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**"47 PROCESS"
"UNIVERSAL" MILL BASES
PHILADELPHIA**

Several "Universal" Mill Bases have been evaluated on 8-gallon and 30-gallon "47 Process" units. It was understood before manufacture that these formulas are outside the formulation limits (FP-01-A) for the percentage of pigment packing. Work was done because lowering the pigment content would restrict universality.

It is becoming apparent; however, that continuing this work with formulations that deviate so markedly from practical operating limits is not justified for existing "47 Process" equipment.

As would be expected from the formulating principles, operating difficulties were present, to some degree, in every formulation tried. Several objectionable conditions varying in degree between the bases - are:

1. high power demand
2. excessive operating temperatures
3. skinning (blocking of screens on unit and hopper)
4. start-up difficulty
5. settling in lines.

It is possible something could be done about settling and start-up. However, high power demand - which manifests itself as heat - is the most objectionable condition. The motors deliver sufficient horsepower to drive the agitator for many bases and it is conceivable that larger motors would keep the agitators in motion for all bases.

However, the existing equipment cannot remove the heat generated under these conditions and some bases develop temperatures which are well above 200°F. These temperatures are a safety hazard in production areas. This also creates skinning and caking on the screens. Skinning even takes place at lower temperatures for some bases because of low vehicle content.

The latest white universal base made at Toledo is in the same category as 42-5043 concerning operating conditions. A lower sand load possibly could enable manufacture of this formula without power and temperature extremes; however, operated at standard conditions on existing equipment this formula will prove as unsatisfactory as 42-5043 for which Toledo recommends lowering pigment content from 63 to 60%.

The attached sheet makes a comparison of some results of 32-Line Universal Bases with 42-Line Universal Mill Bases which were set-up at the optimum formula for operating performance as well as dispersion. While ball mill manufacture might be possible with these compositions, the comparison indicates why an overall universal mill base program, at such a high level of pigmentation, is not practical for existing "47" Process" equipment.

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42-LINE SHADING BASES VS. 32-LINE UNIVERSAL BASES

All data from 8-gallon equipment except where indicated

Pigment Code	42-Line Code	% Pig. Wt.	% F	Sand Temp.	Exit. Temp.	HP	Rate (gph)	Comment
W-612	D-62952	11.4	-	150	116	11.5	70	Reasonable for plant manufacture.
W-630	D-22810	48	36.4	160	150	9.5	40	Reasonable for plant manufacture
W-652	D-62975	66	42	140	130	-	40	Reasonable for plant manufacture
W-679	D-22804	60	35	130	125	11	60	Reasonable for plant manufacture
W-686	D-22803	63	39	120	115	10.5	60	Reasonable for plant manufacture
W-43	5043	63.1	44.3	-	30 gallon	{ 39		Reasonable for plant manufacture
W-43	Proposed 5043	60.	39	about unit		{ 31	200	Unsatisfactory and being revised
W-612	32-Line Code D-6576	40.4		132	125	7.5	50	Skimming will block screens
W-630	D-6579	70	94	-	-	-	-	Unable to reach stable conditions. Excessive power and temperature.
W-652	D-6583	73	55	130	120	10-16	30-60	Slight skimming. Base is marginal for operation.
W-679	D-6574	77	78	above 200°F	-	17.5	40	Excessive power & temp. Stable conditions not achieved
W-686	D-6577	77	75	180	140	13	30	Skimming will block screens.
W-50(S-W)	D-6556	75	(about 85)	190	110	20	115	These conditions were only possible at a reduced sand load.*
W-28(Toledo)	T-36296	75	(about 78)	30 gallon unit	150	38.9	150	W-28 has lower % F of base than W-50.

* About 70% of standard (200 lbs. in 30 gallon unit)

Note: Packing Index data tentative for W-652 and W-686; not available for W-612.