

WORLD WIDE STRATEGY

TRANSFORMER ASKAREL

→ AROCLOR

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WORLDWIDE STRATEGY

Askarel Transformer Fluid

I. The Market Situation

A. Global Market For transformer Askarel

The worldwide market for transformer Askarel (blend of Aroclor fluid and chlorinated benzene) is estimated to be in excess of 36 million pounds per year in 1966. This market is projected to increase to about 50 million pounds per year by 1971.

These numbers are for the blend of the Aroclor fluid and the chlorinated benzene. The Aroclor fluid content of these blends averages about 60%. Thus, the market for Aroclor fluid in the transformer blends was about 22 million pounds in 1966 and will grow to about 30 million pounds in 1971.

The transformer Askarels are sold under a variety of trademarks. The word "Askarel" itself is a generic trade name referring to a dielectric fluid that is fire resistant; and whose arc produced gases are also fire resistant. Some of the common trademarks for Askarel are:

- Pyroclor - a trademark of Monsanto used by MCL but not Monsanto USA.
- Pyranol - a trademark of General Electric extensively used in the Western Hemisphere (products sold by Monsanto USA).
- Inerteen - a trademark of Westinghouse extensively used in the Western Hemisphere (products sold by Monsanto USA).
- Clophen - Bayer (Germany).
- Pyralene - Prodelec (France).
- Kaneclor - Kanegafuchi (Japan).

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Transformer Askarels sold by Monsanto-USA for both domestic and export are not sold under the Monsanto trademark. Rather, the trademarks of the major customers such as Pyranol and Inerteen are used. This permits us to benefit by association with General Electric and Westinghouse without payment of Royalty (there are no current patents covering transformer Askarels).

The main feature of the Askarel fluids is their fire resistance. They are used in transformers for those applications where the threat of fire is of particular concern to the user. These fire resistant transformers are specialty type transformers and their use is confined to a very minor segment of the market. The vast bulk of the transformer market (about 80% of the market) is served by the less expensive petroleum oil filled transformers.

Askarel transformers are used only where there is a particular concern over the threat of fire. This is usually in commercial and industrial applications where people are involved; such as in factories, hospitals, office buildings, apartment buildings, etc.; or where expensive or critical equipment is involved such as in a military installation. In such applications, the Askarel transformer competes with the dry type, which is also fire resistant and in the same price range.

Petroleum oil transformers could be used for applications of this type but usually additional precautions are required such as enclosing the transformer in a special vault that would contain a fire, should one occur. The cost of these special features often increases the total installed cost of the petroleum oil transformer over that for the Askarel transformer, thus making the Askarel transformer more attractive, economically, for these applications.

The size of the total transformer market is directly related to electric generating capacity. Each kilowatt of generating capacity requires approximately 2 kilovolt amperes distribution and 3 kilovolt amperes of power transformer capacity.

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In general, about 5% of the total market is served by the Askarel transformer, about 10% by dry type and the remaining 85% by petroleum oil. This ratio will vary from country to country. Some countries such as France and Canada have laws requiring the use of fire resistant transformers in certain types of applications which allows the Askarel transformer to capture a greater share of the market. In other countries such as India, the fiscal policy of the country may artificially restrict the use of Askarel fluids.

For example, in India where the economy is under a severe financial strain, the government insists that import of material be kept to the absolute minimum. Since Aroclor fluid must be imported into India, the government insists that the locally produced petroleum oil be used wherever possible regardless of the desirability of using an Askarel fluid.

In general, the market may be divided into two areas - domestic and non-domestic. A domestic market is one in which there is a major producer of chlorinated biphenyl in that particular market. For example, Bayer in Germany, Monsanto in the USA and UK, Kanegafuchi in Japan, etc. All other markets are considered to be non-domestic, even though there are small chlorinated biphenyl producers in Italy and Spain. Domestic and non-domestic markets are shown in Table I.

Thus, about 29 million pounds or approximately 80% of the world market for transformer Askarel is served by a domestic supplier. Monsanto (US & UK) supplied about 18 million pounds and thus have about 61% of this domestic market. The US and UK market should grow to 28 million pounds by 1971 and Monsanto should continue to supply all of this segment of the world market.

Domestic markets in France, Germany and Japan will likewise grow from 11,300,000 pounds in 1966 to 13,500,000 pounds by 1971. We do not expect to participate in this business since we cannot profitably compete with the domestic producers. An exception is our study of the possibility of installing Aroclor production facilities in Japan. Initial evaluations look promising and a final decision on this program will be made by mid-1967.

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TABLE I

THE WORLD MARKET FOR TRANSFORMER ASKAREL

TOTAL POTENTIAL AND MONSANTO SHARE

1966 AND 1971 (ESTIMATED)

1000 POUNDS - (FINISHED BLENDS)

DOMESTIC MARKETS

	<u>1966</u>		<u>1971</u>	
	<u>TOTAL</u>	<u>MONSANTO SHARE</u>	<u>TOTAL</u>	<u>MONSANTO SHARE</u>
USA	17000	17000	25000	25000
UK	650	650	3000	3000
France	6100	0	7000	0
Germany	3600	0	4000	0
Japan	<u>1600</u>	<u>0</u>	<u>2500</u>	<u>0</u>
TOTAL	28950	17650	41500	28000

NON-DOMESTIC MARKETS

EFTA	320	30	480	200
EEC	1550	0	2000	0
Eastern Europe	175	25	250	100
Asia-Pacific	305	270	450	500
Rest of Americas	3380	3380	4860	4860
Rest of World	<u>615</u>	<u>300</u>	<u>890</u>	<u>700</u>
TOTAL	6345	4005	8930	6360
GRAND TOTAL	<u>35295</u>	<u>21655</u>	<u>50430</u>	<u>34360</u>

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Non-domestic markets will go from about 7,500,000 pounds in 1966 to 9,000,000 pounds by 1971. Monsanto's share of this market should increase from 4,000,000 pounds (54%) to 5,400,000 pounds (59%) in 1971.

The non-domestic market will be described in detail in a series of area strategies which will be written for each important area of the world. The major non-domestic markets are indicated in Table II.

B. Forces Acting on the Market

For Monsanto

1. Production from three plants - one in the UK and two in the US. Very large production facilities with manufacturing cost in the US at least as good or better than any of the other producers.
2. Exclusive supply position in the US - the largest market - accounting for over 46% of the world's total requirements.
3. Exclusive supply position in the UK - Also, a preferred position in the commonwealth area through UK affiliated companies.
4. Worldwide association with General Electric and Westinghouse - providing favorable influence on associated companies in foreign countries.
5. Good technical and marketing know-how - ability to give good technical service to the customer.
6. Strong position and long term supply relations with Canada, Mexico, South America and Eastern Europe.
7. Because of production in the UK, have preferred position in most EFTA markets.

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TABLE II

NON-DOMESTIC MARKETS FOR TRANSFORMER ASKAREL

BY AREA - BY COUNTRY

1000 POUNDS (FINISHED BLENDS)

	<u>EFTA</u>	
	<u>1966</u>	<u>1971</u>
Austria	100	150
Denmark	None	None
Finland	None	None
Sweden	None	None
Switzerland	100	150
Norway	20	30
Portugal	<u>100</u>	<u>150</u>
TOTAL	320	480

	<u>EEC</u>	
	<u>1966</u>	<u>1971</u>
Italy	750	1000
Belgium	750	900
Holland	<u>50</u>	<u>100</u>
TOTAL	1550	2000

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REST OF THE AMERICAS

	<u>1966</u>	<u>1971</u>
Argentina	70	120
Brazil	200	400
Mexico	170	300
Canada	2900	4000
Chili	20	20
Puerto Rico	10	10
Panama	<u>10</u>	<u>10</u>
TOTAL	3380	4860

REST OF THE WORLD

	<u>1966</u>	<u>1971</u>
Israel	70	100
South Africa	15	50
Spain	500	700
Pakistan	<u>30</u>	<u>40</u>
TOTAL	615	890

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EASTERN EUROPE

	<u>1966</u>	<u>1971</u>
Czechoslovakia .	None	None
East Germany	None	None
Hungary	None	None
Poland	25	50
Romania	None	None
Yugoslavia	<u>150</u>	<u>200</u>
TOTAL	175	250

ASIA-PACIFIC

	<u>1966</u>	<u>1971</u>
Australia	280	350
India	25	100
Hong Kong	<u>None</u>	<u>None</u>
TOTAL	305	450

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Against Monsanto

1. Strong position of competition in the EEC plus no local Monsanto production in any EEC country. Long term relations of competition with major European customers.
2. The largest of the international markets (those outside the US and UK) being supplied by domestic producers (Germany, France, Japan) and therefore, not available to Monsanto.
3. The use of less expensive dielectric fluids such as petroleum oil. Where these are locally available, it is often very difficult to import the more expensive transformer Askarels (for example, India).
4. Higher production cost at MCL - resulting in greater vulnerability of this market to the European producers. Also, the difficulty of getting greater tariff protection for the UK.
5. Prodelec Technology and possible patent position in the manufacture of biphenyl.
6. The fact that Monsanto has over 50% of the world's business - makes it difficult and dangerous to take risks to increase our share of the global market.
7. No large domestic market in the UK such as exist in Germany and France.
8. Non-availability of chlorinated benzene in the UK - must be purchased from our competitor in France, Prodelec.
9. Confusion generated by having many trademarks for the same product such as Pyroclor, Pyranol and Inerteen.

Competition

The major producers of chlorinated biphenyl together with their estimated production capacities are shown in Table III. The most important of these are Bayer and Prodelec and secondarily, Kanegafuchi; followed by Caffaro, Flix and producers in East Germany and Russia. The latter group sell very little material outside of their own domestic markets.

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Since chlorinated biphenyl is used in many other applications and markets, only a portion of the total production (approximately 15%) goes into transformer askarel. Separate strategies will be required for the other markets served by the chlorinated biphenyl fluids.

The analysis of competitive activity in transformer askarel in the various world markets is shown in Table IV. Bayer and Prodelec are the major international competitors. These two companies are described in greater detail below. Table V shows a general comparison of strength and weaknesses of Monsanto compared to the three largest producers in Europe.

Bayer (Germany)

Bayer has been producing chlorinated biphenyl for about 35 years - as long as Monsanto US. Their quality is excellent and their commercial and technical service is considered to be good. Their Clophen products as well as the Bayer name are highly respected throughout the world. Due to a basic position, their chlorine costs are low.

Fortunately for Bayer, they do have a very large domestic market. The acceptance of transformer askarel was enhanced during the war years due to the non-availability of petroleum oil for these applications. This created the proper atmosphere for the enlarged use of askarel-filled transformers in the years following the war.

Bayer, for many years, was content to serve their existing customers and not compete actively for new business outside their historical area of interest in Europe. However, this attitude is changing and Bayer is becoming more aggressive in the world markets, particularly EFTA and Latin America. This will require greater competency of Monsanto to hold its market position and to grow with these expanding markets.

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TABLE III

ESTIMATED WORLD PRODUCTION CAPACITY*

TOTAL AROCLORS

		<u>Million Pounds</u>	<u>Tons</u>
USA	Monsanto	80	36,200
France	Prodelec	10	4,600
UK	MCL	10	4,600
Germany	Bayer	10	4,600
Italy	Caffaro	2	1,000
Spain	Flix	1	500
Japan	Kanegafuchi	<u>7</u>	<u>3,500</u>
		120	55,000

*Also produced in East Germany and Russia

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TABLE IV

KNOWN WORLD MARKET BY PRODUCER - 1966

1000 POUNDS (FINISHED BLENDS)

MARKET	MONSANTO UK	BAYER	PRODELAC	CAFFARO	FLIX	KANEGAFUCHI	MONSANTO USA	TOTAL
Major Domestic Markets	650	3600	6100	0	0	1600	17000	28950
EFTA	30	270	20	0	0	0	0	320
EEC	0	150	650	750	0	0	0	1550
Eastern Europe	25	0	150	0	0	0	0	175
Asia-Pacific	260	200	150	0	0	0	10	620
Rest of Americas	0	0	0	0	0	0	3380	3380
Rest of the World	265	0	50	0	300	0	0	615
TOTAL	<u>1230</u>	<u>4220</u>	<u>7120</u>	<u>750</u>	<u>300</u>	<u>1600</u>	<u>20390</u>	<u>35610</u>

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Prodelec (France)

Prodelec has been producing chlorinated biphenyls for about 25 years. It is a very important line of products for them and accounts for a major part of their income. For this reason, they are much more aggressive than Bayer. In addition, they also produce the chlorinated benzenes necessary for the transformer askarels. These are also sold to others, such as Monsanto in the UK.

Prodelec make an excellent line of products and are respected throughout the European area for technical and commercial innovations. For example, they introduced the three ton returnable bulk container which is now a standard with many major customers in Europe. In addition, they have made a number of quality improvements - notably power factor; and, aggressively market the benefits of this improved quality to all major customers.

For years, Prodelec has carried out a major research program in biphenyl. They have received a number of patents in this area, some of which are of concern to Monsanto.

Prodelec is considered to be a very aggressive marketer of chlorinated biphenyl products. They not only take the necessary pricing action to protect their present business, but are the most likely company to initiate lower prices to take business from others. They lost a substantial amount of their capacitor chlorinated biphenyl business to Monsanto in EFTA in 1966 and could well take pricing action in an effort to regain this business in 1967.

Prodelec has a large domestic market - second only to the United States. This domestic market has been established through the assistance of favorable legislation requiring the use of fire resistant transformers in certain applications. This large domestic market has, of necessity, fixed Prodelec's attention on transformer askarel. This interest, plus their production of the chlorinated benzene, makes them a formidable competitor in the transformer askarel market.

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TABLE V

TRANSFORMER ASKAREL

TABLE OF COMPETITIVE STRENGTHS

	<u>MCL/MC</u>	<u>BAYER</u>	<u>PRODELEC</u>	<u>CAFFARO</u>
R.M. POSITION				
Benzene	Buy/Make	Buy	Buy (Progil)	Buy
Chlorine	Make	Make	Make (Progil)	Make
Chlorinated Benzene	Buy/Buy	Make	Make	Make
PROD. QUALITY				
Askarel Blend	Good/Good	Good	Good	Good
ANALYTICAL	Adequate	Adequate	Adequate	Adequate
DATE PROD. STARTED	1951/1930	1930	1938-1939	Post 1945
Years	14 35	35	27	
PRODUCT RANGE	Large	Limited	Limited	Limited
SALES ORGANIZATION				
Strength	Good	Good	Good	Italy only - weak
Method	Direct/Agents	Direct/Agents	Direct/Agents	Direct
Visit Frequency		Europe more than MCL	Europe more than MCL	Italy OK
Customer Relations	Much respect	Much respect	Much respect	Bit amateur
TECHNICAL SERVICE	Good	Good	Good	Not as good as Big Three
OTHER ASSETS	EFTA (Large Comp.)	EEC (Large Comp.)	EEC (Progil)	Local
SUPPLY SITUATION	Drums OK Bulk GOOD	Drums OK Bulk Good	Drums OK Bulk Good	Drums OK

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Table V
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	<u>MCL/MC</u>	<u>BAYER</u>	<u>PRODELEC</u>	<u>CAFFARO</u>
RESEARCH EFFORT	Needs MC/MCL liaison	Not obviously energetic	Active	Non-existent
NEW PRODUCTS	Yes	No	Active	No
AROCLOR IMPORTANCE ($\pm$ %)	Small but valuable	Small but valuable	Large	Medium
PRICE LEADERS/ CUTTERS	Stability	Stability	Leaders	Cutters
PHILOSOPHY	Common Schedule	Common Schedule	Common Schedule	To Capacity

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II. Long-Range Objectives

- A. Maintain 100% of the business in the U.S. and the U.K. - at maximum profit. Increase sales in these domestic markets from 17,650,000 pounds in 1966 to 28,000,000 pounds in 1971.
- B. Except for the EEC, Switzerland and countries where there are local producers - establish a dominant position in supplying transformer askarel to the rest of the world - at maximum profit.
- C. Increase non-domestic sales from 4,400,000 pounds in 1966 to 5,900,000 pounds in 1971.
- D. Establish a "pull through" advertising and promotion program in the U.S. and U.K. designed to establish preference for askarel designed transformers over the open dry type units.

III. General Strategy

Monsanto now supplies approximately 60% of the world's requirements for transformer askarel. Our major markets are the U.S., the U.K. and Canada where we have 100% of the available business. We have a share of the markets in many other world areas in the face of stiff competition - primarily from Bayer and Prodelec.

Fundamental to our attempt to get additional business around the world is the complete understanding that we do nothing to jeopardize the profitability of our domestic markets in the U.S. and the U.K. Every aggressive move we make to take business away from the competition must weigh the risk of losing any portion of our domestic markets. There is no indication that this will happen in the U.S. (as far as importation of fluid is concerned) but the U.K. market could be open to competitive moves by Bayer or Prodelec. We will make every attempt to strengthen our position in the U.K. through a reduction in manufacturing cost.

Our basic marketing strategy for transformer askarel around the world will include the following:

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- A. We will concentrate our efforts where we have maximum strength rather than dissipate our resources by trying to attack every world area simultaneously (for example: we will concentrate on the U.K. market in the European area). In the selected areas, we will use all available Monsanto resources, including frequent and in-depth account coverage, technical assistance, customer service, supply and quality position and price innovation where desirable.
- B. We will encourage the maximum sales activity on a local basis - involving all Monsanto marketing strengths that are available. This will include local Monsanto salesmen, agents, etc. This involvement will be spelled out in the area strategies.
- C. We will develop area strategies for all important marketing area. These strategies will describe what we plan to do and how we will accomplish our objectives in the selected areas.
- D. We will investigate selected areas where we do not now have market information and establish a plan accordingly.
- E. We will develop accurate cost and profit information from the various producing locations within Monsanto (U.S. and U.K.) and ship material from that source which yields maximum profit - always considering customer needs and market requirements.
- F. We will investigate our competition in depth in an attempt to get more detailed information regarding processes and estimated production cost. This information will guide our marketing program, especially our pricing strategy.
- G. We will use all available Monsanto personnel in the most effective and efficient manner on a worldwide basis - regardless of their present location. Additional people will be added as required to meet agreed upon objectives.
- H. Constantly review the technical innovations which could adversely affect the use of transformer askarel - for example, improved and lower cost dry type insulation, non-flammable gasses and vapors, etc.

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Recognizing the fluidity of relationship between the EEC and EFTA, we will be constantly alert to the need to revise our strategy for these two areas.

In summary, we will use all Monsanto resources in an attempt to gain additional business in selected areas of the world where we have strengths over competition - carefully considering at all times the risk of any action to maintaining 100% of our domestic markets.

IV. Goals (1967)

- A. Maintain current business and expand marketure of transformer askarel as follows:
 - 1. Maintain 100% of the business in the U.S.
 - 2. Maintain 100% of the business in the U.K.
 - 3. Maintain 100% of the business in Canada.
 - 4. Maintain 100% of the business in Mexico & South America.
 - 5. Obtain 100% of the business in Australia & South Africa.
 - 6. Obtain 75% of the business in India.
 - 7. Obtain 100% of the business in Portugal - cover other EFTA customers during capacitor sales trips as convenient.
 - 8. Obtain 50% of the business in Spain - avoid problems with Flix.
 - 9. Maintain 100% of the business in Israel.
- B. Initiate "pull through" advertising and promotion programs in U.S. and U.K. designed to create preference for askarel transformers over other types.
- C. Complete area strategies on all important markets of the world.
- D. Coordinate and standardize as much as possible the M.C. and M.C.L. testing procedures - resolve and understand any differences.

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E. Maximize profit on export transformer askarel blends by shipping from lowest cost production plant.

F. Attempt to establish blends with a high Aroclor content - reduce M.C.L. dependence on Prodelec for TCB.

V. PLANS (1967-1968)

A. Establish specific area strategies, complete with goals and plans to obtain marketure objectives in selected areas:

<u>STRATEGY</u>	<u>RESPONSIBILITY</u>	<u>DUE DATE</u>
U.S. area	GRB/PGB	2nd Quarter-1967 (R)
Canada*	T. Oneson	June-1967 (R)
Mexico*	J. Morales	June-1967 (R)
Argentina*	F. D. Manfrin	August-1967 (R)
Brazil*	W. Pruks	November-1967 (R)
U.K.	P.J.A. Marsh/DW	2nd Quarter-1967
Eastern Europe*	D. Wood	2nd Quarter-1967
Spain*	D. Wood	3rd Quarter-1967
South Africa*	RAS	December-1967
Australia*	A. D. Phillips	2nd Quarter-1968 (R)
India*	RAS	August-1967 (R)
Japan*	RAS	December-1967

(R) Means Revision Due

*Indicates strategy will be combined with the capacitor Aroclor strategy to produce a dielectric Aroclor strategy for the particular area.

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B. Initiate "pull through" advertising in U.S. and U.K.

<u>RESPONSIBILITY</u>	<u>ACTION</u>	<u>TARGET DATE</u>
Organic	Develop advertising & promotion program - maintaining coordination with ME.	2nd Quarter-1967
D. Wood	Prepare advertising & promotional program for the U.K. - maintaining coordination with Monsanto-U.S.A.	2nd Quarter-1967
Organic ME	Apply best features of the U.S. and U.K. program to other market areas such as Australia & Canada	4th Quarter-1967

C. Establish blends with higher Aroclor fluid content.

<u>RESPONSIBILITY</u>	<u>ACTION</u>	<u>TARGET DATE</u>
Organic	Work with Westinghouse to establish a transformer askarel using 100% Aroclor fluid. (See product strategy for details)	4th Quarter-1967
D. Wood	Evaluate possibility of selling high Aroclor fluid content transformer askarel in ME market and take appropriate action.	3rd Quarter-1967

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