STATUS OF MAJOR 1982

COLORED PIGMENTS R&D PROGRAMS

KARL H. DIETZ
5-6-82

MAJOR 1982 COLORED PIGMENTS R&D PROGRAMS

PROGRAM	BUDGET 1982 MP	INCENTIVE ('83-'86) ($M)
QA		
• LOW RHEOLOGY QA'S	2.5	4,200
• YT-915-D	-	~2,000
• RESINATED QA'S FOR PLASTICS (XRT-891-D)	0.6	540
CPC		
• IMPROVED CPC PRODUCTS BP-565-D XBT-579-D XBT-584-D	1.0	2,500
OTHER ORGANICS		
• HIGH SOLIDS DISPERSIONS	0.6	2,200

KHD-1

LOW RHEOLOGY QUINACRIDONES

KHD-2

BACKGROUND

FEDERAL REGULATIONS REQUIRE REDUCED SOLVENT EMISSIONS AT AUTOMOTIVE PLANTS

- TREND FROM LACQUERS TO HIGH SOLID ENAMELS (HSE)
- INCREASED PIGMENT LOADING
- CHANGES CAUSE RHEOLOGY PROBLEMS

OBJECTIVE

DEVELOP A LINE OF PRODUCTS THAT WORK WELL IN HSE TO PROTECT AND POSSIBLY EXPAND OUR CURRENT BUSINESS

MAJOR PRODUCTS THREATENED

RT-243-D, "MONASTRAL" MAGENTA ⟶ XRT-343-D

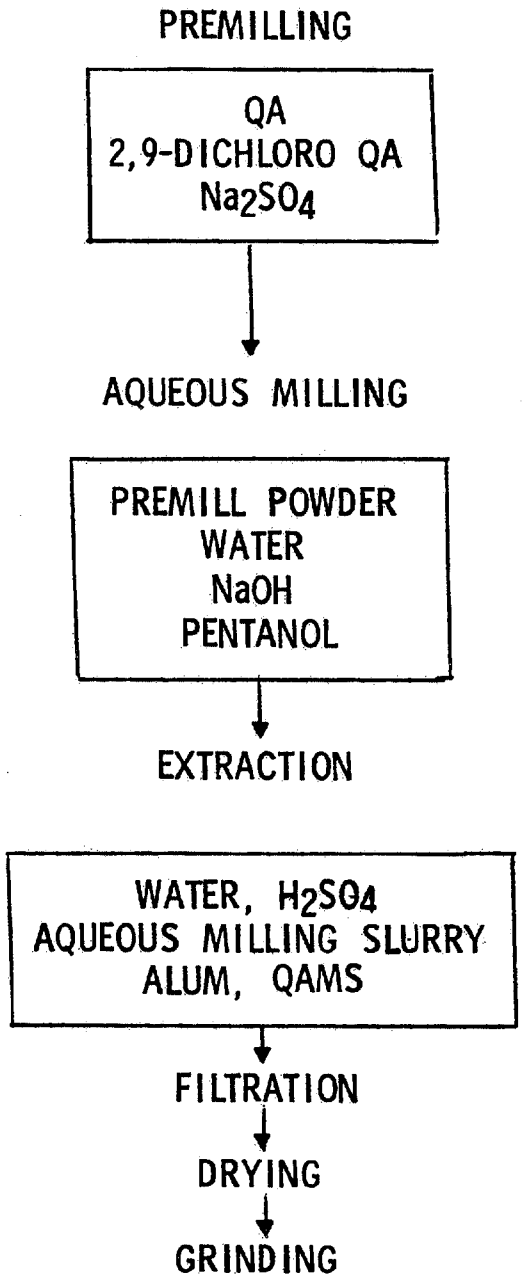
RT-233-D, "MONASTRAL" TRANSPARENT RED B ⟶ XRT-333-D

RT-759-D, "MONASTRAL" RED Y (IN SOME SYSTEMS)
⟶ XRT-859-D

APPROACH

- NEW FINISHING PROCESS (RT-243-D, RT-233-D)
  - ACETONE MILLING - HIGH INVESTMENT, ABANDONED
  - AQUEOUS MILLING - ACTIVE
- CHANGE POLARITY OF SURFACE (RT-759-D)

AQUEOUS MILLING - PROCESS OUTLINE



KHD-5

VARIABLES STUDIED AT SEMI-WORKS

- MILLING TIME
- MILLING TEMPERATURE
- NaOH AND ALCOHOL CONCENTRATIONS
- EFFECT OF SURFACTANT
- COMPOSITION (100% 2,9-DICHLORO QA VS. SOLID SOL.)

- BASIC DATA + SCOPE
  - SAFETY + ENVIRONMENTAL
    - PENTANOL ODOR CONTROL
    - MATERIAL HANDLING (NaOH, PENTANOL)
    - PMN FOR SURFACTANT
  - MINIMIZE INVESTMENT
    - USE OF EXISTING FACILITIES
    - MINIMUM ESSENTIAL DESIGN FOR NEW FACILITIES

	YIELD STRESS (DYNES/CM^2)	VISCOSITY (POISE)	GLOSS (IN RED BLENDS IN HSE)	DOI
RT-243-D	1307	29	85	90
XRT-343-D (ACETONE)	125	3.4	92	90+
XRT-343-D (AQUEOUS)	211	6.8	93.3	95+

AQUEOUS MILLING - VENTURE GUIDANCE ESTIMATE ($M)

MILL AREA	~75
MILL TEMPERATURE CONTROL	
PIPING FOR NaOH, H_2O	
SPOT VENTILATION	
DRUMMING BOOTH	
PARTITION	
CONTAINERS	
TOTE BINS	30
OR	OR
"DYEPAKS"	5
EXTRACTION AREA	
TOTE UNLOADING FACILITIES	20

PROGRAM SCHEDULE

PRODUCT/PROCESS

PROCESS STUDIES	4-82
DECISION ON VIABILITY	5A-82
CUSTOMER SAMPLING	6-82
CUSTOMER RESULTS	9-82
PLANT DEMONSTRATION	3Q-82

PLANT

DRAFT BASIC DATA - SCOPE-ESTIMATE	5A-82
APPROVED BASIC DATA - SCOPE	6A-82
AUTHORIZATION	7B-82
DESIGN COMPLETE	11-82
CONSTRUCTION COMPLETE	2-83
COMMERCIAL PRODUCTION	3-83

KHD-9

Problem-e plant making statement on project earth

XRT-859-D, IMPROVED RHEOLOGY RT-759-D "MONASTRAL" RED Y

APPROACH

INCREASE SURFACE POLARITY OF RT-759-D BY APPLYING ALUMINUM QUINACRIDONE MONOSULFONATE (AQM)

STATUS

- SUCCESSFUL PLANT TRIAL (2 BATCHES, 2500 LB.) IN MARCH/APRIL '82
- CUSTOMER SAMPLING LOT BLENDED AT NEWARK
- WAITING CUSTOMER RESPONSE

KHD-10

FUTURE WORK

- DIMETHYL QA XRT-353-D, PINK E COUNTERPART
- IMPROVED RT-201-D BETA QA VIOLET
- IMPROVED RT-233-D, XRT-333-D

KHD-11

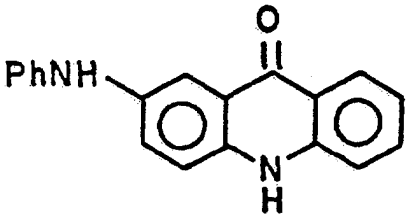
YT-915-D

"MONASTRAL" FAST GOLD

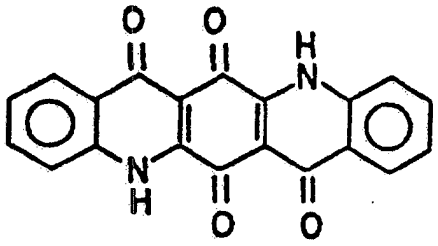
KHD-12

BACKGROUND

DEVELOPED A NEW GOLD PIGMENT FOR AUTOMOTIVE FINISHES MORE DURABLE THAN YT-815-D BASED ON A SOLID SOLUTION OF QUINACRIDONEQUINONE (QAQ) WITH THE STABILIZER ANILINOACRIDONE (AA), LAKED WITH NICKEL CARBONATE.



AA



QAQ

KHD-13

STATUS

- TECHNOLOGY PLANT DEMONSTRATED (MAY '81 - 1600 LB.; JAN. '82 4500 LB.)
- AA SUPPLY
  - FIRST AA PRODUCTION IN BLACKMAN/UHLER'S (B/U) SEMI-WORKS
  - MAKE VS. BUY DECISION AUGUST '81
    - SHORT TERM CASH FLOW
    - R&D EXPENSE
    - NEWPORT PRODUCTION INTERFERENCE
  - EVALUATED ALTERNATIVE TOLL MANUFACTURE AT HELIX ASSOC. AND GRANT CHEMICALS (FERRO)
  - TOLL MANUFACTURE CONTRACT WITH B/U BEING NEGOTIATED
  - INGREDIENTS FOR AA (AMINE + ESTER) FROM SINGLE SUPPLIERS
    - STOCK PILE

      VS.

    - ALTERNATE SUPPLY TOLL MANUFACTURE

CHOICE OF BLACKMAN/UHLER

	B/U	GRANT	HELIX
INVESTMENT	~ 350M	~375M	~100M
CONVERSION COST	~ 33	~33	~ 21
EXPERIENCE	+	-	-
LONG TERM ECONOMIC VIABILITY	+	+	?

OUTLOOK

- FINALIZE B/U CONTRACT IN MAY
- GET ~1000 LBS. OF AA FROM B/U BY 10-1-82
    - o AMINE ON HAND.
    - o ESTER ORDERED - JUNE MANUFACTURE
- ~8000 LBS. OF YT-915-D BY JAN. '83
- PURSUE ALTERNATE TOLL MANUFACTURE FOR ESTER

KHD-15

XRT-891-D RESINATED VIOLET

OBJECTIVE

DEVELOP A QA VIOLET OF IMPROVED HEAT STABILITY AND DISPERSIBILITY FOR AUTOMOTIVE PLASTICS

BACKGROUND

NEW QA OPPORTUNITIES

RED 3B - INTENSE BUT EXPENSIVE

HF4B - INTENSE BUT POOR LIGHTFASTNESS

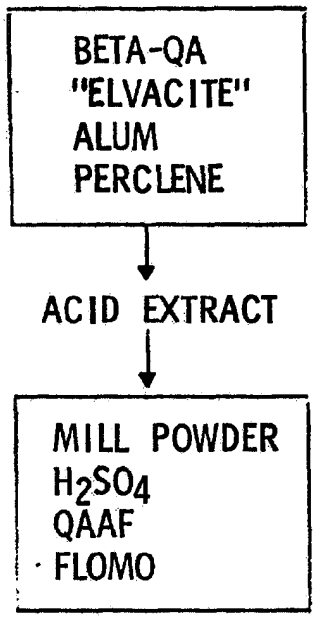
DU PONT PRODUCTS	RT-791-D	RT-899-D
1981 DOMESTIC USE IN PLASTICS	76M LBS.	11M LBS.
LIST PRICE	$23/LB.	$23/LB.
SALES DOLLAR	$1.7MM	$250M
PRODUCT CHARACTERISTICS		
- DISPERSIBILITY	MARGINAL	IMPROVED
- HEAT STABILITY	MARGINAL	IMPROVED
- MASSTONE SHADE	"PLUM"	BROWN & DULL

KHD-16

APPROACH

BETA QA DISPERSION MILLED WITH 10% "ELVACITE" 2046

DISPERSION MILL



PRESS, WASH, DRY, PULVERIZE,
BLEND WITH SHADING LOT
CONTAINING BT-449-D

STATUS AND PROGRAM

PLANT TRIALS

- DEC./JAN. — 5 NEWPORT MILLINGS TO STUDY MILLING TIME
- MAR./APR. '82 — 15 NEWPORT MILLINGS
  2 EXTRACTIONS
  1 BLENDING LOT
- APR. '82 — NEWARK DRYING
- MAY '82 — FINAL CHESTNUT RUN EVALUATION AND BLENDING RECOMMENDATION
- JUNE '82 — CUSTOMER SAMPLING

KHD-17

IMPROVED CPC PRODUCTS

OBJECTIVE:

FILL CPC CAPACITY WITH ENHANCED PRODUCT MIX

BP-565-D. FOR PLASTICS

XBT-579-D FOR LDL

XBT-584-D FOR HSE

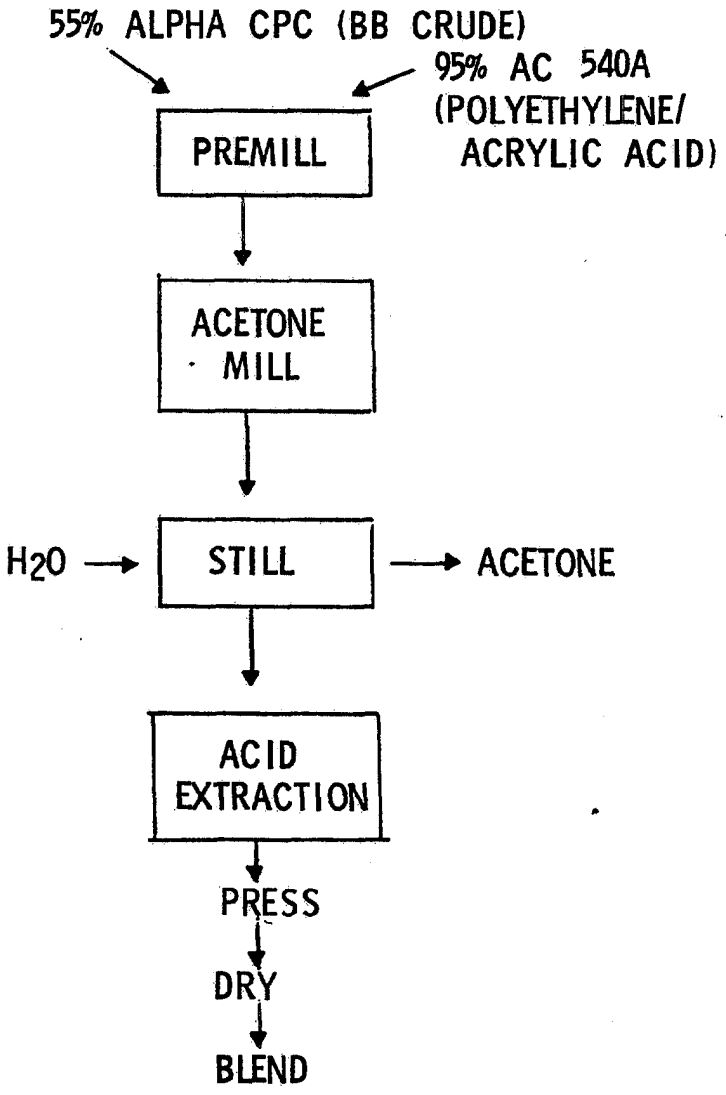
KHD-18

BP-565-D

OBJECTIVE:

DEVELOP A HIGHLY DISPERSIBLE BLUE FOR POLYOLEFIN BLOWN FILMS AT AMPACET (120,000 LB. '82 OPPORTUNITY, INCREM. EARN. $2.22/LB.) AND OTHER CUSTOMERS.

APPROACH:



KHD-19

STATUS

- FIRST TWO PLANT TRIALS 6/81 AND 10/81 GAVE VARIABLE QUALITY
- THIRD TRIAL 12/81 GAVE EXCELLENT QUALITY
- FEB./MAR. '82 PRODUCTION (18,000 LBS.) GAVE EXCELLENT QUALITY

LONG DRYING CYCLE REMAINS A CONCERN

- ASSESSING LONG TERM DRYING CAPACITY
- R&D AND NEWARK PRODUCTION EVALUATING DRYING ALTERNATIVES

PROGRAM

- COMPLETE TURNOVER TO PRODUCTION, WRITE PROCESS
- DRYING ALTERNATIVES
- SAMPLE PRODUCT TO OTHER CUSTOMERS
- LOOK FOR OTHER OPPORTUNITIES TO APPLY THIS TECHNOLOGY

KHD-20

XBT-579-D

OBJECTIVE

REGAIN LOST BP-479-D BUSINESS IN DARK METALLICS AT F&F

APPROACH

DEVELOP TONER PRODUCT SIMILAR TO BP-479-D IN COLOR AND TRANSPARENCY BY

PREMILL + ACID GROWTH

- BBFZ
- 70°C. /60% H_2SO_4
- DILUTE/70°C.
- ISOLATE

PROCESS PATENT APPLICATION FILED

VALUE-IN-USE

AT LEAST 60% BETTER THAN BP-479-D

STATUS

- PLANT TRIALS COMPLETE (3 LOTS - 1200 LBS. EACH)
- LOTS 2 & 3 BLENDED FOR SAMPLING TO F&F

PROGRAM

- F&F'S EVALUATION
- FOLLOW NEXT PRODUCTION
- FINISH DOCUMENTATION

KHD-21

XBT-584-D

OBJECTIVE

DEVELOP A BT-284-D COUNTERPART SUITABLE FOR HSE

BACKGROUND

- BT-284-D HAS POOR RHEOLOGY
- BT-425-D EXTENDER INCOMPATIBLE WITH HSE

APPROACH

HIGH POLARITY SURFACE CPC FOR GOOD RHEOLOGY:
TREATMENT WITH CATIONIC SURFACTANT
AND CPC-MS

N-8510 (ACETONE MILLED SEMICHLORO CPC)

TREATMENT WITH

ARQUAD 16-50

CPC-MS

ALUM

PRESS, WASH, DRY, PULVERIZE

STATUS

- SAMPLED TO F&F AND OTHER CUSTOMERS
- F&F INTERESTED (1985 COLORS IN LDL; ENAMEL F/C AND COMMITMENT BY MAY)
- TMR CIRCULATING FOR SIGNATURES
- WAITING FOR F&F'S 5/82 RESPONSE BEFORE PLANT TRIAL

KHD-22

HIGH SOLIDS DISPERSIONS FOR TRADE SALES

OBJECTIVE

OFFER HIGH VALUE-IN-USE PRODUCTS FOR TRADE SALES TO PROTECT OUR EXISTING BUSINESS AND EXPAND SHARE BY DEVELOPING HIGH SOLIDS PIGMENT DISPERSION

APPROACH

FORMULATE STABLE DISPERSIONS OF SAND MILLED PRESSCAKES

PRESSCAKE (40-50% SOLIDS-MEMBRANE PRESS)
↓
FLUIDIZE
↓
SAND MILL
↓
STANDARDIZE
↓
PACKOUT (40-50% PIGMENT, 5-10% ADDITIVES, BALANCE WATER)

KHD-23

STATUS

PRODUCT LINE COMPLETE

PRODUCT LINE	'81 SALES (M LBS.)	'82 F/C (M LBS.)	MARKET
YW-958-P	38.6	80	INTERIOR
YW-911-P	1.2	96	EXTERIOR
YW-928-P	17.6	30	EXTERIOR
YW-968-P	14.6	30	EXTERIOR
GW-951-P	5.7	25	EXT./INT.

PROGRAM

- CONSOLIDATE LINE
  - REPLACE YW-968-P WITH YW-911-P?
  - DROP YW-928-P?
  - STUDY MIXING YW-958-P WITH YW-911-P
- FINALIZE RW-252-P FORMULA
  - DEVELOPED 2.6% PETRO DISP., 2.5% IGEPAL, NALCO 2300, BIOCIDE, AMP 95, ETHYLENE GLYCOL
  - CHESTNUT RUN TESTING
  - PPG TESTING
- DEVELOP DIMETHYL QA DISPERSION
- LONG TERM SAND MILLING FACILITIES
  - SECRECY AGREEMENT SIGNED WITH AMERICAN COLOR
  - ESTABLISH TECHNICAL LIAISON
  - TRANSFER TECHNOLOGY

KHD-24