## PROCESS IMPROVEMENT (CONT'D.)

**CRITICAL CHECKPOINTS:**

| | |
|---|---|
| ESTABLISH PROCESS IMPROVEMENT GROUPS | DONE |
| DEVELOP SPECIFIC PROBLEMS/CHECKPOINTS | DONE |
| REVIEW WITH PLANT/WILMINGTON MANAGEMENT | 1/'82 |
| COMPLETE MAJOR DOCUMENTATION | 12/'82 |
| COMPLETE FACILITIES DEVELOPMENT | 12/'83 |

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# PROCESS IMPROVEMENT

**OBJECTIVE:**

IMPROVE PIGMENTS PROCESS TECHNOLOGY AND OPERATING FACILITIES TO OBTAIN FUTURE BATCH PRODUCTION >90% BLENDABLE TO AFS WITHIN EACH PRODUCTION CAMPAIGN AND CONTINUOUS PRODUCTION TO >95% OK STRAIGHT. DEVELOP FULLY DOCUMENTED TECHNOLOGY ON EACH PROCESS.

**MANPOWER:** 18 (1982)

**INCENTIVE:** $1500M (1985)

**TECHNICAL APPROACH:**

REVIEW CURRENT PROCESS DOCUMENTATION AND PRODUCTION HISTORY/PROBLEMS FOR EACH PRODUCT MANUFACTURED. DEVELOP LAB PROGRAMS TO EXPLORE CRITICAL VARIABLES WHERE NEEDED TO INSURE ADEQUATE PRODUCTION REPRODUCIBILITY AND DEVELOP RECOMMENDATIONS FOR IMPROVED FACILITIES WHERE REQUIRED. DOCUMENT ALL TECHNOLOGY.

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## 1982 MTE TECHNICAL PROGRAMS

- PROCESS IMPROVEMENT
  - DOCUMENTATION OF EXISTING TECHNOLOGY
  - PROCESS DEVELOPMENT
  - IMPROVED OPERATING FACILITIES
  - IMPROVED WASTE TREATMENT
    - BLUE HUMUS
    - HEAVY METALS

- PLANT ASSISTANCE
  - QUALITY MAINTENANCE
  - TECHNOLOGY TRANSFER
  - COST REDUCTION
    - REWORK OF SUBSTANDARD
    - ENERGY
    - LOWER COST INGREDIENTS

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## 1982 MTE RESOURCE ALLOCATION

| | PROCESS IMPROVEMENT | PLANT ASSISTANCE | TOTAL |
|---|---|---|---|
| QA | 4.3 | 3.4 | 7.9 |
| CPC | 5.7 | 3.1 | 8.8 |
| INORGANICS | 3.5 | 2.0 | 5.5 |
| OTHER ORGANICS | 4.5 | 1.3 | 5.8 |
| | 18 | 10 | 28 |

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## NEW CHEMISTRY

**OBJECTIVE:**

DEVELOP AND DEMONSTRATE PLANT PROCESS FOR XYT-303-D (ANTHRANILAMIDE (AA) → ACETOACETYLAMINO-BENZIMIDAZOLONE (AABI)), AN AUTOMOTIVE QUALITY AZO YELLOW PIGMENT.

**MANPOWER (DIRECT 1982):**

1.0

**INCENTIVE:**

$60-75M PTE/YEAR (1981 $; BASED ON 1983 PLANNING VOLUME OF 12-15M LB., $25/LB. SELLING PRICE, $20/LB., COST OF SALES).

**TECHNICAL APPROACH:**

ONE POT, DIAZOTIZATION/COUPLING IN SOLVENT, NO ISOLATION FOR SURFACTANT ASSISTED CRYSTAL DEVELOPMENT, USE PURCHASED INTERMEDIATES.

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## NEW CHEMISTRY (CONT'D.)

### CURRENT STATUS:

CHESTNUT RUN AND INITIAL F&F EVALUATION POSITIVE. VALUE-IN-USE ESTIMATE ONLY FROM CHESTNUT RUN. BUSINESS CENTER APPROVAL TO PROCEED WITH DEVELOPMENT (UNDERWAY). HASKELL SKIN IRRITATION TEST OK. AA ON HAND FOR SEMI-WORKS TRIAL, AABI ORDERED. ~ $50M INVESTMENT SMALL LOT MANUFACTURING SET AT "MONASTRAL" BLDG., NEEDS COMMITMENT TO SECURE VIS A VIS BIOCHEM'S POTENTIAL INTEREST.

### FUTURE CHECKPOINTS:

| | |
|---|---|
| ESTABLISH COMMERCIAL AVAILABILITY OF AABI | DEC. '81 |
| OBTAIN AABI FOR SEMI-WORKS TRIAL, COMPLETE DEVELOPMENT WORK | MARCH '82 |
| START SEMI-WORKS RUN; 1 YEAR FLORIDA ON EARLIER SAMPLE | APRIL '82 |
| 20-30 LB. MADE IN SEMI-WORKS; SAMPLE TO CUSTOMERS | MAY '82 |
| F&F'S VALUE-IN-USE FEEDBACK | JULY '82 |
| MCN ON "MONASTRAL" EQUIPMENT | AUG. '82 |
| RECEIVE AABI FOR PLANT TRIAL | NOV. '82 |
| EQUIPMENT READY | DEC. 82 |
| PLANT TRIALS | JAN./FEB. '83 |
| CUSTOMERS HAVE ONE YEAR FLORIDA EXPOSURE (SEMI-WORKS MATERIAL) | JULY '83 |
| EARLIEST ORDERS FOR 1984 MODEL CAR CONSUMPTION | AUG. '83 |

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# COLORED PIGMENTS R&D

# 1982 BUDGET AND PROGRAMS

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## OVERVIEW

- BUDGET: '81 vs. '82
  - MANPOWER AND EXPENSE
- MANPOWER FORECAST: '82-'86
- IEB RESOURCE ALLOCATION: '82-'86
- 1982 TECHNICAL PROGRAMS: OVERVIEW
- MAJOR TECHNICAL PROGRAMS

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## COLORED PIGMENTS R&D BUDGET

## '81 ACTUAL VS. '81 BUDGET

| | | 1981 (9+3) | 1981 (B) | % ACTUAL VS. BUDGET |
|---|---|---|---|---|
| **JACKSON LAB.** | | | | |
| IEB | $M | 3500 | 3810 | 92 |
| | MP | 19 | 18 | 105 |
| **NEWARK/NEWPORT** | | | | |
| MTE | $M | 3460 | 4200 | 82 |
| | MP | 23.7 | 27 | 88 |
| **CONTROL LAB** | | | | |
| | $M | 1915 | 2040 | 94 |
| | MP | 7 | 7 | 100 |
| **PROJECT ENG.** | | | | |
| | $M** | 410 | 445 | 92 |
| | MP | 3.7 | 4 | 92 |

**ADDITIONAL $240M SPENT ON P.E. AT GRASSELLI

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# COLORED PIGMENTS R&D BUDGET

## '81 VS. '82

| | | 1981 (9+3) | 1982 (B) | 1982 AS % OF 1981 |
|---|---|---|---|---|
| **JACKSON LAB** | | | | |
| IEB | $M | 3500 | 2350 | |
| | MP* | 19 | 11 | |
| MTE | $M | - | 1008 | |
| | MP | - | 5 | |
| TOTAL | $M | 3500 | 3358 | 96% |
| | MP | 19 | 16 | 84% |
| **NEWARK/NEWPORT** | | | | |
| MTE | $M | 3460 | 3746 | 108% |
| | MP | 23.7 | 23 | 97% |
| CONTROL LAB | $M | 1915 | 2205 | 115% |
| | MP | 7** | 8 | 114% |
| PROJECT ENG.*** | $M | 650 | 645 | 99% |
| | MP | 6.7 | 6 | 90% |

*RES. MANAGER INCLUDED IN IEB NUMBERS
**MAN ON LOAN TO PRODUCTION IN 1981-RETURNS IN '82
***TOTAL EXPENDITURES EXPECTED ON P.E., BUDGET NO LONGER UNDER R&D CONTROL

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## MANPOWER FORECAST

| SITE | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 |
|---|---|---|---|---|---|---|
| JACKSON LAB | | | | | | |
| IEB | 18 | 10 | 12 | 9 | 7 | 7 |
| MTE | - | 5 | - | - | - | - |
| NEWARK | | | | | | |
| MTE | 12 | 12 | 11 | 10 | 7 | 7 |
| CONTROL LAB | 6 | 6 | 4 | 4 | 4 | 4 |
| NEWPORT | | | | | | |
| MTE | 12 | 11 | 10 | 8 | 7 | 7 |
| CONTROL LAB | 2 | 2 | 2 | 2 | 1 | 1 |
| RESEARCH MNGR. | 1 | 1 | 1 | 1 | - | - |
| TOTAL | 51 | 47 | 40 | 34 | 26 | 26 |

ASSUMPTIONS

- ABLE TO RETAIN MOST COMPETENT PERSONNEL
- MINIMAL MOVEMENT OF EXPERIENCED PERSONNEL
- ABLE TO MOVE S, G PERFORMERS

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## MANPOWER FORECAST

| SITE | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 |
|---|---|---|---|---|---|---|
| JACKSON LAB | | | | | | |
| IEB | 18 | 10 | 12 | 9 | 7 | 7 |
| MTE | - | 5 | - | - | - | - |
| NEWARK | | | | | | |
| MTE | 12 | 12 | 11 | 10 | 7 | 7 |
| CONTROL LAB | 6 | 6 | 4 | 4 | 4 | 4 |
| NEWPORT | | | | | | |
| MTE | 12 | 11 | 10 | 8 | 7 | 7 |
| CONTROL LAB | 2 | 2 | 2 | 2 | 1 | 1 |
| RESEARCH MNGR. | 1 | 1 | 1 | 1 | - | - |
| TOTAL | 51 | 47 | 40 | 34 | 26 | 26 |

ASSUMPTIONS

- ABLE TO RETAIN MOST COMPETENT PERSONNEL
- MINIMAL MOVEMENT OF EXPERIENCED PERSONNEL
- ABLE TO MOVE S, G PERFORMERS

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## IEB RESOURCE ALLOCATION*

| | 1982 | 1983 | 1984 | 1985 | 1986 |
|---|---|---|---|---|---|
| QA | 3.9 | 6.8 | 5.2 | 5.2 | 5.2 |
| CPC | 1.3 | 1.9 | 1.0 | .6 | .6 |
| INORGANICS | 1.2 | .8 | .8 | .6 | .6 |
| OTHER ORGANICS | 1.5 | 2.0 | 2.0 | .6 | .6 |
| NEW CHEMISTRY | 2.1 | .5 | - | - | - |
| | 10.0 | 12.0 | 9.0 | 7.0 | 7.0 |

*DIRECT MANPOWER, RES. MGR. EXCLUDED

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# QUINACRIDONES FOR HIGH SOLIDS ENAMELS

## OBJECTIVE:

DEVELOP NEW QA PRODUCTS THAT PROVIDE THE RHEOLOGICAL AND TINCTORIAL PROPERTIES REQUIRED BY NEW HIGH SOLIDS ENAMEL SYSTEMS.

## MANPOWER (DIRECT 1982):

2.0

## INCENTIVE:

$4MM PTE '83-'86. PROTECTION OF EXISTING BUSINESS THAT WOULD BE LOST BECAUSE OF RHEOLOGICAL DEFICIENCIES OF EXISTING PRODUCTS.

## TECHNICAL APPROACH:

MODIFY PIGMENT PARTICLE MORPHOLOGY AND SURFACE PROPERTIES TO GIVE ACCEPTABLE RHEOLOGY IN HIGH SOLIDS ENAMEL SYSTEMS. UTILIZE SOLVENT (ACETONE OR AQUEOUS) MILLING PROCESS ROUTE.

## CURRENT STATUS:

SEMI-WORKS SCALE-UP COMPLETE FOR THREE POTENTIAL NEW PRODUCTS. CUSTOMER EVALUATIONS ARE IN PROGRESS FOR THESE MATERIALS. LABORATORY/SEMI-WORKS DEVELOPMENT OF LOW INVESTMENT ROUTE (AQUEOUS MILLING) HAS BEEN INITIATED.

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## QUINACRIDONES FOR HIGH SOLIDS ENAMELS (CONT'D.)

**FUTURE CHECKPOINTS:**

| | |
|---|---|
| BASIC DATA - ACETONE MILLING | 11/'81 |
| RESULT CUSTOMER EVALUATIONS (ACETONE MILLED, BREACHED) | 11/'81-1/'82 |
| PLANT TEST - ACETONE MILLING | 2/'82 |
| SEMI-WORKS TESTS - AQUEOUS PROCESS | 1Q'82 |
| DECISION DEADLINE ALTERNATIVE PROCESSES | 4/'82 |
| PROJECT AUTHORIZATION - ACETONE MILLING | 5/'82 |
| PLANT TEST ALTERNATIVE PROCESS (IF NEEDED) | 3Q'82 |
| EQUIPMENT TURNOVER - ACETONE MILLING | 1Q'83 |
| COMMERCIALIZE NEW PRODUCT | 1Q'83 |

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# EASY DISPERSING QA FOR PLASTICS

## OBJECTIVE:

DEVELOP IMPROVED VIU PRODUCTS TO INCREASE QA SALES TO THE PLASTICS INDUSTRY.

## MANPOWER (DIRECT 1982):

0.5

## INCENTIVE:

$540M PTE '82-'85 FROM NEW BUSINESS IN A MARKET WE DO NOT NOW PARTICIPATE IN.

## TECHNICAL APPROACH:

UTILIZE DISPERSION MILLING OF PIGMENT AND RESIN TO DEVELOP RESIN EXTENDED QA PRODUCTS WITH IMPROVED DISPERSION PROPERTIES IN PLASTICS.

## CURRENT STATUS:

TWO NEW PRODUCTS HAVE BEEN DEVELOPED THROUGH THE SEMI-WORKS WITH 90% AND 50% TONER CONTENT. SAMPLES HAVE BEEN SENT FOR CUSTOMER EVALUATION. PLANT TEST OF 90% TONER PRODUCT IS IN PROGRESS. ECONOMICALLY MOST DESIRED PRODUCT IS 90% TONER.

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## EASY DISPERSING QA FOR PLASTICS (CONT'D.)

FUTURE CHECKPOINTS:

| | |
|---|---|
| PLANT TEST 90% TONER PRODUCT (XRT-891-D) | 11/'81-2/'82 |
| SAMPLE CUSTOMERS - PLANT MATERIAL | 1Q'82 |
| CONFIRMING PLANT TEST | 2Q'82 |
| COMMERCIALIZE XRT-891-D | 3Q'82 |
| DECIDE FATE OF XRP-266-D | BY YEAR END '82 |

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# EASY DISPERSING CPC FOR PLASTICS

## OBJECTIVE:

DEVELOP IMPROVED VIU PRODUCTS TO INCREASE CPC SALES TO THE PLASTICS INDUSTRY.

## MANPOWER (DIRECT 1982):

0.8

## INCENTIVE:

$2MM INCREMENTAL PTE '82-'86.

## TECHNICAL APPROACH:

UTILIZE EXCESS SOLVENT MILLING CAPACITY TO DEVELOP RESIN EXTENDED CPC PRODUCTS WITH IMPROVED DISPERSION PROPERTIES IN PLASTICS SYSTEMS.

## CURRENT STATUS:

COMPLETED TWO PLANT TESTS. DEFINED PROCESS CONDITIONS NEEDED TO PRODUCE A 55% TONER PRODUCT THAT MEETS AMPACET'S TECHNICAL SCREEN.

## FUTURE CHECKPOINTS:

| | |
|---|---|
| COMMERCIALIZE XBP-565-D (55%) | 1/'82 |
| SAMPLE INDUSTRY | 1Q/82 |
| OPTIMIZE AND DOCUMENT PROCESS | 2Q'82 |
| EXPAND PRODUCT LINE | 12/'82 |

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# HIGH SOLIDS DISPERSIONS

## OBJECTIVE:

DEVELOP HIGH SOLIDS DISPERSIONS TO MEET THE INCREASING DEMAND IN THE TRADE SALES PAINT INDUSTRY FOR PREDISPERSED VS. DRY PIGMENT PRODUCTS.

## MANPOWER (DIRECT 1982):

0.5

## INCENTIVE:

$2.4MM '82-'86.

## TECHNICAL APPROACH:

UTILIZE SAND MILLING DISPERSION TO FORMULATE AQUEOUS HIGH SOLIDS (>40%) PRODUCTS THAT CAN BE USED IN UNIVERSAL COLORANT AND IN-PLANT TINTING SYSTEMS.

## CURRENT STATUS:

HAVE COMMERCIALIZED FIVE NEW PRODUCTS.

## FUTURE CHECKPOINTS:

| | |
|---|---|
| COMMERCIALIZE HIGH STRENGTH PRODUCT (YW-958-P) | 1Q'82 |
| COMPLETE "DALAMAR" PRODUCTS CONVERSION TO HIGH SOLIDS PRESSCAKES | 3Q'82 |
| PRODUCT/PROCESS MODIFICATIONS TO MEEET TOTAL MARKET NEEDS | 12/'82 |
| DEVELOP ALTERNATIVE PRODUCTION CAPABILITY | 12/'82 |

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# 1982 IEB TECHNICAL PROGRAMS

| PRODUCT LINE | MP | PROGRAM | INCENTIVE ('83-'86) ($M) | SUCCESS PROB. |
|---|---|---|---|---|
| QA | 2.5 | • PRODUCTS FOR HIGH SOLIDS ENAMELS | 4200 | .8 |
| | .7 | • RESINATED QA FOR PLASTICS | 540 | .6 |
| | .4 | • COST REDUCTION - $H_2SO_4$ FOR ACETIC ACID | 2400 | .5 |
| | .3 | • SSE YIELD IMPROVEMENT | 2700 | .3 |
| | - | • NEW QA DISPERSIONS FOR TRADE SALE TO REPLACE HF MILLED CODES | TBD | - |
| | - | • ALTERNATE OXIDIZING AGENT TO REPLACE "SITOL" | TBD | - |
| CPC | 1.3 | • RESINATED CPC'S FOR PLASTIC | 2500 | .8 |
| | - | • HIGH SOLIDS CPC BLUE DISPERSIONS | TBD | - |
| OTHER ORGANICS | | | | |
| | .8 | • HIGH SOLIDS DISPERSIONS | 2200 | .8 |
| | .7 | • "DALAMAR" PRODUCT SUPPORT | TBD | .3 |
| | - | • RESINATED WATCHUNG | TBD | .2 |
| | - | • LITHOL RUBINE | 500 | .8 |

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## 1982 IEB TECHNICAL PROGRAMS (CONT'D.)

| PRODUCT LINE | MP | PROGRAM | INCENTIVE ('83-'86) ($M) |
|---|---|---|---|
| INORGANICS | | | |
| | .6 | • "KROLOR" PRODUCT SUPPORT - RESINATED "KROLOR" | TBD |
| | .6 | • "KROLOR" PATENT SUPPORT | - |
| NEW CHEMISTRY | | | |
| | 1.3 | • NEW ANTHRANILAMIDE AZO DEVELOPMENT | 500 |
| | .8 | • NEW PRODUCT SCOUTING | 8000 |

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