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Newark, New Jersey  
January 31, 1969

P. D. GRAHAM  
Pigments - Wilmington

EXPERIMENTAL "MONASTRAL" BLUE GF (B)BT-465-D

Attached is a Research check list for BT-465-D, including information on composition, suggested uses, properties, material on hand, and patent status.

Submitted by: H. Matrick

APPROVED BY: F. F. EHRICH

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A. A. BRIZZOLARA

dc

## I. COMPOSITION

84.4% N-657 Blue G  
14.9% N-873 CPC-AF  
0.7% Moisture (based on BT-297-D data)

## II. SUGGESTED USES

### A. Paint

BT-465-D offers improved transparency and strength over BT-297-D in any system where BT-297-D is subject to crystal growth during dispersion. This appears to include virtually all paint systems where ball milling or CAB chipping is the method of dispersion. BT-465-D is also fully superior to BT-297-D in working properties such as mill base viscosity, gloss, and flocculation resistance.

BT-465-D offers improved tinctorial properties such as transparency and strength over BT-417-D in most paint systems, but particularly in low work applications such as sand milling. This is because BT-465-D is readily dispersible relative to BT-417-D.

### B. Plastics

BT-465-D offers dramatic improvement in heat stability in linear polyethylene vs. BT-297-D or BT-383-D. BT-417-D has not been evaluated in this application because of poor dispersibility. BT-465-D is expected to perform well in other plastics with similar solvent characteristics and/or fabricating temperatures such as non-linear polyethylene, polypropylene, acrylonitrile-butadiene-styrene and possibly "high temperature" PVC. If the resin is too good a solvent for CPC such as in polystyrene, no advantage over BT-297-D will be evident. If the resin is too poor a solvent for CPC as in low temperature PVC, BT-297-D will perform sufficiently well. Heat stability performance of BT-465-D is concentration dependent. At very low concentrations (0.01 phr), heat stability is not as good as at moderate concentrations (0.1 phr). At high concentrations (1.0 phr), BT-297-D may suffice.

### C. Inks

BT-465-D shows no advantages over BT-417-D in ball-milled nitrocellulose ink. Likewise, the former did not demonstrate any advantages over BT-297-D or BT-383-D in oleoresinous ink by 3 roll milling.

## III. PROPERTIES (Chestnut Run has evaluated BT-465-D for automotive applications under NC-69-22.)

### A. Acrylic Lacquer

#### 1. Tinctorial and Working Properties

a. Sand Milling - Re: 68-322A, 68-877A

|                      | Brookfield Viscosity |     | Ford Cup Seconds | Shear/Strength Uniformity 0-10 scale** | Transparency Strength* |
|----------------------|----------------------|-----|------------------|----------------------------------------|------------------------|
|                      | 6 rpm                | 60  |                  |                                        |                        |
| B-4804, C#68176      | 2100                 | 740 | 138              | 4                                      | vs trans. 110+         |
| GTNF-55-3450 C#69701 | 1300                 | 550 | 101              | 8                                      | s trans. 100           |
| BT-417-D, 84871      | 300                  | 290 | 85               | 6                                      | standard 110-130+      |
| BT-465-D, 1888-22    | 600                  | 440 | 107              | dip flooded                            | full trans. 100        |

Hegman Gauge Grit Reading

|                 | 5'  | 10' | 15' | 20' |
|-----------------|-----|-----|-----|-----|
| BT-417-D, 97482 | 1.0 | 2.5 | 4.0 | 6.0 |
| BT-465-D, 00399 | 3.0 | 5.0 | 6.0 | 7.0 |

b. CAB 2-Roll Mill Dispersion Re: 68-839

|                      | Ford Cup Viscosity | Shear/Strength Uniformity | Transparency | Strength |
|----------------------|--------------------|---------------------------|--------------|----------|
| B-4804, C#68176      | 48"                | 4                         | s trans.     | 120+     |
| GTNF-55-3450 C#69701 | 46"                | 8                         | vs trans.    | 100      |
| BT-417-D, 84871      | 30"                | 10                        | standard     | 110      |
| BT-465-D, 1888-22A   | 40"                | 10                        | transparent  | 100      |

2. Humidity Resistance

The humidity resistance in High Gloss "Lucite", by CAB dispersion, using Semi-Works material which had been washed to 2100, 5000, and 8000 ohms, respectively, showed all three samples to be markedly superior to BT-417-D. The latter is considered to be acceptable. However, it is recommended that BT-465-D be washed to 5000 ohms routinely as in process (B).

3. Outdoor Durability

Series 68409 - Ball milled - 6 Mos. Exposure

|                               | 25 A1<br>75 color | 75 A1<br>25 color | 90 A1<br>10 color | 5<br>95 tint |
|-------------------------------|-------------------|-------------------|-------------------|--------------|
| BT-465-D, 187584F (dry blend) | 10                | 9.5               | 9                 | 6            |
| BT-417-D, 84871               | 8                 | 8                 | 8                 | 6            |
| BT-297-D, PS-98150            | 9                 | 9.5               | 10                | 10           |

\*Strengths are rough estimates.

\*\*Comparison of spray vs. pour; at = strength, rating is 10; at low pour strength rating approaches 0.

Series 68411 - CAB Dispersion - 6 Months

|                                | <u>90 Al</u> | <u>25 Al</u> | <u>5 Tint</u> |
|--------------------------------|--------------|--------------|---------------|
|                                | 10           | 75           | 95            |
| BT-465-D, 1875-83B (dry blend) | 6            | 9            | 5             |
| BT-417-D, TS-84871             | 6            | 8            | 5             |
| BT-297-D, PS-98150             | 7            | 6            | 6             |

Series 68411 - Sand Milled - 6 Months

|                      | <u>90 Al</u> | <u>25 Al</u> | <u>5 Tint</u> |
|----------------------|--------------|--------------|---------------|
|                      | 10           | 75           | 95            |
| BT-465-D (dry blend) | 7            | 8            | 6             |
| BT-417-D, TS-84871   | 7            | 8            | 5             |
| BT-297-D, PS-98150   | 7            | 9            | 6             |

Series 68430 - CAB Dispersion - 3 Months

|                    | <u>75 Al</u> | <u>25 Al</u> | <u>5 Tint</u> |
|--------------------|--------------|--------------|---------------|
|                    | 25           | 75           | 95            |
| BT-465-D, 1888-22A | 8            | 7            | 6             |
| BT-417-D, TS-84871 | 10           | 9            | 6             |
| BT-297-D, PS-98150 | 8            | 9.5          | 8             |

Series 68430 - Sand Milled - 3 Months

|                    | <u>75 Al</u> | <u>25 Al</u> | <u>5 Tint</u> |
|--------------------|--------------|--------------|---------------|
|                    | 25           | 75           | 95            |
| BT-465-D, 1888-22A | 9            | 10           | 9             |
| BT-417-D, TS-84871 | 10           | 10           | 8             |

B. Thermosetting Acrylic Enamel

1. Tinctorial and Working Properties

a. Sand Milling Re: 68-323

|                         | Brookfield<br>Viscosity<br>CPS |           | #4 Ford<br>Cup | Shear/Strength<br>Uniformity | Trans-<br>parency | Strength |
|-------------------------|--------------------------------|-----------|----------------|------------------------------|-------------------|----------|
|                         | <u>6 rpm</u>                   | <u>60</u> |                |                              |                   |          |
| B-4804, 68176           | 6100                           | 850       | 63"            | 1                            | equal             | 98       |
| GTNF-55-3450<br>C#69701 | 500                            | 120       | 19"            | 8                            | s.trans.          | 93       |
| BT-417-D,<br>TS-84871   | 100                            | 30        | 14"            | 6                            | standard          | 100      |
| BT-465-D,<br>1888-22A   | 400                            | 130       | 20"            | dip flooded                  | full<br>trans.    | 94       |

b. Ball Milled Re: 68-111

|                                   |      |       |     |             |          |      |
|-----------------------------------|------|-------|-----|-------------|----------|------|
| GTNF-55-3450                      | 1700 | 190   | 35" | 8.5         | s.opaque | ca # |
| C#69701                           |      |       |     |             |          |      |
| BT-417-D,<br>TS-84871             | 75   | 70    | 23" | 6           | standard | std. |
| BT-465-D<br>1875-88B, (dry blend) | 300  | 142.5 | 30" | dip flooded | trans.   | ca = |

## 2. Outdoor Durability

### Series 68410 (TAE-2) Sand Mill - 6 Months

|                                | $\frac{90}{10} \text{ Al}$ | $\frac{25}{75} \text{ Al}$ | $\frac{5}{95} \text{ Tint}$ |
|--------------------------------|----------------------------|----------------------------|-----------------------------|
| BT-465-D, 1875-77E (dry blend) | 6                          | 10                         | 8                           |
| BT-417-D, TS-84871             | 6                          | 10                         | 7                           |
| BT-297-D, PS-98150             | 6                          | 10                         | 7                           |

### Series 68411 (TAE-3) Ball Mill - 6 Months

|                                | $\frac{90}{10} \text{ Al}$ | $\frac{25}{75} \text{ Al}$ | $\frac{5}{95} \text{ Tint}$ |
|--------------------------------|----------------------------|----------------------------|-----------------------------|
| BT-465-D, 1875-77C (dry blend) | 5                          | 9                          | 7                           |
| BT-417-D, TS-84871             | 6                          | 8                          | 7                           |
| BT-297-D, PS-98150             | 7                          | 8                          | 7                           |

### Series 68430 - TAE-3 - Sand Mill

|                    | $\frac{75}{25} \text{ Al}$ | $\frac{25}{75} \text{ Al}$ | $\frac{5}{95} \text{ Tint}$ |
|--------------------|----------------------------|----------------------------|-----------------------------|
| BT-465-D, 1888-22A | 9                          | 10                         | 8                           |
| BT-417-D, TS-84871 | 10                         | 10                         | 9                           |
| BT-297-D, PS-98150 | 10                         | 10                         | 9                           |

## C. Plastics - Polyethylene

### 1. Heat Stability

Re: NC-67-22 Alathon 7050

|                               | $\frac{450}{9}$ | $\frac{500}{9}$ | $\frac{550}{8.5}$ | $\frac{600^\circ\text{F.}}{7.5}$ |
|-------------------------------|-----------------|-----------------|-------------------|----------------------------------|
| BT-465-D, 1875-8E (dry blend) | 9               | 9               | 8.5               | 7.5                              |
| BT-297-D, 1875-8G             | 8               | 6               | 4                 | 3.5                              |

Re: NC-67-14 - Alathon 7040

|                                | 10 | 10 | 10 | 9 |
|--------------------------------|----|----|----|---|
| BT-465-D, 1859-89D (dry blend) | 10 | 10 | 10 | 9 |
| BT-297-D, PS 98150             | 8  | 7  | 5  | 4 |

## D. Specific Gravity: 1.68

## IV. MATERIAL ON HAND

BT-465-D, lot 00399 (38 lbs.) prepared in the Newark Semi-Works by wet blending is available for trade sampling. A 25 lb. sample has been transferred to Sales. An additional 10 lbs, are being retained by Research.

## V. PATENT STATUS

A composition of matter patent on  $\beta$ -CPC with CPC-AF has been applied for (patent application 1702K).

5745

MAKING INSTRUCTIONS: BATCH UP

S.V. 200, 202, 204, 210, 240, 261, 264 C.V.

D.V.

CG 20 CODE BT-465-D PKG.

EST. WGT. 2327 LBS.

STD. HRS. TIME M

| PROCESSES    |     | APPROVED   |
|--------------|-----|------------|
| (B) BT-465-D | ( ) | FMK 2-6-69 |
| ( )          | ( ) | HM 2-6-69  |
| ( )          | ( ) | RG 2-10-69 |
| ( )          | ( ) |            |
| TYPED BY     |     |            |
| FC 2-24-69   |     |            |

NON-BLEEDING

| EQUIPMENT | NAME:                                                    | USE<br>LBS. | N<br>CODE | AC<br>LB |
|-----------|----------------------------------------------------------|-------------|-----------|----------|
| SV<br>1   | 1 "MONASTRAL" BLUE GF<br>RUN ± 2" (±100 G) WATER INTO V- |             |           |          |
|           | 2 PUMP IN THRU 20 MESH SCREEN<br>Lot #100% %             |             | 873-A     | 350      |
|           | 3 PUMP IN THRU 20 MESH SCREEN<br>Lot #100% %             |             | 657-A     | 2000     |
|           | 4 FLOOD TO " & STIR 15 MIN                               |             |           |          |
|           | 5 DO NOT STOP AGITATOR                                   |             |           |          |
|           | S 200 202 204 210 240 261 264                            |             |           |          |
|           | 4 90" 92" 88" 86" 72" 85" 82"                            |             |           |          |
|           | (6084G) (5446G) (5174G) (5977G) (3182G) (7395G) (3624G)  |             |           |          |
|           | START FIN OPTR                                           |             |           |          |

CG 20 CODE BT-465-D PKO. \_\_\_\_\_

EST. WGT. 2327 LBS.

PROCESSING INSTRUCTIONS: BATCH UP

|                           |                                                    |
|---------------------------|----------------------------------------------------|
| PROCESSES<br>(B) BT-465-D | APPROVED<br>EVK 2-6-69<br>RPM 2-6-69<br>RG 2-10-69 |
| TYPED BY<br>FC 2-24-69    |                                                    |

MAKING NOTES

REMARKS

NAME: "MONASTRAL" BLUE GF

NON-BLEEDING

INSTRUCTIONS

-PRESSING-

RECORD

| VAT          |           |      |      |  |  | PRESSLOAD       | 1ST | 2ND         | 3RD | 4TH | 5TH |
|--------------|-----------|------|------|--|--|-----------------|-----|-------------|-----|-----|-----|
| DATE         |           |      |      |  |  | STARTED         |     |             |     |     |     |
| TIME         |           |      |      |  |  | CAKES USED      |     |             |     |     |     |
| RELEASED BY  |           |      |      |  |  | WATER ON        |     |             |     |     |     |
| PRESS        | 12        | 26   | 90   |  |  | HRS. WASHED     |     |             |     |     |     |
| NO. OF CAKES | 3X36      | 3X40 | 2X48 |  |  | OHMS            |     |             |     |     |     |
| PRESS WITH   |           |      |      |  |  | HRS. WASHED     |     |             |     |     |     |
| WASH TO      | 5000      |      |      |  |  | OHMS            |     |             |     |     |     |
| TEST AFTER   | 3         |      |      |  |  | HRS. WASHED     |     |             |     |     |     |
| LOAD         | ON 6 CARS |      |      |  |  | OHMS            |     |             |     |     |     |
|              |           |      |      |  |  | CAKE CONDITION  |     |             |     |     |     |
|              |           |      |      |  |  | NO. CARS LOADED |     |             |     |     |     |
|              |           |      |      |  |  | EXPLAIN LOSSES  |     |             |     |     |     |
|              |           |      |      |  |  |                 |     |             |     |     |     |
|              |           |      |      |  |  |                 |     |             |     |     |     |
|              |           |      |      |  |  |                 |     |             |     |     |     |
| AMPLES       |           |      |      |  |  |                 |     |             |     |     |     |
| DELIVER TO   |           |      |      |  |  | SAMPLED BY      |     | RELEASED BY |     |     |     |

-DRYING-

|                     |                                        |
|---------------------|----------------------------------------|
| DRY 16 HRS AT 220°F | LUMP: - OK - WET - SALTS - CONTAMINATE |
|                     |                                        |
|                     |                                        |
|                     |                                        |
|                     | ADDITIONAL DRYING HOURS REQUIRED       |
|                     |                                        |
|                     |                                        |
| AMPLES              | NO. CARS PULLED                        |
| DELIVER TO          | SAMPLED BY                             |
|                     | LUMP WGT.                              |
|                     | RELEASED BY                            |

-GRINDING-

|                       |             |     |                |             |
|-----------------------|-------------|-----|----------------|-------------|
| 7 HSP .066"RP         | SCREEN 3500 | RPM | SCREEN         | RPM         |
| MAX. TEMP. 210 °F     |             |     | MAX. TEMP.     | °F          |
|                       |             |     |                |             |
|                       |             |     |                |             |
|                       |             |     | EXPLAIN LOSSES |             |
|                       |             |     |                |             |
|                       |             |     |                |             |
| PLES / WITHOUT MIXING |             |     | DATE MIXED     |             |
| PLES 1 ENV + 1 PT CAN |             |     |                |             |
| DELIVER TO C T L      |             |     | SAMPLED BY     | RELEASED BY |

101 REV1

DUP050081442

(B) BT-465-D

STANDARD FORMULA NOTES

THE "B" PROCESS IS WRITTEN FOR COSTING. NO PLANT PRODUCTION HAS BEEN MADE TO-  
DATE ON THIS PROCESS. IT REPLACES THE "A" PROCESS AND DIFFERS AS FOLLOWS:

1. FILTRATION IN A WASH PRESS IS SUBSTITUTED FOR CENTERFEED PRESSING. THE  
PRODUCT IS PRESS WASHED TO 5000 OHMS TO ENSURE GOOD HUMIDITY RESISTANCE IN  
AUTOMOTIVE FINISHES.
2. TO OBTAIN SATISFACTORY PRESS BURDENS FOR MULTIPLE PRESSLOADS, THE BATCH  
SIZE IS INCREASED FROM 2100 TO 2327#. BG(N657-A) AND CPC-AF (N-873-A) ARE  
INCREASED FROM 1785 TO 2000# AND 315 TO 350# RESPECTIVELY TO ACCOMODATE  
THE INCREASE IN BATCH SIZE.
3. VATS 240, 261 AND 264 ARE ADDED AS ALTERNATE STRIKE VATS.
4. HSP WITH .066" SCREEN REPLACES HSP, WITH 3/32" SCREEN, TO ENSURE OPTIMUM  
PRODUCT PERFORMANCE IN PLASTICS AND SAND MILLED PAINT APPLICATIONS.

THE CALCULATED COMPOSITION AND GOAL YIELD FOLLOWS:

| <u>COMPONENT</u> | <u>ACCOUNT</u><br><u>POUNDS</u> | <u>% ANHYD</u><br><u>SOLIDS</u> | <u>ANHYD</u><br><u>POUNDS</u> | <u>GOAL</u><br><u>YIELD</u> | <u>CALCULATED %</u><br><u>COMPOSITION</u> |
|------------------|---------------------------------|---------------------------------|-------------------------------|-----------------------------|-------------------------------------------|
|                  | (1)                             |                                 |                               |                             |                                           |
| PBGCSH (N-657-A) | 2000(2)                         | 98.2                            | 1964                          |                             | 84.4                                      |
| PBZFAH (N-873-A) | 350(1)                          | 99.2                            | 347                           |                             | 14.9                                      |
|                  |                                 |                                 | ANHYD                         | 2311                        |                                           |
| MOISTURE         |                                 |                                 |                               | 16                          | .7                                        |
|                  |                                 |                                 |                               | 2327#                       | 100.0                                     |

REFERENCES:

1. N-657 AND N-873, IF DRIED ARE ASSUMED TO RETAIN 0.8% MOISTURE.
2. N-657 IS ASSUMED TO CONTAIN 1.0% WATER SOLUBLE SALTS WHICH WILL BE WASHED  
OUT DURING PROCESSING.
3. MOISTURE CONTENT OF BT-297-D, PS-98150: 0.7%

SIGNED: E.W.KOSLOSKY 2-6-69  
APPROVED: H.MATRICK 2-7-69  
R.GEDD 2-8-69  
H.ARNOUL 2-10-69

EWK:FC

### RAW MATERIAL CARD

NAME: "MONASTRAL" BLUE GF DATE: 2-6-69

[illegible]

REPLACE PROCESS { }  
ORIGINAL PROCESS { }  
~~REPLACE PROCESS~~ PROCESS { }

## \* EXPERIMENTAL

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