



ExpoCheck™

One-Step Exposure Calculator

Make just one exposure using an ExpoCheck test positive and the neutral density filter to test ten different exposures!

ExpoCheck consists of three high-quality test positives, each with 10 identical test images: a halftone pattern (at 10%, 25%, 50%, 75%, 85%, and 90%), line work patterns in positive and negative, and a special fan-like pattern used to evaluate both resolution and stencil hardness. A fourth **ExpoCheck** positive (shown below) is a 9-step neutral-density filter.

One of the test positives is for the evaluation of high resolution work on fine mesh (defined as > 260 threads/inch (> 102 /cm.) with thread diameter \leq 40 microns). Its circle pattern has line widths in 25 micron increments, two each, ranging from 50 – 250 microns, plus 300 microns. Its “chevron” pattern has the same line thicknesses as its circle pattern, with increments changing every three lines. The print pattern font sizes are 3, 4, 6, 8, 10, and 12 point (each point is 1/72nd of an inch). The high resolution halftone is 85 lines per inch (33.4 /cm.) with dot percentages of 10, 25, 50, 75, 85, and 90.

Another test positive is for the evaluation of medium resolution work on mesh between 110 and 260 threads/inch (43 – 102 /cm.) with thread diameters between 40 and 80 microns. Its circle pattern has line widths, two each, in thicknesses of 100, 125, 150, 200, 225, 250, 300, and 350 microns. Its “chevron” pattern has the same line thicknesses as its circle pattern, with increments changing every three lines. The print pattern font sizes are 4, 6, 8, 10, and 12 point (each point is 1/72nd of an inch). The medium resolution halftone is 55 lines per inch (27.7 /cm.) with dot percentages of 10, 25, 50, 75, 85, and 90.

The third test positive is for the evaluation of coarse resolution work on mesh 110 threads /inch or less (\leq 43 /cm.). Its circle pattern has line widths in 50 micron increments, two each, ranging from 200 – 400 microns, plus 500 microns. Its “chevron” pattern has the same line thicknesses as its circle pattern, with increments changing every three lines. The print pattern font sizes are 10, 12, and 14 point (each point is 1/72nd of an inch). The coarse resolution halftone is 35 lines per inch (13.8 /cm.) with dot percentages of 10, 25, 50, 75, 85, and 90.

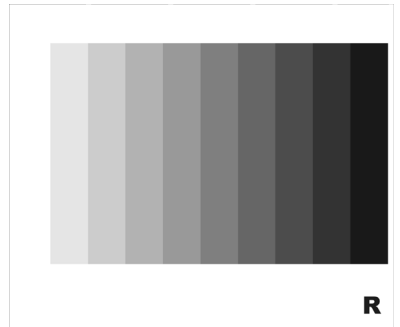
ExpoCheck's neutral density filter's 9 steps are factored at 0.9, 0.8, 0.7, 0.6, 0.5, 0.4, 0.3, 0.2, and 0.1.

ExpoCheck's neutral density filter, used in combination with the test positive appropriate to the required resolution, makes an effective one-step exposure calculator. **A single exposure allows the evaluation of ten different exposure times.**

The **ExpoCheck** positives have excellent density and clarity, and thus provide a standard by which to evaluate the quality of other artwork.

Ulano's **ExpoCheck**, unlike many “exposure calculators” on the market, permits **separate** use of the neutral density filter positive with any other artwork--silver film positives, Rubylith® brand masking film, laser printed vellums and acetates, and inkjet prints on Ulano's Pigment Inkjet Film—in order to evaluate stencil exposure times using those materials as artwork.

Alternatively, **ExpoCheck** test positives can be used with Rubylith® in sheets or strips, or with cardboard strips, to make Step Wedge Tests with lesser (or greater) exposure increments than can be made using the neutral density filter.



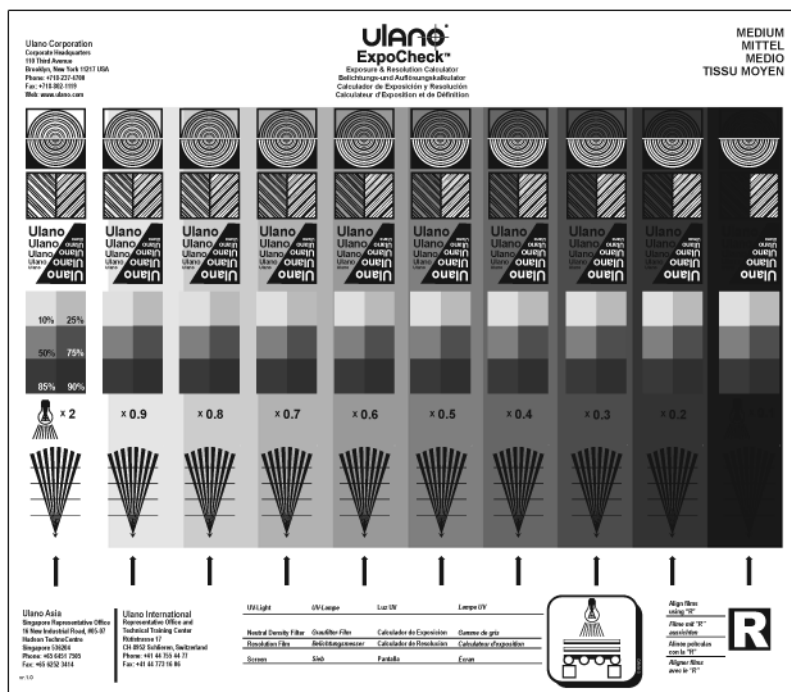


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ExpoCheck™ Instructions

1. Calculate an Approximate Exposure Time for the Ulano product you are using following the guidelines in Ulano's Technical Data Sheets, which are posted on our Web site (www.ulano.com).
2. Prepare the stencil material (i.e., coat the screen or adhere the capillary film) for exposure *as usual*.
3. Place the emulsion (right-reading) side of the resolution-appropriate **ExpoCheck** test positive against the stencil material. Place the 9-step neutral density filter positive over the 10-image test positive, so that the "R's" at the lower right hand side of both positives are aligned. **By design, the first (left-most) section of the test positive will not be covered by the neutral density filter in order to allow complete (1.0) light transmission.**
4. Expose the stencil at **double** the Approximate Exposure Time.
5. Develop /wash out and dry the stencil.



Evaluating Optimal Exposure Time

The processed stencil will show color variations from one density step to the next. The filter-factor area where the stencil first becomes darkest in color indicates the exposure time that probably best balances resolution requirements with full polymerization (molecular cross linking) and greatest stencil strength. Exposures that exceed this are usually unnecessary but may increase durability and ink resistance. At lesser exposure times, the stencil will be weaker and less ink resistant, and may be more difficult to reclaim. To calculate the best exposure time using the neutral density filter positive and artwork, multiply the best-performing filter factor by the test exposure time.

For example:	Best Filter Factor	x	Test Exposure Time	=	Optimal Exposure Time
	0.5	x	8 Minutes	=	4 Minutes

To evaluate exposure increments at closer intervals than the neutral density filter positive allows, make a traditional Step Wedge Test using the **ExpoCheck** positive. (For instructions visit www.ulano.com).

Examination of an incrementally-exposed stencil is a quick and useful way to determine exposure. Ultimately, however, the only conclusive way to determine optimum exposure is to make and evaluate an actual test print made with the stencil.



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ExpoCheck™ Additional Evaluation Refinements

Evaluate exposure and full stencil hardness.

Examine the fan-like pattern. Look between the “fan blades” and determine the exposure increment in which there is *no discernable color change* for the screen when wet from the washout rinse and, later, after drying. Note the neutral density filter factor of this area.

If the area of no discernable color change lies in one of the extremes of the neutral density filter (that is, at 2.0 or at 0.1), make a new stencil using the exposure time of that factor.

Evaluate resolution, acutance, and mesh bridging on the test stencil.

After exposure, washout, and drying of the test stencil, examine the fan-like pattern between the “fan blades” closely for all ten exposures for resolution, acutance (edge definition), and mesh bridging. These are the three prime qualities that determine image quality. Select the exposure area that has the best reproduction of all three qualities and note its factor.

The fan-like pattern readily shows differences in resolution between under- and over-exposure. If under-exposed, the narrowest “fan blades” will wash away, as they were not cross-linked by exposure where they interact with the mesh structure. Where the stencil is overexposed, the areas between the “fan blades” will close up (fill in).

Calculate the “Production Exposure Time”

Multiply the test exposure time by the factor that yielded best results to determine an exposure time for production. For example, if the test stencil was exposed for 100 seconds and the best imaging was at the 0.7 factor, multiply the exposure by the factor (100 seconds X 0.7 factor) to determine the Production Exposure Time (= 70 seconds).

It is entirely possible that one or another different exposure factors will be better depending upon whether one is evaluating full stencil exposure or the three qualities (resolution, acutance, mesh bridging) that determine image quality. In such cases, one must choose a factor that offers the best compromise. Possibly, by using the **ExpoCheck**, the screen printer will discover the imaging quality limitations he now has, given his present light source, stencil material, and shop conditions.

Examination of an incrementally-exposed stencil is a quick and useful way to determine exposure. Ultimately, however, the only conclusive way to determine optimum exposure is to make and evaluate an actual test *print* made with the stencil.