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PIGMENTS DEPARTMENT
CHESTNUT RUN

LABORATORY REPORT

SECOND AND FINAL

CUSTOMER	WORK REQUEST NO.	DATE
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SUBJECT: COWLES DISPERSIBLE MONASTRAL® BLUE G, BT-476-D

OBJECT

- Evaluate plant produced and finished BT-476-D, Lot 55462, 55468 and experimental 75-00675-2 versus Ciba Geigy's LGLD and BT-383-D for Cowles dispersibility in a heatset ink vehicle.
- Compare Cowles quality to purchased commercial flushings.
- Determine whether BT-476-D would be a desirable 3-roll mill dispersible product for promoting in oleoresinous ink systems.

CONCLUSIONS

- BT-476-D production lots, BT-383-D and experimental are not Cowles dispersible.
- BT-476-D Cowles dispersion quality is better than the poorest quality of the commercial flushings obtained. Two commercial flushings were superior in dispersion quality.
- BT-476-D is equal to very very slightly superior in dispersion to BT-383-D, our present 3-roll mill product.
- We recommend R&D work be continued to develop a Cowles dispersible product as there is growing interest in this type product.

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SUMMARY

Cowles Dispersion

BT-476-D production lots, BT-383-D and experimental did not develop satisfactory texture whereas LGLD developed good texture (3 NPIRI) after one canning pass over the mill.

Modifying the method to compensate for the lower viscosity of BT-476-D did not improve dispersibility of the two BT-476-D production lots or the experimental; BT-383-D was not included in this test series.

Of the three commercially obtained flushings, Hilton Davis' Peacoline Blue and Chemetron's Phthalo Blue G, are superior in quality (0-NPIRI). Flushing made by Wykoff Chemical Co. using Chemetron's Phthalo Blue G, presscake had a 10 NPIRI texture rating, whereas, BT-476-D production lots rate 6.0 on NPIRI texture gauge. The textures of the flushings indicate there may be different flushing quality sold.

Tinctorially, BT-476-D, L-55462 and exp. 75-00675 versus LGLD in masstone are generally dark and intense in reflected undertone (print tone), green and less intense in tint. Versus LGLD, L-55462 is equal in strength and the experimental is 17.5% weak.

3-Roll Mill Dispersions

Versus BT-383-D, BT-476-D is generally very very slightly superior in 3-roll mill dispersibility properties (tailings, separation, texture) tested in three vehicle systems, Thermex A-6E, (heatset) #1 transparent varnish (linseed oil) and Terlon #3 (alkyd).

LGLD included in the tests is no better than BT-383-D or BT-476-D as a 3-roll mill dispersible product.

In the Thermex vehicle system, tinctorially versus BT-383-D, BT-476-D is generally dark in masstone and red in tint. Strength varies (See Tables IV, V & VI.

EXPERIMENTAL DETAILS

Pigments Tested

LGLD C#72104	Cowles & 3-roll mill
BT-383-D, PS-97644	" "
BT-476-D, L-55462	" "
BT-476-D, L-55468	Cowles Only
Experimental 75-0075-2	"

Flushings Tested

Hilton Davis Peacoline Blue 5-66-4-319	C#73222
Chemetron Phthalo Blue G, FCS-116	C#73223
Wykoff Chem. Co. - Chemetron Pthtalo Blue	C#75474

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Grind Details

Cowles Dispersion (Ref. TF-2302)

Regular Method

	LGLD C#72104	BT-476-D L-55462(1)
Grind (30 Min.)		
Pigment	44	60
Thermex A6E	150	143
Solvar	19	26
Reduction		
Thermex A6E	-	61
Magie Oil	26	31

The above was then passed over the 3-roll one medium tight pass.

Modified Method

After 30 minutes on the Cowles, the grind portion was not reduced but passed over the 3-roll mill one medium tight pass.

3-Roll Mill Dispersion

All pigments tested were given 5 medium tight passes over the 3-roll mill.

The grind pigment/vehicle ratios were:

Thermex A6E	25/75
#1 Transparent Varnish	35/65
Terlon #3	35/65

REFERENCES

ILF 5-74

(1) BT-383-D, BT-476-D, L-55468 and the experimental were done using the same formula.

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Cowles

Table I - Dispersibility Data

		% Pigment Grind Level ①		NPIRI Texture Cowles	3-Roll Mill ② 1st P.	Last P.	Final	3-Roll Mill % Dispersion	Tailing
Cowles - 30 min.									
LGLD C# 72104	Reduced on the Cowles	20.7	18.4	10	0	8.0	3.0	<0.5	VS
BT-383-D PS-97644		26.2	18.4	10	8.0	10	9.0	10	GRD
BT-476-D L-55462		26.2	18.4	10	3.5	10	6.0	5.0	CONS
BT-476-D L-55468		26.2	18.4	10	5.0	10	6.0	3.0	CONS
Exp. 75-00675-2		26.2	18.4	10	7.0	10	7.0	<0.5	VS
BT-476-D L-55462	Not reduced	26.2	26.2	10	7.0	10	10	10	VS
BT-476-D L-55468		26.2	26.2	10	7.0	10	8.0	5.0	CONS
Exp. 75-00675-2		26.2	26.2	10	5.0	7.0	5.5	2.0	S
Change Can Mixer - 15 min.									
BT-476-D L-55462		26.2	26.2	10	5.5	6.5	6.5	5.0	CONS

Competitive Flushings	NPIRI Texture
Hilton Davis - Peacock Blue 5-66-H-319 C# 73222 (Purchased from Hilton Davis)	0
Chemetron - Phthalo Blue G FS-116 C# 73223 (Purchased from Chemetron)	0
Wykoff Chem. Co Flushing of Chemetron's Phthalo Blue G C# 75424	10

① Passed over the 3-roll mill one medium tight pass at this pigment level and NPIRI texture readings taken.

② 1st P. and last P. are 1st and last portions that come over the mill. Final is the two portions mixed on the change can mixer till incorporated.

③ Visual observations and ratings.

Key: NPIRI Rating, 10 = poor, 0 = perfect

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Table II - BT-476-D 3-Roll Mill (1) Dispersibility

Vehicle System	Thermex A-6E			#1 Transparent V.			#3 Teflon		
Pigment Identification No.	LGLD C#72104	BT-383-D PS-97644	BT-476-D L-55462	LGLD C#72104	BT-383-D PS-97644	BT-476-D L-55462	LGLD C#72104	BT-383-D PS-97644	BT-476-D L-55462
% Pigment	35	25	25	35	35	35	35	35	35
Tailings									
1st pass	0	Cons.	Sl.	Vl. sl.	Cons.	Cons.	V. sl.	sl.	sl.
2nd "	0	sl.	V. sl.	0	0	0	0	V. sl.	0
3rd "	0	V. sl.	0	0	0	0	0	0	0
% Separation									
1st pass	0	15	0	0	25	2	0	25	0
2nd "	0	0	0	0	0	0	0	2	0
NPIRI-Texture									
1st pass	8	10	9	7	10	6	9	10	10
2nd "	4	5	4	6	4	4	7	9	5
3rd "	0	3	0	5	3	3	6	5	4
4th "	0	0	0	4	2	2	5	5	4
5th "	0	0	0	4	1	2	5	4	4

(1) - Medium tight setting

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Table III - Tinctorial Properties - Cowles Dispersions

(THERMEX A-6E)

	Masstone	Undertone: Reflected	Undertone: Transmitted	Tint
BT-476-D L-55462 vs. LGLD C# 72104	Vdk., int.	green, s less int.	s less int.	green BT-476-D (100) = (101) LGLD
Exp. 75-00675-2 vs. LGLD	Vdk., int.	green, s less int., less trans	s less int.	green 00675 (100) = (72.5) LGLD
Exp. 75-00675-2 vs. BT-476-D L-55462	VS dk.	VVS green, less trans.	VVS less int.	VVS green 00675 (100) = (72.5) BT-476-D

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Table IV - Tinctorial Properties - 3 Roll Mill Dispersion
(Thermax A-6E)

	Masstone	Undertone: Reflected	Undertone: Transmitted	Tint
BT-476-D L-55462 vs. BT-383-D PS-97644	s dk.	dk., S int., Trans.	VVS int.	S red BT-476-D (100) = (103) BT-38
BT-476-D L-55462 vs. LGLD C#72104	dk.	VVS dk., Vs less int., VVS trans., S green	VVS lt., VVS green	S green BT-476-D (100) = (100) LGLD
BT-383-D PS-97644 vs. LGLD C#72104	VVS dk.	S opaq. S green, Vs less int., Vs dk.	Vs dk., VVS less int., Vs less int., VVS green	green BT-383-D (100) = (97.5) LGLD

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Table V - Tinctorial Properties - 3 Mill Dispersion
(#1 Transparent Varnish)

	Masstone	Undertone: Reflected	Undertone: Transmitted	Tint
BT-476-D L-55462 vs. BT-383-D PS-97644	VVS dk.	VVS less int., VVS dk.	VVS dk.	BT-476-D(100)=(100)BT-383-D
BT-476-D L-55462 vs. LGLD C#72104	s dk.	green, VVS dk., VVS trans.	VVS dk., VVS int., VVS green	BT-476-D(100)=(100)LGLD
BT-383-D L-55462 vs. LGLD C#72104	VVS dk.	green, VS dk., VS less int. VS trans.	VS green, VS int.	S green BT-383-D(100)=(100)LGLD

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Table VI - Tinctorial Properties - 3 Roll mill Dispersion
(Terlon #3)

	Undertone			
	Masstone	Reflected	Transmitted	Tint
BT-476-D L-55462 vs. BT-383-D PS-97644	VVS dk.	VVS dk, Sl int.	VVS dk.	VVS red BT-476-D (100) = (95) BT-383-D
BT-476-D L-55462 vs. LGLD C# 72104	VS dk.	green, int, VVS trans.	green, VS less int.	green, less int. BT-476-D (100) = (95) LGLD
BT-383-D PS-97644 vs. LGLD C# 72104	VVS dk.	green, VS trans.	green, VS less int.	green, less int BT-383-D (100) = (100) LGLD

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