2001 Edition

Wilflex Screen Printing Inks
Manufactured by PolyOne Corp.

Textile User's Manual

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Executive Report

Founded more than 30 years ago, Wilflex is widely regarded as being on the leading edge of vinyl plastics technology throughout its markets.

Wilflex is an international company. Manufacturing facilities on the east coast of the United States as well as in Europe and Australia allow us to efficiently service the growing worldwide demand.

The key to our present and future success is the continuing development of the products and markets that fall within our basic technology.

We are proud that our Wilflex® Textile Screen Printing Inks command a leadership position in the marketplace.

Our Wilflex Color Systems DispenseMaster™ , PCMaster, PowerPax and Aerosol product line reflect our commitment to serve the screen printing industry.

We are the recognized problem-solver and technical educator in the industry due to our commitment to product development and customer service.

Our success reflects the value our customers place on our products. Our commitment to quality and improvement, coupled with our expanding investment in resources and technology, increases this value and positions us well to serve the present and future marketplace.

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SERVICE IN EVERY COLOR

An Introduction

TO WILFLEX

History

Wilflex was founded in the 1960s, in Marietta, Georgia, as a manufacturer of screen printing inks for the garment decoration market. The company's growth accelerated rapidly during the 1970s and 1980s, thanks to the additional development of existing markets. In 1988, Wilflex opened a subsidiary in the United Kingdom, setting up Wilflex Europe Ltd., and opening the worldwide market for plastisol inks.

By the early 1990s, Wilflex had moved for further expansion into the international marketplace by purchasing controlling interest in former distributor, Screen Products Australia, which is now Wilflex Australasia Pty. Ltd. With the same service and support, Wilflex has been successful marketing Wilflex products in Australia and the Far East.

In 1998, The Geon Company acquired Wilflex and Plast-O-Meric, two leading manufacturers of textile screen printing inks. Geon was one of the largest North American producers of vinyl (PVC) resins and the world's largest producer of vinyl compounds. By purchasing the plastisol ink producers, Geon strengthened its strategy of providing value-added products and services to the worldwide marketplace. Later that same year, Geon purchased AdChem, a custom plastisol formulator. The manufacturing facilities of Wilflex and AdChem now have been combined in Kennesaw, GA.

In September 2000, Geon merged with MA Hanna and the two companies formed a new corporation called PolyOne. This merger created the world's largest polymer services company with more than 9,000 employees, an international team that can be a single source for custom compounding and manufacture of high-performance polymers. At this time, no other company offers such a diverse and unbiased portfolio of polymer products and services. As a member of the PolyOne family, Wilflex continues to lead the textile screen printing market as the plastisol ink brand of choice.

Key Growth Strategies

Wilflex's growth will be driven by key strategies...

- Focus on our customer's needs ..
- Leverage the strengths of our large organization while maintaining the entrepreneurial spirit and agility of a small organization.

Wilflex in Today's Marketplace

Wilflex has a solid reputation for innovation and a "non-standard" approach to the rapidly developing field of plastics technology and applications.

Wilflex custom formulates plastisol dispersions for the textile printing industry and within our Wilflex Aerosol line, we custom formulate and package a complementary line of products for the textile screen printing industry.

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Corporate office for inks

PolyOne Corporation
8155 Cobb Center Drive
Kennesaw, GA 30152
770-590-3500 Fax: 678-290-2749

Customer Service: 800-326-0226 Fax: 800-827-5061
Technical Services: 800-735-4353
email: wilflex@wilflex.com
web site: www.wilflex.com
www.polyone.com

European Sales and Distribution Center:

Main Office

Wilflex Europe Ltd.
Unit 12 Orbital One
Green Street Green Road
Dartford, Kent, England DA1 1QG
Tel: (+44) 01322 277778
Fax: (+44) 01322 288370

Pacific Rim Sales and Distribution Center:

Main Office

Wilflex Australasia Pty. Ltd.
77 Parkhurst Drive
Knoxfield 3180
Victoria, Australia
Tel: (+61) 3 9887 1522
Fax: (+61) 3 9887 1711

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Contact Us. . .

To place an order for any Wilflex product or to request a product demonstration, please contact your local Wilflex distributor listed on the following pages.

Please do not hesitate to contact Wilflex directly. Wilflex - USA, Wilflex - Europe and Wilflex-Australasia all offer:

- technical assistance with ink and screen printing questions
- product information
- details regarding how to purchase Wilflex products

Send us email on the Internet by contacting **wilflex@wilflex.com**. Or send email to a specific Wilflex employee by using the first letter of the first name, the last name and @wilflex.com. (Example: jdoe@wilflex.com)

See our web site at **www.wilflex.com.** Our web site offers product information, technical tips, order tracking and bulletin boards. Visitors can contact Customer Service and Technical Services personnel directly.

We value our customers and their input and suggestions. We believe we have a strong, quality distribution network to provide our customers with excellent sales and technical service. We hope you will give us the opportunity to serve you.

Worldwide Distribution

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Wilflex
U.S. Distributors

AA SCREEN PRINTING SUPPLY
1720 Cumberland Park Drive, Unit 21
Marietta, GA 30067
770-850-0110 • 800-334-4513
http://www.aasps.com
aasps@aasps.com

ATLAS / CONTROL PROCESS
9353 Seymour Avenue
Schiller Park, IL 60176
847-952-0222 • 800-621-4173
http://www.atlascontrol.com

COMMERCIAL PLASTICS & SUPPLY
Calle C #48 Urb. Ind. Constitucion
Caparra Heights, PR 00922
787-792-8747

COMMERCIAL SCREEN
6 Kiddie Drive, Avon Ind. Pk.
Avon, MA 02322
508-583-2300 • 800-227-1449
Commericalscreen@worldnet.att.net

DESMOND SUPPLY
2277 Elliott Avenue
Troy, MI 48083-4502
810-589-9100 • 800-968-1115
http://www.desmondpro.com
despro@bignet.net

FLORIDA FLEX INK & SUPPLIES
6832 NW 77 Court
Miami, FL 33166
305-468-0004
Floflexink@aol.com

FREEDOM SCREEN SUPPLY
4330 Wendell Dr. SW
Atlanta, GA 30336
404-691-0055
www.freedomsupply.com

GARSTON, INC.-Manchester
110 Batson Drive
Manchester, CT 06040
860-649-9626 • 800-966-9626

GARSTON, INC.-Haverhill
8 Parkridge Road
Haverhill, MA 01835
978-374-0600
garston@worldnet.att.net

JAY PRODUCTS COMPANY
2868 Colerian Avenue
Cincinnati, OH 45225
513-541-2514 • 800-543-4436

LEE'S SCREEN PROCESS SUPPLY
10440 West Airport
Stafford, TX 77477
281-879-5337 • 800-447-8874

M&R
155 Sherwood Avenue
Farmingdale, NY 11735
516-293-0063 • 800-729-3338
http://www.mrprint.com

MIDWEST SIGN & SCREEN -Denver
5301 Peoria Street
Denver, CO 80239
303-373-9800 • 800-332-3819
http://www.midwestsignandscreen.com

MIDWEST SIGN & SCREEN-Franklin
10061 S. 54th Street
Franklin, WI 53132-9185
414-423-1200 • 800-242-7430

MIDWEST SIGN & SCREEN-Hayward
21054 Alexander Court
Hayward, C A 94545-1234
510-732-5800 • 800-824-2468

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MIDWEST SIGN & SCREEN-KC
4949 E. 59th Street
Kansas City, MO 64130-4701
816-333-5224 • 800-233-3770

MIDWEST SIGN & SCREEN-Omaha
9313 J Street
Omaha, NE 68127-1206
402-592-7555 • 800-228-3839

MIDWEST SIGN & SCREEN-Portland
5035 NW Front Ave.
Portland, OR 97210-1105
503-224-1400 • 800-228-0596

MIDWEST SIGN & SCREEN-SLC
2534 West Director's Row
Salt Lake City, UT 84104-4515
801-974-9449 • 800-497-6690

MIDWEST SIGN & SCREEN -Seattle
401 Evans Black Drive
Seattle, WA 98188-2912
206-433-8080 • 800-426-4938

MIDWEST SIGN & SCREEN -St. Paul
45 E. Maryland Avenue
St. Paul, MN 55117-4610
612-489-9999 • 800-328-6592

MULTICRAFT
3233 East Van Buren
Phoenix, AZ 85008
602-244-9444

NAZDAR -Atlanta
4260 Peachtree Industrial Boulevard
Norcross, GA 30071
770-476-0510 • 800-537-4606
http://www.nazdar.com/

NAZDAR -Cincinnati
3905 Port Union Road
Cincinnati, OH 45014
513-870-5706 • 800-729-9942

NAZDAR -Indiana
2910 Fortune Circle West, Suite C
Indianapolis, IN 46241
317-484-4500 • 800-783-3883

NAZDAR -Miami
8601 N.W. 81st Road, Suite #101
Medley, FL 33166
305-888-3796 • 800-788-0554

NAZDAR -Michigan
687 Minnesota Avenue
Troy, MI 48083
248-588-4900 • 800-733-9942

NAZDAR -Mid-America
3000 South Hanley Road #100
St. Louis, MO 63143
314-647-1129 • 800-755-9942

NAZDAR -Midwest
1982 Lunt Avenue
Elk Grove Village, IL 60007
847-439-8668 • 800-837-0234

NAZDAR-North Carolina
7001-C Cessna Drive
Greensboro, NC 27409
336-668-4085 • 800-426-0290

NAZDAR -Orlando
310 Anchor Road
Casselberry, FL 32707
407-265-3380• 800-788-4657

NAZDAR-Pennsauken
7055 Central Highway
Pennsauken, NJ 08109
856-663-7878 • 800-257-8226

NAZDAR -Shawnee
8501 Hedge Lane Terrace
Shawnee, KS 66227-3290
913-422-1888 • 800-767-9942

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NAZDAR -Tennessee
625 4th Avenue South
Nashville, TN 37210
615-726-0946 • 800-926-0946

NAZDAR -West
11821 Western Avenue
Garden Grove, CA 92841
714-894-7578 • 800-252-7767

NEO SIGN SUPPLY
6731 S. Eastern Avenue
Oklahoma City, OK 73149
405-672-0555 • 800-522-4386 (OK)

ONE SHOT SUPPLIES
815A Waiakamilo Road
Honolulu, HI 96817
808-841-7683

ONE STOP
2686 Northridge Drive NW
Grand Rapids, MI 49544
616-784-0404 • 800-968-7550

PARMELE SCREEN PRINTING SUPPLY
13105 Saticoy St.
North Hollywood, CA 91605
818-982-9339

PRIMESOUCE
2403 Sidney Street
Pittsburgh, PA 15203
412-432-1333

SCREEN PROCESS OF ALABAMA LLC
710 Gadsen Hwy.
Trussville, AL 35173
205-655-2757 • 800-804-0786

SOUTHWEST INDUSTRIAL PRODUCTS
1210 West Alameda Drive, Ste. 125
Tempe, AZ 85282
480-921-7050 • 800-947-6674

SUNCOAST SCREEN & INK
13000 Automobile Blvd. Suite 102
Clearwater, FL 33762
727-556-0039 • 800-248-3226 (FL)
http://www.suncoastscreen.com

TEXAS SCREEN PROCESS SUPPLY CO.-Dallas
304 N. Walton Street
Dallas, TX 75226
214-748-3271 • 800-366-1776
http://www.txscreen.com

TEXAS SCREEN PROCESS SUPPLY CO.-Houston
4466 W. 12th
Houston, TX 77055
713-957-0850 • 800-775-7545
http://www.txscreen.com

TW GRAPHICS EAST
1175 Florida Central Parkway
Ste 3000
Longwood, FL 32750
407-332-4488 • 800-262-3051
http://www.twgraphics.com

WILDSIDE NORTH
107 Arrowhead Drive
Slippery Rock, PA 16057
724-794-4100 • 888-245-3810

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Wilflex
International Distributors

Canada

Screenflex Inks, Canada, Ltd.	Calgary, Alberta	403-255-7766 800-661-7766
Screenflex Inks, Canada, Ltd.	Waterloo, Ontario	519-746-0227 877-205-9218

Caribbean

Graphic Equipment & Supply	Nassau, Bahamas	809-322-1334
Suplidora Grafica	Dominican Republic	809-689-7637
Commercial Plastics	Puerto Rico	787-792-8747

Central America & Mexico

Proveedora Grafica	Costa Rica	506-257-0707
Nebiera, SA	El Salvador	503-225-5598
Omnigrafic	Guatemala	502-476-2583
Distribuidora Serigrafica S.A.	Guatemala	502-337-3008
La Bobina	Honduras	504-56-0370
Nazdar	Mexico	525-519-0281
Ray Color SA DE CV	Mexico	525-532-4445

South America

Control Systems SRL	Argentina	541-854-4284
Maria-Teresa Lujan *Latin American Manufacturer's rep*	Sunrise, FL	954-288-8685

Distribution for the Americas through Wilflex (Kennesaw, GA)

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Wilflex
International Distributors

Europe

Company	*Location*	*Telephone*
Putz Siebdrucktechnik	Austria	0043 1 2921508
Unico	Belgium	0032 2582 1690
Aentep Ltd.	Cyprus	0035 75 587120
Sitaservis	Czech Republic	0042 2422 402
Juhl A/S	Denmark	0045 8693 1333
Active Screen (Europe) Ltd.	England, South East	0044 1634 719400
TR Serigrahie	France	0033 1414 75099
Borchert & Moller	Germany	0049 7474 95650
Gabler Siebdruck Service	Germany	0049 2349 237710
KIT GmbH	Germany	0049 61 04950114
Aentep Ltd.	Greece	0030 15 149830
AP Zeefdruktechniek BV	Holland	0031 1357 29090
Indoflex SP Supplies	India	0091 421 710244
Ponger 2000	Israel	00972 35 371997
Quaglia SRL	Italy	0039 135 532040
Folis	Lithuania, Rep. of	0037 02 2262900
Pace Ltd.	Mauritius	00230 454 7256
Norleas A/S	Norway	0047 331 14477
You & Me	Poland	0048 2286 52510
Soprotex LDA	Portugal	0035 12 294 82913
Tecno Screen	Spain	0034 95234 4750
Club Shop AB	Sweden	0046 1113 1617
Bezema AG	Switzerland	0041 71 763 8811
Serilith AG	Switzerland	0041 41 4483636
Mami SA	Tunisia	00216 178 7433
Bogazici	Turkey	0090 212575 3552
Ali Alhashemi Trading	Dubai, UAE	00971 6 5333440
Colenso Screen Services Ltd	United Kingdom	0044 1928 701356
Wilflex Europe Limited	United Kingdom	0044 1322 277778

European Distribution through Wilflex Europe Ltd.

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Wilflex
International Distributors

Pacific Rim

Company	*Location*	*Telephone*
Wilflex Australasia Pty. Ltd.	Melbourne, Aust.	61 3 9887-1522
Wilflex Australasia Pty. Ltd.	Sydney, Australia	61 2 9569-8666
Sericol Australia	Adelaide, Australia	61 8 8351-8677
Sericol Australia	Brisbane, Australia	61 7 3252-3465
Sericol Australia	Perth, Australia	61 8 9381-8200
All Australian Screen Supp.	Melbourne, Aust.	61 3 9762-3092
Lanart Graphics	Sydney, Australia	61 2 4957-4474
Eurotech Quality Products	Sydney, Australia	61 2 9517-1411
Kingtech Colour & Chemical	Hong Kong	852 2692-3889
Artrend Industrial Ltd.	Hong Kong	852 2950-0030
Tony Silk Screen Co Ltd.	Hong Kong	852 2341-0159
Tony Silk Screen Technology	China Beijing	86 10 6345-0625
Tony Screen Technology	China Shanghai	86 21 6254-4211
FT Wimble & Co.	Fiji	679 385-344
Luca's Screen Printing Supp.	Indonesia	62 22 43-4426
FK Trading Co.	Tokyo, Japan	81 3 3762-8901
Seiko Advance	Tokyo, Japan	81 48 766-4511
Dong in Texchem Co Ltd.	Seoul, Korea	82 2 2242-7811
Pan Asia Trading Co Ltd.	Korea	82 2 2635 9736
Chuanplus Indust. SDN BHD	Malaysia	60 3 961-8110
Just Screen Ltd.	New Zealand	64 9 299-7770
Nestor Distributors	Phillippines	63 2 893-9533
Winson Screen Co. Ltd.	Bangkok, Thailand	66 2 898-6199

Distribution for the Pacific Rim through Wilflex Australasia Pty. Ltd.

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White Inks by Wilflex

— XTREME WHITE — #11999XW
Super Smooth, Fast Flashing, No After-Tack

— BRIGHT TIGER — #11480HT
Optically Bright, Superb Printability, Excellent Fiber Mat-down

— ATHLETIC TROPHY WHITE — #11003WHT
Mat-Down . . . Durability . . . Coverage

— PHANTOM WHITE— #11555WHT
Fast flash, low-tack white

— POLYWHITE — #11117WHT
Bleed Resistance on Polyester

— OLYMPIA PLUS WHITE — #11135WHT
Opaque, Excellent Printability - 100% cottons

— MX WHITE — #11888MX
Wet-on-wet, Highlight White

— OMEGA FLASH WHITE— #11175WHT
Fast Flashing, Low After-tack, Superior Printability Through Fine Meshes

— PENNANT WHITE— #11000PEN
Designed for Direct Printing of Athletic Uniforms

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WILFLEX® WHITE INK APPLICATIONS CHART

White Ink Designation	Application	Bleed Resistance	Opacity	Mat Down	Flash Prop.	Gloss	Printability
Athletic Trophy 11003WHT	Superb Bleed Resistant White	9	E	E	E	M	5
PolyWhite 11117HT	Premium Bleed Resistance	10	E	VG	F	M	4
Omega Flash 11175WHT	Fast-flash White 100% Cottons	1	VG	VG	E	L	9
Xtreme White 11999XW	Super Opaque General Purpose	8	E	E	E	L	10
Bright Tiger 11480HT	Printability Optically Bright	8	E	E	VG	L	9
Olympia Plus 11135WHT	Opacity Mat-down 100% cotton	1	E	E	E	L	9
Phantom White 11555WHT	General Purpose White	9	E	E	E	M	5
MX White 11888MX	Wet-on-wet Highlight White	1	G	G	F	L	10
Pennant White 11000PEN	Nylon White	1	VG	VG	VG	H	9
SPECIAL APPLICATION WHITES							
NuPuff White 11000NPF	Premium Puff White	5	E	G	G	L	6
Transflex White 11000TF	General Purpose Hot Split Transfer	5	VG	G	E	L	9
Premium Transflex White 11010TF	Bleed Resistant Hot Split Transfer White	7	E	VG	VG	L	7
MCV-FF White 110000MCV FF	Wet-on-wet Heat Sensitive Stretch Lights	1	P	P	F	H	10
SSV-FF White 11000SSV FF	Athletic Heat Sensitive Stretch Darks	1	G	F	G	H	9
Lithoprint White #11620	Back-up White Offset Lithographic Transfers Stretch Darks	8	VG	G	NA	M	10

H = High
M = Medium
L = Low

10 = Best
1 = Worst

E = Excellent
VG = Very Good
G = Good
F = Fair
P = Poor

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WILFLEX® BRIGHT TIGER™ #11480HT

GENERAL DESCRIPTION Wilflex 11480HT Bright Tiger is an extremely true, optically bright white plastisol ink formulated to give excellent printability across a range of screen printing applications. Bright Tiger's excellent opacity, fiber mat down, low gloss level, and very good flash properties permit it to be utilized as both a stand-alone and an underbase white. Bright Tiger also exhibits a very good level of dye migration resistance without the offensive odor commonly found in bleed resistant white plastisols.

RECOMMENDED SUBSTRATES 100 percent cotton, cotton/polyester blends, some synthetics. **Pre-print and test all substrates for dye migration, ink adhesion, wash fastness, and other desired properties**. It is extremely important to pre-test on light colored or stone-washed garments. Avoid stacking hot, because such colors are more prone to color distortion due to the dye stuffs inherent in the garment. Fabric and dye characteristics can exhibit variance between manufacturers and from dye lot to lot. To determine a fabric's discoloration potential, follow the procedures recommended in the "Evaluating Plastisol Inks" section of the Wilflex User's Manual. 11480HT Bright Tiger is a low bleed ink, not a non-bleed ink. On some types of fabric, dye migration may occur. To determine a material's bleed potential, please reference the testing procedures outlined in the "Evaluating Plastisol Inks" section of the Wilflex User's Manual.

PRINTING RECOMMENDATIONS Mesh: 86 to 125 threads/in (34-49 threads/cm) for optimum opacity on darks. 140 to 230 threads/in (55-90 threads/cm) for underbasing. 195 to 305 threads/in (77-120 threads/cm) for fine-line printing. Screens: The use of consistent, high tensioned screens will optimize the performance properties of Bright Tiger. Retensionable frames that allow for work-hardening the mesh fabric are highly recommended. Stencils: Use capillary films or a high quality emulsion and coating procedure that totally encapsulates the mesh and establishes a consistent stencil on the screen. For one hit opacity printing through coarser meshes, use a coating procedure that builds a thick, even stencil to ensure a good column height of printed ink. Squeegee: 60-80 durometer. Use a slightly dulled edge for coarse mesh counts and a sharp edge for fine mesh counts. Dual (70/90) or triple (70/90/70) durometer squeegees are highly recommended. Ensure that the print edge of the squeegee material is straight and free of nicks for optimal results. Avoid excessive squeegee pressure. A heavy flood stroke that fully fills the open areas of the stencil with ink is recommended.

FLASH CURE AND FUSION Gel: 160-180 F (71-82 C). Due to differences in power, height above ink film, and efficiency of the flash unit, a specific dwell time cannot be given. Incorporating the use of finer mesh counts for your flash plate will decrease the dwell time needed to gel the ink, resulting in faster production speeds. Be certain to set flash dwell times on heated pallets to simulate production. Adjust your settings so that the ink is just dry to the touch. Avoid excessive overflashing, as it can result in poor inter-coat adhesion of overprint colors. Cure: 320 F (160 C)

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throughout the entire ink film. Fusion tests should be performed prior to production printing. Failure to cure ink properly can result in poor wash fastness, inferior adhesion, unacceptable durability, and increased likelihood of dye migration. Maximum ink tensile strength and elongation is accomplished by ensuring total fusion of the ink film. Testing procedures for plastisol fusion are outlined in the "Evaluating Plastisol Inks" section of the Wilflex User's Manual.

MODIFIERS The performance properties built into whites are adversely affected by the addition of reducers and extenders. Bright Tiger was formulated to be printed without any need for viscosity modification. If viscosity reduction is absolutely necessary, a maximum of 5 percent (by weight) of Wilflex Curable Reducer #10070 may be added. At this level of addition, the ink's viscosity can be reduced by 20-25 percent from its original viscosity. Always stir plastisol inks prior to use or viscosity modification to break down any false body.

WASH-UP Conventional solvents or Wilflex Screen Wash.

HEALTH AND SAFETY Complete Health and Safety Data available upon request.

STORAGE Recommended storage temperature is 65-90 F (18-32 C). Avoid storing in direct sunlight or in extreme temperature conditions. It is recommended that Wilflex products be used within one year of receipt of product. Inks subjected to extreme temperatures or prolonged shelf life could thicken or expand in the container.

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WILFLEX® PHANTOM WHITE #11555WHT

GENERAL DESCRIPTION Wilflex Phantom White is a fast-flashing, creamy plastisol screen printing ink formulated to give excellent opacity, brightness and dye bleed resistance. The ink has super fast flashing properties that provide excellent mat-down characteristics with little or no after-tack. Phantom White is a versatile ink and can be used by most printers who want to use one ink for a variety of print jobs.

RECOMMENDED SUBSTRATES Phantom White may be printed on 100 percent cotton and cotton blend fabrics. **Pre-print and test all fabrics for dye bleeding, ink adhesion, wash fastness and other desired properties.**

PRINTING RECOMMENDATIONS Mesh: For optimum opacity, a 60 to 120 threads/in (24-49 threads/cm) mesh is recommended. For light color and medium fabrics or fine line printing, a 120-200 threads/in (49-81 threads/cm) mesh gives good results. Some modifications may be required when using finer meshes. Squeegee: Medium durometer slightly rounded blade. Emulsion: The product contains no solvent or water. Screens may be prepared with conventional direct emulsions or capillary films. Automatic Printing- Phantom White requires a medium hard flood and a medium print stroke, although optimum ink application needs to be determined by the print operator. A 75 or a triple durometer 60/90/60 squeegee at a 35 degree angle is recommended. Manual Printing- Optimum opacity can be achieved with a medium pressure flood, and a medium hard print stroke with a 45 degree angle using a 75 durometer square squeegee. Using a softer squeegee may require a slower stroke by the operator.

CURING Gel or Flash cure: 170-189 F (76-87 C). Due to differences in power, height above ink film, and efficiency of the flash unit, a specific dwell time cannot be given. Incorporating the use of finer mesh counts for your flash plate will decrease the dwell time needed to gel the ink, resulting in faster production speeds. Be certain to set flash dwell times on heated pallets to simulate production. Adjust your settings so that the ink is just dry to the touch. Avoid excessive overflashing, as it can result in poor inter-coat adhesion of overprint colors. Cure: 320 F (160 C) throughout the entire ink film. Fusion tests should be performed prior to production printing. Failure to cure ink properly can result in poor wash fastness, inferior adhesion, unacceptable durability and increased likelihood of dye migration. Maximum ink tensile strength and elongation is accomplished by ensuring total fusion of the ink film. Testing procedures for plastisol fusion are outlined in the Wilflex Textile User's Manual.

MODIFIERS Wilflex Phantom White can be used straight from the bucket. Some stirring will help break down the false "body" that occurs in plastisol inks over time. Phantom White may be modified with Miracle Clear #10160 or a small amount of Curable Reducer #10070 (1-5 percent by weight) to lower viscosity. Please note: Excessive modification will reduce the bleed resistance of Phantom White and may cause problems in curing or flash curing.

WASH-UP Conventional solvents or Wilflex Screen Wash.

HEALTH AND SAFETY Complete Health and Safety Data available upon request.

STORAGE Recommended storage temperature is 65-90 F (18-32 C). Avoid storing in direct sunlight or in extreme temperature conditions. It is recommended that Wilflex products be used within one year of receipt of product. Inks subjected to extreme temperatures or prolonged shelf life could thicken or expand in the container. As with any plastisol ink, store ink in container with lid closed.

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ATHLETIC TROPHY WHITE #11003WHT

GENERAL DESCRIPTION Wilflex Athletic Trophy White is a high viscosity plastisol screen printing ink formulated to give ultimate opacity and bleed resistance along with excellent mat-down characteristics. Though designed for direct printing on fabrics subject to dye bleeding and/or sublimation, Athletic Trophy White is a premium ink useful to those printers who wish to use one ink for most jobs.

RECOMMENDED SUBSTRATES Wilflex Athletic Trophy White may be printed on cotton, cotton blends, polyesters, some nylons (generally open weave or mesh types) and other synthetics. On some types of fabric, dye migration may occur. To determine a material's bleed potential, please refer to the testing procedures outlined in the "Evaluating Plastisol Inks" section of the Wilflex User's Manual. **Pre-print and test all fabrics for dye bleeding, ink adhesion, wash fastness and other desired properties.**

PRINTING RECOMMENDATIONS Mesh: For optimum opacity, a 60 to 120 threads/in (24-49 threads/cm) mesh is recommended. For light color and medium fabrics or fine line printing, a 120-200 threads/in (49-77 threads/cm) mesh gives good results. Some modifications may be required when using finer meshes. Squeegee: Medium durometer slightly rounded blade. Emulsion: The product contains no solvent or water. Screens may be prepared with conventional direct emulsions or capillary films. Automatic Prints- Athletic Trophy requires a hard flood and a medium stroke. A 75 or a 60/90/60 durometer squeegee at a 35 degree angle is recommended. Manual Printing- Opacity is optimized with a hard flood, and a hard, slightly slower stroke with a 45 degree angle using a 75 durometer square squeegee. Using a softer squeegee may require a slower stroke by the operator. When printing is finished, remove ink from the screen.

CURING Gel or Flash cure: 170-189 F (76-87 C). Due to differences in power, height above ink film, and efficiency of the flash unit, a specific dwell time cannot be given. Incorporating the use of finer mesh counts for your flash plate will decrease the dwell time needed to gel the ink, resulting in faster production speeds. Be certain to set flash dwell times on heated pallets to simulate production. Adjust your settings so that the ink is just dry to the touch. Avoid excessive overflashing, as it can result in poor inter-coat adhesion of overprint colors. Cure: 320 F (160 C) throughout the entire ink film. Fusion tests should be performed prior to production printing. Failure to cure ink properly can result in poor wash fastness, inferior adhesion, unacceptable durability and increased likelihood of dye migration. Maximum ink tensile strength and elongation is accomplished by ensuring total fusion of the ink film. Testing procedures for plastisol fusion are outlined in the Wilflex Textile User's Manual.

MODIFIERS Wilflex Athletic Trophy White can be used straight from the bucket. Some stirring will help break down the false "body" that occurs in plastisol inks over time. Athletic Trophy White may be modified with Miracle Clear #10160 or a small amount of Curable Reducer #10070 (1-5 percent by weight) to lower viscosity. Please note: Excessive modification will reduce the bleed resistance of Athletic Trophy White and may cause problems in curing or flash curing.

WASH-UP Conventional solvents or Wilflex Screen Wash.

HEALTH AND SAFETY Complete Health and Safety Data available upon request.

STORAGE Recommended storage temperature is 65-90 F (18-32 C). Avoid storing in direct sunlight or in extreme temperature conditions. It is recommended that Wilflex products be used within one year of receipt of product. Inks subjected to extreme temperatures or prolonged shelf life could thicken or expand in the container. As with any plastisol ink, store ink in container with lid closed.

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WILFLEX® POLYWHITE #11117WHT

GENERAL DESCRIPTION Wilflex PolyWhite is a plastisol ink specifically formulated to address dye migration problems on a variety of specialty substrates.

RECOMMENDED SUBSTRATES 100 percent cotton, cotton/polyester blends and 100% polyester. Product works especially well on heavy colored aprons, dark athletic meshes, and caps with heavy dye loads. On rare occasions, dye migration may occur. To determine a material's bleed potential, please reference the testing procedures outlined in the Wilflex User's Manual. **Pre-print and test all fabrics for dye bleeding, ink adhesion, wash fastness and other desired properties.**

PRINTING RECOMMENDATIONS Mesh: 60-130 threads/in.(24-51 threads/cm) Squeegee: 60-80 durometer and a straight edge. Emulsion: Conventional direct or capillary films.
Suggestions for automatic printing of PolyWhite:
First print 130 mesh screen -- flash -- second print 86 mesh screen.

(Please see High Tech Spec Sheet for specific print details.)

CURING Gel or Flash cure: 200 F (94 C). Due to differences in power, height above ink film, and efficiency of the flash unit, a specific dwell time cannot be given. Incorporating the use of finer mesh counts for your flash plate will decrease the dwell time needed to gel the ink, resulting in faster production speeds. Be certain to set flash dwell times on heated pallets to simulate production. Adjust your settings so that the ink is just dry to the touch. Avoid excessive overflashing, as it can result in poor intercoat adhesion of overprint colors. Cure: 320 F (160 C) throughout the entire ink film. Fusion tests should be performed prior to production printing. Failure to cure ink properly can result in poor wash fastness, inferior adhesion, unacceptable durability, and increased likelihood of dye migration. Maximum ink tensile strength and elongation is accomplished by ensuring total fusion of the ink film. Testing procedures for plastisol fusion are outlined in the "Evaluating Plastisol Inks" section of the Wilflex User's Manual.

MODIFIERS None - Any modification will negatively affect bleed resistance.

WASH-UP Conventional solvents or Wilflex Screen Wash.

HEALTH AND SAFETY Complete Health and Safety Data available upon request.

STORAGE Recommended storage temperature is 65-90 F (18-32 C). Avoid storing in direct sunlight or in extreme temperature conditions. It is recommended that Wilflex products be used within one year of receipt of product. Inks subjected to extreme temperatures or prolonged shelf life could thicken or expand in the container.

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WILFLEX® OMEGA FLASH 11175WHT

GENERAL DESCRIPTION Wilflex Omega Flash White has been specifically formulated as an opaque white underbase for non-bleed garments. Its fast flash time combined with an extremely low tack enables the printer to utilize all printing stations without sacrificing production speeds. The matte appearance and excellent fiber matdown properties provide an excellent surface for the overprint of colors.

RECOMMENDED SUBSTRATES 100 percent cotton, non-bleed fabrics. Omega Flash White is not recommended for fabrics with polyester content or any material that exhibits the potential for dye migration. Pre-print and test all fabrics for dye bleeding, ink adhesion, wash fastness.

PRINTING RECOMMENDATIONS Mesh: 60-125 threads/in (24-48 threads/cm) for optimum opacity when used as an underbase white. Squeegee: 60-80 durometer. Dual or triple squeegees are highly recommended. The use of consistent, high tensioned screens will optimize the performance properties of Omega Flash White. Stencils: Use capillary films or a high quality emulsion and coating procedure that totally encapsulates the mesh and establishes a consistent stencil to ensure good height of the printed ink. Avoid excessive squeegee pressure when printing Omega Flash White.

FLASH CURE AND FUSION Gel: 200-210F (93-99C). Due to differences in power, height above ink film and efficiency of the flash drying unit, specific dwell time cannot be given. Incorporating the use of finer mesh counts for your flash plate will decrease the dwell time needed to gel the ink, resulting in faster production speeds. Be certain to set flash dwell times on heated pallets to simulate the production cycle. Adjust the settings so that the ink is just dry to touch. Avoid excessive overflashing because it can result in reduced inter-coat adhesion of overprint colors. Cure: 320 F (160C) throughout the entire ink film.

MODIFIERS The performance properties built into a white ink can be adversely affected by the addition of reducers and extenders. If any reduction of the ink is required, a maximum of 5 percent by weight of Wilflex Curable Reducer #10070 may be added. Always stir the white ink prior to use to break down the false body that occurs in storage.

WASH-UP Conventional solvents or Wilflex Screen Wash.

HEALTH & SAFETY Complete health and safety data available upon request.

STORAGE Recommended storage temperature is 60-90F (16-32C). Avoid storing in direct sunlight or in extreme temperature conditions. It is recommended that Wilflex inks be used within one year of receipt of product.

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WILFLEX® OLYMPIA PLUS #11135WHT

GENERAL DESCRIPTION Olympia Plus White is an opaque highlight white specifically formulated for non-bleed garments. Its fast flash time and superior low after-tack also enables the ink to be used as a flash white. The matte appearance and excellent fiber mat-down ensures Olympia Plus White is an excellent all round, general-purpose white ink.

RECOMMENDED SUBSTRATES 100 percent cotton, non-bleed fabrics. Olympia Plus White is not recommended for fabrics with polyester content or any material that exhibits the potential for dye migration. **Pre-print and test all fabrics for dye bleeding, ink adhesion, wash fastness.**

PRINTING RECOMMENDATIONS Mesh: 60-125 threads/in (24-48 threads/cm) for optimum opacity when used as an underbase white. Squeegee: 60-80 durometer. Dual or triple squeegees are highly recommended. The use of consistent, high tensioned screens will optimize the performance properties of Olympia Plus White. Stencils: Use capillary films or a high quality emulsion and coating procedure that totally encapsulates the mesh and establishes a consistent stencil to ensure good height of the printed ink. Avoid excessive squeegee pressure when printing Olympia Plus.

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FLASH CURE AND FUSION Gel: 200-210F (93-99C). Due to differences in power, height above ink film and efficiency of the flash drying unit, specific dwell time cannot be given. Incorporating the use of finer mesh counts for your flash plate will decrease the dwell time needed to gel the ink, resulting in faster production speeds. Be certain to set flash dwell times on heated pallets to simulate the production cycle. Adjust the settings so that the ink is just dry to touch. Avoid excessive overflashing because it can result in reduced inter-coat adhesion of overprint colors. Cure: 320 F (160C) throughout the entire ink film.

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MODIFIERS The performance properties built into a white ink can be adversely affected by the addition of reducers and extenders. If any reduction of the ink is required, a maximum of 5 percent by weight of Wilflex Curable Reducer #10070 may be added. Always stir the white ink prior to use to break down the false body that occurs in storage.

WASH-UP Conventional solvents or Wilflex Screen Wash.

HEALTH & SAFETY Complete health and safety data available upon request.

STORAGE Recommended storage temperature is 60-90F (16-32C). Avoid storing in direct sunlight or in extreme temperature conditions. It is recommended that Wilflex inks be used within one year of receipt of product.

XTREME WHITE #11999XW

DESCRIPTION

Wilflex 11999XW Xtreme White is a super smooth, creamy white ink that flashes fast and prints through fine meshes. Xtreme White takes your production processes to the extreme by cutting flash times dramatically and producing a fiber-lock matte finish on color overprints.

PRINTER'S PARAMETERS

Substrates	100% cotton, cotton blends, some uncoated synthetics
Bleed resistance	Good
Mesh (on darks)	86-125 t/in (34-48 t/cm)
Mesh (underbasing)	140-300 t/in (54-120 t/cm)
Mesh (fine line)	195 to 300 t/in (77-120 t/cm)
Tension (newtons)	15-20 acceptable, 25-35 recommended
Stencil emulsion	Direct, indirect & capillary
Squeegee type	Dual (70/90) or triple (70/90/70)
Squeegee blade	Sharp
Squeegee angle	45 degrees
Squeegee speed	Maximum
Gel temp	160-180 F (71-82 C)
Cure temp	330 F (166 C) entire film
Extender	None
Reducer	5 percent max (by weight) Curable Reducer #10070
Caution	Do not stack hot
Storage	65-90 F (18-32 C). Avoid direct sun. Use within one year of receipt.
Wash-up	Wilflex Screen Wash
Health & Safety data	Available upon request

FEATURES

- Super smooth, creamy texture and viscosity
- Fast flashing
- Prints through fine meshes
- Use as a first-down, underbase flash white or an overprint stand-alone white.
- Superior ink flow properties. Flows easily from the bucket and in the screen printing operation. Speed up production without losing definition.
- Good bleed resistance
- Odorless
- Competitively priced for a top-value ink

SPECIAL RECOMMENDATIONS

- Pre-test Xtreme White on light colored or stone washed garments. Avoid stacking printed garments hot because such colors are more prone to color distortion. Fabric and dye characteristics can vary between manufacturers and from dye lot to lot. Xtreme White 11999XW is a low-bleed, not a non-bleed ink.
- Use consistent, high tensioned screen mesh to optimize performance properties.
- To increase production speeds, use finer mesh counts for the flash plate to decrease gel time. Set flash dwell times on heated pallets to simulate production. Adjust your settings so that the ink is just dry to the touch.
- Avoid overflashing, as it can result in poor inter-coat adhesion of overprint colors.
- Perform fusion tests before production. Failure to cure ink properly can result in poor

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wash fastness, inferior adhesion, unacceptable durability, and increased likelihood of dye migration. Testing procedures for plastisol fusion are outlined in the Wilflex User's Manual.

- Stir plastisols prior to printing.
- Do not dry clean, bleach or iron the printed area.
- Any application not referenced in this product information bulletin should be pre-tested or consultation sought with Wilflex Technical Services Department prior to printing (US - 800-735-4353).

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PRODUCT INFORMATION BULLETIN

WILFLEX® PENNANT WHITE #11000PEN

DESCRIPTION

Wilflex 11000 Pennant White is a specialty plastisol ink designed for direct printing of athletic uniforms. Pennant White is an excellent choice when printing on to nylon micro-mesh, port-hole and dazzle cloth nylon game jerseys. Best results will be obtained when the printer uses the recommended screen tension and squeegee choice.

PRINTER'S PARAMETERS

Substrates	Nylon mesh (micro & porthole), dazzle cloth and other athletic uniforms.
Bleed resistance	None
Mesh	60-110 t/in (24-43 t/cm)
Tension	In excess of 15 newtons per centimeter
Stencil emulsion	Conventional direct, capillary or both
Squeegee type	Single 65-75 durometer, medium hard
Squeegee blade	Straight edge
Gel temp	156 F (69 C)
Cure temp	300 F (149 C) entire film
Extender	None
Reducer	None
Pallet	Semi-soft, NOT metal
Storage	65-90 F (18-32 C). Avoid direct sun. Use within one year of receipt.
Wash-up	Wilflex Screen Wash
Health & Safety data	Available upon request

FEATURES

- High gloss finish
- Excellent adhesion to fabrics
- Excellent printability
- Fast flashing
- High opacity on dark fabrics
- Non-migrating pigment
- Super elongation on nylon
- Excellent wash properties

SPECIAL RECOMMENDATIONS

- When printing, allow one flood followed by two print applications. Printing properties will be determined by manual or automatic printing applications.
- Perform fusion tests before production. Check the cure temperature at the ink surface. Failure to cure ink properly can result in poor wash fastness, inferior adhesion, unacceptable durability, and increased likelihood of dye migration. Testing procedures for plastisol fusion are outlined in the Wilflex User's Manual.
- Preprint and test all fabrics for dye migration. Pennant White has no built-in bleed resistance, and it should not be printed onto any nylon that is prone to bleeding.
- Stir plastisols prior to printing.
- Do not dry clean, bleach or iron the printed area.
- Any application not referenced in this product information bulletin should be pre-tested or consultation sought with Wilflex Technical Services Department prior to printing (US - 800-735-4353).

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Wilflex Genesis Inks . . .

Solve the screen printing puzzle

Print at high production rate. Excellent for auto and manual printing.

Build-up resistant

Wide standard color range

Genesis Super Colors
offer GREAT opacity

Great for over-printing
onto flashed white!

Genesis Bases
10540GNS,
10680GNS Plus available
for use with PC Express

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PRODUCT INFORMATION BULLETIN

WILFLEX® GENESIS SERIES

General Purpose Wet-On-Wet Ink

GENERAL DESCRIPTION Wilflex Genesis (GNS) plastisol inks have been specifically formulated for high productivity wet-on-wet printing. Although most Genesis inks are opaque, optimum opacity is achieved with Genesis Super inks. Genesis inks are guaranteed to have excellent resistance to build-up and possess excellent printability. Genesis inks also may be used to print conventional cold peel transfers. 10540GNS Genesis Base and 10680GNS Genesis Plus Base have similar print characteristics. However, 10680GNS offers a matte finish and is more opaque.

RECOMMENDED SUBSTRATES Cotton, cotton blends, polyesters, some nylon (generally open weave or mesh types) as well as other synthetics. Underbase White- A bleed resistant white such as Wilflex Athletic Trophy White or Bright Tiger is suggested. Omega Flash or Olympia Plus whites are suggested for 100 percent cotton fabrics. Cold Peel Transfers- Parchment paper. **Pre-print and test all fabrics for dye bleeding, coverage, ink adhesion, wash fastness and other desired effects.**

PRINTING RECOMMENDATIONS Mesh: For optimum opacity- 86-120 threads/in. (34-49 threads/cm). Overprinting and fine line printing: 120-280 threads/in.(49-110 threads/cm). Printing onto white or light fabrics: 110-280 threads/in. (49-90 threads/cm). Process colors: 305-355 threads/in. or 120 -140 threads/cm. Cold Peel Transfers: 86-120 threads/in. or 34-49 threads/cm. Squeegee: Medium durometer, slightly rounded edge. Emulsion: Conventional direct or capillary films.

CURING Gel or flash-cure: Approximately 230 F (110 C). Full Cure: 320 F (160 C). Transfer Temp: 350 F (177 C). Fusion tests should be made prior to any production run. Failure to cure properly causes poor wash fastness, inferior adhesion and increased dye migration.

MODIFIERS Genesis Inks should be stirred first to determine if modification is necessary. Finesse #10150- Add to extend and soften hand. Additions greater than 20 percent (by weight) will reduce opacity. Curable Reducer #10070- Maximum addition of 5 percent by weight. Caution: The viscosity or thickness of GNS plastisol inks have been specially designed to enhance opacity and printability. Any alteration of this viscosity should be minimized.

WASH-UP Conventional solvents or Wilflex Screen Wash.

HEALTH & SAFETY Complete Health and Safety Data available upon request.

STORAGE Recommended storage temperature is 65-90 F (18-32 C). Avoid storing in direct sunlight or in extreme temperature conditions. It is recommended that Wilflex products be used within one year of receipt of product. Inks subjected to extreme temperatures or prolonged shelf life could thicken in the container.


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GENESIS
Standard Color List

Genesis*

12600	Flesh	62100	Light Royal
13300	Russell Gray	66100	Bear's Navy
14600	Dark Gray	67800	Deep Aqua
19000	Black	68500	Winter Blue
20100	Dark Brown	70000	Kelly
23800	Spice Brown	70500	Dallas Green
30200	Bright Orange	75300	Turquoise
30400	Dolphin Orange	75900	Blacklight Green
40000	Scarlet	80000	Gold
40700	Brock Red	80100	Light Gold
41400	Rebel Red	81000	Lemon Yellow
42000	Dallas Scarlet	82500	Yellow
43000	National Red	90000	Fluo. Yellow
45800	Russell Cardinal	90100	Fluo. Blue
47600	Brandywine	90200	Fluo. Green
48600	Burgundy	90300	Fluo. Orange
50200	Purple	90400	Fluo. Pink
50400	Russell Purple	90500	Fluo. Neon
60000	Navy	90600	Fluo. Red
60420	Deacon Blue	90700	Fluo. Magenta
60650	Contact Blue	90800	Fluo. Purple

Genesis Super*

23801	Super Spice Brown	75601	Super Spring Green
30401	Super Dolphin Orange	80000	Super Gold
34800	Super Clockwork Orange	80100	Super Light Gold
40500	Super Red	87020	Super Lemon Yellow
42270	Super Drake Red	87030	Super Primrose
47030	Super Fuchsia	90010	Super Fluo. Yellow
47210	Super Red 2	90110	Super Fluo. Blue
57010	Super Purple	90210	Super Fluo. Green
57130	Super Fuchsia 3	90310	Super Fluo. Orange
60007	Super Marine Blue	90410	Super Fluo. Pink
67040	Super Bright Blue	90510	Super Fluo. Neon
67050	Super Royal	90610	Super Fluo. Red
70501	Super Dallas Green	90710	Super Fluo. Magenta
74240	Super Alpha Lime	90810	Super Fluo. Purple
75301	Super Turquoise		

**Above products are made with 10540GNS Genesis Base or 10000GNS Halftone Base*

Genesis Specialty Inks

19850	Process Black	89850	Process Yellow
49850	Process Magenta	99990	Phosphorescent
69850	Process Cyan		

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PRODUCT INFORMATION BULLETIN

WILFLEX® GENESIS PROCESS

DESCRIPTION

Genesis process inks are formulated to achieve the cleanest and highest intensity colors for textile process screen printing. These pure, transparent colors are designed for high productivity, direct wet-on-wet printing. Excellent resistance to build-up, superb printability, extremely soft hand and minimal dot gain.

PRINTER'S PARAMETERS

Substrates	100% cotton, cotton blends, all-white grounds.
Mesh	305 to 355 threads/in (120-140 threads/cm)
Tension (newtons)	25+
Stencil emulsion	Direct, indirect & capillary
Squeegee type	Dual (70/90) or triple (70/90/70)
Squeegee blade	Sharp
Squeegee angle	60+ degrees
Squeegee speed	Medium/fast
Cure temp	320 F (160 C) entire film
Extender	ProMatch Clear/Soft Hand Clear 10140
Reducer	Finesse #10150FNS
Storage	65-90 F (18-32 C). Avoid direct sun. Use within one year of receipt.
Wash-up	Wilflex Screen Wash
Health & Safety data	Available upon request

ORDER INFORMATION

GENESIS STANDARD PROCESS SET:

- 19850GNS Process Black
- 13850GNS Process White
- 49850GNS Process Magenta
- 69850GNS Process Cyan
- 89850GNS Process Yellow

GENESIS PROCESS TONE SET:

Create natural colors straight from the container.

- 49855GNS Process Tone Magenta
- 69855GNS Process Tone Cyan
- 89855GNS Process Tone Yellow
- Use with 19850GNS Black, 13850GNS White.

PROMATCH SET

- 19853GNS Black
- 49853GNS Magenta
- 69853GNS Cyan
- 89853GNS Yellow

EXTENDED GAMUT

Extended gamut refers to adding RGB to a CMYK palette. Wilflex recommends using the Tone Set with RGB colors:

- 47507GNSRGB Red
- 77507GNSRGB Green
- 67507GNSRGB Blue

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HEXACHROME

The hexachrome set is an independent color gamut.

- 87501GNSHX Hex Yellow C
- 37501GNSHX Hex Orange C
- 47501GNSHX Hex Magenta C
- 67501GNSHX Hex Cyan C
- 77501GNSHX Hex Green C
- 19501GNSHX Hex Black C

FIBRILLATION

Lower viscosity process inks are more prone to allowing fibers to be exposed during laundering. To combat this, use SuperGuard HT as an overprint.

The left side of the image at left was overprinted with SuperGuard

WHERE TO GET THE COLOR VALUES

The process color values for Wilflex inks are available on the Wilflex User's Manual CD-ROM, or download from the Wilflex's web site: www.wilflex.com.

SPECIAL RECOMMENDATIONS

- Use an appropriate underbase on colored fabrics.
- To ensure good quality separations, use a separator who specializes in the textile screen print industry.
- Line/mesh count relations of 55/305 (55/120) and 65/355 (65/140) have proven to be very effective at minimizing moire. Refer to information on half-tones in the Art Work section of the Wilflex User's Manual.
- Use consistent, high tensioned screen mesh to optimize performance properties.
- Retensionable frames that allow for work-hardening of the mesh fabric are recommended.
- Perform fusion tests before production. Failure to cure ink properly can result in poor wash fastness, inferior adhesion, unacceptable durability, and increased likelihood of dye migration. Testing procedures for plastisol fusion are outlined in the Wilflex User's Manual.
- Stir plastisols prior to printing.
- Do not dry clean, bleach, iron the printed area.
- Any application not referenced in this product information bulletin should be pre-tested or consultation sought with Wilflex Technical Services Department prior to printing (US - 800-735-4353)

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WILFLEX® GENESIS APPLICATIONS CHART

	Product Applications	Suggested Meshes threads/in / threads/cm	Suggested Squeegees durometer
GNS Colors †	wet-on-wet or over flashed white Omega or Olympia Plus on cotton Bright Tiger or Athletic White on 50/50	180-230 / 68-90 Underbase 110 / 43	60-70
GNS Super Colors (except Super Fluos) ††	wet-on-wet or dark substrate	86-125 / 34-49 Staggered by print order	65-70
	wet-on-wet over flashed white— Omega or Olympia Plus on cotton Bright Tiger or Athletic on 50/50	140-230 / 55-90 Underbase 140 / 55	65-70
	wet-on-wet over flashed clear— Miracle Clear 10160	140-180 / 55-73 Underbase 140 / 55	65-70
GNS Super Fluo	wet-on- wet over flashed white— Omega or Olympia Plus on cotton Bright Tiger or Athletic on 50/50	180-196 / 73-77 Underbase 86-110 / 34-43	65-70
GNS Process Colors †††	wet-on-wet on white or ecru	280-355 / 110-140	70-75

Special Notes

† evaluate opacity of colors

†† courser meshes earlier in print order

††† roller frames with high tension preferable; consistency, detail and precision are essential

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PRODUCT INFORMATION BULLETIN

WILFLEX® MSH NYLON SERIES

DESCRIPTION

Wilflex's MSH Series is designed to direct print on 100 percent Nylon Open Mesh offering:

- High gloss
- Excellent durability
- Superior adhesion
- Creamy viscosity suitable for manual or automatic printing
- 15 MSH Mixing Colors (MX Color) produce simulations of coated and uncoated PANTONE® Color Formula Guide colors.
- MSH-MX Kits- starter kits available
- PC Users: 11422MSH Nylon Mesh Base can used with the PC Express Mixing System to simulate PANTONE colors.
- Formulated as the alternative to Pennant Athletic Inks

PRINTER'S PARAMETERS

Substrates	100% nylon
Bleed resistance	Excellent
Mesh	40-160 t/in (15-61 t/cm)
Stencil emulsion	Conventional direct or capillary films
Squeegee type	60 to 90 durometer, straight edge blade
Cure temp	325 F (163 C) entire film
Extender/Base	11422MSH Nylon Mesh Base
Reducer	10025VB Viscosity Buster. Use 1- 3% max by weight. Do not exceed recommended amount.
Storage	65-90 F (18-32 C). Avoid direct sun. Use within one year of receipt.
Wash-up	Wilflex Screen Wash
Health & Safety data	Available upon request. Formulated to comply with EN71 and ASTM F9-63.

MIXING COLOR GUIDELINES

MSH Mixing colors are created to mirror MX Mixing colors. For Pantone simulations, simply follow the MX formulas in the Wilflex MX Formula Guide. MSH formulas that reproduce PANTONE® color simulations have been calculated by weight and are presented as a total of 1,000 grams in the Formulation Guide. The final volume of ink produced from these formulas will vary according to color and the specific gravity of the ink concerned, but all formulas will make approximately 1 quart/1 liter.

PC USERS: 11422MSH Nylon Mesh Base can be used with Wilflex Pigment Concentrates. Generally, a 20% maximum pigment loading is suggested. However, we recommend the use of a PC to Base Ratio Chart or IMS (Wilflex Ink Management Software) to calculate the maximum loading for each pigment.

Wilflex recommends that MSH Mixing Inks be weighed on scales accurate to +/- 0.1 gram. Proof formulas prior to commencing any production run to ensure color accuracy, as the final color is dependent on print technique, mesh count and substrate used. PolyOne and its associated companies assume no responsibility for the actual color achieved.

COLOR SPECIFICATION

MX formulas were printed through a 156 t/in (62 t/cm) mesh screen and viewed under cool white fluorescent (4100K illuminant). These specifications were used internally at Wilflex for

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all PANTONE simulation color approvals. Similar print application, screen mesh, squeegee profile and light specifications should be implemented in your shop to ensure comparable results. Remember, any variation in screen mesh and application can vary depth of color and opacity. We recommend that you maintain a color library of your prints. By keeping prints achieved under various conditions and on differing substrates, it is possible to build your own reference library of color and data.

SPECIAL RECOMMENDATIONS

- Inks produced using the MSH Mixing System are translucent to opaque. When blended according to formulations, resulting colors vary in opacity from translucent to semi-opaque.
- If your application requires Non-migrating Pigments, please contact Wilflex Technical Services for custom blending.
- Colors will reproduce best on white or light fabrics.
- 11888MSH is used as a Mixing White. For High Opacity Nylon Mesh Printing, 11000PEN Pennant White is suggested.
- Perform fusion tests before production. Failure to cure ink properly can result in poor wash fastness, inferior adhesion and unacceptable durability. Testing procedures for plastisol fusion are outlined in the Wilflex User's Manual.
- Stir plastisols prior to printing.
- Do not dry clean, bleach, or iron the printed area.
- Any application not referenced in this product information bulletin should be pre-tested or consultation sought with Wilflex Technical Services Department prior to printing (US - 800-735-4353).
- MSH inks WILL NOT adhere to nylon jackets and other water repellent fabrics without the addition of a Hugger catalyst. Prior to production, always PRETEST for adhesion!

ORDERING INFORMATION

11888MSH Nylon White	78888MSH Nylon Green
19888MSH Nylon Black	88888MSH Nylon Yellow
38888MSH Nylon Orange	98888MSH Nylon Fluorescent Yellow
48888MSH Nylon Red (Blue Shade)	98884MSH Nylon Fluorescent Red
48889MSH Nylon Magenta	98880MSH Nylon Fluorescent Pink
58888MSH Nylon Violet	98886MSH Nylon Fluorescent Blue
68888MSH Nylon Marine (Red Shade)	98885MSH Nylon Fluorescent Purple
68889MSH Nylon Blue (Green Shade)	

SOLD SEPARATELY

- MSH Starter Kit - contains 1 quart of each color, 1 gallon 11888MSH White, formulations, PANTONE® Color Formula Guide and IMS software.
- MSHGKit - contains 1 gallon of each color, 1x5 of 11888MSH, formulations, PANTONE® Color Formula Guide and IMS software.
- IMS Software - Windows-based software containing all formulations or download recipes from www.wilflex.com
- PowerPax - Buy an MSH kit, plus software and a scale for one low price. 7,500- and 1,000-gram capacity scales available.

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WILFLEX® MSH NYLON SERIES

11422MSH Nylon Mesh Base

The PC Base Ratio Chart is used to calculate the recommended minimum and maximum amount of PC used with11422MSH Nylon Mesh Base. Generally a 20 percent PC may be added, but we strongly recommend the use of this chart when formulating new recipes. All Pigments have different plasticizer levels and the published ratios allow for maximum pigment loading when necessary to achieve desired results. There is no Maximum amount of base required for 11422 MSH. The base will cure on its own. The IMS software will automatically calculate mins and max base requirements.

Example of a test formula using the chart to manually calculated the minimum amount of base required. This will result in most opaque color and most expensive!

Test Blue		Ratio		
11422MSH Nylon Mesh Base	500 grams			
10110PC Extra White PC	150 grams	1.51	=	226.5
11650PC Marine Blue PC	50	2.69	=	134.5
Min. amt of base required				361.0 grams

The example shows that the base amount of 500 grams is ample. The minimum amount required is 361.

WILFLEX® PC/ BASE Ratio Chart

PC Code	PC Description	Minimum Amount of Base per Gram of PC
10000PC	Clear PC	5.75
10110PC	Extra White PC	1.51
10470PC	Magenta PC	4.67
10570PC	Violet PC	5.56
10680PC	Blue PC	4.88
10700PC	Green PC	4.41
10940PC	Velvet Black PC	5.00
10970PC	Black PC	5.65
11650PC	Marine Blue PC	2.69
18000PC	Electron Yellow PC	2.78
18010PC	Electron Blue PC	2.63
19040PC	Fluo Pink PC	2.64
19050PC	Fluo Neon PC	2.66
18060PC	Electron Red PC	2.63
19080PC	Fluo Purple PC	3.07
10490PC	Venus PC (Blue shade Red) Non- Migrating	3.68
11840PC	Mars PC (Yellow) Non- Migrating	4.37
11830PC	Jupiter PC (Golden Yellow) Non- Migrating	3.68
10390PC	Pluto PC (Yellow Shade Red) Non- Migrating	1.79

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PRODUCT INFORMATION BULLETIN

WILFLEX® ONE-STEP NYLON INK

GENERAL DESCRIPTION Wilflex One-Step Nylon Ink was formulated to print onto "untreated" nylon substrates. The ink can be used like a standard plastisol ink and will not dry in the screen or harden in the container. OSN inks flash quickly to allow multi-color production, with cure/gel temperatures for the inks of 300 F (149 C).

RECOMMENDED SUBSTRATES Any nylon fabric - ranging from coarse deniers used in back-packs & luggage to the finer deniers used in garments/umbrellas. One-Step Nylon should not be used on waterproofed satin jackets or when printing onto water-proofed nylon materials. If the nylon material to be printed has been treated to repel water, the waterproofing must be removed and the addition to ink of Hugger catalyst at 10 percent by weight will be necessary. The ink will adhere to 100 percent polyester fabrics but pre-printing and testing for bleed resistance are necessary to determine overall results. **All garments/fabrics should be tested thoroughly to determine the fusion parameters.**

PRINTING RECOMMENDATIONS Mesh: 60-110 threads/in (24-43 threads/cm) for OSN white. 110-195 threads/in (43-77 threads/cm) for OSN colors. Squeegee: 60 to 90 durometer, straight edge blade. Emulsion: Conventional direct or capillary films. Caution: Special pigments are required to manufacture One Step Nylon fluorescent colors. When these fluorescent colors are printed on top of a flashed white, there will be improved opacity and no reaction between colors. However, if white (or any non-opaque color) is printed on top of a fluorescent color, color migration will occur. To avoid this, do not trap or overprint on fluorescent colors.

CURING Gel or Flash Cure: 155 F (168 C). Due to differences in power, height above ink film, and efficiency of flash unit, a specific dwell time for flashing cannot be given. Field testing showed significantly faster flash times than any catalyzed system presently available. Full Cure: 300 F (149 C). Failure to cure ink properly causes poor wash fastness and unacceptable adhesion.

MODIFIERS This product should be used straight out of the container. If there are process applications, extend with One Step Nylon Extender. NOTE: Always stir before use. This product has a unique surface tension. Upon opening a container that has been unused for several days or weeks, it will appear to have aged or thickened. A quick stirring immediately will restore the creamy texture.

WASH-UP Hot cleaning solvents (containing Toluene, Xylene, and Acetone etc.) will react with this ink causing hardening in the screen. Cleaning with mineral spirits is recommended.

HEALTH AND SAFETY Complete Health and Safety Data available upon request.

STORAGE Recommended storage temperature is 65-90 F (18-32 C). Avoid storing in direct sunlight or in extreme temperature conditions. It is recommended that Wilflex products be used within one year of receipt of product. Inks subjected to extreme temperatures or prolonged shelf life could thicken in the container.

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One-STEP *Nylon Adhesion Information*

1. If the nylon material to be printed has been treated to repel water, the waterproofing must be removed and the addition of Wilflex Hugger catalyst will be necessary.
2. Test for water repellence with a drop of water on the fabric surface. Zero water penetration and a ready flow over the surface indicate a water repellence treatment.
3. Facilitate adhesion to these garments by:
   a. Sending the unprinted garment down the dryer belt.
   b. Wiping the print area with Acetone or rubbing alcohol. Reminder: Acetone and alcohol are flammable. Evaporate completely from the fabric before running through a dryer.
   c. Mixing in Hugger catalyst into the OSN ink, 10 percent by weight.
   d. All of the above.
4. Cure temperature of 300 F (149 C) will give best adhesion.
5. ALWAYS pre-print and test for adhesion BEFORE printing production run. Contact Wilflex Technical Service for further information.

You MUST use a catalyst such as Wilflex Hugger catalyst when printing on waterproofed nylon materials.

Great for Bags!

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ONE STEP NYLON Colors

11000	White
19000	Black
23800	Spice Brown
30200	Bright Orange
40000	Scarlet
40700	Brock Red
45400	Maroon
50400	Russell Purple
60000	Navy Blue
60650	Contact Blue
62100	Light Royal
70000	Kelly Green
80000	Gold
80100	Light Gold
81000	Lemon Yellow

ONE STEP NYLON Process Colors

19850	Process Black
49850	Process Magenta
69850	Process Cyan
89850	Process Yellow


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WILFLEX® TRANSFLEX® APPLICATIONS CHART

	Application	Features/Benefits	Screen Mesh Sizes Screen Tension Squeegee Types Gel Temps * Fusing Ranges *
TF Super Opaque Inks	Cotton-Cotton Polyester-Cotton Polyester blends Polyester-Denim Drill Uncoated Lycra	Soft feel inks for use on dark and light colored fabric/garments. Durable wash properties. No white under color to achieve opacity.	60-110 mesh 10-25 newtons 60-75 squeegee 210-250 F 370-375 F
TF Soft Inks	Cotton-Cotton Polyester-Cotton Polyester blends Denim Drill Uncoated Lycra	Formulated for soft-feel-hot split (hot-peel) Inks on light or pastel colored fabric garments. Durable wash properties.	60-156 mesh 10-25 newtons 60-75 squeegee 210-250 F 370-375F
TF Tuf Puff (Transfer Puff)	100% Cotton Cotton-Polyester 100% Polyester	Formulated for hot-split (hot peel) puff transfers. Ready to use straight from the container. No need for adhesive particle powder.	60-110 mesh 10-25 newtons 60-75 squeegee 210-220 F 370-375 F
TF 4-Color Process	Cotton Cotton-Polyester 100% Polyester	Produce half-tone transfer inks. Produce hot-split (hot peel) fine line graphics and photographic reproduction transfers. Durable wash properties.	305-355 mesh 15-35 newtons 75-85 squeegee 210-250 F 370-375 F
TF Shimmers	Cotton Cotton-Polyester 100% Polyester Denim Drill	A hot-split (hot peel) shimmer ink system. Highly opaque silver shimmer can have pigment concentrate (PC) added to ink to extend color range. Highly durable wash/ink properties.	60-110 mesh 10-25 newtons 60-75 squeegee 210-250 F 370-375 F
TF 10007 Clear	Hot-split coating onto most uncoated papers to extend the hot-split feel properties.	Base carrier clear for 4-color process colors and fluorescent colors. Highly durable clear coat system can be used as a clear adhesive for most TF inks.	305-355 mesh 15-35 newtons 75-85 squeegee 210-250 F 370-375 F
TF Printable Adhesive 10210TF	Used as an over print or under print coating adhesive for all TF inks. Also for metallic foil adhesive.	Acts as a printable adhesive to be printed on all TF inks to enhance adhesion to garment. Hot-split or cold peel ink system.	60-86 mesh 10-25 newtons 60-75 squeegee 210-250 F 370-375 F
TF Super, Soft, Tuf Puff, 4-Color Process	Use these inks in combination with all other TF systems.	Use in a combination graphic to enhance all aspects of the transfer graphic design	60-355 mesh 10-25 newtons 60-85 squeegee 210-250 F 370-375 F

*Key for Celsius: (210-250 F=99-121 C); (340-345 F=171- 174 C); (370-375 F=188-191 C)

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PRODUCT INFORMATION BULLETIN

WILFLEX® TRANSFLEX® SUPER

Super Opaque Heat Transfer Ink

GENERAL DESCRIPTION Transflex Super is a soft-feel, hot-split transfer ink formulated to give the appearance of a direct print. Transflex Super colors give excellent opaque prints on dark fabrics and also offer wide improvements in printability and transfer latitude over conventional hot-split transfer inks. Using Transflex Super ink, the printer is able to produce high definition transfers using fine screen meshes without losing opacity. Transflex Super also can be used to produce conventional cold-peel transfers. Transflex is recognized as the industry's number one super opaque hot-split transfer ink!

RECOMMENDED SUBSTRATES Knitted fabrics, cotton, linens, polyester, polyester blends and rayon. Transflex Super is NOT recommended for woven nylon or lycra fabrics. The use of TF Printable Adhesive 10210TF will improve the adhesion of Transflex inks to a far wider range of substrates when cold peeled. **Pre-print, transfer and test all fabrics for desired properties before beginning production printing.** The user should examine the fabric type and color before and after application of the transfer, as color distortion of the garment may occur due to the introduction of heat to sensitive fabric types and dye-stuffs inherent in the garment.

PRINTING AND TRANSFERRING RECOMMENDATIONS Mesh: High opacity transfers require a 60-86 threads/in (24-34 threads/cm) mesh screen. Finer meshes such as 110-195 threads/in (43-77 threads/cm) can be used when transferring to a lighter colored substrates or for producing fine detail prints. Transflex Super transfers should be transferred at 365-375 F (185-190 C) for five to seven seconds at 40-45 PSI. The transfer paper should be peeled immediately for optimum results. When producing cold-peel transfers, allow the transfer to cool for approximately 15 seconds before removing the paper. Emulsion: Solvent-resistant direct emulsions or capillary films.

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RECOMMENDED TRANSFER PAPERS Transfer papers recommended and supplied by Wyndstone Heat Transfer Papers and Hobart-McIntosh can be used in association with this ink system. Other paper types can be used with confidence, but when evaluating inks for transfers, printers should obtain current information about coated and non-coated paper types from these manufacturers before proceeding with transfer manufacture. Wilflex Technical Services can provide more information on the use of transfer papers. See the "Transfer Papers" section in the Wilflex User's Manual for information on the care and use of transfer papers.

CURING Gel: All Transflex Super inks should be passed through the dryer or gelled at temperatures between 195-230 F (90-110 C). These temperatures will partially cure the ink film. It is important to stay within this temperature range as lower temperatures will result in a transfer with little tensile strength and higher temperatures will negatively effect the "split" of the final transfer.

WASH FASTNESS Transfers produced with Transflex Super ink possess good washability. Transflex transfers should only be ironed from the reverse side of the garment and never dry-cleaned.

MODIFIERS Small amounts of Reducer #1 (3 to 5 percent by weight) may be added to Transflex Super Inks to aid in the breakdown of the false body that builds up over time.

WASH-UP Conventional solvents or Wilflex Screen Wash.

HEALTH AND SAFETY Complete Health and Safety Data available upon request.

STORAGE Recommended storage temperature is 65-90 F (18-32 C). Avoid storing in direct sunlight or in extreme temperature conditions. It is recommended that Wilflex products be used within one year of receipt of product. Inks subjected to extreme temperatures or prolonged shelf life could thicken or expand in the container.

WILFLEX® TRANSFLEX® SOFT

Semi-Opaque Heat Transfer Ink

GENERAL DESCRIPTION Transflex Soft is a soft-feel, hot-split transfer ink formulated to print on white or pastel substrates. Transflex Soft Process Colors allow four-color process transfer prints to be produced with or without a clear back-up ink. Transflex Soft inks also may be used for conventional cold-peel transfers.

RECOMMENDED SUBSTRATES Knitted fabrics, cotton, linens, polyester blends and rayon. Transflex Soft is NOT recommended for woven nylon or lycra fabrics. The use of Transflex Printable Adhesive 10210TF will improve the adhesion of Transflex inks to a far wider range of substrates when cold peeled. **Pre-print, transfer and test all fabrics for desired properties before beginning production printing.** The user should examine the fabric type and color before and after the application of the transfer, as color distortion of the garment may occur due to the introduction of heat to sensitive fabric types and dye-stuffs inherent in the garment. See the "Evaluating Plastisol Inks" section of the Wilflex User's Manual for testing procedures.

PRINTING AND TRANSFERRING RECOMMENDATIONS Mesh: Standard opacity transfers require a 60-86 threads/in (24-34 threads/cm) mesh screen. Finer meshes such as 110-195 threads/in (43-77 threads/cm) can be used when transferring on to lighter colored substrates or for producing fine detail prints. Transflex Soft transfers should be transferred at 365-375 F (185-190 C) for 5 to 7 seconds at 40-45 PSI. The transfer paper should be peeled immediately after transferring for optimum results. When producing cold-peel transfers, allow the transfer to cool for approximately 15 seconds before removing the paper. Emulsion: Solvent-resistant direct emulsions or capillary films are recommended.

RECOMMENDED TRANSFER PAPERS Transfer papers recommended and supplied by Wyndstone Heat Transfer Papers and Hobart-McIntosh can be used in association with this ink system. Other paper types can be used with confidence, but when evaluating inks for transfers, printers should obtain current information about coated and non-coated paper types from these manufacturers before proceeding with transfer manufacture. Wilflex Technical Services can provide more information on the use of transfer papers. See the "Transfer Papers" section in the Wilflex User's Manual for information on the care and use of transfer papers.

CURING Gel: All Transflex Soft inks should be passed through the dryer or gelled at temperatures between 195-230 F (90-110 C). These temperatures will partially cure the ink film. It is important to stay within this temperature range as lower temperatures will result in a transfer with little tensile strength and higher temperatures will negatively effect the "split" of the transfer.

WASH FASTNESS Transfers produced with Transflex Soft ink possess good washability. Transflex transfers should only be ironed from the reverse side of the garment and never dry-cleaned.

MODIFIERS Small amounts of Reducer #1 (3 to 5 percent by weight) may be added to Transflex Soft inks to aid in the breakdown of the false body that builds up in plastisols over a period of time.

WASH-UP Clean screens with conventional solvents or Wilflex Screen Wash.

HEALTH AND SAFETY Complete Health and Safety Data available upon request.

STORAGE Recommended storage temperature is 65-90 F (18-32 C). Avoid storing in direct sunlight or in extreme temperature conditions. It is recommended that Wilflex products be used within one year of receipt of product. Inks subjected to extreme temperatures or prolonged shelf life could thicken or expand in the container.

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TRANSFLEX® TUF ONE PACPUFF
TUF NEUTRAL BASE #10480TUF
TUF WHITE #11000TUF
TUF CREAM #12520TUF

One **P**uff, **A**dhesive, **C**olor...All in ONE can and ready to use.

GENERAL DESCRIPTION Tuf One Pacpuff produces multi-dimensional graphics, either as an all-in-one puff ink or as an under-print to the standard Transflex hot-split inks. The puffed ink gives a suede feel and an embossed puff effect. Tuf One Pacpuff has tough adhesive properties, without the application of particle adhesive, to adhere the puff to the garment. Tuf One Pacpuff is available as a neutral base that can be used on its own, or by the introduction of 5-8 percent of pigment concentrate (PC) by weight to create colored puff. Tuf One Pacpuff White can be used as a super white puff ink on its own, or as a puff back-up ink to any Transflex hot-split Ink. Tuf One Pacpuff ink can be used right out of the container, without the application of particle adhesive powder to adhere the puff to the garment.

RECOMMENDED SUBSTRATES 100 percent cotton, cotton/polyester blends, polyester, rayon and linen. **Pre-print, transfer and test all fabrics for desired properties before beginning production printing.** The user should examine the fabric type and color before and after the application of the transfer, as color distortion of the garment may occur due to the introduction of heat to sensitive fabric types and dye-stuffs inherent in the garment. See the "Evaluating Plastisol Inks" section of the Wilflex User's Manual for discoloration testing procedures.

PRINTING AND TRANSFERRING RECOMMENDATIONS Mesh: 74-86 threads/in. (24-34 threads/cm) Emulsion: Conventional direct emulsions and capillary films.

RECOMMENDED TRANSFER PAPERS Transfer papers recommended and supplied by Wyndstone Heat Transfer Papers and Hobart-McIntosh can be used in association with this ink system. Release-coated transfer papers have produced the best overall puff transfer results. Other paper types can be used with confidence, but when evaluating inks for transfers, printers should obtain current information about coated and non-coated paper types from these manufacturers before proceeding with transfer manufacture. Wilflex Technical Services can provide more information on the use of transfer papers. See the "Transfer Papers" section in the Wilflex User's Manual for information on the care and use of transfer papers.

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CURING Gel Temp: Be sure not to "over gel" the puff ink on the transfer paper. A suggested gel temperature of 190-215 F (88-102 C) is recommended. Should the puff ink be allowed to exceed the recommended gel temperatures, the "hot" release of the puff ink from the transfer paper, at the transfer heat-pressing stage and the adhesion properties when applied to the fabric, will be significantly reduced. The surface feel of the puff ink following ink gelation should feel smooth to touch. If the ink surface feels coarse and the puff has embossed on the paper, then the puff ink gelation temperature needs to be reduced. If 10007TF TransClear is printed first down, this will give extended stretch and wash durability to the puff transfer when heat-fused onto fabric. Print the 10007TF TransClear using a 305 screen mesh. The heat press should be set at a temperature range of 375-385 F for 5-7 seconds, 40-45 psi for a hot-peel transfer.

MODIFIERS Small amounts of Reducer #1 (1-3 percent by weight) can be added to the puff ink to assist the breakdown of the ink's body that builds up in the inks over time.

COLOR RANGE Transflex Tuf One Pacpuff Ink is available in a base, white and cream ink. Puff colors are obtained by introducing a Wilflex pigment concentrate 5-8 percent by weight into the Tuf One Pacpuff.

WASH-UP Conventional solvents or Wilflex Screen Wash.

HEALTH AND SAFETY Complete Health and Safety Data available upon request.

STORAGE Recommended storage temperature is 65-90 F (18-32 C). Avoid storing in direct sunlight or in extreme temperature conditions. It is recommended that Wilflex products be used within one year of receipt of product. Inks subjected to extreme temperatures or prolonged shelf life could thicken or expand in the conta iner.

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WILFLEX® TRANSFLEX® PROCESS INKS

Heat Transfer Inks

GENERAL DESCRIPTION Wilflex TransFlex Process colors have been specially formulated to produce 4-color process heat release transfers. Superb color can be achieved when using either full photographic or airbrush quality graphics. The TransClear Process colors have enhanced properties over the outgoing 10007TF Clear and associated process colors. The four process colors are: 19000TF Black, 49858TF Process Magenta, 69858TF Process Blue and 89858TF Process Yellow. The carrier for the Pigment Concentrates (PCs) is 10007TF TransClear. Spectral data is available for these colors.

RECOMMENDED SUBSTRATES Cotton, cotton blends, rayon, linen and lycra. We do not recommend these inks on nylon or satin. **Pre-print and test all fabrics for dye bleeding, ink adhesion, wash fastness and other desired properties.** The user should examine the fabric type and color before and after the application of the transfer, as color distortion of the garment may occur due to the introduction of heat to sensitive fabric types and dye-stuffs inherent in the garment. See the "Evaluating Plastisol Inks" section of the Wilflex User's Manual for discoloration testing procedures.

PRINTING RECOMMENDATIONS Mesh: Depends on the graphic reproduction required and film seperation designation. A recommended mesh type is between 140-255 threads/in (54-140 threads/cm). A standard printing sequence for the process colors is as follows: 1) Black, 2) Blue, 3) Magenta, 4) Yellow. If the Transclear 10007TF is used as the hot-peel coat, be sure that the TransClear is printed FIRST on the paper. The process colors are then printed on top of the first-down TransClear. The recommended screen mesh for the first-down TransClear is 305-355 threads/in (120-140 threads/cm). Emulsion: Solvent-resistant direct emulsions and capillary films are recommended.

RECOMMENDED TRANSFER PAPERS The majority of the standard transfer papers can be used with confidence. If a softer feel transfer is required, an uncoated transfer paper is suitable, especially if TransClear is printed on the paper first. In most cases, a hot-split/hot-peel transfer paper will be required. Wilflex Technical Services can provide more information on the use of transfer papers. See the "Transfer Papers" section in the Wilflex User's Manual for information on the care and use of transfer papers.

CURING Gel Temps: 210-260 F (99-127 C). It is important to stay within this temperature range because a temperature that is too low will result in a transfer with little strength and a temperature that is too high negatively affects the split of the final transfer. Adjustments to the drying mechanism may be required as the variables of different (heat/drying) types, will affect the overall transfer finish.

WASHFASTNESS Transfers produced with TransFlex Process inks possess

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good tensile strength and washability. TransFlex transfers should be ironed only from the reverse side of the garment and never dry-cleaned.

TRANSFER HEAT-PRESS Transflex Four Color Process hot-split inks should be heat-pressed onto fabric at a temperature of 375 F (190 C) for 7-10 seconds at a pressure setting of 45 PSI (medium-firm pressure).

WASH-UP Conventional solvents or Wilflex Screen Wash.

HEALTH AND SAFETY Complete Health and Safety Data available upon request.

STORAGE Recommended storage temperature is 65-90 F (18-32 C). Avoid storing in direct sunlight or in extreme temperature conditions. It is recommended that Wilflex products be used within one year of receipt of product. Inks subjected to extreme temperatures or prolonged shelf life could thicken or expand in the container.

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WILFLEX® TRANSFLEX® ULTRA GOLD SHIMMER #85570TF SILVER SHIMMER #15370TF

Heat Transfer Inks

GENERAL DESCRIPTION Transflex Shimmer inks are soft-feel, hot-split transfer inks especially formulated to print on most substrates. Transflex Shimmer inks offer improvements in printability and transfer latitude over conventional hot-split inks and produce superb shimmer-shine hot-split transfers on dark fabric. Transflex Shimmer inks may also be used for conventional cold-peel transfers. Wilflex PCs can be added to the Silver Shimmer to create interesting shimmer colors.

RECOMMENDED SUBSTRATES Transflex Shimmer inks are intended for use on knitted fabrics, cotton, linens, polyester blends and rayon. Transflex Shimmer inks are NOT recommended for woven nylon or lycra fabrics. The use of Transflex Printable Adhesive 10210TF will improve the adhesion of Transflex inks to a far wider range of substrates when cold peeled. **Pre-print, transfer and test all fabrics for desired properties before beginning production printing.** Users should examine the fabric type and color before and after the application of the transfer, as color distortion of the garment may occur due to the introduction of heat to sensitive fabric types and dye-stuffs inherent in the garment. See the "Evaluating Plastisol Inks" section of the Wilflex User's Manual for discoloration testing procedures.

PRINTING AND TRANSFERRING RECOMMENDATIONS A 60-86 threads/in (24 -34 threads/cm) mesh screen is recommended to allow metallic particles to flow easily. Transflex Shimmer transfers should be transferred at 365-375 F (185-190 C) for 5 to 7 seconds at 40-45 PSI. The transfer paper should be peeled immediately after transferring for desired split. When producing cold-peel transfers, allow the transfer to cool for approximately 15 seconds before removing the paper. Emulsion: Solvent-resistant direct emulsions or capillary films are recommended.

RECOMMENDED TRANSFER PAPERS Transfer papers recommended and supplied by Wyndstone Heat Transfer Papers and Hobart-McIntosh can be used in association with this ink system. Other paper types can be used with confidence, but when evaluating inks for transfers, printers should obtain current information about coated and non-coated paper types from these manufacturers before proceeding with transfer manufacture. Wilflex Technical Services can provide more information on the use of transfer papers. See the "Transfer Papers" section in the Wilflex User's Manual for information on the care and use of transfer papers.

CURING Gel Temps: All Transflex Shimmer inks should be passed through the dryer or gelled at temperatures between 195-230 F (90-110 C). These temperatures will partially cure the ink film. It is important to stay within this temperature range as lower temperatures will result in little tensile strength and higher tempera-

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tures will negatively effect the "split" of the final transfer.
wash fastness Transfers produced with Transflex Shimmer Inks possess good washability. Transflex transfers should be ironed only from the reverse side of the garment and never dry-cleaned.

MODIFIERS Small amounts of Reducer #1 (3 to 5 percent by weight) may be added to Transflex Shimmer Inks to aid in the breakdown of the false body that builds up in plastisols over time.

HEALTH AND SAFETY Complete Health and Safety Data available upon request.

STORAGE Recommended storage temperature is 65-90 F (18-32 C). Avoid storing in direct sunlight or in extreme temperature conditions. It is recommended that Wilflex products be used within one year of receipt of product. Inks subjected to extreme temperatures or prolonged shelf life could thicken or expand in the container.

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TRANSFLEX® #10007TF TRANSCLEAR

The Clear Choice for Extending Your Transfer Ink Capabilities

Use Transflex 10007TF Clear as a clear backer to all the Transflex inks to extend the wash and durability of every transfer.

Use 10007TF Clear as a first down print for transfer four color process transfers. This clear gives superb color contrast and keeps the half-tone dot in definition.

Use 10007TF Clear as a first down or last down print for Transflex One PacPuff. It extends the stretch and wash durability of the puff.

When using 10007TF Clear as a first down print for Transflex colors, four color process and One PacPuff transfers, be sure to use a 355-365 half-tone screen mesh.

WILFLEX® TRANSFLEX® PRINTABLE ADHESIVE #10210TF

Enhances Adhesion to Substrates and Metallic Foils

Transfers backed up with Transflex Printable Adhesive will have excellent adhesion to a wide range of substrates, improved stretch and washability to 204 F (95 C). Printable Adhesive is printed last over all Transflex colors in a screen printed design to enhance adhesion.

Transfers backed with Transflex Printable Adhesive will have excellent latitude and can be transferred at temperatures between 350 and 400 F (175 and 200 C). Transflex Printable Adhesive will gel at temperatures between 212 and 245 F (100 - 120 C).

Transfer Adhesive powder is also available. Powder can be sprinkled on back of wet ink surface to promote better adhesion of the inks onto fabrics.

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WILFLEX® TRANSFLEX®
LITHOPRINT WHITE #11620TF

DESCRIPTION Transflex Lithoprint White is a plastisol screen printing ink formulated as an overprint white ink for offset lithographic four-color process transfers. Lithoprint White provides the litho process decal inks with excellent cross-linking properties, color and adhesion strength as well as washfastness. TF Lithoprint White can be heat transferred using a conventional heat-press and standard cool/cold-peel method of transfer application.

PRINTER'S PARAMETERS

Substrates	100% cotton, cotton blends, polyester, rayon, linens. Not recommended for woven nylon or Lycra fabrics.
Mesh	76-86 t/in (24-34 t/cm)
Stencil emulsion	Direct, indirect & capillary
Squeegee type	70 durometer
Squeegee blade	Slightly rounded
Gel temp	215-230 F (85-90 C)
Transfer temp	350-375 F (180-190 C)
Transfer time/pressure	10-12 seconds at 40 PSI
Extender	None
Reducer	3-5 percent (by weight) Reducer #1
Storage	65-90 F (18-32 C). Avoid direct sun. Use within one year of receipt.
Wash-up	Wilflex Screen Wash
Health & Safety data	Available upon request

FEATURES

- Excellent cross-linking properties
- Good color and adhesion strength
- Cold-peel transfer

SPECIAL RECOMMENDATIONS

- The use of TF Printable Adhesive as an additional print will improve adhesion of the litho back white on stretchable fabric surfaces
- The user should examine the fabric type and color before and after the application of the transfer, as color distortion of the garment may occur due to the introduction of heat to sensitive fabric types and dye-stuffs inherent in the garment.
- Perform fusion tests before production. Failure to cure ink properly can result in poor wash fastness, inferior adhesion, unacceptable durability, and increased likelihood of dye migration. Testing procedures for plastisol fusion are outlined in the Wilflex User's Manual.
- Stir plastisols prior to printing.
- Do not dry clean, bleach or iron the printed area.
- Any application not referenced in this product information bulletin should be pre-tested or consultation sought with Wilflex Technical Services Department prior to printing (US - 800-735-4353).

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TRANSFLEX

TROUBLESHOOTING

NO OPACITY:
- Ink deposit too thin
- Color not opaque
- Ink over-gelled
- Too much press:
  - Time
  - Temperature
  - Pressure

PENETRATION:
- Too much application time/temperature
- Ink viscosity too low
- Fabric very thin
- Over or under gel

NO ADHESION:
- Ink over-gelled
- Pressure too low
- Application time/temp too low
- Weave too tight
- Synthetic weave
- Try Transflex Adhesive
- Check paper type
- High moisture content in transfer release paper

NO ADHESION AT ONE OR MORE EDGES:
- Transfer press too small
- Image too close to edge
- Pressure is marginal
- Ink too thick at edge
- Delay before peeling
- Check paper type

COBWEBBING-STRINGING:
- Inadequate ink flow
- Delay before peeling
- Image edges sawtoothed
- Application time, temp., pressure low

HARSH HAND:
- Ink deposit too thick
- Poor stencil quality
- Ink too thick when printing
- Check paper type
- Delay before peeling

POOR TRAPPING:
- Keyline deposit too thin
- Squeegee edge too sharp
- Squeegee durometer too high

BLURRING SECONDARY COLORS:
- No space between colors
- Printing on contact
- Printing on soft surface
- Squeegee pressure too high
- Ink deposit too heavy

UNEVEN OR PARTIAL SPLIT: LOW PRESSURE
- Remove moisture from fabric
- Application time/temperature too low
- Cool spot on platen
- No ink flow
- Marginal overcure
- Delay before peeling
- Overall faulty press, ink on heat plate
- Check paper type

POOR SHELF LIFE OF PRINTED TRANSFERS:
- Paper absorbing plasticizer
- Transfer over gelled
- Transfers stored in extreme temps
- Transfer under gelled
- Check paper type

SUBSEQUENT SHIRTS IMPROVE:
- Pre-heat transfer press

MIS-REGISTER:
- Paper not pre-shrunk/shrink @ 260 F/132 C
- Excess off contact
- Changed grain direction
- Varying gel temperatures
- Humidity change in stock paper

CAN'T HOLD DETAIL:
- Mesh too coarse
- Stencil low quality
- Excess squeegee pressure
- Ink too fluid
- Paper movement
- Inadequate off-contact

There are many variables affecting the resulting deposit of Transflex ink, including: screen tension, emulsion/stencil preparation, squeegee durometer, squeegee angle & printing speed. Please contact your Wilflex representative, Technical Services or the Transflex Product Manager for further information.

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TRANSFLEX SUPER Standard Colors

11000	Super White
11010	Premium White
23801	Super Spice Brown
30402	Super Dolphin Orange
34802	Super Clock Orange
40500	Super Red
42270	Super Drake Red
47030	Super Fuchsia
57010	Super Purple
67040	Super Bright Blue
67050	Super Royal
70501	Super Dallas Green
75301	Super Turquoise
75601	Super Spring Green
80101	Super Light Gold
87020	Super Lemon Yellow

TRANSFLEX SOFT Standard Colors

14600	Soft Dark Grey
19000	Soft Black
20100	Soft Dark Brown
23800	Soft Spice Brown
30200	Soft Bright Orange
30400	Soft Dolphin Orange
40000	Soft Scarlet
40160	Soft Panther Pink
44700	Soft Winter Red
45800	Soft Russell Cardinal
47031	Soft Fuchsia
47060	Soft Deep Red
50200	Soft Purple
60000	Soft Navy
60650	Soft Contact Blue
62100	Soft Light Royal
68500	Soft Winter Blue
70000	Soft Kelly
70500	Soft Dallas Green
75300	Soft Turquoise
80100	Soft Lt. Gold
81000	Soft Lemon Yellow
87700	Soft Sunshine
90000	Soft Fluo. Yellow
90100	Soft Fluo. Blue
90200	Soft Fluo. Green
90300	Soft Fluo. Orange
90400	Soft Fluo. Pink
90500	Soft Fluo. Neon
90600	Soft Fluo. Red
90700	Soft Fluo. Magenta

TRANSFLEX SOFT Standard Process Colors

19000	Black
49858	Process Magenta
69858	Process Blue
89858	Process Yellow

TRANSFLEX SHIMMER Standard Colors

15370	Silver Shimmer
85570	Ultra Gold Shimmer

TRANSFLEX LITHOPRINT White

11620	Lithoprint White

TRANSFLEX BASE AND CLEAR

10440	TF Base
10007	TransClear

TRANSFLEX TUF ONE PACPUFF Colors

11000	TF Tuf Puff White
12520	TF Tuf Puff Cream
10480	TF Tuf Neutral Base

TRANSFLEX PRINTABLE ADHESIVE

10210	TF Printable Adhesive

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MESH, STENCIL & MEASUREMENT

TEST BEFORE GEL:

Measure wet ink film thickness before curing the print. You will need an average ink film deposit (Ex: 3 mils for TF Super Opaque inks) to achieve hot-split opacity on dark fabric using an 83 mesh screen.

TEST AFTER GEL:

Use a Micrometer or Dial Indicator to measure dry ink film thickness. Don't forget to subtract the thickness of the paper.

TRANSFLEX DRY INK DEPOSIT RANGE

2 MILS & UP — TRANSPARENT SUPER SOFT-HAND (TRANSFLEX SOFT)

5 TO 12 MILS — OPACITY AND ULTIMATE LATITUDE (TRANSFLEX SUPER)

TRANSFLEX REGISTRATION

HELPFUL HINTS TO SPEED PRODUCTION

• PRE-SHRINK paper stock then keep out moisture. See the "Transfer Papers" section in the Wilflex User's Manual for information on paper care and storage.

• When using multiple ink colors with **hot-split inks**, be sure to butt-register, rather than overlay ink on ink. If ink overlay occurs, ink/color strength will be impaired when the transfer is heat fused onto the garment.

• Pre-heat paper in a dryer to 260 F (132 C), then print immediately to maintain registration, or cover with plastic sheeting. The paper also may be stacked in a temperature controlled oven. Oven temperature should be set in the region of 100 F (38 C).

• When printing transfer graphics that have disciplined registration, it is important that all moisture is removed from the paper before the print run commences. Failure to achieve this will result in poor graphic registration as the print run continues. Remember to continue to keep the transfer paper in plastic wrapping or in a temperature controlled oven, as moisture will invariably be absorbed by the paper between each printed color.

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TRANSFER PAPERS

Care and Use of Transfer Papers

Plastisol heat transfers are mostly printed on specially prepared transfer papers. There are only a handful of specific papers for this process, and they are usually available from your local screen print supply company.

Transfer papers should have good release characteristics to allow the ink to release from the paper during application. They also should have good hold-out characteristics to keep the ink from absorbing into the paper during storage. (10007TF Clear can be used as a paper release coating.)

Transfer papers must be very stable when exposed to moisture and heat. Poor quality papers may shrink, expand or curl when exposed to these elements, causing poor registration.

Transfer papers are usually supplied for hot-split (hot-peel) or cold-peel transfer inks. When printing hot-split inks onto uncoated or semi-release coated papers, the majority of the ink is heat-pressed onto the garment while some ink stays on the paper.

For cold-peel transfers, when the transfer is heat-pressed onto the garment, the transfer is allowed to cool and the transfer ink is peeled totally from the paper, leaving 100 percent of the ink on the garment.

Storage of Heat Transfer Papers

- Keep paper in original wrappers and cartons until ready to use.
- Do not stack cartons or wrapped reams on cement floors. Use pallets.
- Keep all mill information from cartons or skid wrappers (lot#, run#, date, order#, etc.) for proper identification, in case of a problem or claim.
- Store paper away from heating pipes, overhead water pipes or any area that would add or subtract moisture.
- Don't allow paper to sit on the loading dock, exposed to temperature, humidity and possible damage.

Storage of Finished/Printed Transfers

- Finished/printed transfers should be kept in an environment that is not hot or cold. Continual temperatures of 100 F (38 C) or more may result in the transfer ink not easily releasing from the paper. Freezing temperatures result in transfers that will impair the ink's release from the paper.

For information on testing the shelf life/aging of printed transfers, see the "Evaluating Plastisol Inks" section in the Wilflex User's Manual. For further information on the care and use of transfer papers, call Wilflex Technical Services.

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SPECIALTY INKS

Wilflex knows that staying ahead creatively and meeting the demands of your business mean anticipating trends. Our innovative research and development provides specialty inks that enable you to *set* the trends. With your imagination and Wilflex inks, there's no limit to what you can create. Take a look at our unique First Base program, which delivers textured surfaces for the creative printer, Straight-Up High Density additives, as well as a variety of glitters, shimmers and puff products.

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PRODUCT INFORMATION BULLETIN

WILFLEX® SSV-FF

Fast Fusing, Low Temperature Plastisol

GENERAL DESCRIPTION Wilflex SSV-FF (Silk Screen Vinyl - Fast Fusion) is a plastisol screen printing ink formulated to fuse and cure at lower temperatures than conventional plastisol inks. SSV-FF is designed to match the popular Wilflex SSV in opacity while curing at temperatures low enough to prevent or substantially reduce shrinkage of heat-sensitive fabrics such as 100 percent acrylic. SSV-FF plastisols offer excellent durability and tensile strength. SSV-FF plastisols produce excellent conventional heat transfers when used with coated transfer paper and yield good results as an adhesive for foil.

RECOMMENDED SUBSTRATES Wilflex SSV-FF may be printed on cotton, cotton blends, acrylic, some nylon (generally open weave or mesh type) as well as other synthetic materials. SSV-FF has been used on Lycra/Spandex fabrics with good results. **Pre-print and test all fabrics for dye bleeding, ink adhesion, wash fastness, tensile strength and other desired properties.** Coated transfer paper is recommended to produce conventional transfers.

PRINTING RECOMMENDATIONS Mesh: For optimum opacity, a 63-120 threads/in (24-49 threads/cm) mesh is recommended. Finer meshes such as 125-230 threads/in (49-90 threads/cm) may be used on light colored fabrics. Emulsion: The product contains no aggressive solvents or water. Screens may be prepared with conventional direct emulsions or capillary films.

CURING Gel or Flash cure: SSV-FF may be flashed between 170-190 F (75-88 C). Due to differences in power, height above ink film, and efficiency of the flash unit, a specific dwell time cannot be given. Incorporating the use of finer mesh counts for your flash plate will decrease the dwell time needed to gel the ink, resulting in faster production speeds. Be certain to set flash dwell times on heated pallets to simulate production. Adjust your settings so that the ink is just dry to the touch. Avoid excessive overflashing, as it can result in poor inter-coat adhesion of overprint colors. Cure: Wilflex SSV-FF is 100 percent solvent-free and cannot be air-dried. For proper fusion the ink film must reach at least 270 F (132 C). SSV-FF inks remelt at 300 F (149 C) and may be cold-peel transferred at this temperature. Fusion tests should be made prior to any production run.

MODIFIERS Wilflex SSV-FF may be used straight from the container. Some stirring will help break down the false "body" that builds in plastisol inks during storage. If desired, up to 3 percent by weight of Reducer #11 can be used to thin the ink. Curable Reducer #10070 also may be used to reduce ink viscosity, in quantities up to 10 percent (by weight).

WASH-UP Mineral spirits, conventional solvent-based screen cleaners or Wilflex Screen Wash.

HEALTH AND SAFETY Complete Health and Safety Data available upon request.

STORAGE Recommended storage temperature is 65-90 F (18-32 C). Avoid storing in direct sunlight or in extreme temperature conditions. It is recommended that Wilflex products be used within one year of receipt of product. Inks subjected to extreme temperatures or prolonged shelf life could thicken in the container.

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WILFLEX® MCV-FF

Fast Fusing, Low Temperature Plastisol

GENERAL DESCRIPTION Wilflex MCV-FF (Multi-Color Vinyl - Fast Fusion) is a wet-on-wet plastisol screen printing ink formulated to cure at lower temperatures than conventional plastisols. MCV-FF is suitable for light or pastel garments and is not recommended for dark fabrics. MCV-FF is ideal for printing on heat-sensitive or stretch fabrics. MCV-FF has similar characteristics to SSV-FF but with lower opacity and higher gloss.

RECOMMENDED SUBSTRATES Wilflex MCV-FF may be printed on cotton, cotton blends, acrylics as well as some polyesters. Excellent durability and tensile strength make MCV-FF ideal for printing carpet/woven mats and lycra or stretch fabrics. **Pre-print and test fabrics for ink adhesion, washability, etc.** Conventional heat transfers can be produced on coated stock.

PRINTING RECOMMENDATIONS Mesh: Wilflex MCV-FF has been formulated to be printed through fine mesh screens onto light colored fabrics. For garment printing, mesh counts between 140-305 threads/in (55-120 threads/cm) are recommended. For mat printing, mesh counts between 74-110 threads/in (24-43 threads/cm) are recommended. Emulsion: Screens may be prepared with conventional direct emulsions or capillary films.

CURING Flash cure: MCV-FF is rarely flash cured, but if it is flashed, the gel temperature is between 170-190 F (75-88 C). Cure: Wilflex MCV-FF is 100 percent solvent-free and cannot be air-dried. For proper fusion the ink film must reach at least 270 F (132 C). MCV-FF inks remelt at 300 F (149 C) and may be cold-peel transferred at this temperature. Fusion tests should be made prior to any production run.

MODIFIERS Wilflex MCV-FF may be used straight from the container. Some stirring will help break down the false "body" that builds in plastisol inks during storage. If desired, up to 3 percent by weight of Reducer #11 can be used to thin the ink. Curable Reducer 10070 may also be used to reduce ink viscosity in quantities up to 10 percent (by weight).

WASH-UP Mineral spirits, conventional solvent-based screen cleaners or Wilflex Screen Wash.

HEALTH AND SAFETY Complete Health and Safety Data available upon request.

STORAGE Recommended storage temperature is 65-90 F (18-32 C). Avoid storing in direct sunlight or in extreme temperature conditions. It is recommended that Wilflex products be used within one year of receipt of product. Inks subjected to extreme temperatures or prolonged shelf life could thicken in the container.

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MCV-FF vs. SSV-FF

	MCV-FF	SSV-FF
Opacity	Low	Medium to High
Viscosity	Low	Medium to High
Elongation	Excellent	Excellent
Gloss	High	Medium
Cure	270°F/132°C	270°F/132°C
Gel/Flash	170°F/77°C	170°F/77°C
Bases available for PC System		
Pigment Concentrates Percentage Used in Color Matches	10% of weight of MCV-FF Base with standard PCs	10% of weight of SSV-FF base with standard PCs
	or refer to PC Base Ratio Chart in PC Manual.	*three special PCs 10770 Fast Gold 11040 Fast White 10370 Fast Red May be used for high opacity shades
Recommended Meshes	140-305 threads/in 55-120 threads/cm	63-120 threads/in 25-49 threads/cm

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WILFLEX® SILVER GLITTER #16055
WILFLEX® GOLD GLITTER #86065

GENERAL DESCRIPTION Wilflex Gold and Silver Glitter are formulated to produce a dramatic glitter effect with high gloss and excellent durability. Wilflex glitter inks are formulated in a fast fusing/curing clear plastisol to ease cure of heavy ink deposits typical of glitter inks.

RECOMMENDED SUBSTRATES Wilflex glitter inks may be printed on cotton and cotton blends. **Pre-print and test all fabrics for ink adhesion, wash fastness and other desired properties.**

PRINTING RECOMMENDATIONS Mesh: 20-35 threads/in (10-15 threads/cm) Emulsion: Direct or capillary stencils may be used. It is recommended to use a 50 to 70 micron capillary stencil film and use a compatible emulsion for adhesion to mesh. The emulsion coating offers exceptional abrasion resistance against the glitter particle and produces a thicker stencil for controlled glitter prints.

CURING 325 F (163 C). Failure to reach the recommended temperatures will result in poor wash fastness, inferior adhesion, unacceptable durability and increased dye migration.

MODIFIERS Wilflex glitter inks are designed to be used straight from container. If reduction of viscosity is desired, up to 5 percent Reducer #11 may be used. As a special note: Wilflex PCs may be used in combination with Silver Glitter to produce colored glitters.

WASH-UP Use Wilflex Screen Wash or mineral spirits.

HEALTH AND SAFETY Complete Health and Safety Data available upon request.

STORAGE Recommended storage temperature is 65-90 F (18-32 C). Avoid storing in direct sunlight or in extreme temperature conditions. It is recommended that Wilflex products be used within one year of receipt of product. Inks subjected to extreme temperatures or prolonged shelf life could thicken in the container.

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WILFLEX® IS YELLOW SPARKLE #15340

GENERAL DESCRIPTION Wilflex IS Yellow Sparkle #15340 is formulated to produce subtle sparkle effect with high gloss and excellent durability. Wilflex Sparkle inks are formulated in a fast fusing/curing plastisol to ease cure of heavy ink deposits typical of sparkle inks.

RECOMMENDED SUBSTRATES Wilflex sparkle inks may be printed on light colored cotton, cotton blends and some synthetic fabrics. Wilflex sparkle inks produce interesting highlight effects when printed onto light to medium colored gelled plastisol. **Pre-print and test all fabrics for ink adhesion, wash fastness, bleed resistance and other desired properties.**

PRINTING RECOMMENDATIONS Mesh: The sparkle particles are .008" square (8 mil or 203 micron) and therefore require a large screen opening for easy passage. Mesh counts between 25 and 60 threads/in (10-24 threads/cm) are recommended. When possible, "S" quality thread is suggested due to its smaller diameter resulting in a larger mesh opening. Squeegee: A slightly dull edge squeegee (55-60 durometer) used in combination with a soft printing surface will assist in producing superior print results. Emulsion: Direct or capillary stencils may be used. It is recommended to use a 50 to 70 micron capillary stencil film and use a compatible emulsion for adhesion to mesh. The emulsion coating offers exceptional abrasion resistance to the sparkle particles and produces a thicker stencil for controlled sparkle prints. Consult your stencil dealer for further details.

CURING Wilflex IS sparkle inks will fuse/cure once the entire ink film reaches at least 320 F (160 C).

MODIFIERS Wilflex sparkle inks are designed to be used straight from the container. If reduction of viscosity is desired, up to 5 percent Reducer #11 may be added. As a special note: Wilflex PC's may be used in small amounts with IS Yellow Sparkle #15340 to produce interesting color shifts. As an example, an addition of 1 percent (by weight) 18030 Electron Orange PC will produce a Bright Sparkling Orange ink.

WASH-UP Use Wilflex Screen Wash or mineral spirits.

STORAGE Recommended storage temperature is 65-90 F (18-32 C). Avoid storing in direct sunlight or in extreme temperature conditions. It is recommended that Wilflex products be used within one year of receipt of product. Inks subjected to extreme temperatures or prolonged shelf life could thicken in the container.

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WILFLEX® MCV-FF GOLD SHIMMER #85370
WILFLEX® MCV-FF SILVER SHIMMER #15370

GENERAL DESCRIPTION Wilflex MCV-FF Gold and Silver Shimmers have been formulated to produce a bright, shimmering color with excellent durability and washability.

RECOMMENDED SUBSTRATES Wilflex MCV-FF Gold and Silver Shimmers have excellent opacity and may be printed on light and dark substrates, including cotton, cotton blends, and synthetic textiles. **Pre-print and test all substrates for ink adhesion, shine, and other desired properties.**

PRINTING RECOMMENDATIONS Mesh: Screen meshes between 60 and 110 threads/in (24-43 threads/cm) are recommended to allow metallic particles to flow easily through the screen. Emulsion: MCV-FF Gold and Silver Shimmers do not contain solvents and may be printed using screens prepared with conventional direct emulsions and indirect or capillary films. Although MCV-FF Gold and Silver Shimmers were designed to be direct printed, this ink may be transferred using a gelation temperature of approximately 170 F (77 C) and a transfer press temperature of approximately 300 F (149 C) and a cold-peel process.

CURING Even though MCV-FF Gold and Silver Shimmers are made with the low cure MCV-FF base, the recommended cure temperature is at least 320 F (160 C) due to the reflective and heat transfer properties of the metallic particles as well as the characteristic heavy ink deposits of metallic inks. **Failure to reach the recommended temperatures will result in poor wash fastness, inferior adhesion, unacceptable durability and increased dye migration.**

MODIFIERS Modification of MCV-FF Gold and Silver Shimmers is not recommended. If absolutely necessary, up to 5 percent Reducer #11 or up to 10 percent Curable Reducer #10070 may be added to reduce ink viscosity.

WASH-UP MCV-FF Gold and Silver Shimmers may be cleaned with conventional solvents or Wilflex Screen Wash.

STORAGE Recommended storage temperature is 65-90 F (18-32 C). Avoid storing in direct sunlight or in extreme temperature conditions. It is recommended that Wilflex products be used within one year of receipt of product. Inks subjected to extreme temperatures or prolonged shelf life could thicken in the container.

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WILFLEX® SOLID GOLD METALLIC 85075
WILFLEX® PURE GOLD METALLIC 85065
WILFLEX® SILVER METALLIC 15055
WILFLEX® BRIGHT COPPER 85085

GENERAL DESCRIPTION Wilflex Metallics are designed especially for fashion designs and unique effects. The metallics are easy to print on manual or automatic machines with minimum build-up and a creamy consistency.

RECOMMENDED SUBSTRATES Wilflex Metallics have excellent opacity and may be printed on light, medium and dark color textiles of cotton or cotton/polyester blends. **Pre-print and test all substrates for ink adhesion, shine, and other desired properties.**

PRINTING RECOMMENDATIONS Mesh: 60-125 threads/in (24-48 threads/cm). Print Wet-on-Wet. Emulsion: Wilflex Metallics do not contain solvents and may be printed using screens prepared with conventional direct emulsions and indirect or capillary films.

CURING 325 F (163 C). The metallics rely upon gloss and clarity for their best effect. In general, gloss and clarity increase with the degree of fusion; therefore, under-cured designs will not utilize the special effect ink to its utmost. Failure to reach the recommended temperatures will result in poor wash fastness, inferior adhesion, unacceptable durability and increased dye migration.

MODIFIERS Modification of Metallics is not recommended. If absolutely necessary, up to 5 percent Reducer #11 or up to 10 percent Curable Reducer #10070 may be added to reduce ink viscosity.

WASH-UP Conventional solvents or Wilflex Screen Wash.

STORAGE Recommended storage temperature is 65-90 F (18-32 C). Avoid storing in direct sunlight or in extreme temperature conditions. It is recommended that Wilflex products be used within one year of receipt of product. Inks subjected to extreme temperatures or prolonged shelf life could thicken in the container.

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Glow in the Dark

PHOSPHORESCENT INKS

GNS Phosphorescent #99900
NPF Phosphorescent #99900

(NPF Phosphorescent is a non-standard product)

12200 Excite Yellow P.C. can be mixed with Wilflex PC System using:

Finesse #10150 to produce general purpose glow-in-dark ink
NuPuff Base #10250 to produce glow-in-dark puff

Suggested percentages range between 10- 30%

FACTS ABOUT PHOSPHORESCENTS:

- Wilflex glow-in-dark inks are safe
- Transparent, print on white or over light colored plastisol
- Do not intermix with any inks or PCs
- Life of glow cycle is near infinity
- Meshes: 60-140 threads/in (24-55 threads/cm)
- Cure at 320 F (160 C)

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STRAIGHT-UP HIGH DENSITY ADDITIVES
STRAIGHT-UP GLOSS WP220SUP
STRAIGHT-UP SATIN WP221SUP
STRAIGHT-UP SUEDE WP222SUP

GENERAL DESCRIPTION Introduce your customers to the world of high density printing with Straight-Up High Density Additives from Wilflex and Plast-O-Meric. High density printing with Straight-Up additives allows you to create totally innovative, three-dimensional graphics in three unique styles: Gloss, Satin or Suede. Straight-Up Satin and Suede will produce prints of high opacity and dye bleed resistance. They will have semi-gloss and matte finishes, respectively. Straight-Up Gloss has slightly reduced opacity when used on dark fabric grounds. One of the biggest advantages to using Straight-Up is that the inks are ADDITIVES, not finished inks. By adding one of the versatile Straight-Up additives to your existing inks, you can create your graphic effects with as little fuss as possible. Straight-Up additives allow you to take complete control of your ink usage, color and finish, reducing costs and hassle. The best print results have been obtained by adding the Straight-Up additives to Wilflex MX Color System and Genesis inks. A suggested mixing ratio of 75 parts of finished ink to 25 parts of Straight-Up additive will provide the best results. If you need a high density Pantone color, use the Wilflex MX Color Mixing System with Straight-Up. The combination will produce a high, vertical stack of ink that allows for fine-line print definition as well as open graphic content.

RECOMMENDED SUBSTRATES 100 percent cotton, polyester/cotton blends. **Pre-print and test all fabrics for dye bleeding, ink adhesion, wash fastness and other desired properties.**

PRINTING RECOMMENDATIONS Mesh: 60-110 threads/in mesh (24-43 threads/cm), with retensionable frames. Screen tension: Up to 30 newtons/cm. It is desirable to use the thinnest screen thread diameter obtainable. Dyed mesh has produced good results. The extended exposure times required can result in extended undercutting of the image. Squeegee: Use a sharp 75-80 durometer squeegee. A triple durometer squeegee, 70/90/70, is also recommended. The approach, angle of the squeegee and squeegee pressure must be adjusted to suit the stencil and print image parameters. The inks must print a clean, sharply defined image onto the fabric. Use reduced squeegee speed both on the flood and print strokes, making sure that on the flood, the ink has filled the stencil image well. The off-contact distance between screen mesh and fabric should be 1/8". Be sure that the speed and angle of the screen lifting away from the printed image is immediate and directly follows the squeegee on the print stroke. This "lifting away" action from the screen is of the utmost importance, as failure to create this printing environment will not allow the print to produce defined, "high wall" effects. Emulsion/Stencils: The printer must correctly prepare the screen/stencil. THE PREPARATION OF THE SCREEN IS AS

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IMPORTANT AS THE INKS USED AND THE PRINTING PARAMETERS. To produce one of the high density graphic finishes, the inks must be printed through stencils that are between 200-400 microns thick. By using stencils that are thicker, a higher wall of ink will be deposited. The thicker the stencil and the more open the screen mesh, the higher the ink wall. The use of higher ink deposits and open screen meshes will increase the chance of ink spread and print image distortion. Excellent results can be obtained by using a 200-micron stencil and an 86 threads/in mesh (34 threads/cm). The printer will have more control over the print application, thereby reducing the potential of rejects.

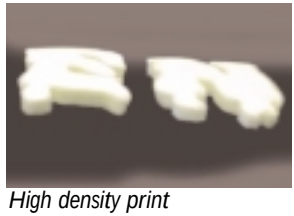
CURING Gel Temp: Tests have indicated that Straight-up inks can be flashed at 175 F (79 C) for 7 seconds. When the last "stack" print has been completed, full cure of the inks can take place. Cure Temp: 320 F (160 C). Higher temperature settings may be required if the ink deposit is extreme. When fully cured, the inks are highly durable and will withstand repeated wash cycles. Failure to cure ink properly causes poor wash fastness, inferior adhesion, unacceptable durability and increased chance for dye migration.

MODIFIERS The use of reducers in the additives is not recommended. However, should the need arise, 1-2 percent of Curable Reducer can be added to the ink to promote enhanced flow properties and sharper print definition.

WASH-UP Conventional solvents or Wilflex Screen Wash.

HEALTH AND SAFETY Complete Health and Safety Data available upon request.

STORAGE Recommended storage temperature is 65-90 F (18-32 C). Avoid storing in direct sunlight or in extreme temperature conditions. It is recommended that WP products be used within one year of receipt of product. Inks subjected to extreme temperatures or prolonged shelf life could thicken or expand in the container.



High density print

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SUPERBOND TRANSFER ADHESIVE WP111SBD

(to be used with SuperBond colors)

GENERAL DESCRIPTION SuperBond Transfer Adhesive is a specially formulated hot-peel/hot-split plastisol transfer adhesive. When applied as a backer to the SuperBond transfer colors, SuperBond Adhesive will provide transfers that have excellent durability, stretch and wash properties on fabrics that are not totally conditioned for regular hot-split plastisol transfer inks. The advantages of SuperBond base and colors are as follows: Excellent abrasion and crack resistance, superior adhesion, maximum elongation, maximum color strength on dark fabrics and easy release from the paper after heat transferring.

RECOMMENDED SUBSTRATES Cotton, cotton blends, uncoated nylon, spandex, lycra, and/or other elongation/heat-sensitive fabrics. **Pre-print and test all fabrics for dye bleeding, ink adhesion, wash fastness and other desired properties.** The user should examine the fabric type and color before and after the application of the transfer, as color distortion of the garment may occur due to the introduction of heat to sensitive fabric types and dye-stuffs inherent in the garment.

PRINTING RECOMMENDATIONS To make a SuperBond transfer, start by pre-shrinking the paper. Print SuperBond colors to get approximately 2-3 mil deposit. Less colored ink deposit can cause loss of film strength and more deposit may harm adhesion. Mesh: 86-156 threads/in screen mesh. (34-61 threads/cm). Gel each color to an ink temperature of 220-260 F (104-127 C). Note: The SuperBond colors are an integral part of the SuperBond hot-split transfer system. Other direct print or transfer inks generally do not perform well in this application. Print the SuperBond Adhesive to get 2.5-3mil deposit using an 86-110 threads/in screen mesh (34-43 threads/cm), printed over the entire image area. Be sure to gel the SuperBond adhesive at a temperature at 220-260 F.

SUPERBOND TRANSFERS AND THE HEAT PRESS Pre-warm the fabrics for 3-5 seconds at 375 F (191 C) using 40-50 psi. Then heat-apply the transfer with the same conditions. Best results have been obtained using the hot-peel/hot-split process. Cold-peel transfers can be achieved but produce less gloss to the surface of the ink when on the garments.

TRANSFER PAPERS The SuperBond Adhesive and colors can work well with many coated transfer papers, including the following: Wyndstone SuperTrans for hot- or cold-peel transfers, Wyndstone Transfert 75 for cold-peel transfers and Wyndstone MagnumTrans.

CURING Gel Temp: 220-260 F (104-127 C). Failure to cure ink properly causes poor wash fastness, inferior adhesion, unacceptable durability and increased chance for dye migration.

MODIFIERS SuperBond Adhesive and SuperBond colors are formulated to use straight from the container. If it is necessary to reduce the viscosity, we recommend Wilflex Reducer #1 at 1-3 percent by weight.

WASH-UP Conventional solvents/mineral spirits or Wilflex Screen Wash.

HEALTH AND SAFETY Complete Health and Safety Data available upon request.

STORAGE Recommended storage temperature is 65-90 F (18-32 C). Avoid storing in direct sunlight or in extreme temperature conditions. It is recommended that WP products be used within one year of receipt of product. Inks subjected to extreme temperatures or prolonged shelf life could thicken or expand in the container.

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SUPERBOND COLORS

(to be used with SuperBond Transfer Adhesive)

GENERAL DESCRIPTION A range of 19 stock SuperBond Colors are available (see colors/stock list) to be used with the SuperBond WP111SBD Adhesive. SuperBond Colors and Adhesive are used together as a hot-peel plastisol transfer system. The inks and adhesive produce transfers that are suitable for a wide range of stretch fabrics. The system is primarily used to produce hot-peel transfers but also can be used as a cold-peel system.

RECOMMENDED SUBSTRATES Lycra, spandex, uncoated nylon and other high elongation/heat sensitive fabrics, as well as cotton and cotton blend fabrics. **Pre-print and test all fabrics for dye bleeding, ink adhesion, wash fastness and other desired properties.**

PRINTING RECOMMENDATIONS Mesh: Best results are obtained when the SuperBond colors are printed through screens of between 86-156 threads/in (34-61 threads/cm). It is important to have an ink deposit of between 1-3 mils. Less ink deposit can result in reduced ink film strength and adhesion to fabric. Print the SuperBond Adhesive through screen meshes of 86-110 threads/in (34-43 threads/cm). A maximum of 3 mils adhesive deposit is recommended over the entire image area. The colored inks can be printed alone or can be backed with the SuperBond white. The adhesive must always be printed as the last-down component, over the entire ink/graphic image area. Squeegee: Triple durometer 70/90/70 squeegee.

CURING Gel Temp: Gel each SuperBond color to an ink temperature of 220-260 F (104-127 C).

TRANSFERRING RECOMMENDATIONS SuperBond transfers should be heat transferred under an automatic heat press for 3-5 seconds at 375 F (191 C), using 40-45psi (medium-firm pressure). Best transfer results are obtained using the hot-peel release program. However, good cold-peel transfers can be achieved. Hot-peel transfers result in a more glossy transfer, while cold-peel transfers result in reduced gloss of the transfer surface. Before the transfer is heat-applied to the fabric, IT IS IMPORTANT TO PREWARM THE FABRIC FOR APPROXIMATELY FIVE SECONDS AT THE SAME TEMPERATURE AND PRESSURE REQUIRED FOR FUSING THE INK AND ADHESIVE. The softening and heating of the fabric surface allows for better ink/adhesive penetration.

TRANSFER PAPERS The SuperBond Colors and Adhesive can work well with many coated paper types. Wyndstone SuperTrans and MagnumTrans release coated papers have given consistent transfer peel results.

MODIFIERS The products are formulated to be used straight out of the container. If it is necessary to reduce the flow viscosity, we recommend Wilflex Reducer#1 at 1-3 percent by weight.

WASH-UP Conventional solvents or Wilflex Screen Wash.

HEALTH AND SAFETY Complete Health and Safety Data available upon request.

STORAGE Recommended storage temperature is 65-90 F (18-32 C). Avoid storing in direct sunlight or in extreme temperature conditions. It is recommended that WP products be used within one year of receipt of product. Inks subjected to extreme temperatures or prolonged shelf life could thicken or expand in the container.

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WILFLEX® REFLECTIVE BASE #10015IS

APPLICATIONS

Cotton /cotton mix fabrics
100 percent polyester

FEATURES/BENEFITS

Super reflectivity on dark and light fabrics
Excellent adhesion to fabrics, wash and scuff resistant
For use with safety and fashion graphic designs
To make reflective colors, add up to 6 percent of PC by weight

GENERAL DESCRIPTION Wilflex direct reflective base is a plastisol screen printing base specially formulated for direct screen applications on textiles. Reflective beads are dispersed into a specially formulated base to create a reflective product with excellent print and wash properties. The printed product produces a reflective response when a light source illuminates the printed surface. The reflective base should be used in combination with up to 6 percent (by weight) of Wilflex pigment concentrates or finished ink to create reflective colors. We do not recommend printing the base without the addition of PCs or finished ink.

RECOMMENDED SUBSTRATES Cottons and cotton mix fabrics, polyesters. **Pre-print and test all fabrics for dye bleeding, ink adhesion, wash fastness and other desired properties.**

PRINTING RECOMMENDATIONS Mesh: For optimum coverage and reflective response, an 110-156 threads/in. (43-61 threads/cm) mesh is recommended. Squeegee: 75 durometer, sharp/straight edge. Tension: 20-30 newtons. Emulsion: Conventional solvent-resistant direct emulsions and capillary films.

CURING 350-360 F (177-182 C). Undercuring can result in decreased reflectivity and poor wash fastness.

TRANSFER PRINTING RECOMMENDATIONS

RECOMMENDED TRANSFER PAPERS Papers without a release coating, such as Wyndstone Heat Transfer Papers T55, are recommended. Some low-release coated papers can be used, but be sure to evaluate the reflective ink's surface texture after peeling the paper from the fabric. (See the "Transfer Papers" section in the Wilflex User's Manual for information on the care and use of transfer papers.)

PRINTING RECOMMENDATIONS Mesh: 83-86 threads/in. Squeegee: 55 durometer squeegee Emulsion: Conventional solvent-resistant direct emulsions and capillary films.

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HEAT PRESS APPLICATION Wilflex reflective transfers should be heat pressed at 375-380 F (191-193 C) for 10 seconds at 45 PSI pressure. Transfer inks should be peeled hot (hot-split application).

CURING Gel Temp: 200-240 F (104-116 C).These temperatures will partially cure the ink film. It is important to stay within this recommended temperature range as lower temperatures will result in a transfer with little tensile strength and higher temperatures will negatively affect the "hot-split" characteristics of the transfer.

MODIFIERS None. Always stir plastisol inks prior to use to break down any false body.

WASH-UP Conventional solvents or Wilflex Screen Wash.

HEALTH AND SAFETY Complete Health and Safety Data available upon request.

STORAGE Recommended storage temperature is 65-90 F (18-32 C). Avoid storing in direct sunlight or in extreme temperature conditions. It is recommended that Wilflex products be used within one year of receipt of product. Inks subjected to extreme temperatures or prolonged shelf life could thicken or expand in the container.

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PRODUCT INFORMATION BULLETIN

WILFLEX® LUNA CLEAR #10022IS

DESCRIPTION Luna Clear is a clear plastisol that appears nearly invisible in daylight, but illuminates in the presence of UV blacklight. Use Luna Clear to create special effects, print secret messages or identify a printer's work by printing hidden licensing data. This ink is an excellent underbase that reduces fibrillation and brightens some colors. Luna Clear will remain bright after numerous washings and may be printed direct or transferred.

PRINTER'S PARAMETERS

Substrates	100% cotton jersey knit, polyester & blends, fleece
Mesh(Satin finish/Transfer)	110-280 threads/in (43-110 threads/cm)
Mesh(Matte finish)	305-355 threads/in (120-140 threads/cm)
Tension	+15 newtons
Squeegee type	60/90/60 durometer (hard)
Squeegee type (Transfer)	65-75 durometer (medium)
Squeegee blade	Straight edge profile
Off-contact	1/16" - Producing clean separation from screen & garment
Gel temp	170-190 F (75-88 C)
Gel temp (Transfer)	200-230 F (93-110 C)
Cure temp	320 F (160 C) entire film.
Heat press application	375 F (190 C), 7-10 seconds, 40-45 PSI medium firm pressure
Extender/Reducer	None
Storage	65-90 F (18-32 C). Avoid direct sun. Use within one year of receipt.
Wash-up	Wilflex Screen Wash
Health & Safety data	Available upon request

FEATURES

- Clear when overprinting designs, but illuminates under blacklight conditions
- Matte finish when printed through high meshes
- Excellent adhesion to fabrics with good elongation
- Excellent printability
- Fast flashing
- Excellent wash properties

SPECIAL RECOMMENDATIONS

- Printing sequence as: (a) Overprint clear - last color (b) Stand-alone color. For transfers: (a) First-down clear - Print as first color, gel, overprint colors, gel, heat press under standard TransFlex recommendations. (b) Stand alone color
- Luna Clear has no built-in bleed resistance.
- For invisible effect on white fabrics, add up to 1% 10110PC (Extra White PC).
- Perform fusion tests before production. Failure to cure ink properly can result in poor wash fastness, inferior adhesion, unacceptable durability, & increased likelihood of dye migration.
- Stir plastisols prior to printing.
- Do not dry clean, bleach or iron printed area.
- Any application not referenced in this product information bulletin should be pre-tested or consultation sought with Wilflex Technical Services Department prior to printing. (US - 800-735-4353)

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WILFLEX® SUPERGUARD HT #10075IS

APPLICATIONS

100 percent cotton
Polyester/Cotton blends
Fleece
Polyester

FEATURES/BENEFITS

Matte finish
Clear when overprinting designs
Enhances color brightness
Improves adhesion and elongation
Fights fibrillation
Improves wash properties
Excellent printability
Excellent shelf life
Safe, non-hazardous

GENERAL DESCRIPTION SuperGuard HT is a clear plastisol designed to fight fibrillation when used as an overprint, especially effective for process printing. SuperGuard HT enhances color brightness, improves adhesion and elongation and improves wash properties.

ART AND SCREEN RECOMMENDATIONS

Process Printing

1. Combine CMYK positives to reproduce the fifth plate for SuperGuard HT.
2. Shoot the fifth screen in a lower mesh count than the CMYK screens.
3. Mesh Recommendations:

   If your CMYK mesh is:
   305 threads/in (120 t/cm) Use mesh for SGHT 255 threads/in. (100 t/cm)
   If your CMYK mesh is:
   355 threads/cm (140 t/cm) Use mesh for SGHT 305 threads/in. (120 t/cm)
4. Place the SuperGuard HT screen in fifth printing position and apply wet-on-wet.
5. You also can flash after the CMYK for optimum results. Pretest and evaluate for your print preference.

Spot Colors

Overprint with SuperGuard HT with a slightly coarser mesh than your spot colors.

PRINTING PARAMETERS

1. Screen tension: In excess of 15 newtons per centimeter.
2. Screen mesh (depending on art/graphic detail and ink deposit requirements): 305-355 threads/in (77-140threads/cm) for direct flat finish
3. Squeegee: 60/90/60 durometer-triple/straight edge profile (hard squeegee).
4. Printing: Allow one flood, one print application. (Printing properties will be determined by manual or automatic printing applications.)
5. Best results obtained with softer pallet surface. But good results can be obtained by using metal surface pallet only.
6. Off contact: 1/16" overall- producing clean separation from screen and

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garment/fabric.

7. Gel (flash) temperature: 170-190 F (75-88 C). Cure (drying) temperature: 320 F (160 C).

TROUBLESHOOTING

1. SuperGuard HT is ready to use. Reducers not recommended.
2. Stir the ink before use.
3. Complete curing of the ink is important.
4. Poor washability of the print is often due to undercuring.
5. Check the cure temperature at the ink surface.
6. Pre-print and test all fabrics for dye migration.
7. SuperGuard HT has no built-in bleed resistance.
8. Use as a clear overprint on any type of printing to fight fibrillation.
9. Do not use as an underprint on process printing. Overprinting offers better washability and color accuracy.

CURING Flash Cure and fusion will be determined by the Wilflex base used. Please refer to specifications outlined for the base. Fusion tests should be performed prior to production printing. Failure to cure ink properly can result in poor wash fastness, inferior adhesion, unacceptable durability, and increased likelihood of dye migration. Maximum ink tensile strength and elongation is accomplished by ensuring total fusion of the ink film. Testing procedures for plastisol fusion are outlined in the "Evaluating Plastisol Inks" section of the Wilflex User's Manual.

WASH-UP Conventional solvents or Wilflex Screen Wash.

HEALTH AND SAFETY Complete Health and Safety Data available upon request.

STORAGE Recommended storage temperature is 65-90 F (18-32 C). Avoid storing in direct sunlight or in extreme temperature conditions. It is recommended that Wilflex products be used within one year of receipt of product. Inks subjected to extreme temperatures or prolonged shelf life could thicken or expand in the container.

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Wilflex defines innovation in terms of creating new ways to help your shop stay ahead. The newest program from Wilflex is First Base, featuring innovative, unfilled bases for the "special inks" market. If you want to produce unique, textured designs that are yours alone, check out First Base.

FOCUS ON: FIRST BASE BY WILFLEX

Textured Surfaces for the Creative Printer

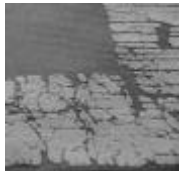
First Base features three bases that, when printed on garments, will have unique surface textures. Use the bases alone, in combination with each other, or mix in additives such as pigments, glitters, shimmers, glow-in-the dark inks and more, to create your own custom print inks. Don't compete with the printer down the street! Produce one-of-a-kind looks with First Base. Maximum additions of additives such as pigment concentrates, finished inks, glitters, shimmers etc. should not exceed 15 percent by weight. A general rule to follow: 85 percent BASES, 15 percent ADDITIVE.

Natural Suede Base 10425NS

Will produce suede surface finishes. Add other First Base products to produce innovative textured surfaces. Natural Suede can be colored to create leather and felt effects - tough and washable.

High Density Clear 10009HDC

Can be used as a high density gloss/clear or as a high gloss overprint to any ink. Add PCs to create special gloss images. Excellent adhesive carrier for special flakes, caviar beads and other surface particles. (Use care when printing on polyester blends, as dye migration can affect the appearance of the bead, especially clear beads) Can be used on most fabric types as well as sublimation dyed garments - super elongation.



Rock Base 10670RB

Rock Hard ink surface. Use Rock Base alone or add other First Base products to create innovative textured surfaces. Add PCs or metallics to create special surface effects - tough and durable.

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PRODUCT INFORMATION BULLETIN

WILFLEX® HIGH DENSITY CLEAR #10009HDC

DESCRIPTION Use High Density Clear to create special effects, such as the appearance of glass, gel, water or high gloss surfaces.

PRINTER'S PARAMETERS

Substrates	100% cotton, cotton blends, acrylic, lycra & uncoated nylon
Bleed resistance	None
Mesh	24-110 t/in (10-43 t/cm)
Tension	25 newtons
Stencil emulsion	Direct, indirect & capillary
Fat films for HD printing	200-600 microns
Squeegee type	75 durometer- (60/90/60) triple durometer
Squeegee blade	Sharp
Squeegee angle	45 degrees
Squeegee speed	Maximum
Off-contact	1/16"
Gel temp	220 F (104 C)
Cure temp	350 F (171 C) entire film
Extender	None
Reducer	3% max (by weight) Reducer #11
Storage	65-90 F (18-32 C). Avoid direct sun. Use within one year of receipt.
Wash-up	Wilflex Screen Wash. Be sure not to scrub the HD image when cleaning.
Health & Safety data	Available upon request

FEATURES

- High gel gloss appearance
- Excellent adhesion to fabrics
- Super elongation and stretch
- Excellent wash properties
- For light or dark fabric grounds (Best on darks)
- Use as an overprint clear on printed colors and metallic inks to increase color vibrancy and create gloss surfaces.
- Use as a clear carrier/adhesive for caviar beads, sand, wood-chip particles.
- Use as a High Density Clear base either on its own or with color addition.
- HD Clear is part of the First Base Program.

SCREEN PREPARATION

- Stretch an 86 mesh screen to a minimum of 25 newtons.
- Complete normal preparation of mesh, abrade, degrease, etc.
- Wet screen with mist of water and apply capillary film.
- For best results, use 250-400 micron film.
- Expose screen to the manufacturer's specs. (Some manufacturers expose 2-3 times normal exposure time)
- Wash out image slowly, keeping water pressure on the emulsion side of screen.

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· Make sure the screen is totally dry.

SPECIAL RECOMMENDATIONS

· Flash colors. Print High Density Clear as the last down overprint, onto the colors.
· Use a print-flash-print method to build ink. Do not print wet-on-wet.
· When printing caviar beads, pre-test when printing on polyester blends, as dye migration can affect the appearance of the bead, especially clear beads.
· Complete curing of the clear is important. Multiple dryer passes may be necessary to ensure total cure.
· Surface of clear will appear milky after flashing, but the milky effect will disappear after the product is totally cured.
· Check the cure temperature at the ink clear surface.
· Preprint and test all fabrics for dye migration.
· Stir plastisols prior to printing.
· Do not dry clean, bleach or iron printed area.
· Any application not referenced in this product information bulletin should be pre-tested or consultation sought with Wilflex Technical Services Department prior to printing. (US - 800-735-4353).

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WILFLEX® NATURAL SUEDE

NATURAL SUEDE BASE 10425NS
NATURAL SUEDE BLACK 19111NS
NATURAL SUEDE MEDIUM BROWN 29111NS
NATURAL SUEDE DARK BROWN 29222NS

DESCRIPTION Wilflex Natural Suede inks can be used to produce a printed graphic with a soft, Suede/Velvet finish that has a soft hand and is highly durable. This product assists the printer in creating fashion graphic concepts and new age designer finishes.

PRINTER'S PARAMETERS

Substrates	100% cotton, cotton blends
Mixing Ratio	To mix custom colors, add up to 10-15% (by weight) Wilflex PC to Suede Base. (PC to Base Ratio available)
Mesh	86-230 t/in (34-90 t/cm)
Tension	Up to 30 newtons
Squeegee type	65-75 or 70/90/70 durometer
Squeegee blade	Medium
Squeegee angle	To suit stencil & print image parameters
Squeegee speed	Reduced to ensure full flood of stencil
Off-contact	1/16-1/8"
Cure temp	320 F (160 C) entire film. Higher settings may be needed for extreme deposits
Extender	None
Reducer	Up to 5% (by weight) Reducer #1
Storage	65-90 F (18-32 C). Avoid direct sun. Use within one year of receipt.
Wash-up	Wilflex Screen Wash
Health & Safety data	Available upon request

FEATURES

- Natural Suede is a textile, direct-print ink system.
- Produce a printed graphic that feels like suede.
- Use on light or dark colored textiles.
- Highly durable with excellent wash resistance.
- No odor.
- Easy to print and use. Suitable for manual or automatic presses.
- 10425NS Natural Suede Base is part of the First Base Program.

SPECIAL RECOMMENDATIONS

- Variable cure temperatures will affect the surface texture and feel of the suede ink.
- Undercuring of the suede ink may result in poor washability.
- Perform fusion tests before production. Failure to cure ink properly can result in poor wash fastness, inferior adhesion, unacceptable durability, & increased likelihood of dye migration.
- Stir plastisols prior to printing.
- Do not dry clean, bleach or iron printed area.
- Any application not referenced in this product information bulletin should be pre-tested or consultation sought with Wilflex Technical Services Department prior to printing. (US - 800-735-4353).

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PRODUCT INFORMATION BULLETIN

WILFLEX® ROCK BASE #10670RB

DESCRIPTION Use Rock Base to create super textured effects, such as solid rock, coarse rope or fabric-textured surfaces.

PRINTER'S PARAMETERS

Substrates	100% cotton, cotton blends, acrylic, lycra & uncoated nylon
Bleed resistance	Good
Mesh	24-230 t/in (10-90 t/cm)
Tension	25 newtons
Stencil emulsion	Direct, indirect & capillary
Fat films for HD	200-600 microns
Squeegee type	75 durometer- (60/90/60) triple durometer
Squeegee blade	Sharp
Squeegee angle	45 degrees
Squeegee speed	Medium
Off-contact	1/16"
Gel temp	220 F (104 C)
Cure temp	350 F (171 C) entire film
Extender	None
Reducer	3% max (by weight) Reducer #11
Storage	65-90 F (18-32 C). Avoid direct sun. Use within one year of receipt.
Wash-up	Wilflex Screen Wash. Be sure not to scrub HD images when cleaning.
HS&E data	Available upon request

FEATURES

- Tough, stretchable textured surface
- Excellent adhesion to fabrics
- Excellent washability
- For light or dark fabrics
- Use as stand alone base or with additions of other additives to achieve many textured surface finishes
- Part of the "Wilflex First Base" program

SCREEN PREPARATION

- Use screens meshes from 83 to 230 threads/in.
- Stretch screen to 25 newtons tension.
- Can be used with High Density films such as 200-400 micron film.

SPECIAL RECOMMENDATIONS

- Can be used as a conventional flat print ink.
- Can be used as a High Density Ink.
- Addition of pigments and other additives to the base should not exceed 20% by weight.
- To gain higher yields, use a print/flash/print method for both flat and high density printing.
- Complete curing is important. Multiple dryer passes may be necessary to ensure total cure.
- Perform fusion tests before production. Failure to cure ink properly can result in poor wash fastness, inferior adhesion, unacceptable durability, and increased likelihood of dye migration. Testing procedures for plastisol fusion are outlined in the Wilflex User's Manual.
- Stir plastisols prior to printing.
- Do not dry clean, bleach or iron the printed area.
- Any application not referenced in this product information bulletin should be pre-tested or consultation sought with Wilflex Technical Services Department prior to printing (US - 800-735-4353).

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WILFLEX® NUPUFF

Plastisol Puff Ink

GENERAL DESCRIPTION Wilflex NuPuff is a plastisol puff ink formulated to give the relief (or the elevated surface) of similar water-based products. NuPuff has good durability and resistance to overblow.

RECOMMENDED SUBSTRATES Wilflex NuPuff may be printed on cotton, cotton blends, polyester and other synthetics. A bleed resistant white, 11010NPF Modified White, is available. See the "Evaluating Plastisol Inks" section in the Wilflex User's Manual for bleed testing procedures. **Pre-print and test all fabrics for dye-bleeding, ink adhesion, wash fastness and other desired characteristics.**

PRINTING RECOMMENDATIONS Mesh: NuPuff is formulated to give good relief or "puff" through a wide range of screen meshes. For maximum puff on a large area print, a 60-86 threads/in (24-34 threads/cm) mesh screen is recommended. For fine detail work, a 95-110 threads/in (43-49 threads/cm) mesh screen is recommended. Different effects may be achieved through the use of multiple passes, flash curing, thick screen stencils and overprinting standard and specialty inks. In multi-color printing, it is necessary to flash the puff prior to overprinting. If printing a large area, lightweight fabric may pucker. To alleviate puckering, print a mezzotint or dot pattern (an 80 percent solid).

EMULSION The product contains no aggressive solvent or water. Screens may be prepared with conventional direct emulsions or capillary film.

CURING Cure: Wilflex NuPuff will "puff" before the ink is cured; expansion occurs between 290-330 F (144-167 C). Recommended temperature for proper cure in production is 320 F (160 C). The product is formulated with overblow protection so the possibility of collapse of the expanded ink is greatly reduced. Failure to cure ink properly causes poor wash fastness and poor adhesion.

MODIFIERS NuPuff may be used straight from the container. If modification is desired, Curable Reducer #10070 may be used. Amounts above 10 percent, by weight, will cause reduction in puff height. Finesse #10150 may be used to lower puff height without reducing viscosity. Caution: Excessive modification will impair puff.

WASH-UP Clean screens with conventional solvents or Wilflex Screen Wash.

HEALTH & SAFETY Complete Health and Safety Data available upon request.

STORAGE Recommended storage temperature is 65-90 F (18-32 C). Avoid storing in direct sunlight or in extreme temperature conditions. It is recommended that Wilflex products be used within one year of receipt of product. Inks subjected to extreme temperatures or prolonged shelf life could thicken in the container.

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WILFLEX®
NUPUFF
APPLICATIONS CHART

Product Applications	Suggested Meshes threads/in threads/cm	Suggested Squeegees durometer
Puff design on very lightweight fabric) (NuPuff) †	86-110 34-43	60-70
Multi-color puff design 1. print neutral color or white puff, flash, overprint with GNS or MCV-FF inks.	NPF 60-86 24-34 GNS or MCV-FF 110-140 43-55	60-70 70
2. stagger puff meshes; flash between colors	60, 86, 110 24, 34, 43	60-70
Puff design on fabric with bleeding dyes —underbase with bleed resistant white such as 11010NPF Modified White ††	60-86 24-34 —Underbase— 86-110 34-43	60-70 70

Special Notes

† use of 80 percent mezzotint will help alleviate pucker of fabric

†† proper screen tension critical when underbasing

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Plastisol Puff

ART: FINE DETAIL PUFF IS BEST

- Easiest to control
- Less noticeable variance in ink deposit
- Stencil plays greater role in deposit
- Can be used to simulate embroidery

STENCIL: MAKE A THICK STENCIL

- Coat-dry-coat direct emulsion
- Use an appropriate capillary film
- Piggy-back the capillary
- Adhere the capillary with a compatible emulsion

PRODUCTION

- Ideally, print puff last
- Flash cure multi-color
- Wash-up with standard solvents
- Allow to cool before crushing puff
- Print wet-on-wet, stagger mesh counts

THE PUFF

- Adhesion good
- Opacity excellent
- Washability very good, do not dry clean
- Resilience excellent
- Hue: less that original color.
  Ex: Red may go slightly pink
- Color may shift toward predominant pigment
  Ex: A yellow shade red may turn orange
- Mesh marks should disappear

SUBSTRATE

- Heat sensitive substrate must with-stand 320 F (160 C)
- Composition- cotton and synthetics (knitted) are fine
- Compression- the softer the better
- Texture- plastisols adhere mechanically
- Color irrelevant: Puffed colors are opaque
- Plastisol puff will trap well and adhere

NuPuff Standard Colors

11000	White	70000	Kelly	90100	Fluo. Blue
19000	Black	75300	Turquoise	90200	Fluo. Green
23800	Spice Brown	75900	Blacklight Green	90300	Fluo. Orange
40000	Scarlet	80000	Gold	90400	Fluo. Pink
50200	Purple	80100	Light Gold	90500	Fluo. Neon
60000	Navy	81000	Lemon Yellow		
62100	Light Royal	90000	Fluo. Yellow		

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Wilflex Color Sets

Control from Art to Production

Wilflex offers color sets to load into Photoshop or work in conjunction with Photoshop Plug-ins or separation programs to help artists bring their vision of the design to reality without the hassle. Wilflex inks feature excellent translucency, allowing colors to blend during printing to produce a full spectrum of color.

PROCESS SET

Strongest process color set. This set reproduces strong, rich colors. Download color values from www.wilflex.com.

- Process Cyan 69850GNS
- Process Yellow 89850GNS
- Process Black 19850GNS
- Process Magenta 49850GNS
- Process White13850GNS

Starter kit: **PROCESSKIT**

TONE SET

Most balanced Wilflex process color set. Download color values from www.wilflex.com.

- Tone Cyan 69855GNS
- Tone Yellow 89855GNS
- Tone Magenta49855GNS
- Tone Black 19850GNS

Starter kit: **PROTONEKIT**

EXTENDED GAMUT

Use with process sets to extend the color palette and improve the look of your prints.

- RGB Red 47507GNSRGB
- RGB Blue 67507GNSRGB
- RGB Green 77507GNSRGB

Starter kit: **EXTGAMKIT**

HEX SET

A form of extended gamut, the Hex Set is designed to work with the widest gamut.

- Hex Yellow C87501GNSHX
- Hex Cyan C 67501GNSHX
- Hex Mag. C 47501GNSHX
- Hex Orange C 37501GNSHX
- Hex Green C 77501GNSHX
- Hex Black C 19501GNSHX

Starter kit: **HEXKIT**

SPOT/COLOR-CRUNCH SET

Print in the same rotation for each job and increase the repeatability and consistency of your prints. Use with Freehand Graphics' automated separation software, Spot Process. (www.colorcrunch.com) To use with ColorCrunch (CC), drop Tan, Purple, Turquoise and Gray. Use with Xtreme White. (With Pantone Cross Ref.)

Red WP43542SPT	PMS 032
Green WP74209SPT	PMS 351
Blue WP61982SPT	PMS 300
Turquse. WP72253SPT	PMS 312
Tan WP20841SPT	PMS 471
Gray WP16062SPT	Cool Gray 8
Gold WP81029SPT	PMS 123
Purple WP55715SPT	Purple C
White WP11888SPT	18888MX
Black WP19888SPT	19888MX

Starter kits: **WPSPOTKIT, WPCRNCHKIT**

RENAISSANCE SET

designed to work with the ICISS color separation programs from Coudray Graphics Technologies. This 8-color set covers an extended gamut for optimal color reproduction www.coudray.com

- Renaissance White 15111SB
- Renaissance Cyan 65111SB
- Renaissance Black 19111SB
- Renaissance Blue 66111SB
- Renaissance Red 44111SB
- Renaissance Green 75111SB
- Renaissance Mag. 45111SB
- Renaissance Yellow 85111SB

Starter kit: **RENKIT**

HOPKINS 6-COLOR SET

The Genesis Hopkins 6 ink set is designed to work with the Riley Hopkins 6-color separation software. It consists of six colors that create a wide gamut with minimal ink stations.

Hopkins 6 Black 17996GNS
Hopkins 6 Rose 47946GNS
Hopkins 6 Orange 37936GNS
Hopkins 6 Blue 67966GNS
Hopkins 6 White 17916GNS
Hopkins 6 Yellow 87986GNS

FAST FILMS SET

Match the following Pantone® colors using a color mixing system to produce a set to use with Fresener's Fast Films separation software. Use with a high opacity white, like Xtreme White or Bright Tiger.

Yellow	102C
Red	185C
Blue	286C
Purple	219C
Green	361C
Lt. Blue	306C
Gray	421C
Brown	167C
White	11888MX
Black	19888MX

Optional colors:

Lt. Flesh	475C
Dk. Flesh	161C

Colors can be made with PC Express or MX kit.

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REDUCERS

CURABLE REDUCER 10070: Viscosity reducer that will cure at standard plastisol cure temperatures (320 F/160 C), which ensures that you can lower ink viscosity without fear of cure problems. Efficient reducer - an addition of 5% by weight will lower the viscosity of most Wilflex inks by 25%. Additions greater than 10% may reduce bleed resistance and opacity. Any dramatic changes in viscosity may result in altered printing characteristics.

VISCOSITY BUSTER 10025VB: Additions of 1-3 % by weight will stabilize and improve the flow properties of finished ink. Do not use more than 3% by weight! This product is very efficient in small amounts. Will not affect Bleed Resistance or opacity, when used as directed.

REDUCER #1: Reducer 1 is a plasticizer blend, therefore, excessive use may cause cure and bleed problems. Preferred reducer is Curable Reducer or Viscosity Buster.

REDUCER #11: Plastisol viscosity reducer, plasticizer type, suited for SSV-FF and MCV-FF ink lines. Up to 5% (by weight) recommended.

THICKENERS

THICKENER #1: Viscous brown liquid used to increase viscosity and add body to low viscosity inks. Recommended limit: up to 3% by weight.

THICKENER #2: White Powder- An essential for High Density printing. Additions up to 8 oz. cup per gallon of ink are recommended to body and stiffen a finished ink. By increasing viscosity, the ink film will sit on substrate surface, improving opacity. Excessive amounts of Thickener 2 will cause build-up on back of screen and accelerate the aging of the ink viscosity. A mask is recommended when handling Thickener 2. High speed, high shear mixing will disperse powder without lumping. Be cautious to not overheat the ink.

THICKENER #3: Use this thickener as a final addition to GNS, OPM, and MX. Adjusting with Thickener 3, it is important to add .5 - 1% (MAXIMUM) to 100 parts ink. Be sure to weigh the amount precisely, as an over-addition will dramatically reduce printability. After adding Thickener 3, stir thoroughly, but do not overheat mixture. You may not notice an immediate build after the introduction of Thickener 3, but refrain from adding more than 1% as the additive may take time to work (up to two hours). Wilflex recommends mixing only what you need to complete the job as any leftover ink may become difficult to print later.

EXTENDERS

FINESSE 10150FNS: A plastisol additive designed to soften and extend general purpose and specialty Wilflex inks. Additions of 10-20% may be used to improve printability and soften hand. Additions greater than 20% will reduce opacity. Pre-test the product to ensure that the desired characteristics are present before a production run.

SOFT HAND CLEAR 10140CLEAR: A soft, clear plastisol designed to blend with general purpose and specialty plastisol inks to soften and extend inks. Tends to drop viscosity slightly. Will reduce build-up while making inks easier to print.

MISCELLANEOUS ADDITIVES

DULLING ADDITIVE: Additions of 7-10% by weight to Genesis inks will reduce gloss of surface and will not interfere with print properties. Dulling Additive is curable and addition greater than 10% may be used, but print characteristics will change.

FLEXIPUFF ADDITIVE 10520/FLEXIPUFF EXTRA 10521*: Formulated to be mixed with Wilflex general-purpose inks (GNS, MP, MX) to give a raised or elevated effect. Flexipuff may be added in amounts of 30% by weight.

*Only Available in Europe

FLASH ADDITIVE (FLASHADD): Add up to 10% by weight of this powder to GNS or MP inks to lower flash temperature. However, this product will alter the print characteristics of these inks and cause build-up when printing wet-on-wet.

STRAIGHT-UP HIGH DENSITY ADDITIVES: Add to existing inks, like MX, to create totally innovative, three-dimensional. WP220SUP Gloss, WP221SUP Satin, WP222SUP Suede

STRETCH ADDITIVE 10108SA: Increase elongation of Wilflex general-purpose inks (GNS MX,SB) by adding 1part additive to 2 parts finished color.

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USAGE CHART FOR WILFLEX ADDITIVES and EXTENDERS

	Reducers		Extenders			Viscosity Modifiers		
Ink Series	**Reducer #1 *Disc 1/02**	**Reducer #11**	**Finesse 10150**	**SoftHand Clear 10140**	**Curable Reducer 10070**	**Thickener #2**	**Thickener #3**	**Viscosity Buster**
Whites	0-5% by weight	NR	5-15% by weight	0-10% by weight > 10% will alter ink properties by reducing opacity & BR	0-10% by weight	3% by weight MAX	NR	1-3%
GNS	0-5% by weight	NR	10-20% by weight (20-100%,when opacity not critical)	0-20% by weight	0-10% by weight	3% by weight	.5-1% by weight	1-3%
MX OPM	NR	NR	10-20% by weight (20-100%,when opacity not critical)	0-20% by weight	0-10% by weight	1-3% by weight	.5-1% by weight	1-3%
SSV	0-5% by weight	NR	10-20% by weight	0-30% by weight	0-10% by weight	1-3% by weight	NR	1-3%
NPF Suedes	0-3% by weight	NR	0-10% by weight	0-10% by weight > 10% will alter ink properties by reducing puff height	0-5% by weight	NR	NR	1-3%
TF	0-5% by weight	NR	NR	NR	NR	NR	NR	1-3%
MCV-FF & SSV-FF	NR	0-5% by weight	0-10% by weight	0-10% by weight > 10% will alter ink properties by raising cure temperatures	0-10% by weight. > 10% will alter ink properties by raising cure temperatures	NR	NR	1-3%
HD Clear	NR	NR	10-20% by weight	0-30% by weight	0-10% by weight	NR	NR	1-3%
Straight-UP inks	NR	NR	NR	NR	0-10% by weight	NR	.5-1% by weight	1-3%
Rock Base	NR		10-20% by weight	0-30% by weight	0-10% by weight	NR	.5-1% by weight	1-3%
MSH Nylon Mesh OSN	NR	NR	Use 11422MSH Base as extender	NR	NR	NR	NR	1-3%


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WILFLEX® FINESSE

Premium Additive for Wilflex Inks

GENERAL DESCRIPTION Finesse #10150 is a plastisol additive for Wilflex inks that is designed to soften and extend general purpose and specialty Wilflex inks.

RECOMMENDED USAGE Finesse may be added to Genesis, MX, and process inks in any quantity.

Additions of 10 to 20 percent may be used to improve printability and soften hand. However, additions greater than 20 percent will reduce opacity. Pre-test the product to ensure that the desired characteristics are present before a production run. **Please note: Finesse will cure at standard plastisol temperatures (320 F/160 C). Therefore, quantities of Finesse that may be added to MX and GNS inks are limited only by the opacity desired.**

Finesse #10150 may be added to MCV-FF, SSV-FF, NuPuff and Wilflex white inks in amounts up to 10 percent by weight. For these inks, additions greater than 10 percent will alter ink properties. It will raise cure temperatures of the Fast Fusion inks; reduce puff height of NPF; and reduce opacity and bleed resistance of Wilflex White inks.

Finesse may be added to SSV inks in quantities up to 30 percent by weight.

Finesse is NOT recommended for Transflex or One-Step Nylon inks. Finesse will impede split on TF transfers and will diminish adhesion to nylon in OSN.

Non-Standard / Custom Compounds

Wilflex manufactures many products that are considered "non-standard." These products range from custom color matches to products that are specifically produced to meet certain needs. Minimum quantities may apply. Please consult your local Wilflex representative for more information regarding these products. A few of the more popular non-standard ink lines are described below.

Flame Retardant (FR) Inks - Many of our standard and non-standard ink lines are also available in a flame retardant version. Please contact your local Wilflex representative or call our Customer Service Department for more information.

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WILFLEX COLOR SYSTEMS

System Options	MX	ColorMaster/ Equalizers	PC Express
Color Specification	Provided Formulas are PANTONE® Formula Guide (coated) approved under cool white fluorescent, 4100Kelvin (2 bulbs, 17 watts each). Colors approved on white fabric printed through 156T (62T) mesh.	Provided Formulas are PANTONE® Formula Guide (coated) approved under cool white fluorescent, 4100Kelvin (2 bulbs, 17 watts each). Colors approved on white fabric printed through 156T (62T) mesh.	Provided Formulas are PANTONE® Formula Guide (coated) approved under cool white fluorescent, 4100Kelvin (2 bulbs, 17 watts each). Colors approved on white fabric printed through 156T (62T) mesh.
System Components	15 Mixing Colors	14 balanced pigments with 21000SB SuperBase	15 primary pigments with 10680GNS general purpose base
Software Support	Windows-based IMS Link to PMA 7500 Scale	Windows-based IMS Link to PMA 7500 Scale	Windows-based IMS Link to PMA 7500 Scale
Opacity	Opaque to semi - center line chips & high loads of fluorescent	FULL OPACITY CONTROL through choice of base type and pigment, and pigment level	FULL OPACITY CONTROL through choice of base type and pigment, and pigment level
Underlay Requirement	Requires underlay on some darks	Underlay optional based on mesh selection	Underlay optional based on mesh selection
Cost Factor	Costs can be lower than most due to lower pigments and additions of Finesse	FULL COST CONTROL due to complete opacity control	FULL COST CONTROL due to complete opacity control
Color Purity	Excellent - single pigment inks	Outstanding- Color is achieved by use of pigments dispersions and use of fluorescents	Outstanding- Color is achieved by use of pigments dispersions and use of fluorescents
Risk Factor	Low risk- needs elementary controls	Higher risk with beginners or shops with poor controls	Higher risks- needs elementary controls
Range of Ink Types			
Wet on Wet	Yes	Yes	Yes
Puff	FlexiPuff Additive - color shift	Pastel or Intense color	Pastel or Intense color
Transfers, Process, Metallic, Fast fusions, Stretch, Athletic	No	Yes	Yes, optional bases with PC/Base ratios available

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WILFLEX

PC Express

PC Express - The Ultimate in Quality and Consistency for the Screen Printer

- ✓ Control Ink and Inventory Costs With Only One Base and 15 Pigments
- ✓ Improve Color Communication With Your Customer
- ✓ Increase Versatility and Flexibility
- ✓ Formulations available on IMS Software
- ✓ Control Opacity and Ink Costs
- ✓ Respond Quickly to Customers' Special Color Needs
- ✓ New Genesis Base, 10680GNS Base, Offers Matte Finish, Creamy, Pumpable Viscosity and Excellent Wet-on-wet Printing Properties

COLOR & APPROVAL SPECIFICATIONS
PANTONE® Color Formula Guide
Cool White Fluorescent (4100K) Printed on White Fabric (156/62 mesh)

PC EXPRESS KIT INCLUDES:
1 Gallon 10680GNS Base
15 Pigments
1 Pantone Color Formula Guide
1 IMS CD-ROM
1 PC Express Formulation Guide

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WILFLEX PC EXPRESS COLOR MIXING SYSTEM

The Easy-to-Use PC/Base System

WILFLEX Base

10680GNS	Genesis Plus Base

Optional Bases

10540GNS	Genesis Base
10250NPF	NuPuff Base
10440TF	TransFlex Base
11422MSH	Nylon Mesh Base
10108SA	Stretch Base/Additive
10000GNS	Genesis Halftone Base
10007TF	TransClear
10040SSVFF	SSV-FF Base
10150FNS	Finesse
18800MCVFF	MCV-FF Base

Create PANTONE® Simulations with Only 15 Pigments

Standard WILFLEX PC Express (PCs) Pigment Concentrates

10110PC	Extra White
10450PC	Maroon
10470PC	Magenta
10570PC	Violet
10680PC	Blue
10700PC	Green
10870PC	Bright Yellow
10940PC	Velvet Black
11300PC	Bright Orange
11650PC	Marine PC
18000PC	Electron Yellow
18010PC	Electron Blue
18060PC	Electron Red
19040PC	Fluo. Pink
19080PC	Fluo. Purple

Optional (PCs) Pigment Concentrates

10000PC	Clear
10200PC	Light Brown
10370PC	Fast Red
10490PC	Venus
10770PC	Fast Gold
10830PC	Blaze Gold
10860PC	Blaze Yellow
10970PC	Black
11040PC	Fast White
11600PC	Bright Blue
11820PC	Blaze Lemon
12220PC	Shining Gold
18020PC	Electron Green
18030PC	Electron Orange
19050PC	Fluo. Neon
19070PC	Fluo. Magenta

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GUIDELINES FOR USING WILFLEX BASES

CHART ON BASES	May be used w/ metallic, glitter pigments	May be used w/ phosphore-scent	May be used to produce opaque inks	May be used to produce excellent trans-parent ink
General Purpose GNS Base 10540GNS GNS Plus 10680GNS GNS Halftone 10000GNS			X	
Fast Fusion/Stretch Stretch Base/Additive 10108SA	X	X	X	
11040SSVFF	X	X	X	
18800MCVFF	X	X		X
Transfers 10440TF TransFlex Base	X	X	X	
10007 TF Clear	X	X		
Puff 10250 NPF Base		X	X	
Finesse #10150 (used as an extender for all ink lines except TF and OSN) (may be used as a transparent base with small amounts of PC)	X	X		X
Nylon Mesh 11422 Nylon Mesh Base	X	X	X	X

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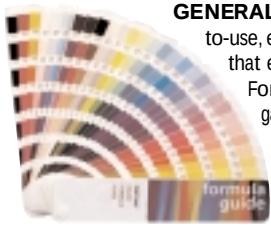
WILFLEX® MX COLOR MIXING SYSTEM



GENERAL DESCRIPTION The Wilflex MX Mixing System is an easy-to-use, easy-to-mix color matching system with 15 intermixable colors that enables printers to produce simulations of PANTONE® Color Formula Guide colors on white and and dark (with white underlay) garments. MX Mixing Inks produce soft-hand inks for high production, wet-on-wet printing, offering a matte finish, and improved crock resistance. An MX Kit contains all mixing inks and an MX Manual with a coated PANTONE® Color Formula Guide. All MX colors were printed through a 156 threads/in (62 threads/cm) mesh screen on white 100 percent cotton fabric and matched under cool white fluorescent lighting (4100K illuminant).

RECOMMENDED SUBSTRATES Inks produced from the MX Mixing System are translucent to opaque. When blended according to formulations, resulting colors vary in opacity from translucent to semi-opaque. For bleed resistance,use a premium bleed resistant underbase white. MX inks may be printed on cotton, cotton blends, and some synthetic fabrics. Colors will reproduce best on white or light colored fabrics. **Pre-print and test all fabrics for dye bleeding, ink adhesion, wash fastness and other desired properties.** The **MSH Nylon Series** is available for printing on nylon mesh. See appropriate pages in the Athletic Products section.

PRINTING RECOMMENDATIONS Mesh: 110-305 threads/in (43-120 threads/cm) Squeegee: 60 to 90 durometer, straight edge blade. Emulsion: Conventional direct or capillary films. For consistency, all formulas provided were printed through a 156 threads/in (62 threads/cm) mesh screen on white 100 percent cotton fabric for color approval. Wilflex MX Mixing Inks inks can, however, be printed through a range of meshes between 43T and 120T (threads per cm) or 110T and 305T (threads per inch). Variation in screen mesh and ink deposit can result in variation in depth of color and opacity. All MX Mixing Inks colors have been developed using Genesis technology and can be printed wet-on-wet with exceptional resistance to build-up.

COLOR SPECIFICATION MX formulas were printed through a 156 threads/in (62 threads/cm) mesh screen on white 100 percent cotton fabric and viewed under cool white fluorescent (4100K illuminant) for PANTONE simulations. These specifications were used internally at Wilflex for all color approvals. Similar print appliation, sreen mesh, squeegee profile and light specifications should be implemented in your shop to ensure comparable results. We recommend that you begin a color library of your prints. By keeping prints achieved under various conditions and on differing substrates, it is possible to build your own reference library of color and data.

MIXING GUIDELINES All the MX Mixing Inks formulas that achieve PANTONE® color simulations have been calculated by weight and have been presented as a total of 1000 grams. The final quantity of ink produced from these formulas will vary according to color and the specific gravity of the ink concerned, but all formulas will make approximately 1 quart/1 liter. Wilflex recommends that MX Mixing Inks be weighed on scales accurate to +/- 0.1 gram. We also strongly recommend that all the formulas be proofed prior to commencing any production run to ensure color accuracy, as the final color is dependent on print technique, mesh count and substrate used. Wilflex Inc. and its associated companies assume no responsibility for the actual color achieved.

CURING Wilflex MX Mixing Inks inks must reach a temperature of 320°F (160°C) to achieve full cure. Failure to reach full cure will result in poor washfastness, adhesion and wet rub resistance. Fusion tests should be made prior to any production run. See the "Evaluating Plastisol Inks" section of the Wilflex User's Manual for cure testing procedures.

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MODIFIERS MX inks are extremely easy to print and mix. The viscosity or thickness has been designed specifically to enhance printability. Viscosity modification is not recommended. However, if necessary, 10150FNS Finesse and 10070 Curable Reducer may be used to extend or reduce ink, but these additions may alter the color and performance of the ink. Note: Stir before use. This product has a unique viscosity. Upon opening a container that has been unused for several days or weeks, it will appear slightly thick. Stir to easily restore the creamy texture before adding modifiers.

SAFETY Complete Health and Safety Information available upon request. Wilflex MX Mixing Colors have been formulated to comply with both EN71 and ASTM F9-63.

STORAGE Recommended storage temperature is 65-90 F (18-32 C). Avoid storing in direct sunlight or in extreme temperature conditions. It is recommended that Wilflex products be used within one year of receipt of product. Inks subjected to extreme temperatures or prolonged shelf life could thicken in the container.

WASH-UP MX inks may be cleaned from the screen with Wilflex Screen Wash or other conventional solvents.

ORDERING INFORMATION

11888MX MX White
19888MX MX Black
38888MX MX Orange
48888MX MX Red (Blue/Shade)
48889MX MX Magenta
58888MX MX Violet
68888MX MX Marine (Red/Shade)
68889MX MX Blue (Green/Shade)
78888MX MX Green
88888MX MX Yellow
98880MX MX Fluorescent Pink
98884MX MX Fluorescent Red
98885MX MX Fluorescent Purple
98886MX MX Fluorescent Blue
98888MX MX Fluorescent Yellow

SOLD SEPARATELY

- MX Starter Kit - contains 1 quart of each color, 1 gallon 11888MX and Formulation Manual including PANTONE® Color Formula Guide (coated).
- IMS Software - Windows-based software containing all formulations in MX Manual or download recipes from www.wilflex.com
- PowerPax - Buy an MX kit, plus software and a scale for one low price. 7,500- and 1,000-gram capacity scales available.
- DispenseMasterTM - an automatic ink dispensing system with MX formulations preprogrammed into the software.
- MXFormGuide - three-ring binder containing product specifications, MX Color Card and MX PANTONE formulations.

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WILFLEX® OPAQUE MATCHMAKER COLOR MIXING SYSTEM

GENERAL DESCRIPTION The Wilflex Opaque MatchMaker Color Mixing System is an easy-to-use, easy-to-mix color matching system with 11 intermixable colors that enables printers to produce opaque simulations of PANTONE® Color Formula Guide colors on dark garments. Opaque MatchMaker produces soft-hand inks for high production, wet-on-wet printing, offering a matte finish and improved crock resistance. The formulas used in this system have been carefully designed to closely simulate PANTONE colors on coated stock as presented in the PANTONE Color Formula Guide 1000. For convenience, a PANTONE Color Formula Guide 1000 has been included with this Opaque MatchMaker Manual.

OPAQUE MATCHMAKER MIXING COLORS

11973OPM White	57973OPM Violet (Strong Red Shade)
87973OPM Yellow (Green Shade)	65973OPM Ultramarine (Red Shade)
88973OPM Golden (Red Shade)	66973OPM Blue (Green Shade)
33973OPM Orange (Red Shade)	77973OPM Green (Blue Shade)
44973OPM Vermilion(Yell. Shade Red)	47973OPM Magenta (Strong Blue Shade)
19973OPM Black (Slight Brown Shade)	

All of the above Opaque MatchMaker Mixing Colors have been formulated to comply with both EN71 and ASTM F9-63. The 11 Mixing Colors are fully intermixable. Every effort has been made to closely simulate an opaque representation of the PANTONE colors listed and, as a result, the finished colors will have consistent opacity.

RECOMMENDED SUBSTRATES Cotton, cotton blends and some synthetic fabrics. For bleed resistance, an underbase white such as 11480HT Bright Tiger must be used. Pre-print and test all substrates for dye migration, ink adhesion, wash fastness and other desired properties. Opaque MatchMaker formulas have been designed for use on dark garments but are very suitable for overprinting onto a flashed white underlay.

PRINTING RECOMMENDATIONS Mesh: For optimum opacity, use 86 threads/in (34 threads/cm) mesh. For overprinting and fine-line printing, use 120-305 threads/in. (49-120 threads/cm). Squeegee: Medium durometer, slightly rounded edge. Emulsion: Conventional direct or capillary films. For consistency, all formulas provided were printed though a 86 T/in (34 T/cm) mesh onto 100 percent cotton black fabric for color approval. Wilflex Opaque MatchMaker inks can, however, be printed through a range of meshes between 86-195 threads per inch (34-77 threads/cm). Variation in screen mesh and ink deposit can result in variation in depth of color and opacity. All Opaque MatchMaker colors have been developed using Genesis technology and can be printed wet-on-wet with exceptional resistance to build-up.

MODIFIERS Opaque MatchMaker inks are extremely easy to print and mix. The viscosity or thickness has been designed specifically to enhance opacity and printability. We do not recommend any modification to these inks. However, if necessary, 10150FNS Finesse and 10070 Curable Reducer may be used to extend or reduce ink, but these additions may alter color and performance of the ink. Note: Stir before use. Upon opening a container that has been unused for several days or weeks, the ink will appear slightly thick. Stir to restore the creamy texture.

COLOR SPECIFICATION For PANTONE color approval, Opaque MatchMaker formulas were printed through an 86 T/in (34 T/cm) mesh onto 100 percent cotton black fabric and viewed under D65 simulated daylight. Wilflex recommends that you begin a color library of your prints. By keeping prints achieved under various conditions and on differing substrates, it

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is possible to build your own valuable reference library of color and data.

MIXING GUIDELINES All Opaque MatchMaker formulas have been calculated by weight and are presented as a total of 1000 grams. The final quantity of ink produced from these formulas will vary according to color and the specific gravity of the ink concerned, but all formulas will make approximately 1 quart/1 liter. We recommend that you weigh Opaque MatchMaker inks on scales accurate to +/- 0.1 gram. Wilflex strongly recommends that all the formulas be proofed prior to commencing any production run to ensure color accuracy as the final color is dependent on print technique, mesh count and substrate used. Wilflex Inc. and its associated companies assume no responsibility for the actual color achieved.

Wilflex now offers an alternative formulation guide, Version 2. This guide offers cleaner, brighter colors on white fabric under fluorescent lighting and a broader mixing color palette. Please refer to MAXIMIZING OPTIONS with VERSION 2 Formulations in the following section.

MAXIMIZING OPTIONS with VERSION 2 Formulations

Version 2 formulations offer the following features:

Enhanced Color Brightness. Cleaner, brighter colors on white fabric, under fluorescent lighting.

Introduction of Finesse in formulations to improve color clarity.

Broader Mixing Color Palette

Introduction of Standard Genesis Super Fluorescent Inks as Mixing Colors:

90010GNS Super Fluo. Yellow	90110GNS Super Fluo. Blue
90410GNS Super Fluo. Pink	90310GNS Super Fluo. Orange
90610GNS Super Fluo. Red	
90710GNS Super Fluo. Purple	

NOTE: GNS Super Fluos. are chemically similar to OPMM, so additions should not alter print characteristics.

Introduction of three (3) new mixing colors

43559OPM Red (Bright Blue Shade Red)

62973OPM Blue 2 (Clean Green Shade Blue)

82973OPM Yellow 2 (Clean Green Shade Yellow)

CURING Wilflex Opaque MatchMaker inks must reach a temperature of 320 F (160 C) to achieve full cure. Failure to reach full cure will result in poor washfastness, adhesion and wet rub resistance. Fusion tests should be made prior to any production run. See the "Evaluating Plastisol Inks" section of the Wilflex User's Manual for cure testing procedures.

WASH-UP Opaque MatchMaker inks may be cleaned from the screen with Wilflex Screen Wash or other conventional solvents.

SAFETY Complete Health and Safety Information is available upon request.

STORAGE Recommended storage temperature is 65-90 F (18-32 C). Avoid storing in direct sunlight or in extreme temperature conditions. It is recommended that Wilflex products be used within one year of receipt of product. Inks subjected to extreme temperatures or prolonged shelf life could thicken in the container.

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PowerPax I
For the Starter Shop or Color Lab

- MX Kit or PC Express Starter Kits
- Acculab VI 1200

Buy ink, software and an easy-to-use scale for one LOW PRICE!

Acculab VI 1200

Standard features include:

- **1,200-gram capacity - Accurate to 0.1 g**
- **Easy auto calibration - weights included with many models**
- **Memory feature allowing for consecutive weighing of multiple samples with totalled results dis played**
- **Easy-to-use parts counting program**
- **Large LCD with low battery, overload, underload, stability and mode indicators**
- **Raised membrane keypads for tactile feel, plus tone to signal function**
- **Large removable stainless steel platforms**
- **AC adapter and built-in lockdown bracket**
- **9V alkaline battery operation**
- **Two-year renewable warranty, with 48-hour service turnaround (U.S. & Canada)**

Ink Starter Kits

MX Kit (PPAX1MX)
One quart each of 14 MX Mixing Colors

- **One gallon MX White**
- **Pantone® Color Formula Guide**
- **MX Form Guide**
- **IMS CD-ROM**

PC Express Kit (PPAX1PCEXP)

- **One gallon 10680GNS Genesis Plus Base**
- **One pint each of 15 Pigment Concentrates**
- **Pantone® Color Formulation Guide**
- **PC Express Form Guide**
- **IMS CD-ROM**

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PowerPax II
For the Automatic Shop

- MX Kit or PC Express Production Kits
- PMA 7500 Scale

Buy ink, software and an easy-to-use scale for one LOW PRICE!

PMA 7500

Standard features include:

- 7,500-gram capacity
- Durable construction that is resistant to inks and solvents
- Adjustable, high contrast, backlit display for easy viewing
- Accurate to 0.1 gram for precise color matching
- Rugged weight cell for maximum overload protection
- Stainless steel weighing pan
- 7/5 warranty
  Seven years - load cell
  Five years - components
- Optional 6' cable #YCC01 available, which allows user to interface the scale and IMS Software

Ink Starter Kits

MX Kit (PPAX2MX)

- One gallon each of 14 MX Mixing Colors
- Five gallons MX White
- Pantone® Color Formula Guide
- MX Form Guide
- IMS CD-ROM

PC Express Kit (PPAX2PCEXP)

- Five gallons 10680GNS Genesis Plus Base
- One gallon 10110PC
- One qt. each of 14 Pigment Concentrates
- Pantone® Color Formulation Guide
- PC Express Form Guide
- IMS CD-ROM

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Wilflex Ink Management Software

Fast...Efficient...

The Wilflex IMS is a Windows™-based program written to enhance Wilflex's existing formulation books by offering all color mixing systems in one package. The user-friendly menu-driven software runs on IBM or IBM compatible computers.

- ✓ Provides formulations for Wilflex color mixing systems at the click of a mouse
- ✓ Forecasts ink usage by weight per print, print area or ink quantity
- ✓ Creates and stores job specifications, including mesh counts, ink quantities, design area, underbase requirements and MORE
- ✓ Offers a variety of measurement units including grams, pounds, gallons and kilograms
- ✓ Allows printing of multiple formulations as reports or labels
- ✓ Customizes formulas with a "usage factor" to allow for double stroking, heavy film stencils, off contact or squeegee pressure
- ✓ Create reporting for VOCs
- ✓ Create and print your own formulation guides
- ✓ Recycle feature allows you to use up old inventory to make new colors
- ✓ Link PMA 7500-g scale with software by adding optional YCC01 6' cable

The IMS Software user may select an ink formulation based on the color code, color description or a prescribed reference code.

The ink requirements for a specific job can be calculated by inputting the job reference term, size of print, percentage of coverage, number of prints, and mesh count. Based on this information, the software can calculate a suggested volume of ink required for the job. Because this is a suggested volume, the user can overwrite the program based on past experience and variations in ink stencils, squeegees, ink viscosity and waste.

The Wilflex Ink Management Software offers the user clear advantages in record keeping, costing and usage parameters for their inks. Please contact Wilflex or your Wilflex Representative for more details or a demonstration.

SPECIFICATIONS

Hardware	IBM Compatible Pentium Processor, 23MG hard drive space, 32MG RAM
Windows	95 or 98
Monitor	VGA Color Display, 32 bit color

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Wilflex Color Systems PCMaster

REPEATABLE, CONSISTENT COLOR

Dispense consistent, accurate colors every time without the worry of calculating pigment load

✓ **Coarse and fine flow dispensing**
Dispensing technology accurate to 100th of a gram

✓ **Make only what you need**
Batch sizes up to 8,000 grams (2 gallons) or as small as 200 grams

✓ **Control labor, inventory requirements**
Create PANTONE color matches with ColorMaster pigments that are accurate every time. Let the machine do the work for you.

✓ **Reduce waste**
Controlled dispensing for batch size and color accuracy means virtually no ink mixing errors, less wasted ink

✓ **Wilflex PCs and Base**
21000 SuperBase is printable, pumpable and build-up free. Wilflex PCs are strong, stable and consistent. Vibrant colors and excellent prints.

SPECIFICATIONS

Electrical Supply: 220 VAC +/- 10 Volt, single phase, 60Hz, 30 amps, circuit breaker GFCI protection is recommended

Compressed Air Supply

Clean, dry air. Filtered to 40 micron or less; capable of 75 CFM @ 120 psi.
Maximum air inlet pressure: 100 psi
Minimum air inlet pressure: 80 psi

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Wilflex Color Systems DispenseMaster

Get it Right the First Time, Every Time.

Wilflex Color Systems DispenseMaster™ ink dispensing system gives you the power to get it right the first time, every time. The first system of its kind, DispenseMaster eliminates guesswork and delivers complete accuracy. It's large enough to handle the most complicated formula, yet simple enough to make your job easier than you ever dreamed possible.

✓ **PRECISION:** Highly accurate metering, measuring and dispensing with electronic feedback for excellent batch repeatability.

✓ **ACCURACY:** Two dispensing valves for coarse flow, fine flow and pulsing. User can dispense precise amounts for an accurate recipe.

✓ **INVENTORY CONTROL:** System automatically deducts weight each time it dispenses, allowing user to monitor inventory at all times. It also utilizes a re-work function to get dead ink inventory off the shelves.

✓ **SPEED:** Dispenses 5-gallon or 25-liter batch size in approximately seven to eight minutes.

✓ **CLEANLINESS:** All component drums remain sealed resulting in less product contamination. No handling of ink or weighing amounts manually–fully automatic.

✓ **EFFICIENCY:** Can be programmed to dispense all ink needed for a day. Keeps record of all materials dispensed.

SPECIFICATIONS

Air requirements: Clean, dry and filtered to 40 micron or less; capable of 75 CFM @ 80 PSI. Maximum air inlet pressure: 100 PSI; Minimum air inlet pressure: 80 PSI

Electrical Supply: 120 VAC, +/- 10 Volt, 60 Hz, 15 amp circuit breaker GFCI protection is recommended

Computer: The system comes with an IBM-compatible, PentiumII 300 MHz, 32 MB RAM, 2 Gig system disk memory (minimum). The computer is set up to function only as a dedicated dispensing control computer, and it is intended that the computer remain on at all times. Environmental requirements for standard PC operation include a temperature range of 60 to 80 F and a humidity level not to exceed 70 percent. In addition, the machine requires stable mounting, no vibration or air currents, which can cause computer failure or scale fluctuations.

Please contact Wilflex's National Sales Manager at 1-800-326-0226 for further information about DispenseMaster.

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CURING

Shirts courtesy of Abracadabra, United Kingdom

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Screen Printing

Introduction

All ingredients — art, stencil, mesh, print parameters, etc. —interrelate. It is the entire recipe, not just one ingredient, that establishes high quality and production rates.

Without organization between departments, the focus of each area will be on only one ingredient, not the entire recipe. The screen printing process can be distorted to accommodate practically any one ingredient, but this is the proverbial "tail wagging the dog" approach. It is much better to evaluate the entire process.

In general, the merchandising department, art department, screen printing, and warehouse groups need to have a good working knowledge of their contribution to the entire process. Education and cross-training is one way to help each department realize its contribution to the overall picture. By this method employees see first-hand how their work directly influences other departments and the quality of the finished product. The relationship between the screen mesh, stencil systems, screen exposure, tension, squeegee parameters, ink transfer to different materials, etc., is important to the quality of the finished product.

It is our hope that this manual will give you some insight into our products and assist you in seeing the "big picture" of the screen printing process.

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Art Work

Although there are many ways to create art, the artist should know some basic information about creating art for screen printing. Some of the questions the artist should ask include:

- o What is the substrate? (color? type of garment? material content?)
- o What type of print? (process? spot?)
- o What size does the art need to be? (child? adult? left-chest?)
- o What are the ink opacity requirements? (bright? muted? glossy? matte?)
- o Is an underlay needed? (bright ink on darks? specialty inks?)
- o What are the registration requirements? (butt? trap? overprint?)
- o What are your production capabilities? (auto? manual? number of colors?)

Art Creation

The three most common forms of art created for screen printing are hand-drawn art, computer-generated art and art replicated from fine paintings or photographs.

Hand-drawn Art

Hand-drawn art comes in many forms. An artist can create a keyline (an outline of the design) by drawing it on paper with an opaquing pen, shooting it on a camera or scanning it into a computer. Art can be created from a hand-drawn keyline provided the image is loaded into a scanning program, converted into paths and then placed into an art program. With the image in a format that can be manipulated, the artist can clean it up, change its size and position, add text and place color in selected areas. Another option is to draw directly onto vellum or onto a coated screen. This method is not recommended, but it is effective for simple one-color designs.

Computer-generated Art

Computer-generated art is conceived and designed on a computer through a variety of design programs. The most common programs in the screen printing industry are PhotoShop, Illustrator, Freehand and Corel. Designs created on a computer are then separated with the computer's separation program.

Replications

Replications of fine art or photographs are most successful when they are shot with a digital camera or scanned into a computer. The artist can then utilize an advanced color separator program. The artist also can separate replications by hand through a series of hand-cut overlays.

Art Separations

After creation, art must be converted into final separations. The goal of separation is to create individual films, either acetate or vellum, in which the print areas block UV light rays and the negative areas allow UV light to pass through. The most frequently used methods involve separating by hand, camera and computer.

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Hand Separations

An artist can achieve hand separations in several ways. Hand-cut positives are created by cutting Photomasking film, or rubylith, into the shapes or letters needed. Then the artist peels away the negative unwanted portion, leaving rubylith in the areas to be printed.

Overlays are color separations created by the use of acetate or rubylith overlaid on a keyline, to create positives. By cutting, drawing, applying adhesive dot patterns, and using acetate or burnishing letters, the artist can build each color (as well as additional colors with dot pattern overlays).

Hand-drawn separations are created by tracing the design directly onto the acetate or vellum. Starting with a keyline of the design, the artist overlays each color one at a time and traces until all of the separations are completed.

Camera Separations

Camera separations are created by the use of a camera or other exposing equipment, such as a contact frame, to create acetate positives. An artist may use the camera to shoot separations from a laser jet printer or a hand-drawn keyline, as mentioned earlier. An acetate keyline from the camera then could be used as the basis for the hand-cut separation, utilizing rubylith (as mentioned earlier), to achieve the trap method of printing. The trap method is simply when colors slightly overlap where they meet on a design. Using basically the same method, after cutting the rubylith, instead of peeling off the negative areas, the artist peels off the positive areas, leaving the print areas clear. The artist then takes this overlay (still attached to the keyline), and exposes it to reversal film on the contact frame. The end result is a perfect butt registration (or perfect dropout) of the separated color.

An artist also can utilize the camera to create "user friendly" separations for the Production Department. Choking a color means that the artist produces a slightly smaller color separation, as if there is a hairline space between the separation and its adjacent color. Choking allows easier registration of overlay colors (if the choked color is a white underlay), and helps stop colors from bleeding into each other by creating a slight barrier of fabric. To choke a color, simply place acetate sheets between the art and the film. The light will naturally expose inside the edges, creating a slightly smaller image on the film. To create a white underlay, an artist can register the film separations together on a contact frame and expose them onto dupe film. This method automatically chokes the plate. This method is also useful in creating transfers because it is critical to butt-register all transfer colors.

Computer Separations

Computer separations usually are rendered from art created in a computer graphics program. Other art can be separated with the use of a computer, but first it must be scanned or converted digitally before it can be manipulated in a graphics program.

A piece of art created in a vector program is separated easily because the color usage is controlled during the creation of the art. The program will render separations per color and will print out exactly what the artist needs.

Fine art or photographs can be separated by computer provided the artist has access to a large format scanner, a drum scanner or a digital camera. (If the Art

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Department doesn't own any equipment, a service bureau can be paid to scan these images.) For best results, the image should be scanned at about 300 DPI in an RGB mode and saved as a TIFF file. Once the piece of art is converted digitally, it can then be introduced into a design program, like PhotoShop.

When a design is in this type of program, it can render process separations or areas of color can be selected to create individual channels for each color, producing spot plates. The use of PhotoShop plug-ins can decrease time spent creating spot color channels.

To calculate line counts for halftone screens, simply divide the mesh count by four. The result will equal the highest line count that should be used. The artist must have an understanding of mesh counts and their effect on the press. For instance, when a fade is needed in a design, the artist may be tempted to put it in a high mesh. However, if that same color also consists of large, open print areas, the printer will require a mesh in a lower count. In this instance, the artist should calculate the halftone line based on the lower mesh. To determine the best resolution for a design, multiply line count by 2.5. Example: 55 lines = 137.5 resolution. This should prevent the program from producing undersized dots in the lower percentage halftone areas.

When the design is ready to be separated, it may be printed directly from the program or you may split the channels to create individual files to be printed later. The program creates individual files for each color, giving the artist the option to go back and change a color individually if the print performance is not satisfactory.

It is important to label each color and to make sure that each piece of film is complete with registration marks. Most programs offer these options on the separation screen, but some programs require the artist to incorporate the color names and registration marks with his or her designs. The artist must type each color name in its own color and color the registration marks with the "registration" color option.

Image output refers to the method in which a computer prints art or separations. One way of printing separations is on a laser jet printer. An artist may choose to print out directly on vellum, which exposes well, or on paper, which is then shot by a camera to render the films. In addition to laser jet printers, an image setter may be used to output separations. This equipment enables the artist to print out his or her art directly onto film (and can totally replace a darkroom).

It is a good idea to have a color "mock -up" of the design to accompany the separations to production. This ensures that everyone from the screen room through packing are on the same page.

Artists must understand the limits and advantages of screen printing. They must react to the needs of the customer as well as those of the production department. The bottom line is achieving communication between the departments to ensure a predictable, repeatable product.

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Mesh Thread Diameter

Mesh Thread Diameter—In certain mesh counts there is a selection of thread diameters: S—O T—O HD—O

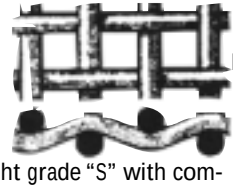
For the best results consider these thread diameters:

S-thinnest diameter-permits higher squeegee speeds-requires quality stencils.
Mesh for glitters: 25-53 threads/in, 10-21 threads/cm
Mesh for metallics: 60-110 threads/in, 24-43 threads/cm

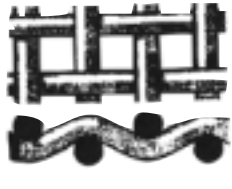
T-medium diameter-soft hand printing as well as wet on wet on darks
Mesh for Soft-Hand: 140-305 threads/in, 55-120 threads/cm
Mesh for Underbase: 110-230 threads/in, 43-90 threads/cm
Mesh for wet-on-wet over underbase: 195-355 threads/in, 77-140 threads/cm
Mesh for halftones: 305-355 threads/in, Mesh for halftones: 120-140 threads/cm

HD-thickest diameter-requires a slower speed, thicker stencil and a dull edged squeegee
Mesh for athletic numbering & flocking: 51-95 threads/in, 20-38 threads/cm
Mesh for opaque hot-split transfers: 51-86 threads/in, 20-34 threads/cm
Mesh for maximum puff height: 74-125 threads/in, 29-49 threads/cm

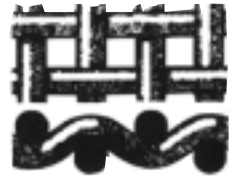
Mesh Conversion Chart					
threads/in	threads/cm	threads/in	threads/cm	threads/in	threads/cm
25	10	123	48	280	110
37	15	137	54	305	120
54	21	156	61	330	130
63	25	173	68	355	140
83	32	195	77	381	150
85	34	206	81	409	161
96	38	230	90	457	180
110	43	254	100	508	200



Light grade “S” with comparatively thin diameter threads and a large open area.



Medium heavy grade “T”



Heavy grade “HD” (Heavy Duty) thick diameter thread and a small open area.

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Screen Frames

The purpose of the screen frame is to hold the screen mesh at proper tension for print production. Therefore, the screen frame must have the stability and strength to withstand the desired screen tension.

Screen frames are made from wood or metal. Metal frames are either fixed or moveable and retensionable. Screen frames must be resistant to the chemicals and inks used during printing and cleaning-up. The surface of the frame where the screen fabric is to be attached must be flat and free of foreign substances.

Screen Tension

Experience has proven that proper screen tension will improve screen performance, which means it will provide high resistance, firm adhesion of the stencil, suitable elasticity for off-contact printing and proper ink flow. It is important to have proper screen tension, but it is just as important to have consistent tension levels throughout a job. Screen tension is one of the most critical factors in producing screens mainly because screen tension directly influences printing results.

Printing parameters improved by proper screen tension include:

- registration accuracy
- line sharpness or acutance due to improved performance of stencil system
- "snap-off" and low off-contact distances
- ink deposit—uniform and consistent
- ink color consistency
- less ink penetration resulting in higher opacity on dark substrates
- less ink build-up on backs of screens
- run of squeegee—less squeegee pressure required; no crimping of mesh, which causes smudged prints
- screen life—stencil life and mesh life
- ink flow—due to shear from screen mesh
- print quality and consistency throughout production run

As these print parameters are improved, overall productivity is improved. Specific areas of improvement include faster set-up time for multicolor work, faster printing speeds and higher number of quality prints.

With this evidence indicating the importance of proper screen tension, screen stretching or tensioning methods need to be considered.

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Stretching/Tension Methods

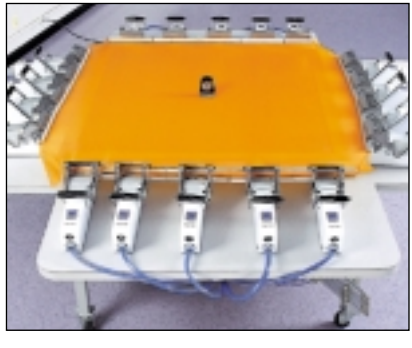
To begin the stretch or tension process, screen mesh must be positioned carefully. Eighty percent of screen accuracy is due to mesh position. In most cases, correct mesh position aligns fibers at right angles.

Devices used to apply tension to screen mesh are basically either mechanical or pneumatic.

1) Mechanical devices operate with tensioning gear and crank or wheel.

Measurement of tension may be recorded as degree of mesh expansion or through use of a tension meter. Once mesh reaches desired tension, mesh is attached to frame with every effort to maintain tension. Disadvantages of this method include limited ability to reduce mesh tension in corners, limited ability to adapt to various frame sizes, and loss of tension when mesh is attached to frame.

2) Pneumatic devices use a number of relatively small clamps operated with air pressure. The small clamps allow even tension over mesh area and controlled tension in corners to prevent mesh distortion. In most pneumatic systems, clamps are calibrated to provide equalized tension on mesh. The small clamps move laterally to minimize mesh distortion. Again measurement of tension may be recorded as a degree of mesh expansion or through use of a tension meter.



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With mechanical and pneumatic stretch devices final screen tension may be enhanced by use of a frame with sides slightly bent in the concave direction. Once mesh is attached to this type of frame, the mesh tension and the frame oppose each other. Although this method enhances tension, it is difficult to control.

3) Re-tensionable frames provide an accurate stretch device as well as a frame. Screen mesh is attached to screen frame prior to stretching. The screen frame is then rotated and locked into position to provide tension. These frames provide even, continuous fabric tension and minimize mesh distortion allowing precision printing and registration within one thousandth of an inch. Retensionable frames address the hardening characteristic of polyester mesh. Polyester fibers of screen mesh brought under tension harden or re-align fiber molecules by breaking and reforming hydrogen and Van der Waals bonds. Retensionable frames may be used to bring fabric to ideal tension before, during and after printing. These frames allow the use of extremely high screen tension (when compared to other types of frames and tensioning devices). These frames can provide constant tension and reduce off-contact requirements while maintaining screen snap-off behind squeegee enhancing print quality. Measurement of tension should be recorded with a tension meter.

Recent developments in mesh technology have produced special polyester filaments that will withstand increased tension and may change the thread diameter recommendations. High tension meshes are particularly desirable when printing process colors and are helpful when printing white inks. For further information please consult your mesh supplier.

In all cases, high screen tension enhances the printability of Wilflex inks.

Mesh tension on a screen should never be left to chance. The whole process should be kept under constant control.

Mesh tension is measured in Newtons/Centimeter. A Newton is a unit of force referring to the amount of mesh deformation ($1N=102g/cm^2$). The need for quality and consistency in the printing process requires the printer to use measurement devices to record and control screen tension. **Although Wilflex inks are designed to perform well on screens with various levels of tension, proper high tension will help to optimize ink performance.**

*For further information, please consult your mesh and frame representatives and other reference materials on the screen printing process.

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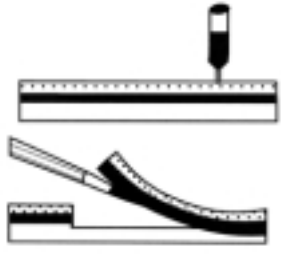
Stencil Systems

The purpose of the stencil system is to provide a method for accurate transfer of artwork to substrate. Artwork should be designed within the parameters of the ink, substrate and stencil system used.

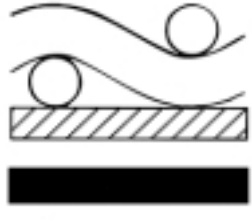
Prior to preparing stencil system, screen mesh is normally roughened on the stencil side of the screen. The purpose of roughening is to provide more surface area for stencil adhesion. Several preparations are available, consult your stencil supplier for further information.

Screen mesh should also be degreased. Degreasing refers to removing any contaminates or dust from mesh. Degreasing chemicals should be handled carefully, using proper industrial hygiene.

There are basically five different types of stencil systems.



1. Hand-cut stencils—Hand-cut stencils are produced by cutting the design into an emulsion film which is backed by a support film. This stencil method is usually used only with simple designs, as cutting away emulsion requires patience and skill. Once the cut area (area to be printed) has been removed, the film is mounted on the screen mesh. The stencil film is wet with suitable adherent, blotted and allowed to dry. Once the hand-cut stencil has dried thoroughly the support film may be peeled away.



2. Indirect Photostencil. The indirect photo stencil consists of a stable film coated with a presensitized emulsion, gelatin or synthetic polymer. Processing the stencil is done prior to adhering the stencil to the screen mesh, hence the name “indirect.” The emulsion film is exposed with the art positive, then chemically hardened. The unexposed emulsion is rinsed away with water. The emulsion film is mounted on mesh and allowed to dry. After emulsion is dry, the support film may be peeled away. Indirect systems give high definition prints for medium print runs.

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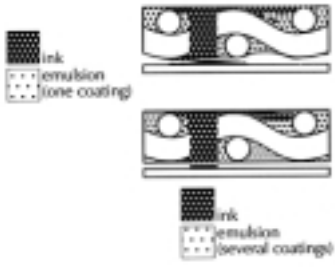
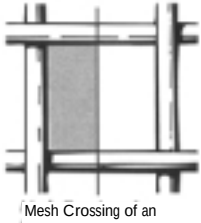


3. Direct Photostencil—Direct photo stencil systems are processed with the stencil system on the screen mesh. The emulsion is a photo-sensitive liquid that is applied to mesh to embed mesh with emulsion. Several coats of emulsion will help produce a higher resolution print. After the mesh is coated and allowed to dry, the emulsion is exposed with the art positive in contact with the emulsion. After proper exposure the unexposed emulsion is washed out. Direct stencils are durable but can allow some ink spread due to poor edge definition.

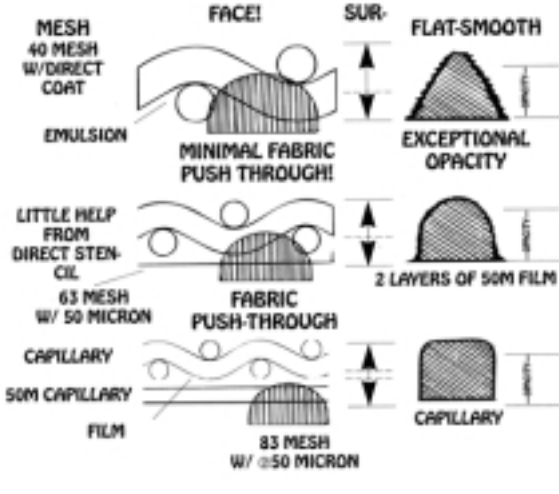


Mesh Crossing of an Indirect Screen

4. Direct/Indirect Photostencil—The direct/indirect photo stencil combines methods and advantages associated with direct and indirect systems. A film consistency of an unsensitized emulsion on a support film is placed in contact with dry screen mesh. A sensitized liquid emulsion is then squeegeed on inside of screen mesh to adhere emulsion film and sensitize it.

The emulsion is dried and the support film is peeled away. The emulsion is exposed with the art positive in contact with the emulsion. After washing away unexposed emulsion, the screen is allowed to dry. The direct/indirect stencil system provides high resolution prints and durability to withstand long production runs.

5. Capillary Stencils—Capillary stencils are made of a presensitized emulsion coated on a support film. The emulsion film is adhered to screen mesh with water. Excess water is removed and emulsion is dried, then the support film is removed. The emulsion/screen is exposed with art positive held in contact



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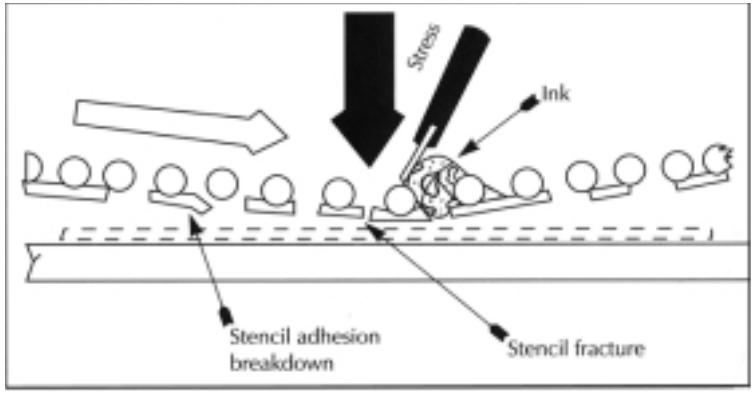
by vacuum frame. Unexposed emulsion is washed away and the screen is allowed to dry. For extra durability, a sensitized emulsion may be used for adhesion instead of water. Capillary stencil systems are convenient and fast to process. They also provide high resolution prints even with thick film coating.

Note: Care should be taken to properly expose emulsions. Exposure units and methods should be monitored and recorded. Proper exposure is critical for durability of stencil system. Exposure calculators are available to assist in determining proper exposure requirements.

For further information, please consult your stencil system supplier.



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Squeegees

Squeegees are designed to help the ink flow through the screen mesh. The squeegee should have an edge to correspond to the screen mesh used. The squeegee pressure should be kept to a minimum to allow the ink to be applied to the surface of the substrate.

USE THE LEAST AMOUNT OF SQUEEGEE PRESSURE TO:

✓ PUT THE MESH INTO CONTACT WITH THE SUBSTRATE.

✓ CLEAN THE INK FROM THE NON-IMAGE AREAS.

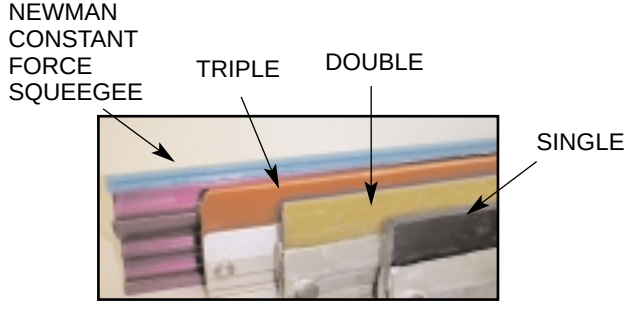
The squeegee durometer or hardness may be changed to suit ink and print. However, a 70-85 durometer squeegee may be used for most printing.

Composite squeegees or squeegees with multiple durometer rubber allow for more control.

Composite squeegee rubber utilizes the strength of high durometer rubber to maintain proper stiffness and durability while using lower durometer rubber for the edge which contacts the screen and ink.

Less radius = less ink deposit
More radius = more/heavier ink deposit

THE EDGE OF THE SQUEEGEE NEEDS TO MATCH THE MESH!



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Substrates

Substrates for plastisol inks vary dramatically, floor mats, tote bags, to T-shirts. In each case, a Wilflex® ink may be used to produce a quality print. Certain characteristics of each substrate should be considered: 1) fabric content, 2) color, 3) fabric mass, 4) heat stability, and 5) end use. Consult data sheets on Wilflex inks for choosing ink for each substrate.

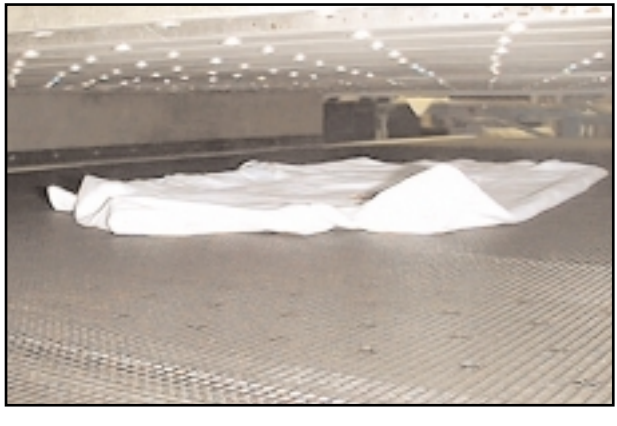
FABRIC CONSTRUCTION OF YOUR GARMENT AFFECTS THE PRINTING PROCESS

PERCENT FABRIC MASS	REMEMBER YOU CAN'T PRINT ON AIR!
90% WOVEN GOODS;	**60%** HIGH END HEAVY WEIGHT TEES;
80% HIGH END FLEECE;	**50%** LOW END HEAVY WEIGHT TEES;
70% LOW END FLEECE;	**40%** 50/50 REGULAR WEIGHT TEES

For low fabric masses, we suggest:

• finer detailed artwork • avoid color on color printing • higher screen tension • small radius, short height, low durometer squeegee • slower squeegee speed • reduced squeegee pressure • capillary film, piggybacked or adhered with compatible emulsion • mist-type spray adhesive like Duo-Tak.

The higher the fabric mass the easier it is to print.



Always pre-print and test new substrates. For assistance, see "Evaluating Plastisol Inks" in the Wilflex User's Manual or call Technical Service.

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Curing

1. GET THE ENTIRE INK FILM TO THE RECOMMENDED CURING TEMPERATURE

2. MONITOR THE HEAT

3. USE THE WASH TEST TO EVALUATE CURE

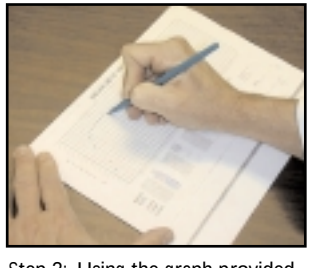
To cure plastisol inks the ink film must reach appropriate cure temperature. A heat history includes time and temperature used to reach total fusion or cure in ink. This cure or fusion is instantaneous once the entire ink film hits the cure temperature (320°F/160°C, except FF inks-270°F/132°C).

Use Thermo-probe to monitor temperatures. Always test for cure with wash tests.

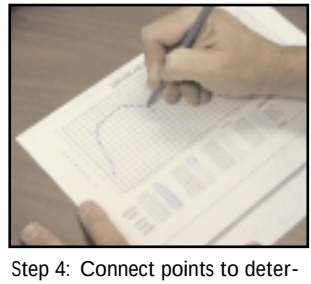
MAPPING OVEN TEMPERATURE

Step 1: Place the donut with the crosshairs in the ink film.

Step 2: Record the temperature at five-second intervals.



Step 3: Using the graph provided in the User's Manual, plot time and temperature points.



Step 4: Connect points to determine temperature curve. Map the dryer in the morning and in the evening to account for changes in the environment.

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THERMO-PROBE

Digital Temperature Monitor and Donut Probe

The Thermo-Probe and Donut package bring a heightened awareness of plastisol curing and dryer performance.

This system provides continuous temperature data for the entire length of conveyor dryer. The Thermo-Probe will interpret air temperature, absorbed garment temperature, and absorbed ink temperature. The Thermo-Probe may also be used with flash cure equipment.

The heat history required to properly cure plastisol inks is reliant on several variables such as ink color, deposit, and cure characteristics. Equally important are the variables associated with the dryer such as type of heat and length of heat chamber. The Thermo-Probe and Donut Probe provide information to address these variables and establish settings for panel height, retention time (belt speed) suited for particular ink and substrate.

The Thermo-Probe Data does not replace the need for ink cure tests but gives quality information for development of quality guidelines and predictability.

Technical Assistance:

Wilflex: 800-735-4353 (US)
Technical Inc.: 352-378-5555

APPLICATION:

1) Choose °C or °F
2) Place donut probe onto garment with cross wires on ink film.
3) As donut probe moves through heat chamber, record temperature readings every 5 seconds.
4) Plot data points to produce curve characteristic of particular dryer settings, ink deposit, and garment color.

The Thermo-Probe includes a 15-foot wire to allow donut to move through heat chamber. Extension wires are available for larger drying units.

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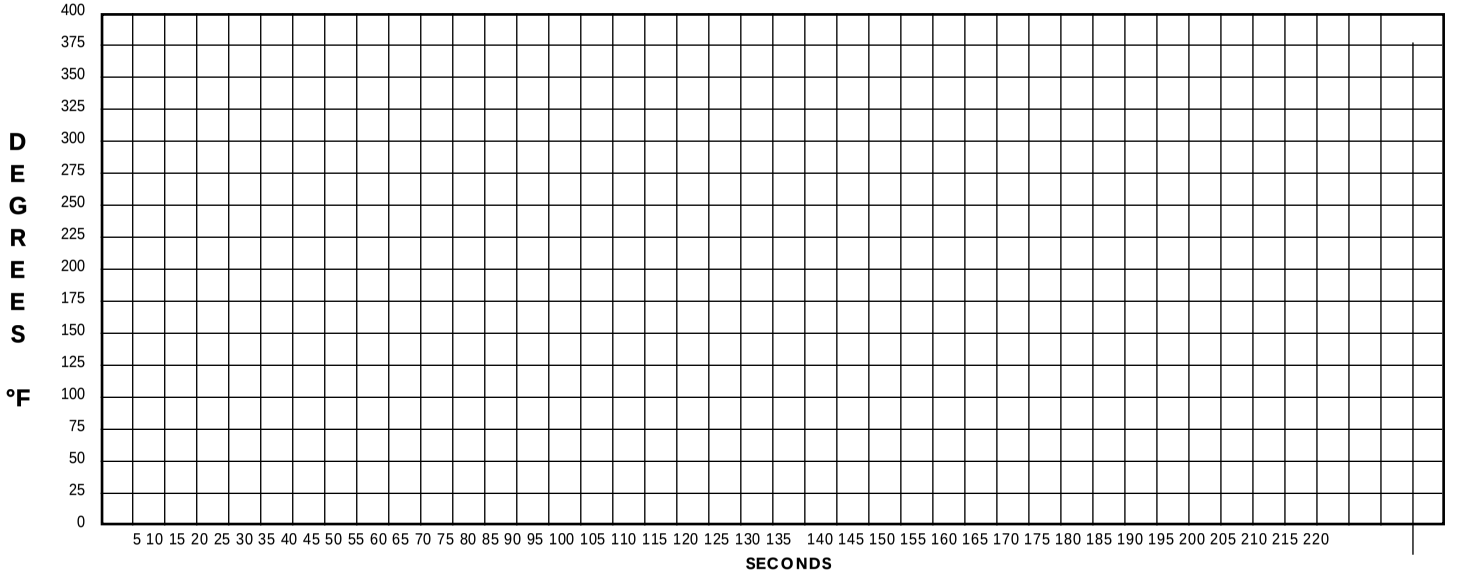
DRYER HEAT HISTORY



DATA LOG

OVEN TEMP. CHART

5 SECONDS - _____
10 SECONDS - _____
15 SECONDS - _____
20 SECONDS - _____
25 SECONDS - _____
30 SECONDS - _____
35 SECONDS - _____
40 SECONDS - _____
45 SECONDS - _____
50 SECONDS - _____
55 SECONDS - _____

60 SECONDS - _____
65 SECONDS - _____
70 SECONDS - _____
75 SECONDS - _____
80 SECONDS - _____
85 SECONDS - _____
90 SECONDS - _____
95 SECONDS - _____
100 SECONDS - _____
105 SECONDS - _____
110 SECONDS - _____

115 SECONDS - _____
120 SECONDS - _____
125 SECONDS - _____
130 SECONDS - _____
135 SECONDS - _____
140 SECONDS - _____
145 SECONDS - _____
150 SECONDS - _____
155 SECONDS - _____
160 SECONDS - _____
165SECONDS - _____

170 SECONDS - _____
175 SECONDS - _____
180 SECONDS - _____
185 SECONDS - _____
190 SECONDS - _____
195 SECONDS - _____
200 SECONDS - _____
205 SECONDS - _____
210 SECONDS - _____
215 SECONDS - _____
220 SECONDS - _____

DRYER SETINGS

Belt Speed _____
Infra Red _____
Forced Air _____
Dryer Length

Heating Chamber _____
Flash Temp _____
Platen Temp _____

DATE _____ **TIME**_____

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Evaluation of Plastisol Inks

It is important to always pre-test plastisol inks before commencing production runs.

Printability or Processing in Screen

Every effort is made to manufacture Wilflex inks to be easily printed under a variety of screen printing conditions. However, quality printing equipment and processes allow Wilflex inks to perform at their best. See the "Screen Printing" section of the Wilflex User's Manual for further details on screen tension, squeegee selection, art work and printing conditions.

Final Print

In addition to printability in the screen, the finished print must meet specific criteria and should always be evaluated. The evaluation should be tailored to the type of print. For example, the testing procedure for evaluation of an athletic uniform print would differ from that of an infant wear print. The tests below are provided for your convenience and cover general print applications only. Please contact Wilflex Technical Services for additional information.

Wash Testing Plastisols for Cure

Failure to cure ink properly can result in poor wash fastness, inferior adhesion, unacceptable durability and increased likelihood of dye migration. Maximum ink tensile strength and elongation is accomplished by ensuring total fusion of the ink film. Testing procedures include wash testing and testing with solvent, with wash testing being the more reliable method.

A wash test ensures that printed samples are subjected to standard home laundering practices to determine state of cure on ink film.
Apparatus and materials include:

- Large Capacity 21.7 gal Washer
- Large Capacity 240 Volt Dryer
- Three Large heavy weight bath size towels.

Procedure

1. Cut printed sample to be tested in half.
2. Place half of the sample in washer with the three large bath towels.
3. Wash settings:
   - Medium load 16.7 gallons
   - Hot Wash/Cold Rinse

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Normal /Reg. @ 10 minutes

90ml of concentrated detergent

4. After washing is complete, place sample and towels into the dryer.
5. Dryer Settings: Cotton / High (105°F/40°C) / Timed Dry 30 minutes
6. Perform two to five complete wash and dry cycles.
7. Compare washed half of sample with unwashed portion.

Evaluation and Classification

Failure

The ink film is not cured when:

1. Severe cracking of the ink is noted.
2. Partial or total loss of the ink film from the garment.

Pass

The ink is cured if none of the above is seen. Slight loss of color intensity (AATCC Gray Scale for evaluating change in color 4-5), and slight nap show through are normal for cured ink films after washing.

Solvent Cure Test

Solvent testing is only the second most reliable method for testing plastisol cure. The most reliable method is wash testing. If solvent testing is chosen to evaluate cure, follow these steps:

Method #1:

1. Apply two or three drops of 99 percent ethyl acetate to the surface of the ink layer being tested. Warning! Ethyl acetate is poisonous and flammable. Always wear butyl or nitrile (not latex) rubber gloves and goggles when handling this chemical. Do not pour directly from the container onto the fabric. Use a glass eyedropper.
2. Fold the T-shirt so that the area of the ink film that has been treated with the solvent is pressed against an unprinted area of the T-shirt.
3. Firmly press the two layers of fabric together with a small C-clamp or similar clamping device for two minutes. If any ink transfers from the printed area to the unprinted area, it is an indication that the ink film is not completely cured.

Method #1 may give false positive results (the test indicates that the ink is completely cured but it is not) if the ink layer is extremely thick. If the ink layer is thick, use Method #2 when testing with solvent.

Method #2: Use for Thick Ink Film

1. Apply two or three drops of solvent to the fabric on the inside of the

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T-shirt, behind a printed area.

2. Fold the shirt so that you can press the ink layer that has been treated with the solvent against an unprinted area of the shirt.

3. Firmly press the two layers of fabric together with a small C-clamp or similar clamping device for two minutes. If any ink transfers from the printed area to the unprinted area, the ink film may not be completely cured.

The ethyl acetate test is described in more detail in "The Solvent Test For Cure" in the April 1995 issue of Screenplay. This article is available as a reprint through ST Publications Inc.

Bleed Test

Since dye lot variation is very common, it is imperative to test a garment's propensity for dye migration. Historically, fabrics containing polyester are more likely to bleed than any other fabrics whereas nylon and cotton much less likely to bleed. However, it is suggested that all dark fabrics that will be printed with white or light colored inks should be evaluated for bleeding.

The bleeding phenomena occurs due to a reaction between the ink and the dyes of the fabric. The following is a test method evaluating the bleed potential of ink printed on a given fabric:

1. Bleed resistance (or the resistance of an ink to accept the dyes from polyester fabric) is determined by the chemistry of the ink, complete ink cure and by the ink deposit. Choose the screen mesh that duplicates the planned use of the white ink as well as two other possible combinations.

2. Print just the white ink on appropriate fabric swatches and hold for three weeks. After three weeks, visually evaluate the prints for whiteness. (You may choose to try accelerating this evaluation by holding the prints at 105 F/ 40 C for 2 to 5 days.)

Additional information on synthetic polyester dye migration and sublimation is detailed in the Screen printing and Graphic Imaging Association (SGIA) Technical Guidebook.

Fabric Discoloration Test

It is extremely important to pre-test on light colored or stone washed garments. Avoid stacking hot, because such colors are more prone to color distortion due to the dye stuffs inherent in the garment. Fabric and dye characteristics can exhibit variance between manufacturers and from dye lot to lot. The following test will determine if the fabric dyestuffs are prone to discolor:

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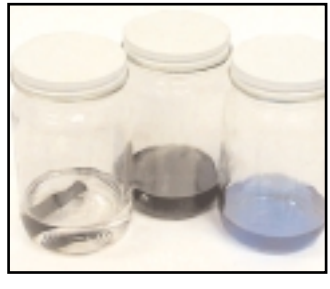
1. Print ink onto suspect fabric and fuse.
2. Cover the print area with a piece of the suspect fabric (sandwiching the print) and set in a heat press.
3. Set the heat press to 200 F and 5 PSI.
4. Close the transfer press and let sit for four hours before visual evaluation.

If material is prone to discoloration, you will see a "ghost" image of your printed image on the material that was covering the printed area.

Transfer Release Test

It is important to conduct accelerated age tests in your plant, which will indicate how a transfer will release from the transfer paper after six months to one year "on the shelf." Accelerated aging tests can be performed by placing the printed transfer in a hot box or hot room, at 100 hours at a temperature of 120 F. This will simulate one year of shelf life. Tests conducted in your plant will help keep your transfer/garment reject risk to a minimum.



Call Wilflex Technical Services for more information on pre-test procedures

1-800-735-4353

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Flash Curing

Plastisol inks gel or reach an intermediate point between liquid and total fusion. This gelled state is tack-free and allows another layer of plastisol to be printed over gelled ink without distortion of print. When flash curing, it is important to monitor temperature with a Thermo-probe, heat tapes or crayons. Due to differences in power, height above ink film, and efficiency of the flash unit, a specific dwell time cannot be given. Incorporating the use of finer mesh counts for your flash plate will decrease the dwell time needed to gel the ink, resulting in faster production speeds. Be certain to set flash dwell times on heated pallets to simulate production. Adjust your settings so that the ink is just dry to the touch. Avoid excessive overflashing, as it can result in poor inter-coat adhesion of overprint colors.

WHEN TO FLASH?

ARTWORK
- Large solids of coverage
- Color on color
- More than 1 predominant color
- More than 1 “problem” color

STENCIL
- Meshes too fine
- Stencil too thin

Consult data sheets on Wilflex® inks for recommended gel or flash temperatures.

Products especially suited for flashing include:

Bright Tiger #11480HT, Xtreme White 11999XW
Olympia Plus White #11135WHT
Athletic Trophy White #11003WHT
Omega Flash White #11175WHT
Phantom White #11555WHT

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NOTES ON OFF-CONTACT

Definition:

Distance the screen is above the substrate before the print stroke.

Key Point:

The point of contact with print surface is limited to edge of squeegee and occurs only at time squeegee passes over surface of screen. Quality and resolution are greatly affected at the point of contact.

Advantages:

1.) **Sharp Print.** The correct amount of off-contact can reduce impact of viscous, cohesive ink. Plastisol ink with its cohesive quality can cause slurring or loss of definition and sharpness. This occurs when the screen sticks to the printed garment, and during the shearing process, the print slides.

2.) **Reduction of ink build-up.** Because the off-contact causes momentary contact with surface, the contact is quick enough to overcome the cohesive nature of ink.

3.) **Increased printing speed.** Ink shears at contact point, therefore, stroke can be faster than printing on contact.

Considerations:

1.) **SCREEN TENSION** The higher the tension, the less off-contact distance is needed.

2.) **FREE MESH AREA** This is the distance between ends of squeegee and inside of screen frame. The smaller the free mesh area, the less off-contact is possible.

RECOMMENDATION: Free mesh area 2 1/2 inches at each end of squeegee and 4 inches for color well at top and bottom.

3.) **PALLET SURFACE:** The harder the surface, the less contact is needed.

Off-Contact Rule:

With properly tensioned screens (16 Newtons and above) and free mesh area of 2 1/2 inches on each end of squeegee, the off-contact distance should be no more than 1/16 inch, ideally 1/32 inch.

With wooden frames, a suggested off-contact distance should be 1/16 to 1/8 inch.

General Rule: Off-contact distance should always be less than 1/8 inch.

GREATER OFF-CONTACT DISTANCE = GREATER SQUEEGEE PRESSURE

THIS LEADS TO: • PINHOLING • STENCIL BREAKDOWN • LOSS OF REGISTER • LONGER SET-UP TIME • INK PICK-UP.

Each screen should be low enough to allow minimum squeegee pressure to put the stencil into contact with the substrate, and high enough to keep the mesh from resting in the wet layers of ink.

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Fibrillation or Washout?

Fibrillation is a condition that occurs when substrate fibers break loose from the ink film due to washing and drying. As the fibers break through the ink film, high contrast between loose fiber ends and the ink film cause a faded appearance. The apparent color loss is not the result of plastisol inks washing out.

What is the difference between fibrillation and washout?

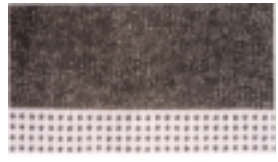
Fibrillation

- Ink color looks washed out or faded in an *even* manner over the entire print
- Inks are cured
- Most often occurs with 100% cotton

Washout

- Ink is faded in spotty, uneven patterns
- Occurs when inks are undercured
- Can occur on any substrate

A



B

Figure 1
To test for fibrillation, use a sample print that has a solid print area and a 50 percent dot area. Cut the print in half, wash and dry only one half, and compare the halves. If the washed photo (B) appears evenly faded after only a few washes, it's usually a sign of fibrillation.

How does fibrillation occur?

Washing and drying create a rubbing action against the print and raise the loose yarn fibers from the ink film. Additional wash and dry cycles cause more loss of ink film.

How can you predict any fibrillation effect?

Test, test, test and test some more. Test your normal printing conditions for each type of garment you offer. Then vary the mesh, stencil, ink and squeegee to find the best combination to hold down loose yarn fibers. Your final result should be an acceptable soft hand print before *and* after washing and drying.

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Fibrillation Guide

	Yarn	Fiber	Stitch	Ink
Fibrillation less likely to occur	High count (fine yarn)	100% polyester (low fiber content)	Higher than 1000	Super-opaque or fast-fusion inks
		Polyester/ cotton blends		Multi-purpose or all-purpose inks
Fibrillation more likely to occur	Low count (coarse yarn)	100% cotton, acrylic, and acrylic blends (high fiber content)	1000 or less	Process inks

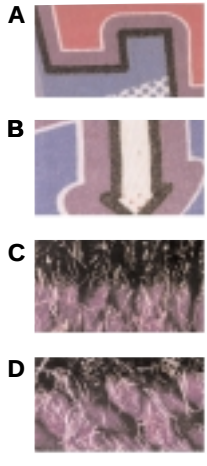

Figure 2
To analyze the degree of fibrillation, view your samples under a magnifier or microscope. Notice that when washed and unwashed test samples are viewed with the naked eye, (photos A & B respectively), fibrillation is barely discernable. But when the same samples are viewed at 11x magnification, the loose fiber ends in the washed sample become obvious (photo D).

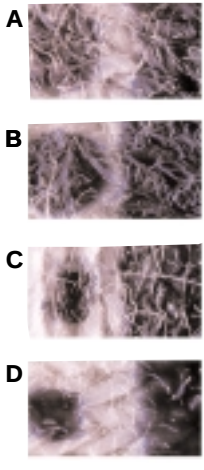

Figure 3
Although some loose fiber ends occur before washing and drying (photos A & C), a wash test significantly increases their number (photos B & D). These views at 11x magnification show the dramatic effect fibrillation has on a 50 percent dot pattern.

Ink System Concerns That Affect Fibrillation

Ink Type	Filler	Mat-Down	Print
Process	Little/None	Poor	Soft
All Purpose	Moderate	Fair	Fair
Fast Fusion	Little/None	Good	Fair
Super Opaque	High	Good	Harsh

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How to improve your results:

1. Apply a wet base of:
   - Finesse
   - Blend of Finesse/MCV-FF Base
   - Do NOT flash
2. With varying mesh counts, apply a flashed base of:
   - MCV-FF Base
   - Transflex Printable Adhesive
3. Alter your ink deposits by combining:
   - Greater stencil thickness and higher mesh count
   - Lower stencil thickness and lower mesh count
   - Softer, slightly rounded-edge squeegees with less pressure
4. Change your ink system to:
   - MCV-FF inks and Genesis inks
   - Transflex transfer inks
   - A mixture of direct print inks and transfer power
5. Apply an overprint of SuperGuard HT
   - This will seal the fibers and protect your designs from apparent fading.

The left side of the above image was overprinted with SuperGuard HT.

Remember: Fibrillation relates to ink film strength and fabric characteristics.

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WILFLEX® AEROSOLS

Wilflex Aerosols are a line of products with chemistry designed and tested for the textile printing industry. As the slogan "engineered chemistry with aerosol convenience" suggests, Wilflex offers unique chemical technology and give the printer increased efficiency. All Wilflex Aerosol products are user-friendly and color coordination of packaging helps in product identification.

1. Fabri-Tak (Magneta can)
   - Web-spray adhesive
   - Special nozzle reduces over spray
   - Exceptional mileage
   - Minimal transfer to garment
   - High relief holds heavy fabrics
   - Not intended for paper
   - Easy to clean using Screen Wash or mineral spirits
   - Ideal for fleece, jersey knits

2. Duo-Tak (Red can)
   - Mist adhesive for transfer papers and garments
   - Holds garment under print-stroke pressure
   - Allows frequent re-spraying without adhesive build-up
   - Does not stain or transfer to fabrics
   - Used properly, will not tear transfer paper
   - Easy to clean using Screen Wash or mineral spirits.

3. Hot-Tak (White can)
   - Mist spray adhesive
   - Exceptional flash cure resistance
   - Easy vertical release
   - Does not stain or transfer to fabric
   - Does not contain chlorinated solvents

4. Screen Wash (Green can)
   - Cleaning spray to remove clogs and stains from screen mesh
   - Low odor, evaporates slowly for easy cleaning
   - Dries without leaving greasy film or oil stain
   - Can clean screens without removing from press

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WILFLEX® AEROSOLS

Storage and Safety Information

Many aerosol products are flammable and must be stored and handled properly to avoid injury. The products are a severe eye irritant and a mild skin irritant. Safety glasses and gloves should be worn when using these materials. Breathing the vapors can cause dizziness and nausea. Use only in a well-ventilated area. It is recommended that Wilflex products be used within one year of receipt of product.

Emergency Treatment

For eye exposure, flush thoroughly with clean water.
Wash any affected skin areas with soap and water.
If breathing problems occur, move to a well-ventilated area.
Do not induce vomiting if swallowed.

Get prompt medical attention for any emergencies.

Wilflex Aerosol products must be stored in a cool, dry location away from flames and excessive heat. During a fire, containers exposed to high temperatures may explode. Cool water should be used on cans exposed to fire.

Spills should be picked up with absorbent material and disposed of following all appropriate regulations. Cans must be completely vented before disposal.

Wilflex Material Safety Data Sheets should be used to educate all employees in the safe use of Wilflex Aerosols products and the proper use of safety equipment.

WILFLEX® SCREEN WASH

Application: Remove excess ink from screen and aim Screen Wash spray at residual ink. Spray Screen Wash onto screen with circular motion. Screen Wash stays wet to allow time for cleaning. Wipe away excess with towel or rag.

Safety: Screen Wash is flammable. Do not spray near motors or electrical parts. Keep away from heat and open flame. Use only with adequate ventilation. Check compatability with indirect stencil systems. Do NOT use to clean hands or skin. Consult MSDS for complete safety infomation. Do not allow waste to accumulate in closed containers. d-Limonene (and other solvents) have the potential for spontaneous ignition, under certain conditions. Read the MSDS and follow storage and handling procedures outlined therein.

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DISPOSAL AND RECYCLING INFORMATION

PLEASE NOTE: The following information is given in good faith and applies to the United States. Other countries should consult their distributor or other regulatory organization for further information.

Wilflex Inc. encourages all printers to reduce waste at its source and recycle as much remaining waste as possible. These practices will help to protect the environment as well as reduce cost.

INK: Wilflex has formulated all Wilflex Inks with quality, safety and the environment in mind. Our plasitsol inks, as supplied are not considered hazardous waste as defined by RCRA (The Resource Conservation and Recovery Act). They are not ignitable, corrosive or reactive and will pass the TCLP (Toxic Characteristics Leaching Procedure). If the ink has been cleaned up (from a screen, floor, etc.) with a solvent listed in the RCRA "F" list (except for F003), the whole mixture is considered a hazardous waste and must be managed in compliance with RCRA regulations. If the ink is mixed with a solvent on the "F003" list, the mixture should be tested to determine the flash point. If below 140 F, it must be managed as a hazardous waste. If the plastisol is mixed with a non-flammable "Safety Solvent" the resulting mixture may be able to be discharged to the municipal sewer. The user must contact their local wastewater treatment plant authority to get permission prior to prior to commencing the discharge.

Screen printers should take care to recover as much excess ink from screens for re-use as possible. Good inventory practices can help avoid waste as well. (Also see information in the Wilflex PC Manual)

All ink should be utilized in operation. When the container is empty, all excess should be scraped from the container. This material can be collected for re-use or put onto rags or cardboard and run through the oven to gel the ink. Ink temperature should achieve at least 250° F (120° C) for 2 minutes 30 seconds. These solids can then be disposed of according to local regulations.

5 GALLON, 1 GALLON AND QUART SIZE HIGH DENSITY POLYETHYLENE CONTAINERS: Soiled HDPE containers should be thoroughly cleaned using the same methods used to clean plastisol ink from screens. The bail or handle should be removed. This container is now a 100 percent recyclable item.

STEEL DRUMS: All excess ink should be removed by wiping down with rags (or for thinner/low viscosity inks; invert drum for 24 hours and collect excess on cardboard). Dispose of rags and cardboard as previously explained. The drum is now in a condition that can be accepted by most steel salvage yards or recyclers.

For information on steel and plastic recyclers near you, consult your local telephlistings.

FIBER DRUMS: Unfortunately, at this time fiber drums are not readily recyclable. Check with your local landfill authorities on guidelines for disposal of fiber drums. If fiber drums are not easily disposed of in your area, please request metal or plastic drums with your ink orders.

AEROSOLS: All aerosol products should be completely emptied prior to any type of disposal. Dispose of according to federal, state and local requirements.

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Dedication To Safety

Wilflex Inc. has a long history of addressing environmental concerns, including no-lead ink formulations and the elimination of cancer-causing plasticizers. We continue that tradition today with ongoing research to ensure that the plastisol inks we sell are the safest available. Wilflex believes that all producers have a responsibility to protect our environment, not only for today's enjoyment, but for the enjoyment of future generations.

In addition, we consider it important that our customers are informed consumers of our products, from safe handling of the material to proper disposal of any wastes.

Hazard information and communication are an integral part of our commitment to safety. To further this awareness, we provide directions for proper use on our labels and in our Material Safety Data Sheets.

Our Safety and Environmental Engineer is also available to answer your safety and health questions.

We follow the many changes that occur each year in the safety and environmental regulations and remain committed to a safe and healthy setting for our workers, customers and the community.

As an added service, Wilflex® customers enjoy the benefit of highly trained technical people who can assist in developing individualized Health and Safety Programs, such as, Hazard Communication and Injury/Illness Prevention, as well as Environmental Compliance Programs.

Our Material Safety Data Sheets should be used to educate all employees in the safe use of Wilflex products and the proper use of safety equipment.

Safety Information: Wilflex Textile Inks

Wilflex inks are formulated to be very safe for the user. As with any chemical used in the industry, good industrial hygiene should be used with Wilflex products. The inks are a moderate skin and eye irritant. In general, safety glasses should be worn and gloves are recommended. Consult the HMIS code on the label or the Material Safety Data Sheet for the proper personal protective equipment recommended for a specific product.

Emergency Treatment

If the ink gets into the eyes, flush thoroughly with clean water.
Wash any affected skin areas with soap and water.
If ink is swallowed, do not induce vomiting.
Get prompt medical attention for any emergencies.

Handling & Storage

Spills of the material should be collected with an absorbent material and disposed of following all appropriate regulations.

Wilflex inks should be stored away from flames and excessive heat. While the inks are not flammable, pressure can build up in a drum if exposed to a fire. Cool water should be used on containers exposed to fire.

Safety Information: Wilflex Aerosols

Many Wilflex Aerosol products are flammable and must be stored and handled properly to avoid injury. The products are a severe eye irritant and a mild skin irritant. Safety glasses and gloves should be worn when using these materials. Breathing the vapors can cause dizziness and nausea. Use only in a well-ventilated area.

Emergency Treatment

For eye exposure, flush thoroughly with clean water.
Wash any affected skin areas with soap and water.
If breathing problems occur, move to a well-ventilated area.
Do not induce vomiting if swallowed.
Get prompt medical attention for any emergencies.

Handling & Storage

Wilflex aerosol products must be stored in a cool, dry location away from flames and excessive heat. During a fire, containers exposed to high temperatures may explode. Cool water should be used on cans exposed to fire.

Spills should be picked up with absorbent and disposed of following all appropriate regulations. Cans must be completely vented before disposal.

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2001 EDITION

WILFLEX® TEXTILE USER'S MANUAL

The purpose of the Wilflex User's Manual is to provide the screen printer with technical information about Wilflex products as well as basic information on screen printing techniques and testing.

The Wilflex plastisol inks produced by Wilflex Inc. have the inherent characteristics of plastisol chemistry. These characteristics include the gradual increase in viscosity over time. Wilflex products are designed to be most effective when used according to the Product Information Bulletins that follow. It is important to carefully follow the guidelines contained in these bulletins. The Wilflex User's Manual also contains brief information on the company and its distribution network. All products, colors and services discussed in this manual may not be available in every country.

The information in this publication is based on our current knowledge and experience. In view of the many factors that may affect processing and application, these data do not relieve processors from the responsibility of carrying out their own tests and experiments. Since Wilflex has no control over the conditions of use or storage of the products sold, we cannot guarantee the results obtained through the use of its products. All products are sold and samples given without any representation or warranty, express or implied fitness for any particular purpose or otherwise, and upon condition that the buyer shall determine the suitability of the product for its own purpose. You must make your own determination of product suitability and thoroughly qualify it for serviceability, for environmental acceptability, and for impact on the safety and health of your employees and purchasers of your products.

Having no control over the conditions of use, we make no representation of freedom from liability, including patent liability, incident to the use of the products referred to, and disclaim any responsibility for any damage or injury resulting therefrom. This applies also where protective rights of third parties are involved. It does not release the user from obligation to test the suitability of the product for the intended purpose and application. It is the responsibility of those to whom we supply our products to ensure that any proprietary rights and existing laws and legislation are observed. No person is authorized to make any statement or recommendation not contained herein, and any such statement or recommendation so made shall not bind Wilflex, Inc.

Complete Health and Safety information about all Wilflex products is available upon request.

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Are Plastisol Inks Safe?

Over the past few years, vinyl products have been under attack by politically and economically motivated environmental groups. An often- asked question made to Wilflex and PolyOne Corporation is "Are plastisol inks safe?" Without reservation, we answer this question "yes!" Safe to use, safe to wear. The screen printing industry and the industry's printed products have a health and safety record that is above reproach.

Plastisol inks are made from a blend of polyvinyl chloride resin (commonly referred to as PVC or vinyl), plasticizers, fillers, pigments and other minor components to control viscosity. Though these products and components have been around for 40+ years, there is a considerable amount of negative publicity surrounding some of these ingredients. However, consider the following:

- Vinyl products are safe

  Vinyl is a tested, tough and trusted component of many products including more than 25% of all plastic medical products made today. The U.S. Food and Drug Administration (FDA) regulates all of them. Vinyl has been around in such applications for more than 40 years and its track record stands.

- Vinyl is one of the most commonly used plastics in the world today

  Vinyl is a very commonly used plastic. In fact, it is the second largest volume plastic sold globally. Vinyl continues to grow strongly and could not have reached its current level of over 50 billion pounds per year globally were it not for its safety and cost-performance. Thousands of companies process millions of pounds of vinyl into useful products for society every day. Banning vinyl would be unrealistic and unthinkable.

- Vinyl resin is virtually inert

  Made from natural gas and chlorine, vinyl resin uses fewer natural resources than other plastics and saves energy throughout its manufacturing process. In addition, it's recyclable. In fact, over 500 million pounds per year are recycled in N. America alone.

- Dioxin is not a vinyl issue

  Poorly run incinerators cause dioxin. Incinerators running properly (high temperatures) will destroy dioxin. Even if vinyl were banned tomorrow, there is enough chlorine in waste from salt, bleach, food and other natural sources to produce dioxin in sub-optimal incinerators. Dioxin in the environment has been steadily decreasing (down over 50 % from 1970) since the EPA began regulating incineration. While dioxin has been going down, vinyl has been steadily growing.

- There are no wholesale bans on vinyl

  No country in the world has banned vinyl. In fact, several small towns in Germany that considered action against vinyl have rescinded them as they worked with the industry on recycling programs. It would be difficult to accomplish a ban on vinyl given its multitude of uses and size. An important question would be; "What is the safety and environmental testing that has been done on any alternative and is it better or worse than vinyl?"

- Vinyl manufacturing is not a problem

  The vinyl industry (and PolyOne in particular) has amassed an outstanding record of safe operations that meet or exceed the regulations and standards in place today. This doesn't mean we don't have room to improve. Almost all manufactur-

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ing processes including vinyl involve the use of materials that can be hazardous if improperly handled. Handling them properly and converting them to compounds that are used safely by our customers is our business. It's what we're very good at doing. Statistics show that our employees are safer at work than at home.

- Definition of Plasticizers

  A plasticizer is a liquid which looks like a vegetable oil that is commonly added to vinyl to make it flexible and soft in products such as toys, blood bags, wire and cable, flooring, and shower curtains. There are many different types of plasticizers but phthalates are the most common and are often used in printing/imaging products.

- Phthalates are safe

  Phthalates have been used safely as plasticizers for vinyl for nearly forty years. Extensive testing and scrutiny by such agencies as the FDA for medical applications and the Consumer Product Safety Commission have concluded that the risk to human health in these applications is insignificant.

- Can phthalates leak from flexible vinyl?

  Yes, in extremely minute amounts which has been deemed totally safe by health authorities after considerable research. And keep in mind that with the abilities of modern day analytical equipment there is always some migration detected with all materials. The FDA knows and considers this when approving vinyl medical devices. Phthalate producers believe that 40 years of research and clinical experience with vinyl in medical devices supports its safe and beneficial use.

- Do Phthalates cause cancer?

  The existing body of scientific studies over many years concludes that there is no validated evidence to indicate that phthalates pose a cancer hazard for humans. Some phthalates have shown that when fed to laboratory rodents in extremely high doses for extended periods that there is potential to induce liver or kidney tumors. This is true for many chemicals besides phthalates. However, government agencies and scientists around the world have widely recognized that for phthalates, what occurs at high doses in rodents is not a predictor for cancer effect in humans. In addition, scientific studies conducted on monkeys have not shown the adverse health effects resulting from exposure to phthalates. Just think, in order to achieve the same effect as the lab rodents, an individual would either have to eat the plastisol logos off of 48 t-shirts per day for the rest of their life or a pregnant woman would have to bathe for 4.5 days in plastisol. Simply put, as our studies indicate, low levels of exposure do not pose a significant human risk.

- Do phthalates cause reproductive problems in humans?

  Similarly to the studies on cancer, laboratory rats and mice have shown that if phthalate esters are given in high doses during certain phases of pregnancy, adverse effects can occur. But long term, high dose levels studies with phthalates in primates did not produce reproductive organ damage. So again, there is a great deal of evidence that indicates the effects seen in laboratory animals will not be seen in humans.

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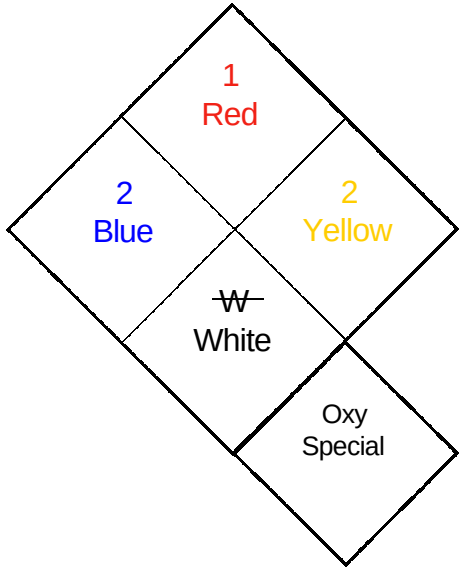
NFPA Rating System

Health (blue)
4- Deadly
3- Extemely Dangerous
2- Hazardous
1- Slightly Hazardous
0- No Hazards

Fire (red)
4- Burns Readily & Rapidly
3- Burns Easily
2- Burns When Heated
1- Burns When Preheated
0- Will Not Burn



Special Hazards (white)
OXY- Oxidizer
ACID- Acid
ALK- Alkaline
COR- Corrosive
W- Use No Water
Radiation Hazard

Reactive (yellow)
4- May Detonate
3- Shock & Heat, May Detonate
2- Violent Chemical Reaction
1- Unstable if Heated
0- Stable

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