FIG. 1

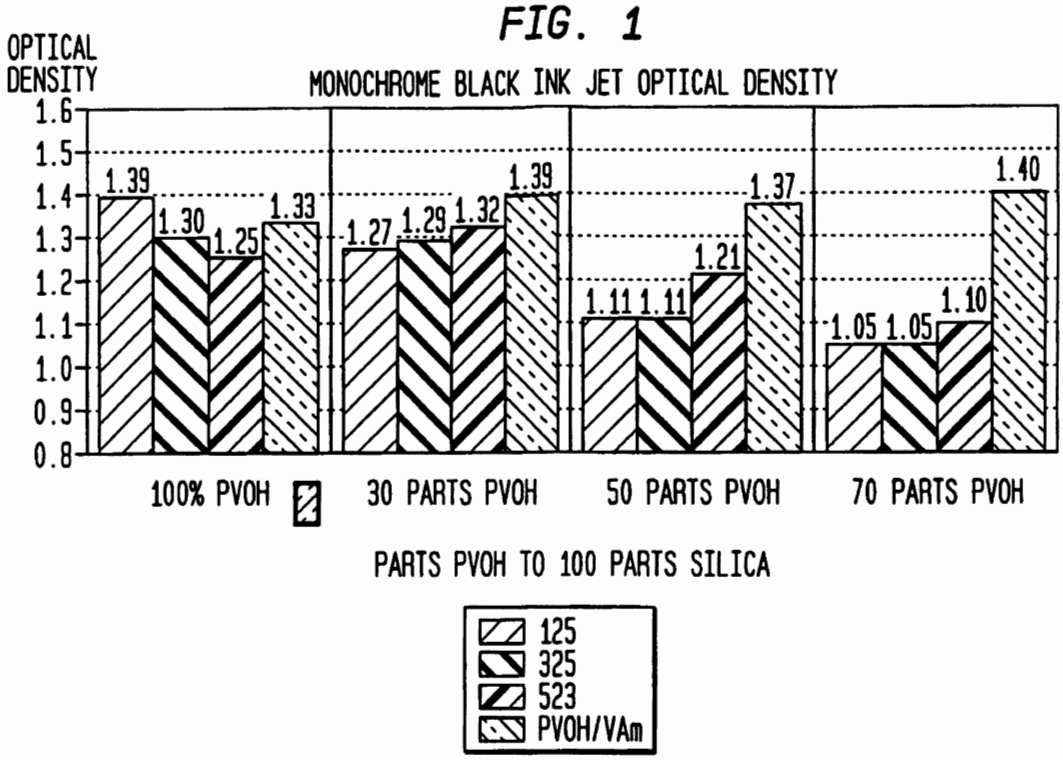

OPTICAL DENSITY
MONOCHROME BLACK INK JET OPTICAL DENSITY
1.6
1.5
1.4
1.3
1.2
1.1
1.0
0.9
0.8
1.39
1.30
1.25
1.33
1.27
1.29
1.32
1.39
1.11
1.11
1.21
1.37
1.05
1.05
1.10
1.40
100% PVOH
30 PARTS PVOH
50 PARTS PVOH
70 PARTS PVOH
PARTS PVOH TO 100 PARTS SILICA
125
325
523
PVOH/VAm

FIG. 2

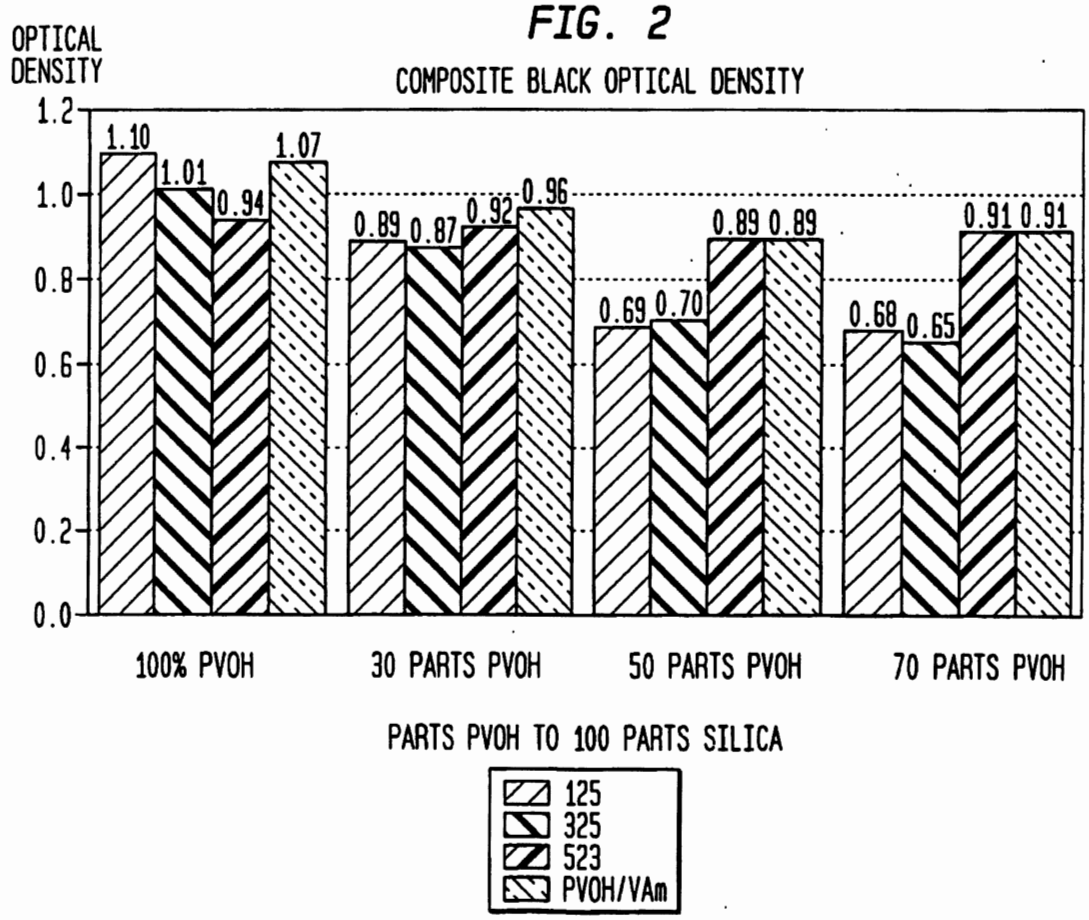

OPTICAL DENSITY
COMPOSITE BLACK OPTICAL DENSITY
1.2
1.0
0.8
0.6
0.4
0.2
0.0
1.10
1.01
0.94
1.07
0.89
0.87
0.92
0.96
0.69
0.70
0.89
0.89
0.68
0.65
0.91
0.91
100% PVOH
30 PARTS PVOH
50 PARTS PVOH
70 PARTS PVOH
PARTS PVOH TO 100 PARTS SILICA
125
325
523
PVOH/VAm

FIG. 3

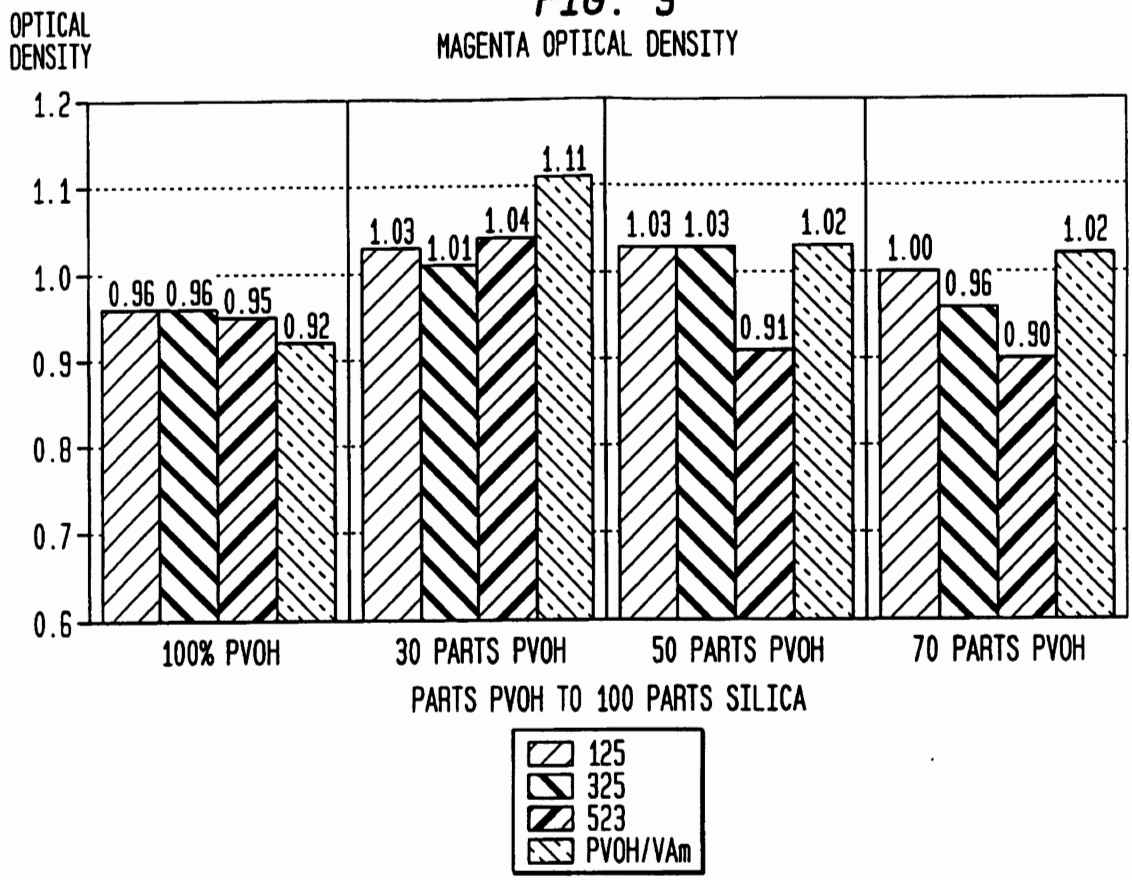

MAGENTA OPTICAL DENSITY
OPTICAL DENSITY
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.96 0.96 0.95 0.92
1.03 1.01 1.04 1.11
1.03 1.03 0.91 1.02
1.00 0.96 0.90 1.02
100% PVOH
30 PARTS PVOH
50 PARTS PVOH
70 PARTS PVOH
PARTS PVOH TO 100 PARTS SILICA
125
325
523
PVOH/VAm

FIG. 4

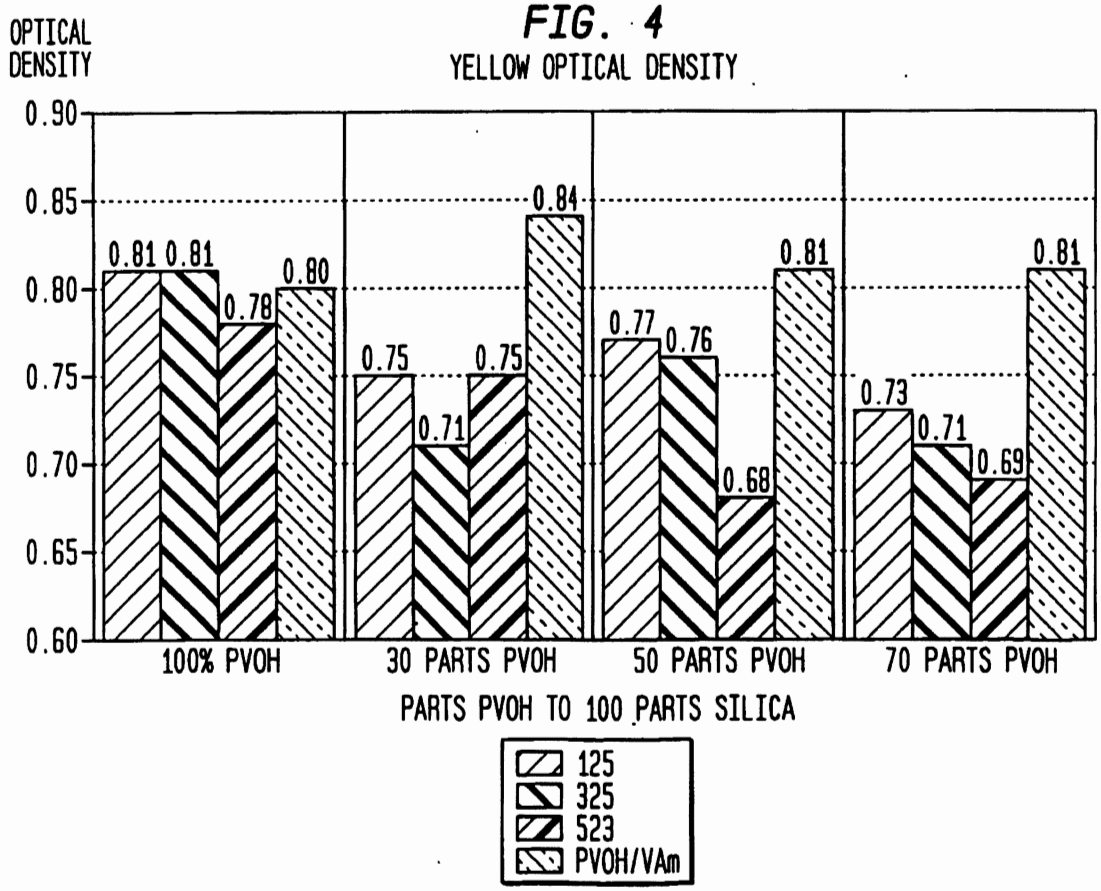

YELLOW OPTICAL DENSITY
OPTICAL DENSITY
0.90
0.85
0.80
0.75
0.70
0.65
0.60
0.81 0.81 0.78 0.80
0.75 0.71 0.75 0.84
0.77 0.76 0.68 0.81
0.73 0.71 0.69 0.81
100% PVOH
30 PARTS PVOH
50 PARTS PVOH
70 PARTS PVOH
PARTS PVOH TO 100 PARTS SILICA
125
325
523
PVOH/VAm

FIG. 5

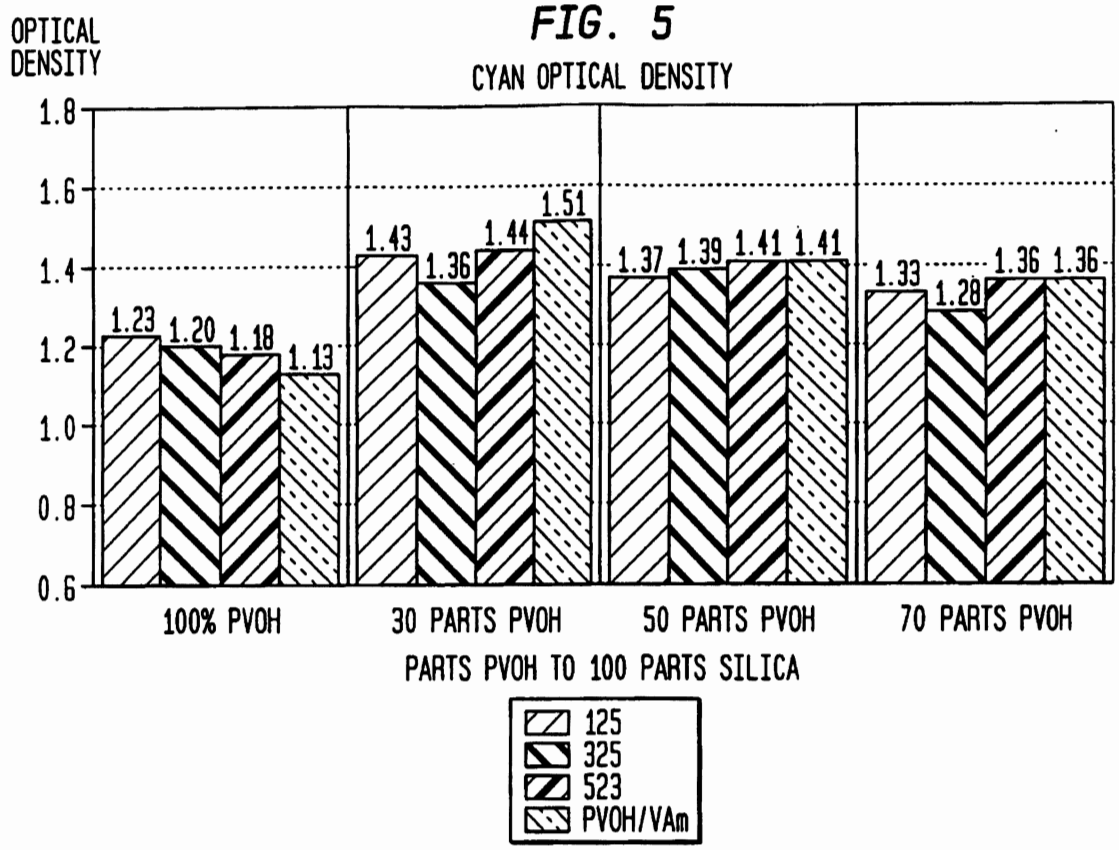

OPTICAL DENSITY
CYAN OPTICAL DENSITY
1.8
1.6
1.4
1.2
1.0
0.8
0.6
1.23 1.20 1.18 1.13
1.43 1.36 1.44 1.51
1.37 1.39 1.41 1.41
1.33 1.28 1.36 1.36
100% PVOH
30 PARTS PVOH
50 PARTS PVOH
70 PARTS PVOH
PARTS PVOH TO 100 PARTS SILICA
125
325
523
PVOH/VAm

FIG. 6

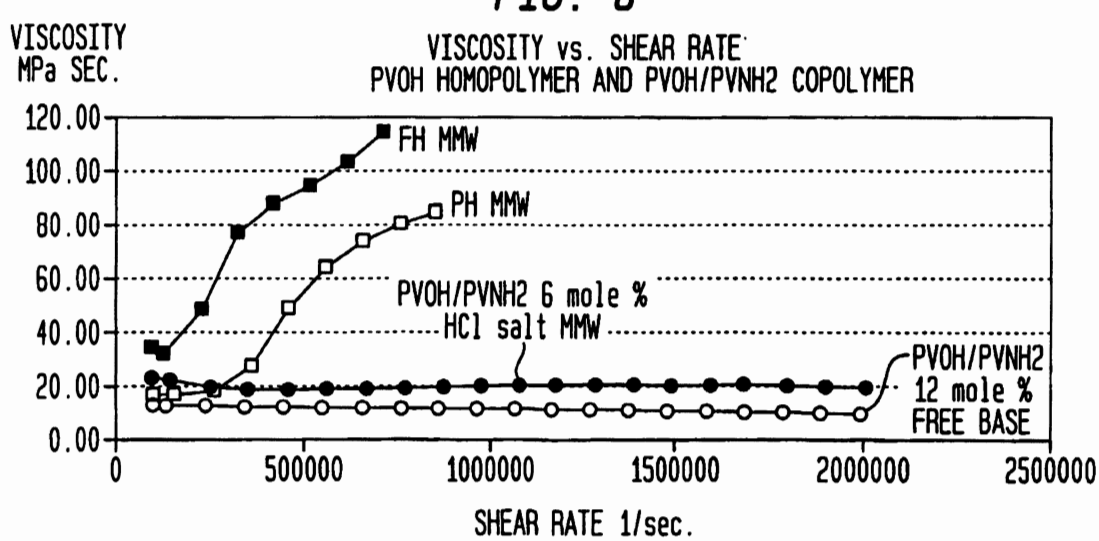

VISCOSITY MPa SEC.
VISCOSITY vs. SHEAR RATE
PVOH HOMOPOLYMER AND PVOH/PVNH2 COPOLYMER
120.00
100.00
80.00
60.00
40.00
20.00
0.00
FH MMW
PH MMW
PVOH/PVNH2 6 mole % HCl salt MMW
PVOH/PVNH2 12 mole % FREE BASE
0
500000
1000000
1500000
2000000
2500000
SHEAR RATE 1/sec.

FIG. 7

INK DRY TIME ON SILICA/POLY(vinyl alcohol) COATINGS

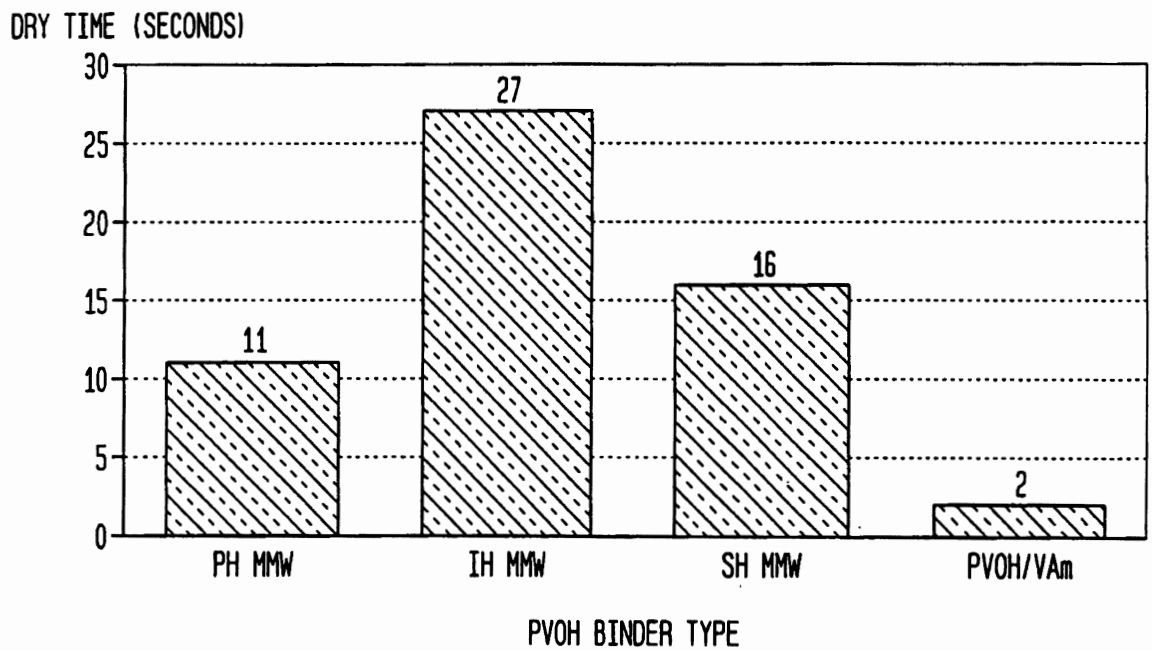


FIG. 8

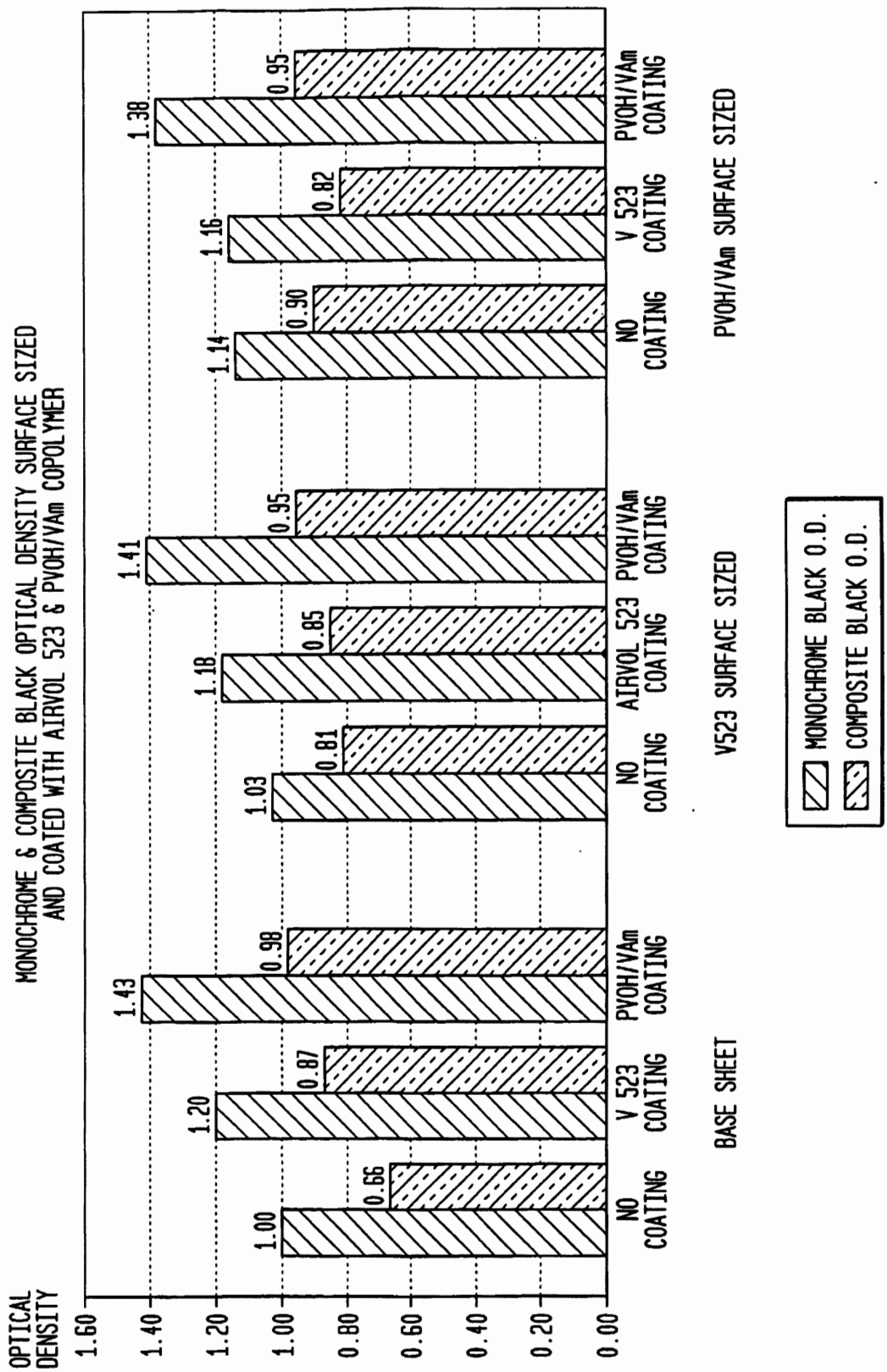

MONOCHROME & COMPOSITE BLACK OPTICAL DENSITY SURFACE SIZED AND COATED WITH AIRVOL 523 & PVOH/VAm COPOLYMER
OPTICAL DENSITY
1.60
1.40
1.20
1.00
0.80
0.60
0.40
0.20
0.00
1.00
0.66
1.20
0.87
1.43
0.98
1.03
0.81
1.18
0.85
1.41
0.95
1.14
0.90
1.16
0.82
1.38
0.95
NO COATING
V 523 COATING
PVOH/VAm COATING
NO COATING
AIRVOL 523 PVOH/VAm COATING
NO COATING
V 523 COATING
PVOH/VAm COATING
BASE SHEET
V523 SURFACE SIZED
PVOH/VAm SURFACE SIZED
MONOCHROME BLACK O.D.
COMPOSITE BLACK O.D.

FIG. 9

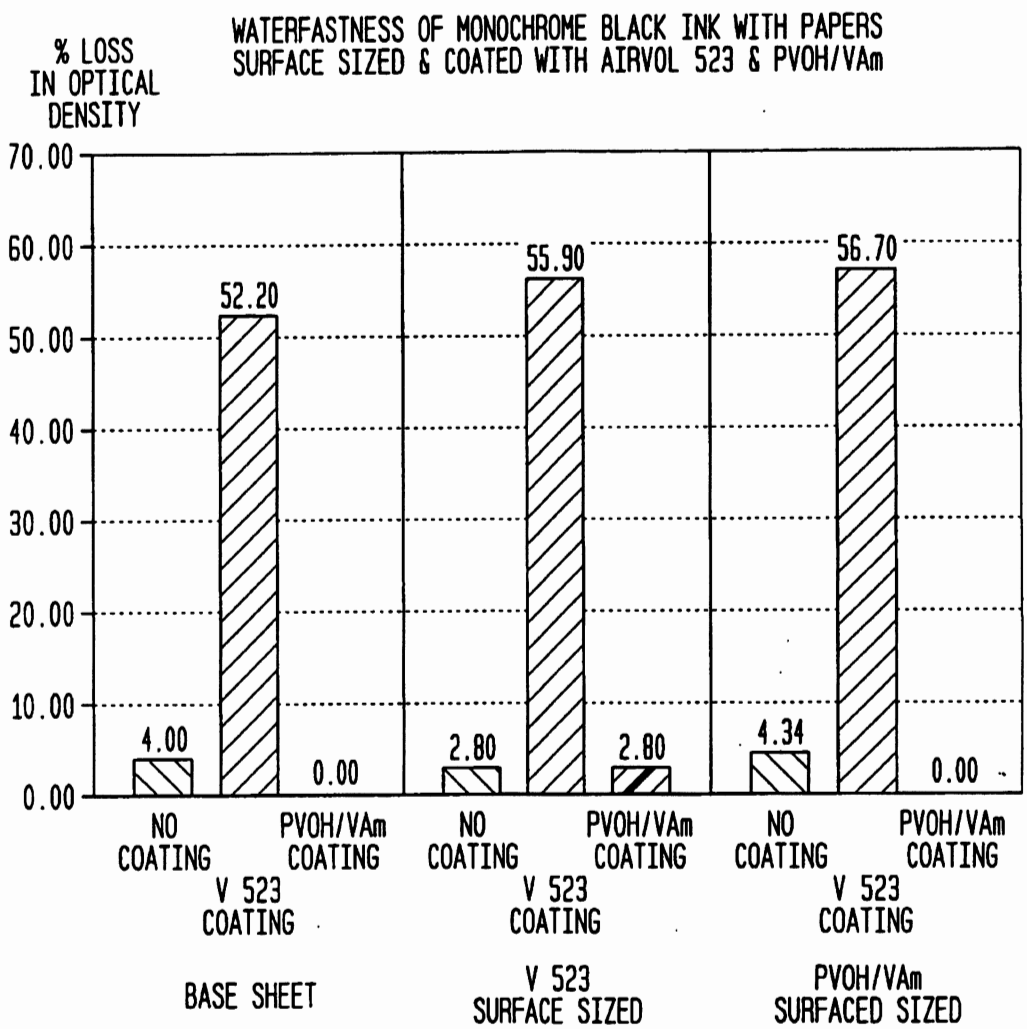

WATERFASTNESS OF MONOCHROME BLACK INK WITH PAPERS SURFACE SIZED & COATED WITH AIRVOL 523 & PVOH/VAm
% LOSS IN OPTICAL DENSITY
70.00
60.00
50.00
40.00
30.00
20.00
10.00
0.00
4.00
52.20
0.00
2.80
55.90
2.80
4.34
56.70
0.00
NO COATING
PVOH/VAm COATING
V 523 COATING
BASE SHEET
V 523 SURFACE SIZED
PVOH/VAm SURFACED SIZED

FIG. 10

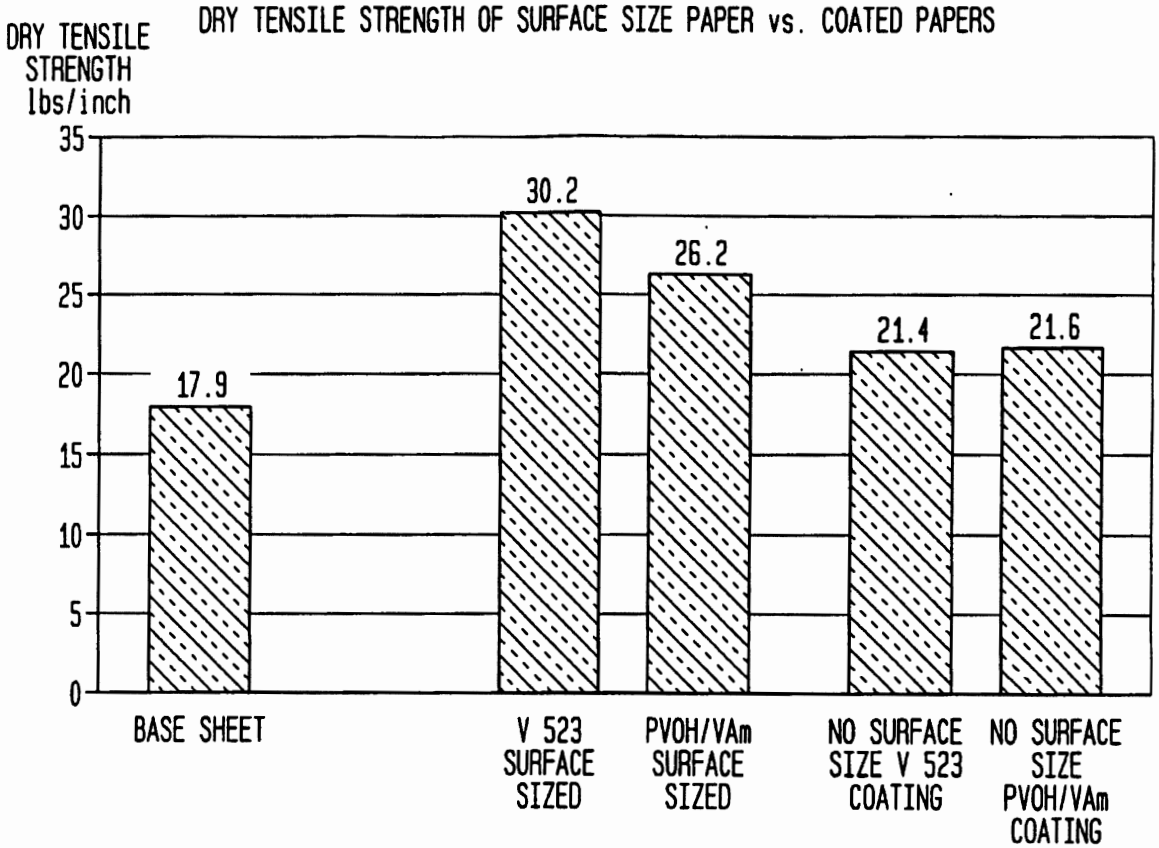

DRY TENSILE STRENGTH OF SURFACE SIZE PAPER vs. COATED PAPERS
DRY TENSILE STRENGTH lbs/inch
35
30
25
20
15
10
5
0
17.9
30.2
26.2
21.4
21.6
BASE SHEET
V 523 SURFACE SIZED
PVOH/VAm SURFACE SIZED
NO SURFACE SIZE V 523 COATING
NO SURFACE SIZE PVOH/VAm COATING

FIG. 11

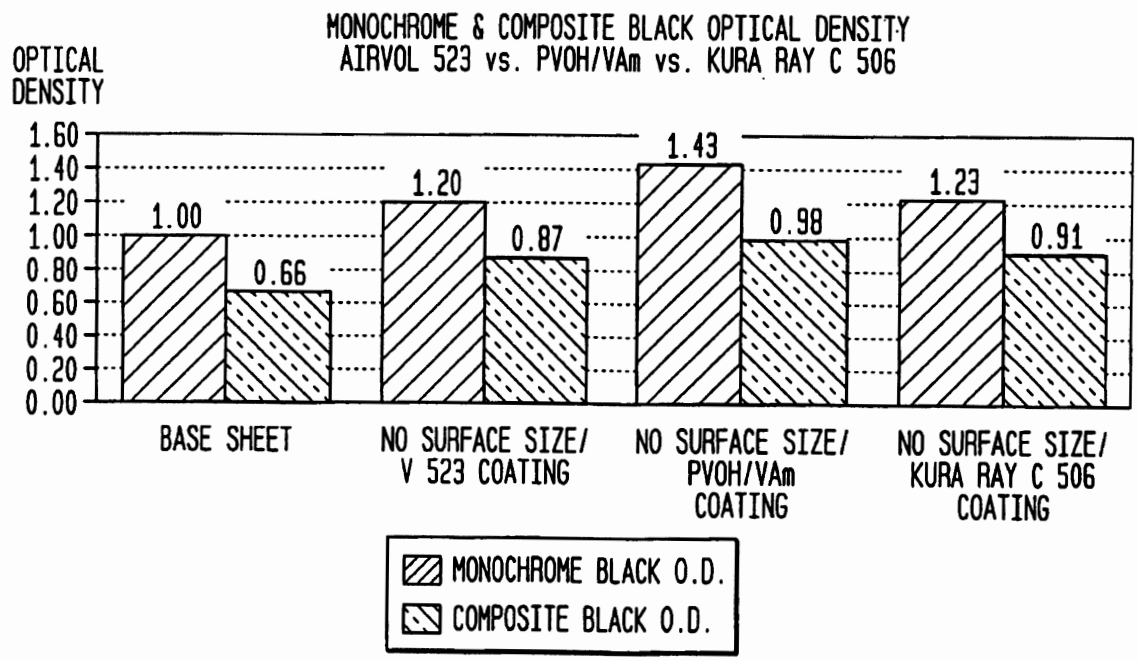

MONOCHROME & COMPOSITE BLACK OPTICAL DENSITY
AIRVOL 523 vs. PVOH/VAm vs. KURA RAY C 506
OPTICAL DENSITY
1.60
1.40
1.20
1.00
0.80
0.60
0.40
0.20
0.00
1.00
0.66
1.20
0.87
1.43
0.98
1.23
0.91
BASE SHEET
NO SURFACE SIZE/ V 523 COATING
NO SURFACE SIZE/ PVOH/VAm COATING
NO SURFACE SIZE/ KURA RAY C 506 COATING
MONOCHROME BLACK O.D.
COMPOSITE BLACK O.D.

FIG. 12

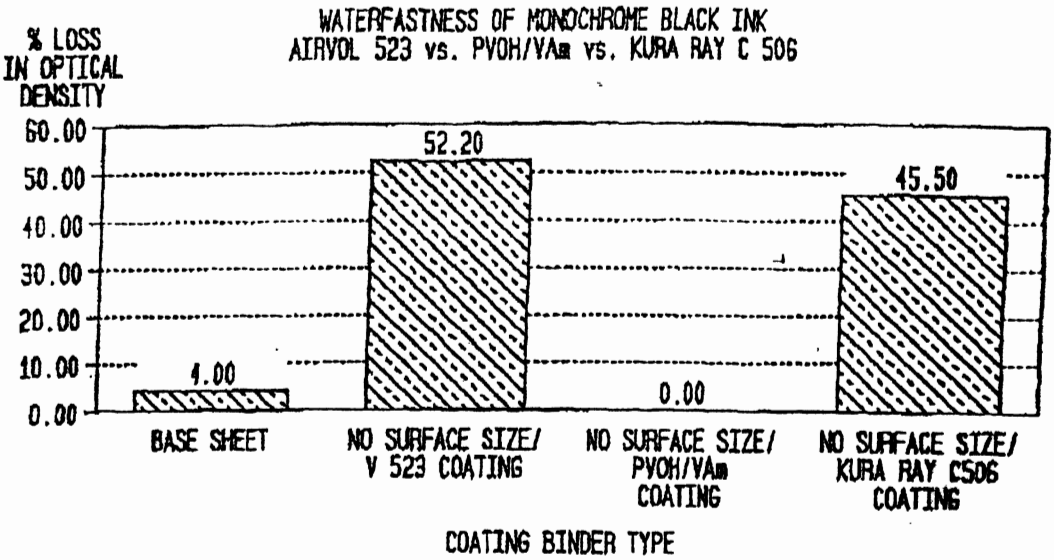
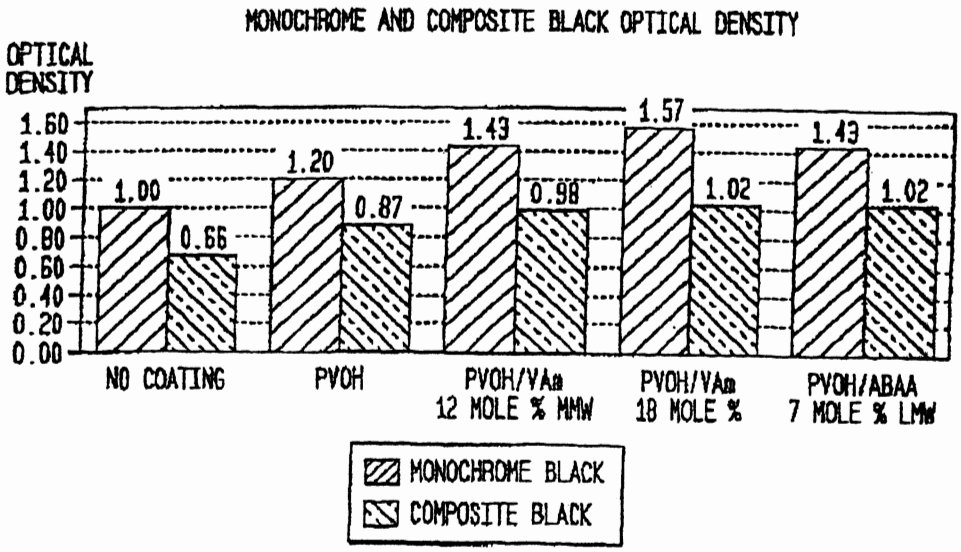

WATERFASTNESS OF MONOCHROME BLACK INK
AIRVOL 523 vs. PVOH/VAm vs. KURA RAY C 506
% LOSS IN OPTICAL DENSITY
60.00
50.00
40.00
30.00
20.00
10.00
0.00
4.00
52.20
0.00
45.50
BASE SHEET
NO SURFACE SIZE/ V 523 COATING
NO SURFACE SIZE/ PVOH/VAm COATING
NO SURFACE SIZE/ KURA RAY C506 COATING
COATING BINDER TYPE

FIG. 13


MONOCHROME AND COMPOSITE BLACK OPTICAL DENSITY
OPTICAL DENSITY
1.60
1.40
1.20
1.00
0.80
0.60
0.40
0.20
0.00
1.00
0.66
1.20
0.87
1.43
0.98
1.57
1.02
1.43
1.02
NO COATING
PVOH
PVOH/VAm 12 MOLE % MMW
PVOH/VAm 18 MOLE %
PVOH/ABAA 7 MOLE % LMW
MONOCHROME BLACK
COMPOSITE BLACK