

COLORED PIGMENTS

Technology Assessment			Support Category	Business Mission			
Year	Product	Process		Strengthen	Sustain	Harvest	Redirect
1975	N/A	N/A	I				
1980	N/A	N/A	II				
1986	N/A	N/A	III				
			IV			X	

Definition of Business

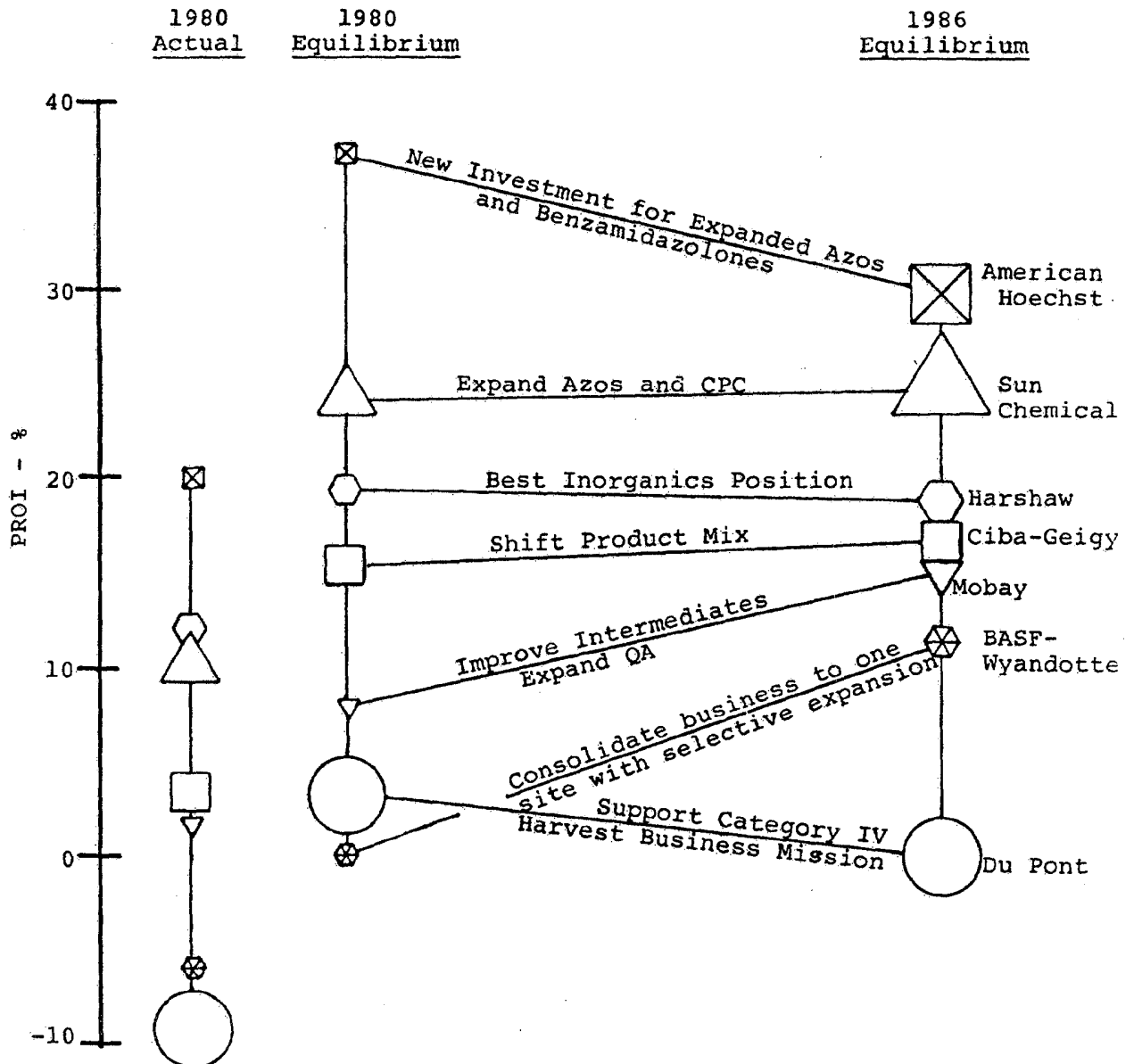
Du Pont's colored pigments business is comprised of four broad product lines, both for internal use, especially for F&F Department, and for sale to the merchant market. The product lines are:

- Inorganics - Du Pont manufactures chrome yellows (lead chromate), molybdate oranges (lead chromate/molybdate) and zinc yellow primers (zinc chromate). These include Krolor® silica-encapsulated products of special value where greater chemical and heat resistance is required. Cadmiums, iron oxide and iron blue are inorganic pigments which Du Pont does not offer. The tabulation below presents the inorganic product lines of each of the competitive companies.

	Chrome Yellow	Moly Orange	Zinc Yellow	Cadmium Pigments	Iron Oxide	Iron Blue	Other
Du Pont	X	X	X				X
Ciba-Geigy	X	X		X		X	X
American Hoechst			(No Inorganics)				
BASF Wyandotte			(No Inorganics)				
Mobay					X		
Harshaw	X	X		X		X	
Sun Chemical			(No Inorganics)				

- Quinacridones (QA) - These red, violet and gold pigments offer outstanding light stability and weather resistance. They are used where durability needs require the use of premium products in automotive finishes, plastics and universal colorants. Du Pont introduced QA pigments in 1958 and has the major portion of world capacity. Other QA producers include Sun Chemical, Mobay and Hoechst (W. Germany).
- Copper Phthalocyanines (CPC) - These blue and green products have outstanding strength, fastness and

EQUILIBRIUM PROFITABILITY PROJECTION
COLORED PIGMENTS



GASchlenk/cmj
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chemical stability. Du Pont consolidated its line in early 1981 to offer greens on a resale basis. Cheap foreign and domestic crude CPC sold to domestic pigment finishers is a major factor in this market. Nearly all colored pigment producers offer CPC products.

- Other Organics - A broad range of pigments, principally azos in the red and yellow hue range are available. No manufacturer can offer a "full line" of azos; companies tend to concentrate on servicing a particular industry, e.g., Sun Chemical and BASF Wyandotte concentrate on printing ink, or they develop proprietary products based on patented chemical structure, e.g., Hoechst's benzamid-azolones and Ciba-Geigy's isoindolinones. Intermediate position is a key element in maintaining long term position.

Profitability Position (Domestic)

<u>Factor</u>	<u>Contribution to Du Pont Equilibrium PROI - %</u>	
	<u>1980</u>	<u>1986</u>
Inorganics (proprietary items)	1	1
QA (scale, process & integration)	7	6
CPC (crude investment & costs)	(5)	(4)
Other Organics (intermediates position)	0	(3)
Total	<u>3</u>	<u>0</u>

Strategic Position

The major competitive strengths and weaknesses of the companies considered here are:

	<u>Strengths</u>	<u>Weaknesses</u>
Du Pont	• Scale and process advantage in QA. • Back integration to dimethyl succinate, a key QA intermediate. • Proprietary Krolor® inorganics.	• Declining azo intermediates position. • Manufacture of CPC crude adds investment and cost. • Heavy reliance on stagnant or declining inorganics market.
Ciba-Geigy	• General purpose U.S. facilities. • Technology transfer from parent company. • Import isoindolinone pigments.	• Relatively weak in azo intermediates. • Batch inorganics technology.

	<u>Strengths</u>	<u>Weaknesses</u>
American Hoechst	● Good azo intermediate position. ● Import benzamidazolone pigments.	● Weak pigment marketing effort.
BASF Wyandotte	● Fair azo intermediate position. ● Import CPC specialty products.	● Acquisition of U.S. facilities (Chemetron) not smooth. Some key people and business lost. ● Multiple problems at Huntington, WV, plant have forced rationalization to their Holland, MI, plant.
Mobay	● Excellent production site available for expansion at Bushey Park, SC. ● Good position in QA and perylene pigments.	
Harshaw	● Best overall process/environmental position in lead/cadmium pigments.	● Large dependence on lead/cadmium pigments.
Sun Chemical	● Excellent integration of pigment business in printing business, including ink and printing equipment. ● Use Phthalchem as raw materials supplier. ● Scale and process advantage in CPC and diarylide yellows. ● Newest U.S. colored pigments plant.	● Heavy corporate dependence on printing (~70% of sales and earnings).

APPENDIX

TECHNOLOGY ASSESSMENT, BUSINESS MISSION AND
SUPPORT TERMINOLOGY

Technology Assessment

<u>Symbol</u>	<u>Interpretation</u>
0	Equal to the best competitive technology, product or product line.
+	Superior to the best competitive technology, product or product line.
-	Inferior to the best competitive technology product or product line.

Support Category

<u>Symbol</u>	<u>Interpretation</u>
I	Full support - unique competitive position.
II	Selective support - strong competitive position.
III	Limited support - fair competitive position.
IV	Minimal support unless concerns are resolved - weak competitive position or business under review.

Business Mission

<u>Key Word</u>	<u>Interpretation</u>
Strengthen	Resources are applied in a positive manner to strengthen important elements of the business relative to the major competitors. Expected results could be increased market share, lower unit costs, and/or a broadened product line. Strategies could include new plant construction, vigorous cost reduction programs or high level of new product research.
Sustain	Businesses with sustain missions are applying resources in a manner perceived to maintain existing relative market shares, cost position, and/or product lines.
Harvest	The relative position of a business with a harvest mission will be allowed to weaken versus competition. If a business is low growth and competition does not choose to be aggressive, such a business can have a harvest mission, generating cash, and providing a good return for long periods of time. If competition

APPENDIX (Continued)

chooses to mount programs to increase market share, build new capacity, and expand product lines, businesses with harvest missions may choose not to react or may prune to a smaller profitable sub-segment of the market place.

Redirect This is a temporary mission assignment, indicating a significant change from a previous mission to correct near term a persistent business deficiency. Likely missions following Redirect are Harvest or Withdrawal.