

CDF®/MATRIX

HIGH PERFORMANCE CAPILLARY FILM

CDF/Matrix is a high quality diazo-photopolymer (dual-cure) capillary film series combining exceptional imaging properties, total solvent resistance, and extremely wide exposure latitude. Its special formulation controls mesh penetration and forms an enhanced cross linking “matrix” during exposure, resulting in sharp printing shoulders and mechanical durability. Particulate-size control reduces granularity effects for optimal resolution and definition. Texturing agents impart a micro-structural pattern to the bottom of the stencil, reducing adverse effects from high and low humidity during printing. **CDF/Matrix** is easy to reclaim, even if underexposed and used with aggressive inks or washup solvents. Blue in color, **CDF/Matrix** is coated onto a 300-gauge optically flat polyester base. **CDF/Matrix** is intended for general graphics printing, including highly demanding UV applications, four-color process and fine detail printing, as well as POP, industrial graphics and sportswear applications requiring excellent quality and high durability. **CDF/Matrix** is resistant to solvent-based, co-solvent, and UV inks, and to a wide variety of on-press cleaners and wash up solvents. **CDF/Matrix** is available in rolls and convenient, custom-cut sheets.

INSTRUCTIONS

Step 1: SELECT A CDF/MATRIX THICKNESS THAT IS COMPATIBLE WITH THE MESH COUNT

The emulsion thickness of **CDF/Matrix** should be matched to the mesh count that will be used for the job. If the fabric is too coarse, the resulting stencil will have low EOM (emulsion over mesh thickness on the printing side of the fabric), a high Rz value, and poor acutance; if the fabric is too fine, resolution will be poor, the EOM will be too thick, and there may be difficulties forcing ink through the stencil. We suggest **CDF/Matrix-UV** for mesh counts of 420/inch (165/cm.) or finer; **CDF/Matrix-20** for mesh counts of 305 – 420/inch (120 – 165/cm.) or finer; **CDF/Matrix-30** for mesh counts of 280 – 420/inch (110 – 165/cm.) or finer; and **CDF/Matrix-40** for mesh counts of 230 – 355/inch (90 – 140/cm.) or finer.

Step 2: PREPARE THE FABRIC

Used or surface-treated fabric need only be degreased using **Screen Degreaser Liquid No. 3**, diluted **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 mechanical bond of the stencil. 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 both a degreaser and an antistatic treatment.)

Note that the screen should be used wet from the degreasing rinse, or the rinse after using **Magic Mesh Prep** or **CDF Mesh Prep No. 25**. If some time has elapsed but the degreasing was recent (or **CDF Mesh Prep** was used within two hours), hold the screen vertically in the washout sink and rewet the mesh with a gentle flow-down of water on the squeegee side of the fabric. The objective is to wet the mesh thoroughly and uniformly on the printing side of the fabric to which the film will be adhered.

Step 3: ADHERE CDF/MATRIX TO THE MESH

For small screens:

Cut a piece of **CDF/Matrix** to size, be sure that it has been wiped free of dust, and place it emulsion (duller) side up on a flat surface. If the work surface is smooth, put a single sheet of newsprint under the film to prevent sticking between the work surface and the smooth backing sheet of the film.

Starting in one corner, lower the wet screen printing side down onto the sheet of **CDF/Matrix**. The water softens the emulsion layer, which is attracted up into the mesh structure by capillary attraction. Immediately, make a light squeegee stroke across the screen, as if printing. This embeds the softened emulsion deeper into the mesh structure and speeds drying time by removing excess water from the film and fabric. Use paper towels to wipe off excess water on the squeegee side mesh, the inside of the frame, the open fabric, and the backing sheet of the **CDF/Matrix**. (Water left on the backing sheet causes the emulsion to dry unevenly; water left on the fabric or in the frame may cause streaking when the screen is lifted to dry.)

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For large screens:

Place the wet screen in a vertical position, printing side facing you. Dry your hands. Cut the **CDF/Matrix** to size and roll it, emulsion side out, around a narrow-diameter plastic core. Place an edge of the film at the top of the screen on the printing side. Unroll it, maintaining firm contact with the fabric. Squeegee from the top to the bottom of the screen on the squeegee side to remove excess water. The squeegee stroke can be effective even if the mesh is not supported. However, if a second large screen is available, “bolster” the squeegee stroke by placing the screens back to back. The screen can also be placed against a smooth wall when making the squeegee stroke. *Ulanotip: CDF/Matrix can be adhered or reinforced with Ulanol dual-cure emulsions, such as **Proclaim** or **DLX**. After drying, re-expose reinforced screens from the squeegee side to further strengthen the stencil.*

Step 4: DRY THE SCREEN

Dry the screen thoroughly in a dirt- and dust-free area. A fan or commercial drying oven, no hotter than 100°F (39°C), will speed the drying time. (Mounted **CDF/Matrix**, preferably with the backing sheet left on as a dirt and dust protector, may be stored for several weeks in a cool, dry, completely dark area before exposure.)

Step 5: REMOVE THE BACKING SHEET

When the emulsion is completely dry, peel off the protective polyester backing sheet. It will release easily. If it does not, dry the screen longer. *Ulanotip: If the humidity in the shop is high, remove the backing sheet but continue drying **CDF/Matrix** for a few additional minutes to insure complete dryness and the evaporation of all residual moisture.*

Step 6: EXPOSE THE SCREEN

*Ulanotip: If **CDF/Matrix** adheres to the fabric, but releases from it after exposure and washout, it is likely to be underexposed.* The camera film or artwork should be right reading on its emulsion (or printed) side. Place this right-reading side in vacuum contact with the emulsion of the **CDF/Matrix** on the printing side of the mesh. See “Determining the Exposure Time,” below.

Step 7: WASHOUT

Wet the stencil, squeegee side first, with water 60°F - 104°F (15°C - 40°C). Wash the screen from the printing side until the image areas open up. Rinse both sides of the screen with a gentle spray until no soft emulsion is left and no foam or bubbles remain. Blot with newsprint; first on the squeegee side, then on the printing side. A properly exposed stencil can withstand a vigorous washout. The thicker the **CDF/Matrix**, the longer the washout time. *Ulanotip: Incomplete washout will cause sawtooth edges and scumming (residue in open image areas). These problems can also be caused by underexposure, poor vacuum contact, and insufficient density in dark areas of the artwork. Dry the screen and frame thoroughly. Warm air, up to 120° F. (50° C), or a fan, will speed drying.*

Step 8: TOUCHUP AND BLOCKOUT

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

Step 9: RECLAIM THE SCREEN

Remove ink from the screen with the ink manufacturer’s recommended solvent. Degrease with **Screen Degreaser Liquid No. 3** to remove ink or solvent residues. Rinse with powerful spray of water. Brush **Stencil Remover Liquid No.4** or **Stencil Remover Paste No.5** on both sides of the screen. Let the screen stand for no more than 5 minutes. Do not allow the stencil remover to dry on the screen, as this can result in a permanent stencil. Wash with a strong spray of water. Optional: use **Walk Away Haze Remover** or **Haze Remover Paste No. 78** to remove ink haze residues.

STORAGE:

Unexposed screens can be stored in a dark, dry, cool environment for 3 weeks. Unused film can be stored in its tube for at least 15 months from the date of manufacturing. High heat and humidity reduce the shelf life of **CDF/Matrix**.

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DETERMINING THE EXPOSURE TIME

1). Select a Base Exposure Time from the following table:

Base Exposure Time Table*				
Exposure Unit	CDF/Matrix-UV	CDF/Matrix-20	CDF/Matrix-30	CDF/Matrix-40
Carbon Arc				
30 amps	6 min.	8 min.	12 min.	20 min.
110 amps	102 sec.	131 sec.	200 sec.	330 sec.
Metal Halide				
1,000 Watts	153 sec.	197 sec.	5 min.	8 ½ min.
2,000 Watts	77 sec.	99 sec.	149 sec.	248 sec.
3,000 Watts	51 sec.	66 sec.	99 sec.	165 sec.
4,000 Watts	38 sec.	50 sec.	75 sec.	125 sec.
5,000 Watts	30 sec.	39 sec.	60 sec.	99 sec.
7,000 Watts	21 sec.	29 sec.	42 sec.	71 sec.
Pulsed Xenon				
2,000 Watts	7 min.	9 min.	14 min.	23 min.
5,000 Watts	170 sec.	219 sec.	5 ½ min.	9 ½ min.
8,000 Watts	107 sec.	138 sec.	209 sec.	6 min.
Mercury Vapor				
1,000 Watts	207 sec.	267 sec.	7 min.	11 min.
2,000 Watts	104 sec.	134 sec.	203 sec.	5 ½ min.
4,000 Watts	53 sec.	68 sec.	102 sec.	168 sec.
Fluorescent Tubes				
40 Watts (glass to bulb, 2-3 inches)	7 min. 40 sec.	10 min.	15 min.	25 min.

* The exposures are based on white mesh at 1 meter (approx. 40 inches) exposure distance (except for fluorescent tubes). As with any photographic product, ideal exposure may vary from lamp to lamp. Correct exposure for any given lamp is best evaluated by performing a Step Wedge exposure test.

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2). From the following table, select any “exposure variables” that apply:

EXPOSURE VARIABLES TABLE

	Factors for Variables Affecting CDF/Matrix Exposures
Mesh Factors:	
Stainless steel or metalized polyester	1.5 – 2.0
Dyed fabric	1.3 – 1.5
Exposure Distance Factors	
20 inches (50 cm.)	0.25
24 inches (60 cm.)	0.36
28 inches (70 cm.)	0.49
32 inches (80 cm.)	0.64
36 inches (90 cm.)	0.81
40 inches (100 cm.)	1.00
44 inches (110 cm.)	1.21
48 inches (120 cm.)	1.44
52 inches (130 cm.)	1.69
56 inches (140 cm.)	1.95
60 inches (150 cm.)	2.25
72 inches (180 cm.)	3.24
84 inches ((210 cm.)	4.41
100 inches (250 cm.)	6.25
High Humidity Factor:	1.3 – 1.8
Vellum Positives:	1.3 – 1.8
Taped-up (Montage) Positives	1.2 – 1.3
Factors for Non-Standard Adhering:	
Direct/Indirect (dry screen) Method	1.3 – 1.5
Wet Adhering, reinforced with Emulsion	1.3 – 1.5

3). Calculate the Approximate Exposure Time using the Base Exposure Time you selected and multiplying it by all relevant Exposure Variable Factors.

$$\begin{array}{ccccccc}
 \text{Approximate} & & \text{Base} & & \text{Exposure} & & \text{Exposure} & & \text{Exposure} \\
 \text{Exposure} & = & \text{Exposure} & \times & \text{Variable} & \times & \text{Variable} & \times & \text{Variable} \\
 \text{Time} & & \text{Time} & & \text{Factor} & & \text{Factor} & & \text{Factor}
 \end{array}$$

4). Using the *Approximate* Exposure Time, make a test with **CDF/Matrix** to find your *optimum* exposure time. You can make a Step Wedge Test using the Approximate Exposure Time as the middle exposure (video instructions are on the Ulano Web site—www.ulano.com—on the “Support” tab; or use the Ulano Exposure Calculator at *double* the Approximate Exposure Time. For surest results, make an actual print from the stencil processed in your exposure test.