THERMINOL FR CONVERSION TEAM

PROJECT CLOSING REPORT

Paul W. Gann
Coordinator

December 1, 1972

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THERMINOL FR CONVERSION TEAM
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December 1, 1972

OBJECTIVES	RESULTS
1. Search out and contact Therminol FR* users to assure awareness of the PCB food and environmental issues and to encourage the voluntary termination or further use of the FR fluids, and assure acceptable disposal of the FR fluids.	All U.S. customers known to have FR fluids received a minimum of one phone call and confirmation letter in addition to the formal Monsanto policy and announcement letters. Canadian customers were handled by Monsanto Canada sales personnel except where the Team was specifically requested to make contact. All customer information relative to the Therminol FR conversion project is filed by individual customer using site (city and/or division). Additional information relative to conversion status and return of FR fluid to Monsanto is contained in the Project Log and Return Notice Register. As far is known, all Monsanto plants and warehouses have returned all PCB containing fluid to Sauget. Exception: the Akron site continues to use Therminol FR in a space heating system. Plans are underway to convert although the actual target date has not been set.
*In this report, the term FR refers to the Therminol FR series of heat transfer fluids based upon the polychlorobiphenyl fluids (PCBs).	Table 20 in the addendum lists the information sources used to locate FR users. Note also, certain other sources were not used primarily due to lack of time and consensus of low probability FR uses in heat exchange systems.

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OBJECTIVES	RESULTS
2. Avoid the creation of unsatisfactory customer relations which may lead to future damage suits or claims against Monsanto as a result of Monsanto's FR sales termination policy.	Based upon customer phone conversations, correspondence and purchase orders, customer aggravation directed at Monsanto resulting from Monsanto's FR sales termination and conversion policies and conversion team activities were and remained relatively low at project end. See addendum Table 6B for list of outstanding and known potential problem areas. The Conversion Team handled several special mailings to customers of Monsanto policy statements on Therminol FR and dielectric fluids. See addendum Table 19 for these and previous special mailings. It should be noted that all Therminol FR mailings excluded any reference to the Aroclors. Some of the older heat transfer systems were still using Aroclor fluids. The Monsanto "policy" mailings did not alert customers that the Therminol FR (PCB) issue also applied to Aroclor. Another point of possible confusion in their mind is that some customers used the Aroclor and Therminol FR fluids in hydraulic applications and never mentally connected alerts on heat transfer subjects to these applications. It is known that many mailings of the December 15, 1971 letter which were addressed to corporate or purchasing officers never penetrated to the plant operating personnel (engineering or maintenance) where real "application" understanding existed. Monsanto's policy on receiving returned PCB fluids continues as "receive all fluids and back charge for freight in absence of prior agreement; fluids received at sites other than Sauget are immediately shipped to Sauget and all freight costs are back charged to the customer".

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OBJECTIVES	RESULTS
3. Retain at least 80% of the Therminol FR customers as conversions to Monsanto's non-FR heat transfer fluids.	Based upon the Therminol FR systems converted in 1972 or committed to conversion (294 sites total), 72% (227) stayed with Monsanto fluids and 28% (89) converted to competitive fluids. There are an additional 45 sites where the systems are drained but decisions to fill are still pending and approximately 240 known sites still use Therminol FR type fluids. This includes approximately 15 customers believed purchasing PCB fluids for top-up purposes from Coastal Chemical. There are 77 sites where circumstances indicate the old FR system will not be re-used and, therefore, are not probable candidates for near term fluid sales. . Therefore, of the total FR sites potentially convertible to non-PCB fluids (838), it is expected that Monsanto will retain 70-80% as on going customers. Note 1: The term "site" refers to a customer plant site at a specific city. The customer may have or have had numerous Therminol FR heat exchange systems at any one site. This report does not attempt to account for all systems, although such information is available from the customer files and summary sheets. 0063591 Note 2: It should be kept in mind that essentially all customer information involved in this project is second hand (i.e. customer communication to Monsanto personnel) rather than first hand based upon "at site experience of a Monsanto employee".

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OBJECTIVES	RESULTS
4. Develop a documentary file on each customer, including telephone notes and correspondence.	It is beyond the scope of this report to present the detailed operating procedures and results of this project. Such information is documented in the individual customer files and in the weekly status reports or project closing memoranda. Selected summary data, however, is presented in the addendum to this report. This data is intended to aid in understanding the customers' circumstances (particularly as to unusual situations which may require future attention) and the nature of the information in the project files. The project files and control log are left as property of the Functional Fluids Group.
5. Complete project within the cost assigned in the "Disaster Budget".	All indicators show that the cost objective is being met keeping in mind, however, the scope changes which have occurred (i.e. $10,000/month insurance cost for the incinerator).
6. Completion target of project -- April 1, 1972.	Conversion Team CED engineers' activity phased out during period of April, 1972 to June, 1972 but the coordinator's assignment continued to December 1, 1972. Delay in project closing (December 1 vs. original target of April 1) was due primarily to "no customer initiative to convert". Therefore, the Conversion Team was required to take the initiative and contact each customer and personally persuade action.

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THERMINOL FR CONVERSION TEAM
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SCOPE OF CONVERSION TEAM ACTIVITIES

1. Handle all direct U.S. customer contacts relative to Therminol FR system change-out to non-PCB fluids and advise on FR fluid disposal (Monsanto's incineration policy). Team contacts with Canadian customers were limited to "customer or Canada sales request". Monsanto Canada Montreal sales office had prime responsibility for conversion activity of Canadian users of Therminol FR fluids.

2. Advise customers of non-PCB replacement fluids available from Monsanto and that conversion costs (i.e. fluids for flush and fill, production downtime and equipment modification) were the customer's responsibility and expense.

3. Assure customer is fully aware that Monsanto replacement fluids are not "classified as non-flammable" and that the customer should consult his equipment insurance underwriter of any fluid change.

4. Consult or suggest to the customer possible engineering changes or areas of concern.

5. The Conversion Team of four engineers and one coordinator operated under the direct supervision of the Functional Fluids Product Group. The Product Group trained the Team on the technical considerations of the Therminol line of fluids and problems related to equipment conversion. The Product Group established the policies, guidelines and priorities within which the Team functioned.

6. The Conversion Team worked directly with the customer's plant maintenance and engineering departments as well as their purchasing departments (thus relieving Monsanto's salesmen of this responsibility).

7. Communications to the appropriate Monsanto management was primarily through the issuance of a weekly status report encompassing all areas of conversion activity and by special review meetings.

8. Commencing July 1, 1972 control of PCB fluid returns from customer to Monsanto was expanded to include dielectrics, industrial and plasticizer fluids and end uses -- including fluids ex-U.S. (i.e. South America, Japan, Australia).

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Addendum Index

Table	No. of Pages	Title
1	1	Manpower
2	1	Therminol FR Conversion Summary - Statistics
3	14	Uncommitted Therminol FR Systems, Up Date (Reference PWG to CP, 11/28/72)
3.1	5	Additional Uncommitted FR Sites
4	3	Summary of Table 3 Sites
5	1	Open - Free Incineration Extensions as of Nov. 30, 1972 (Reference PWG to CP, 11/30/72)
6A	3	System Fires and Tube Failures
6B	1	Potential Problem Areas
7	2	Customers Using Coastal Chemical Chemtherm SH-600
8	2	% FR in Converted Systems - Customer Plants
9	4	% FR in Converted Systems - Monsanto Plants (Reference PWG to WBP, 10/11/72)
10	2	Food Customers - March 6, 1972 Survey Letter, Status (Reference PWG to CP, 11/28/72
11	1	Food Related Customers Not Included in March 6, 1972 Survey; 1972 Conversion Activity
12	2	FR Disposal, Not Monsanto Incineration
13	1	Special Situations - OEM
14	1	Leakers - Customer Drum Returns
15	1	Return Policy
16	4	Therminol FR Conversion Status
17	1	Project Files Retained by Product Group
18	9	December 15, 1971 Mailing, Customer Sites Not Contacted by Conversion Team
19	1	Special Mailings
20	1	Information Sources

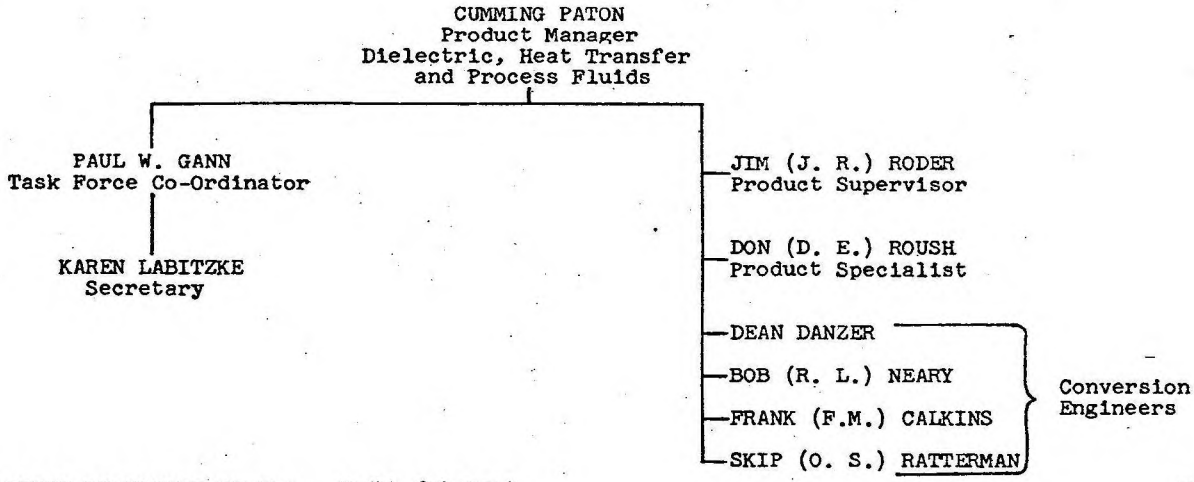
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SPECIALTY PRODUCTS BUSINESS GROUP

MONSANTO INDUSTRIAL CHEMICALS COMPANY

PCB TASK FORCE - HEAT TRANSFER FLUIDS



TASK FORCE TELEPHONE NUMBER: (314) 694-2514

TASK FORCE MAIL ADDRESS: Cumming Paton
Monsanto Company
P. O. Box 14617
St. Louis, Missouri 63178

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Table 1
Manpower

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Table 2

Therminol FR Conversion Summary
As Of Dec. 7, 1972

SITES ONLY*

	1971 & Earlier			1972			
	T-55	T-66	Total 1	T-55	T-66	Total 2	Total 3
1. Monsanto Fill	107	64	171	105	77	182	353
***2. Monsanto Committed						45	45
3. Sub Total, Monsanto			171			227	398
4. Competitor Fill			33			68	101
**5. Potential Competitor Fill						19	19
6. Sub Total, Competitor			33			87	120
7. System Drained			35			45	80
*8. No Action to Convert						240	240
9. Once Thru Situations, no fill potential			2			77	79
10. Grand Total			241			676	917
11. % of Converted Sites Retained by Monsanto (Line 3 ÷ 3+6)			84%			72%	77%

*Many sites have more than one system. Also, includes approximately 40 sites suspected of having FR systems but not necessarily verified. A portion of these "not verified"are included in Table 3.1.

**Total from Table 3 of >1000 and <1000 gal. sites.

***"Technically" not listed as converted as notice of returned fluid not received from WGK, Sauget Plant.

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Monsanto

FROM (NAME & LOCATION) B2SD P. W. Gann

DATE November 28, 1972

SUBJECT Uncommitted Therminol FR Systems

REFERENCE PWG to CP, Aug. 11, 1972, "Therminol FR Conversion Project"

TO : C. PATON

cc
B2SC G. F. Fague
1070 H. R. Ford
1800 D. R. Hansen
B2NA W. B. Papageorge
G4NN J. J. Roder
B2SC D. E. Roush
1010 E. L. Shimley
1650 P. L. Slayton

The attached tables (>1,000 gallon and < 1000 gallon systems) list the November 15, 1972 status of those FR systems which were listed as uncommitted in my August 11, 1972 memorandum. All >1000 gallon sites were contacted by phone and were sent a confirming follow-up letter -- or received a salesman visit. All of the <1000 gallon sites received at least a follow-up letter.

Exception -- no follow-up was made with Coastal Chemical, Dow Chemical at Midland or Dow Corning at Midland. The latter two sites are in a lengthy conversion program to Dowtherm G.

Referring to my August 11, 1972 memorandum, effort priorities A and B are complete. No effort is being directed to the Priority C items -- namely,

a. verifying FR situation at "no response" sites of the 12-15-71 mailing.

b. verifying heat transfer application on an old A-1242 and A-1248 survey list.

P. W. Gann

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More than 1,000 Gallon Systems

11/15/72

ompany	Location	Gallons	Status
llied Chemical	Moundsville, W. Va.	2500	Refusal, 4/3/72
merican Cyanamid	Mobile, Ala.	1500	Target, 1974. Reluctant to convert.
endix	Kansas City, Mo.	20,000	Have not made decision on whether to use T-66 or Dow G. Plan to convert 4th quarter 1973.
. P. Petroleum	Oakville, Ont., Canada	5,000	Conversion to T-55 complete.
hanslor Western Oil	Fellows, Cal.	2000	Customer has sufficient FR on hand for next 3 - 5 years. Will not convert.
old Spring Co.	Yardley, Pa.	1500	Dow pushing to get customer's conversion. No plans to convert.
otter Corp.	Cannon City, Colo.	1000	Target, January, 1973.
etroit Housing Comm.	Detroit, Mich.	4000	May lose to Dow G.
Detroit Metro Water Works	Detroit, Mich.	2000	No action.
ow Corning	Hemlock Mich.	3200	Lost to Dow G.Will return Therminol FR.
ow Chemical	Midland, Mich.	14,000	Expect to lose. No idea of status. Dow will handle disposal themselves.
ow Corning	Midland, Mich.	2000	Expect to lose to Dow G.
ragon Cement	Thomaston, Me.	1500	No action since 9/28/72. Their insurance company slow in OKing plans for conversion.
Eastalco Aluminum	Frederick, Md.	3000	No action. They are receiving Safeheat t keep going. Planning T-55 conversion.
Esso-Creole Co.	La Salinas, Venezula	20,000	No action
Eureka Chem. Co.	San Francisco, Cal.	1000	Refusal
P. D. George	St.Louis, Mo.	1000	Target T-66 in 1st quarter 1973. Plans to hold off converting as long as possibl

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Table 3
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More than 1,000 gallon systems

Company	Location	Gallons	Status
General Tire & Rubber	Jeanette, Pa.	1000	Ordered 55 x 54 gal. drums T-55 on 10/27/72. Target Nov., 1972.
Hudson Cement	Kingston, N.Y.	1000	Converted to T-55.
Humble Oil	So. Timberline, Offshore	4000	Bought 7 drums of Coastal for top-up 10/23/72. May have used.
Intalco Aluminum	Ferndale, Wash.	2400	Target 1973. Won't convert until forced. Returned used FR in 1971.
Koppers	Bridgeville, Pa.	3200	Target date for conversion not set. Have 3 fluids under consideration. All are about $1/gallon.
Lever Brothers	Los Angeles, Calif.	2000	Lost to Dow G.
Lubrizol	Painesville, Ohio	3500	Returned 72 drums FR for incineration. No new orders. May lose.
Lubrizol	Deer Park, Texas	6000	Returned 10,000 tankcar FR waste for incineration. Drained system; no new orders.
M & R Plastics	Maryland Hgts., Mo.	1500	Target 1974.
National Southwire	Hainesville, Ky.	12,500	No action.
National Tea	Chicago, Ill.	4000	Has 2 - 3 drums FR-1 on hand. No plans to convert.
New England Petroleum	Kingston, N. Y.	4300	Converted to T-55.
Noranda Alum.	New Madrid, Mo.	6000	Refuses to convert until forced.
Pioneer Plastics	Auburn, Me.	1000	Refusal . Have not returned any fluid.
Raychem Corp.	Menlo Park, Cal.	8000	Disposed of fluid thru Ind. Tank Co. 10/1 Lost to Dow G.
Randy Mfg. Co.	Randolph, Mass.	1000	Refused to convert. Will run as long as possible. Money a problem.
Reichhold	Tuscaloosa, Ala.	5000	Expect to lose to steam about 7/73.

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More than 1,000 gallon systems

Company	Location	Gallons	Status
Shakespeare Co.	Columbia, S. C.	1200	No action.
Shell Oil, Off Shore	New Orleans, La.	5000	No action.
Southern Nat. Gas	Houston, Texas	1500	Buying Chemtherm SH-600, refuses conversion.
Std. Oil of Cal.	Gaviota, Cal.	1100	No action.
Texaco, Inc.	Morgan City, La.	3600	May convert to T. 66 within next year (as of 9/72 call report).
Union Carbide	Niagara Falls, N.Y.	1000	No action.
Uniroyal	Port Clinton, Ohio	3000	Converted to T-55.
UOP	E. Rutherford, N. J.	6000	Bought 2 x 55 gal. drums T-66 top-up. Have not returned any fluid. No target for conversion.
Westinghouse	Muncie, Indiana	3000	Target -- 1st quarter 1973. Customer considers he has closed system. Sees no reason to push conversion.

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Table 3
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ess than 1000 Gallon Systems

11/15/72

ompany	Location	Gallons	Status
erojet General	Azusa, Cal.	10	No action.
erojet General	Sacramento, Cal.	850	Converted to T-66.
IM Packaging	W. Springfield, Mass.	50	No action.
llied Chemical	Buffalo, N. Y.	110	Conversion target date, Oct., 1972; no action to date.
llied New Hampshire Gas.	Ester, New Hampshire	30	No action.
lmon-Wiggins	Richmond, Va.	2	Not interested in converting. Could last 5 years.
merican Mineral Spirits	Lamirada, Cal.	600	Expect to lose in October to Mobil.
merican Mineral Spirits	Tucker, Ga.	600	Converted 10/13/72 to Mobiltherm.
merican Mineral Spirits	Palatine, Ill.	400	Corp. Office direction conversion.
American Hospital Supply	Santa Ana, Cal.	20	No action.
Airco Speer	Niagara, New York	20	No action.
American Thermoplastics	Bound Brook, New Jersey	55	Converted 10/10/72; lost to Sun-Vis 21.
Amex Plastics	Rockway, New Jersey	50	No action.
Anadarko Products	Liberal, Kansas	50	Refusal.
Antrim Lumber	Ponca City, Okla	80	Drained; no evidence of fill.
Angelo, Tony	Detroit, Mich.	50	No action.
Ansley East Corp.	Doylestown, Pa.	50	No action.
Argus Chem (Witco)	Taft, La.	200	Converted to T-66
Atlantic Research	Gainesville, Va.	100	No action.
Argus Chem (Witco)	Brooklyn, N.Y.	700	Converted to T-66
Athol Mfg.	Butner, N. C.	10	Converted to T-66

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Table 3
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Less than 1000 Gallon Systems

Company	Location	Gallons	Status
Badger Company	E. Weymouth, N. J.	50	Drained; no evidence of fill.
Baumgartner, F.	St. Petersburg, Fla.	10	Converted. Ordered 2 x 5 gal. T-55, 10/31/72.
Bendix Corp.	Sidney, New York	500	Target, May, 1972. No further word.
Bogues Brothers, Inc.	Kingston, Jamaica, W.I.	100	No confirmation of system.
Braun, C. J.	Alhabra, Cal.	100	No sales in past 2 years.
Brea Canyon Oil	Brea, Cal.	500	No action.
B. C. Molybdenum	B. C., Canada	600	Equipment sold to Kennecott.
B. S. P. Corp.	Brisbane, Cal.	200	No target and maybe no system.
B. S. P. Corp.	Pittsburgh, Pa.	100	Drained; no fill ordered. Test unit.
Burlington Industries	Greensboro, N. C.	Target, November, 1972	
Ca. Bond Industries	N. Hollywood, Cal.	25	No target, No action.
Canadian Helium	Saskatchewan, Can.	165	One drum on hand; one year's supply.
Canadian Pittsburgh Ind.	Toronto, Canada	500	Maybe 1973 for conversion. No action.
Carborundum	Sanborn, N. Y.	150	No target. DE Roush says FR not now used.
Cascade Fibers	Eugene, Oregon	250	Drained; may go to Std. Oil - Cal. All fluid returned.
Celenese Plastic	Clark, New Jersey	50	Refusal.
A. B. Chance	Centralia, Mo.	5	No action.
Chemetron Corp.	Holland, Mich.	600	Converted to T-66.
Chemical Development	Ontario, Canada	200	Drained; no new orders.

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Less than 1000 Gallon Systems

Company	Location	Gallons	Status
Chemical Processors	Seattle, Wash.	600	No action.
Clayton Chemical	Clayton, Mo.	250	No action.
Continental Can	Reading, Pa.	100	Target November, 1972. No action.
Contour Laminates	Seattle, Wash.	50	No action.
Crane Packing Co.	Vandalia, Ill.	75	Drained; no new fill.
Crawford Mfg.	Richmond, Va.	300	System lost in flood.
Creative Mica Tops	New York, N. Y.	3	No action.
Deering Milliken	Abbeville, S. C.	100	Target, Dec., 1972.
Dexter Chemical	Rocky Hill, Conn.	150	No action.
Dip Seal Plastics	Rockford, Illinois	100	Refusal
Dock Resins	Linden, N. J.	20	No action.
DuPlate Canada	Ontario, Canada	80	Target Nov., 1972.
DuPont	Philadelphia, Pa.	50	No action.
Ecology	Brooklyn, N. Y.	200	No Action.
Engelhard, Inc.	Newark, N. J.	100	Target, 1972; ordered 1 x 54 gal. drum T-55, 4/7/72.
Esso Research	Baytown, Texas	300	No action.
Ethyl Corp.	Baton Rouge, La.	200	Refusal.
Federal Color	Cincinnati, Ohio	500	No action.
Fine Organics	Lodi, New Jersey	400	Drained; assume lost.
Firestone	Akron, Ohio	4	Target, 1974. Sees no need to convert.

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Table
Page

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Less than 1000 Gallon Systems

Company	Location	Gallons	Status
Ford Motor Co.	Mt. Clemens, Mich.	600	Target, Nov., 1972.
General Dynamics	San Diego, Cal.	4	No action.
Geanco Inks	Amityville, N. Y.	2	No action.
General Motors	Muncie, Ind.	20	Converted to Therminol 55.
George & Lynch	Newcastle, Del.	30	No action.
Ginther Gas	Gillette, Wyoming	500	No action.
General Motors	Anderson, Ind.	50	Returned all fluid. No more orders expected.
Grace, W. R.	Owensboro, Ky.	770	Target, May, 1973.
Grace, W. R.	Linden, N. J.	800	2 systems converted in August & Sept. 1972 to T-55.
Graniteville	Graniteville, S. C.	200	Target, 1973.
Halo Carbons	Hackensack, N.J.	150	No action.
Hazen Research	Golden, Colo.	200	No action.
Hoffmeister Cabinet	Las Vegas, Nev.	1	No action.
Hooker Chemical	Hahnville, La.	800	Converted to Therminol 66, 6/72.
Hercules, Inc.	Glen Falls, N. Y.	50	Drained;
Inca Inks	Northbrook, Ill.	50	No action.
Inmont	Canada	700	No conversion date.
Intermt Concrete	Salt Lake City, Utah	15	Converted to "Hecla" Oil.
Int'l Royal	N. Bedford, Mass.	500	Refusal.
Jenkins, Geo. C.	Bridgewater, Me.	50	No action.

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