

CDF® DIRECT-FILM SYSTEM

DIAZO SENSITIZED CAPILLARY FILMS; PHTHALATE-FREE (CDF-15, CDF-2/UV, CDF-3, CDF-4, and CDF-5/VT)

CDF® Direct-Films range in emulsion layer thickness from 15 µm (CDF®-15) to 50µm (CDF®/5VT). They adhere with water; no chemicals or emulsions are necessary. For available film thicknesses and mesh counts appropriate for each, see the reverse side.

INSTRUCTIONS

Step 1: PREPARE THE FABRIC

Used or surface-treated fabric need only be degreased using **Screen Degreaser Liquid No. 3**, dilute **Screen Degreaser Concentrate No. 33**, or **Magic Mesh Prep™**. (Mechanical abrasion, an option for new fabric that is not surface treated, increases the surface area of fabric for a better wetting of the fabric, which improves adhesion, and a better mechanical bond of the stencil, which increases printing run length. Use **Microgrit No. 2** before degreasing. Abrading and degreasing can be combined in one step with **Ulanogel 23**.) Rinse thoroughly. Use **Magic Mesh Prep** or **CDF Mesh Prep No. 25** to promote uniform water retention during adhering. (**Magic Mesh Prep** also acts as a degreaser and an antistatic treatment.)

Step 2: ADHERE THE FILM TO THE SCREEN

Standard Method: Position **CDF Direct-Film** on a flat surface, emulsion side up. Place the printing side of a wet screen on top of film. Make a single squeegee stroke across the squeegee side. Wipe off any excess water. “Roll-Down” Method: Roll the cut-to-size film, emulsion side out, around a small plastic tube approximately 1 to 1 ½ inches (2 ½ - 4 cm.) in diameter. Soak the fabric from the squeegee side. Contact the edge of the roll to the fabric at the top end of the screen on the printing side. Unwind the roll, maintaining contact between the film and the fabric. Make one light squeegee stroke across the squeegee side to remove excess water.

Step 3: DRY THE SCREEN

Dry the screen at room temperature in a dirt- and dust-free area. Use a fan to speed drying. Avoid high humidity. Under humid conditions, dry the screen with warm, filtered air, up to <104°F. (38° C.) in a commercial dryer. Use a dehumidifier in the drying area, if possible.

Step 4: REMOVE THE BACKING SHEET

The backing sheet acts protects the emulsion from dirt and dust. Remove it immediately before exposure.

Step 5: CALCULATE THE APPROXIMATE EXPOSURE TIME

Refer to the Base Exposure Table (below). Base Exposure Time X Exposure Variable Factors = Approximate Exposure Time.

Step 6: DETERMINE THE OPTIMAL EXPOSURE TIME

Make a Step Wedge Test (instructions are posted on the Ulano Web site: www.ulano.com), or use the **Ulano Exposure Calculator Kit**—carried through to actual printing—to determine your optimum exposure time. Optimum exposure is indicated: ■ At the exposure time when the emulsion first reaches its maximum color density and the edges of the positive do not "resolve." ■ There is no suggestion of softness or sliminess on the stencil. ■ The print best duplicates the test positive *at the level of resolution that the job requires*.

Step 7: WASHOUT

Wet both sides of the screen with a gentle spray of cold water. Then spray forcefully from the printing side until the image areas clear. Rinse both sides with a gentle spray until no soft emulsion is left on the squeegee side, and no foam or bubbles remain. Blot excess water from the printing side, including the inside of the frame, with newsprint (unprinted newspaper stock). Dry the screen.

Step 8: BLOCKOUT & TOUCHUP

For blocking out the screen, use **Screen Filler No. 60** or **Extra Heavy Blockout No. 10** on dry fabric. For touchups, use **Screen Filler No. 60** or **Extra Heavy Blockout No. 10** thinned with water.

Step 9: RECLAIM THE SCREEN

Aggressive screen openers or ink washes may cause CDF Direct-Films to lock into the mesh, making reclaiming very difficult. Remove ink with **All-Purpose Ink Wash™**. Plastisols can also be removed with mineral (white) spirits; other inks with the solvents recommended by the ink manufacturer. Rinse the screen with water. Degrease with **Screen Degreaser Liquid No. 3** to remove ink and solvent residues. Rinse with a forceful spray. Brush **Stencil Remover Liquid No. 4** or **Stencil Remover Paste No. 5** on both sides of the screen. Do not let the stencil remover stand for more than 5 minutes, and never allow it to dry on screen, as this can result in a permanent, unreclaimable stencil. Rinse off the stencil remover with a gentle spray of water, then follow with a forceful spray. Use **Walk Away Haze Remover** or **Haze Remover Paste No. 78** to remove any ink haze or emulsion residue.



Technical Data Sheet

BASE EXPOSURE TABLE for CDF DIRECT-FILMS at 100 cm. (40 inches) exposure distance on white polyester or nylon.

Light Source	CDF-15	CDF-2/UV	CDF-3	CDF-4	CDF5/VT
Carbon Arc:					
15 amps	496 sec.	641 sec.	972 sec.	1613 sec.	2259 sec.
30 amps	248 sec.	321 sec.	486 sec.	806 sec.	1129 sec.
40 amps	186 sec.	240 sec.	365 sec.	605 sec.	847 sec.
60 amps	124 sec.	160 sec.	243 sec.	403 sec.	564 sec.
110 amps	68 sec.	87 sec.	133 sec.	220 sec.	308 sec.
Metal Halide:					
1000 watts	102 sec.	131 sec.	199 sec.	333 sec.	462 sec.
2000 watts	51 sec.	66 sec.	99 sec.	165 sec.	231 sec.
3000 watts	34 sec.	44 sec.	66 sec.	110 sec.	154 sec.
4000 watts	25 sec.	33 sec.	50 sec.	83 sec.	116 sec.
5000 watts	20 sec.	26 sec.	40 sec.	66 sec.	92 sec.
7000 watts	14 sec.	19 sec.	28 sec.	47 sec.	66 sec.
Pulsed Xenon:					
2000 watts	284 sec.	266 sec.	556 sec.	922 sec.	1291 sec.
5000 watts	113 sec.	146 sec.	222 sec.	369 sec.	516 sec.
8000 watts	71 sec.	92 sec.	139 sec.	231 sec.	324 sec.
Mercury Vapor:					
125 watts	1105 sec.	1427 sec.	2164 sec.	3590 sec.	5028 sec.
1000 watts	138 sec.	178 sec.	271 sec.	449 sec.	629 sec.
2000 watts	69 sec.	89 sec.	135 sec.	224 sec.	314 sec.
4000 watts	35 sec.	45 sec.	68 sec.	112 sec.	157 sec.
Fluorescent Tubes#*					
40 watts	305 sec.	395 sec.	597 sec.	990 sec.	1387 sec.

*Base Exposure Times are given for 10 - 15 cm (4 - 6 inches) exposure distance for unfiltered black light tubes. For "cool white" or "daylight" tubes, double the exposure time, at least.

EXPOSURE VARIABLES FACTORS: variables affecting exposure time

Mesh:		Exposure Distance:		Exposure Distance:	
Stainless steel mesh	1.5-2.0	20"/50 cm	0.25	56"/140 cm	1.95
Dyed Mesh	1.3-1.5	24"/60 cm	0.36	60"/150 cm	2.25
Imaging:		28"/70 cm	0.49	72"/180 cm	3.24
Fine line positive printing	0.80	32"/80 cm	0.64	84"/210 cm	4.41
Fine line reverse printing	1.20	36"/90 cm	0.81	100"/250 cm	6.25
Halftones, to 50 lines/in (20/cm)	0.90	40"/100 cm	1.00		
Halftones above 50 lines/in (20/cm)	0.80	44"/110 cm	1.21		
Adhering:		48"/120 cm	1.44		
Direct/Indirect Method	1.3-1.5	52"/130 cm	1.69		
Taped-up Positives:					
Tape-up or montage positives, per layer	1.2-1.3				
High Humidity:	1.3-1.8				

Emulsion Thickness and Mesh Count Range – CDF Direct-Films

CDF Direct-Films	Thickness	Recommended Mesh Count Ranges
CDF@-15	15: thickness in μ m	165+ threads per cm. = 419+ threads per inch
CDF@-2/UV	20: thickness in μ m	120-165 per cm. = 305-419 threads per inch
CDF@-3	30: thickness in μ m	90-165 per cm. = 230-419 threads per inch
CDF@-4	38: thickness in μ m	77-120 per cm. = 196-305 threads per inch
CDF@-5VT	50: thickness in μ m	43-77 per cm. = 110-196 threads per inch

STORAGE: Unused rolls and sheets should be kept under cool conditions (not exceeding 24° C. or 75° F.) with relative humidity of 20 – 40%. Shelf life is 18 months from the date of manufacture. Storage outside the recommended conditions will result in reduced shelf life.

Screens with (unexposed) film adhered can be stored for up to two weeks in a cool, dark, dry area. Unexposed CDF Direct-Film screens stored under high humidity conditions deteriorate more quickly, and will need a longer exposure.

904dm, rev. 1211