of PVC fabricating industry and PVC resin industry members,

157 b. doesn't know whether Chrysler even on committee,

157, 158, 159, 173 c. committee hired [redacted] about 1974 to conduct proportional epidemiological study of mortality in PVC fabricating industry; doesn't feel competent to discuss results; Chiazze information available to everyone through publications,

161 d. Society of Plastics Industries VCM EPA Tech. Committee:

162, 163 (i) group did discuss their experiences with V.C. at time of OSHA hearings on proposed standards,

162, 163 (ii) doesn't recall them taking a position to support anybody,

163 (iii) Chrysler was not participant.

164 Thirty or so resin manufacturers were members of MCA Vinyl Chloride Technical Committee; doesn't know of any PVC resin manufacturers who were not.

165 Research program subcommittee commissioned:

165 1. Long term inhalation study of V.C. in rats and hamsters; work done by Industrial Biotest;

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165	2. Metabolism study by Dow;
165	3. Epidemiological study by first Tabershaw/Cooper and believes Equitable Environmental Health Associates;
166	4. All of their research made public in journals when completed.
166	No other studies in the industry, trade organizations or associations done which were not made public.
166, 167	GC used when testing Union Carbide batch of resin for RVCM started in 1974; has no idea of cost per test.
	Answers to Interrogatories - No. 17:
167, 168	1. Papers referred to publicly available;
168	2. [redacted] of liver; [redacted]
168	3. [redacted]
168-169	Epidemiological studies reports done at South Charleston and Texas City [redacted]; were not published.
169-170	Study revealed nothing of marked significance; regarding statistical significance, would need to review; had copy which he transferred to [redacted] when retired.
170	Doesn't know if Chiazze work included Bound Brook and Illinois fabrication facilities.
173, 174	To his knowledge, no one ever contended that any angiosarcoma cases arose at Bound Brook or Illinois facilities.
174	[redacted]
174	Doesn't know when [redacted], Union Carbide attorney, last employed.
175	Plaintiff's Exhibit 10 - letter to OSHA from John Whittlesey dated 3/5/74; letter attachment from John Whittlesey to Office of Standards dated 12/12/73.
176	Quite sure has seen before; was not furnished in response to request for production of documents.
176, 177, 178	Believes document speaks for itself regarding Union Carbide's position regarding OSHA's enactment of temporary emergency

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standard governing manufacturing of PVC and V.C. exposure of less than 200 ppm recommended by ACGIH.

178, 179, 186, 187 — Plaintiff's Exhibit 11 - Letter from Wheeler to OSHA dated March 7, 1974 enclosing Union Carbide's position regarding work practice for V.C. resin manufacture; wasn't produced pursuant to document production request as had forgotten about it; was part of Union Carbide input to OSHA hearing presented by Richard Hughes, Union Carbide Vice-President.

179, 180 — 1. Page 3 - Item 1 - trying to find work practice acceptable to PVC industry and Union Carbide; solid mixtures refers to PVC;

180 — 2. .1 percent translates to 1,000 ppm.

181 — Page 4 - Item 4(a) - was trying to come up with practice acceptable to industry and Union Carbide; felt 50 ppm on time weighted average safe level.

181-182 — [R. A. Bunda's objection to question whether Union Carbide's position concerning OSHA regulation regarding V.C. should apply to every person exposed to V.C.]

182, 183, 184 — Page 8 - No. 8 - Union Carbide believed each employee exposed to V.C. should be told of hazards, precautions; [redacted]

184, 185 — When OSHA issued V.C. standard, Union Carbide position changed.

185, 186 — Although studies done in 1973 and 1974 could have been commissioned 5-10 years earlier, there was no indication they were necessary then.

187, 188, 189 — [redacted] doesn't know whether Chrysler received; doesn't know if any information furnished earlier.

189, 190, 191 — [redacted] - identified as proposed warning label for bagged PVC products for use by MCA before BF Goodrich incident; [redacted]

191 — [redacted]

191 — Doesn't know of any dust mask or respirator designed only to prevent dust inhalation which can prevent inhalation of gaseous V.C.

191, 192 — [redacted] production

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request; introductory letter covers work done in Union Carbide laboratories; attachment is section "Vinyl Chloride Monomer Threshold Odor Concentration in Air" written by Wheeler.

193 — Test results at Union Carbide South Charleston laboratory determined normal odor detection level of VCM at 2,000 ppm.

193 — BF Goodrich information determined later that people routinely exposed to V.C. often couldn't detect its presence below concentrations of 4,000 ppm.

193, 194 — Agrees: Testing at end of document done at Union Carbide's Texas City facility; date of report May 21, or 22, 1974.

194 — Some testing of type reported on these tables was done prior to 1974 regarding exposure of reactor cleaners at Texas City and South Charleston about 1970.

194 — Testing done because acro-osteolysis study didn't connect or disconnect V.C. from exposure to monomer.

194, 195 — Did testing to insure people working inside reactors exposed to 50 ppm or less as was recommended by MCA Occupational Health Committee study; received results of study about 1969.

195, 196 — Union Carbide did not pass this information on as was manufacturing problem, not customer problem.

196 — Plaintiff's Exhibit 14 - identified as addition to Union Carbide testimony at OSHA hearing.

196 — Plaintiff's Exhibit 15 - identified as Dr. Darneil's testimony on behalf of Society of Plastics Industry to OSHA hearings.

196, 197 — Plaintiff's Exhibit 16 - identified as information given Dr. Lassiter regarding methods of monitoring V.C. concentration in work space air.

198 — Regarding section of document called "Control and Recovery of V.C. Emissions," written by Wheeler:

198 — 1. Believes subparagraph 1 as written too broad;

198 — 2. Do not make off grade product all the time.

198, 199 — Plaintiff's Exhibit 17 - identified as document seen previously containing proposed V.C. standard; was added to OSHA hearing input.

199 — Agrees with statement, page 11, that single teaspoon full of liquid V.C. introduced into normal sized room enough to cause present temporary standard to be exceeded.

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208	Believes MSD sheets provided by Union Carbide to customers for resin inversions between 1971 and 1981 versions.
208	Has no specific knowledge but believes product literature provided by Union Carbide to resin customers before 1974.
209	Regarding Exhibit 17 - funding for research:
	1. Smyth study - Union Carbide;
	2. Rest done through industry committees, at MCA or Organization Resources Counselors.
211	Difference between ppm by weight and ppm by volume.
211	1. ppm is gravimetric determination; usually done on solid or liquid;
211	2. ppm by volume is usually gaseous.
211	ppm of resin refers to ppm by weight.
211, 212	Air sample or gas sample referred to as ppm by volume.
212	Two terms are not interchangeable.
212	Has been told by those doing research of the difficulties extrapolating animal data in relationship to effect on humans.
213, 214	Regarding translation of figures for residual V.C. monomer from ppm by weight to ppm by volume.
214	Gaseous material with high molecular weight converted to weight percentage would show up a much higher figure on ppm by weight basis.