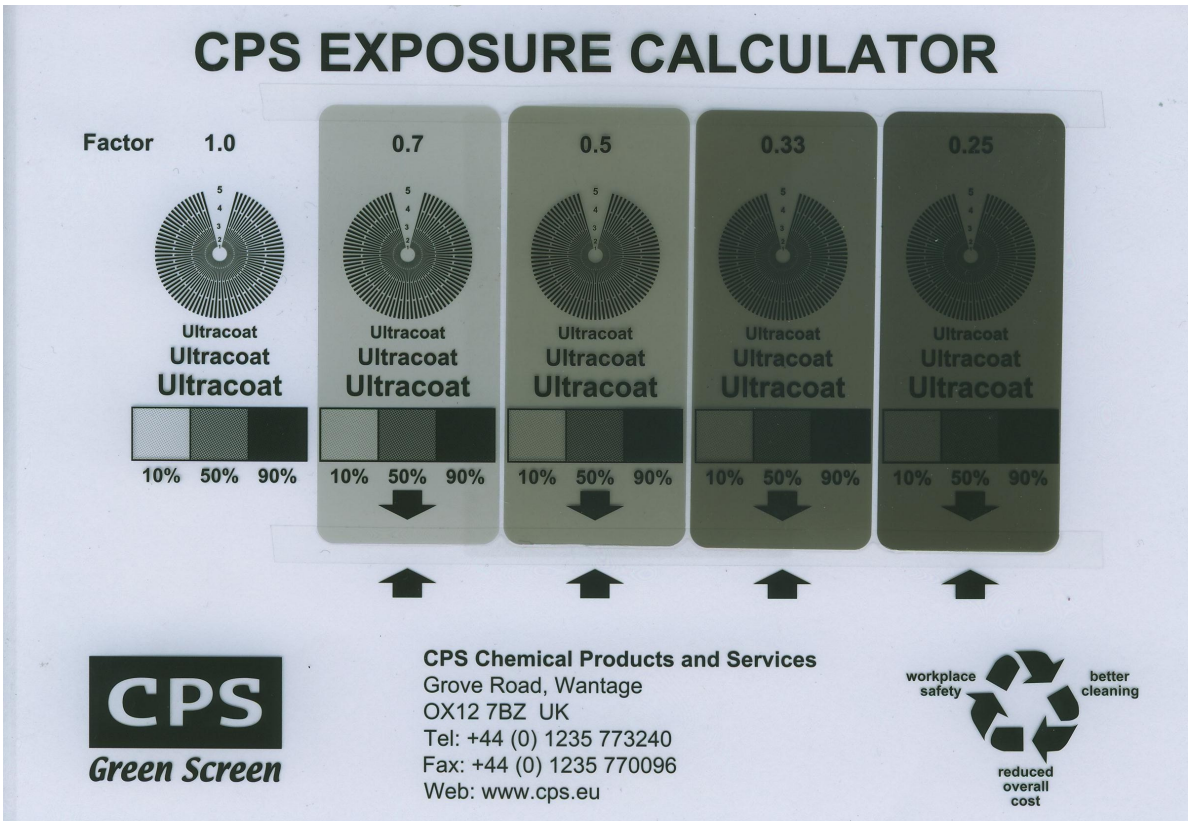
CPS Exposure Calculator
Product Data Sheet

PRODUCT DESCRIPTION

The CPS Exposure Calculator is a film positive compromising five columns, each with a resolution target, a set of half-tone tints and lines of text. Each column is marked with a factor number and four columns are backed with a grey neutral filter of different density.



This format enables five different exposures to be made simultaneously.

APPLICATIONS

Incorrect exposure is one of the primary and most frequent causes of stencil failure in screen printing. The CPS Exposure Calculator provides quick, accurate determination of exposure times, with all photostencil systems. It can also be used as a printing aid to optimize print quality, or as a means of process control.

WORKING INSTRUCTIONS

1. Estimate the correct exposure time, using the guidelines supplied with all CPS photostencil materials, then double it i.e. an exposure time of ten minutes should be doubled up to 20 minutes.
2. Expose the photostencil to the calculator in the normal way, washout and dry thoroughly. Note: For indirect stencils dry the film unmounted, for one pot photopolymer emulsions the initial check for exposure time should be made when still wet.
3. Examine the stencil to determine the correct exposure time. Interpretation of correct exposure depends on stencil system.

Note: Keep exposure calculator away from any source of water or heat as this can damage the neutral density filters.

READING THE RESULTS OF THE EXPOSURE TESTS

EMULSIONS:

- **Diazo & Dual Cure** (Ultra Coat 100 & 200 / Ultra Coat 535, 550, Viking, Titanium):

  The correct exposure for diazo and dual cure emulsions is the point at which the entire thickness of exposed stencil is fully hardened by the UV light. This process of exposing / hardening is accompanied by a colour change in the stencil.

  Examining The Stencil:

  1. The Stencil will show variations in colour from one factor to the next. Follow the colour change from the lightest to the darkest until it stops. The factor where the colour change stops is the column that represents optimum exposure.
  2. Once the correct factor has been chosen multiply the factor by the test exposure time. This gives the correct exposure time (or number of units if you have an integrator) for the particular stencil, mesh and light source combination.

  Example:

CORRECT FACTOR	X	TEST EXPOSURE	=	CORRECT TIME
0.7	X	10 minutes	=	7 minutes
0.7	X	50 units	=	35 units

3. Underexposure: If there is still a colour change between Factor 0.7 and Factor 1, this indicates an underexposed stencil. Double the original test exposure and repeat the test.

- **Photopolymer + Diazo** (Ultra Coat 600 W):

The correct exposure for photopolymer + diazo emulsions is the point at which the entire thickness of exposed stencil is fully hardened by the UV light. This process of exposing / hardening is accompanied by a colour change in the stencil.

Examining The Stencil:

1. The Stencil will show variations in colour from one factor to the next. Follow the colour change from the lightest to the darkest until it stops. The factor where the colour change stops is the column that represents optimum exposure.
2. Once the correct factor has been chosen multiply the factor by the test exposure time. This gives the correct exposure time (or number of units if you have an integrator) for the particular stencil, mesh and light source combination.
3. Underexposure: If there is still a colour change between Factor 0.7 and Factor 1, this indicates an underexposed stencil. Double the original test exposure and repeat the test.

CAPILLARY FILM (Ultra Cap)

The correct exposure for diazo based capillary film is the point at which the entire thickness of exposed stencil is fully hardened by the UV light. This process of exposing / hardening is accompanied by a colour change in the stencil.

Examining The Stencil:

1. The Stencil will show variations in colour from one factor to the next. Follow the colour change from the lightest to the darkest until it stops. The factor where the colour change stops is the column that represents optimum exposure.
2. Once the correct factor has been chosen multiply the factor by the test exposure time. This gives the correct exposure time (or number of units if you have an integrator) for the particular stencil, mesh and light source combination.

Example:

CORRECT FACTOR	X	TEST EXPOSURE	=	CORRECT TIME
0.7	X	10 minutes	=	7 minutes
0.7	X	50 units	=	35 units

3. Underexposure: If there is still a colour change between Factor 0.7 and Factor 1, this indicates an underexposed stencil. Double the original test exposure and repeat the test.

INDIRECT STENCILS

1. Process the stencil as normal but dry unmounted.
2. There are two ways to read the results:

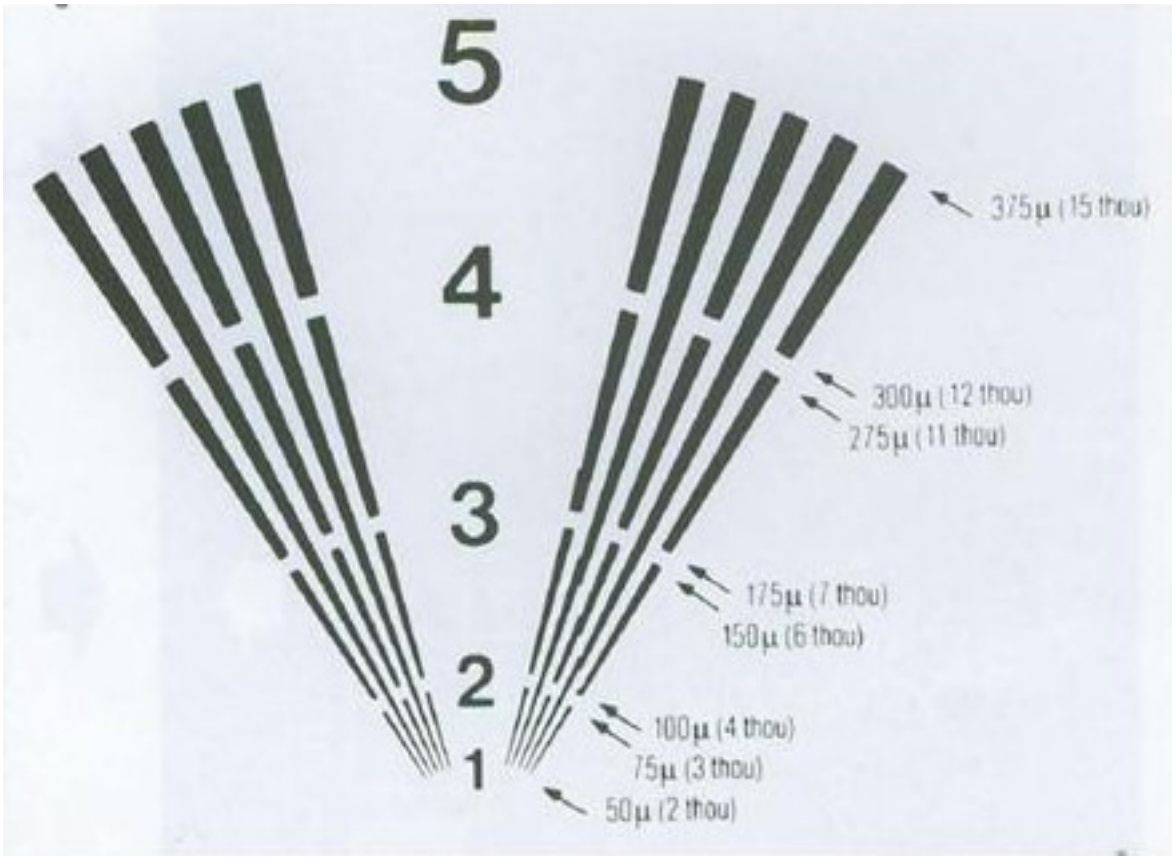
a) Carefully cut out solid areas of the emulsion from the columns, peel them from the base and measure with a micrometer. Consult the product data sheet for the recommended guideline thickness for determining correct exposure.

b) An alternative method is visual inspection of the resolution of the five columns. Inspect the centers of the targets for filling in of the image. As the exposure time increases, resolution will decrease. At optimum exposure, the films have resolving powers:

Note: Resolution capability is diminished by the use of multi-point light sources (e.g. fluorescent tubes), or shorter than recommended lamp to glass distances.

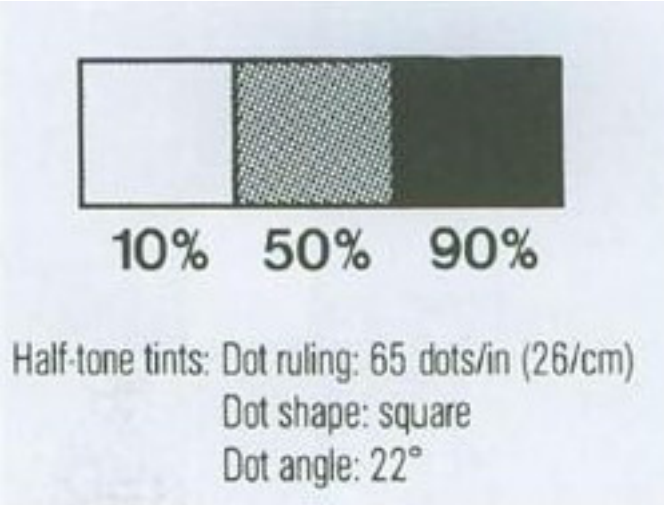
THE CALCULATOR AS A PRINTING AID

DEFINITION TARGETS:



These can be used to assess printed edge definition (straightness/clarity of the printed edge) and print resolution (fitness of detail available). The target is designed to allow the user to select the best angle to position film positive/stencils in order to avoid ‘sawtooth’ and mesh interference. Resolution is checked by assessing the degree of ‘filling-in’ at the centre of the target.

HALTONE TINTS:



The 10 and 90% areas can be used to gauge the degree of highlight dot loss and flooding of shadow areas respectively.
The use of square dot* configuration means that the 'corners' of the dots just meet at 50%. Examination of a print will show at a glance whether there is 'dot loss' or 'dot gain' in the mid tone.

- Failure of the 'corner' to meet indicates 'dot loss'. This may be due to undercutting, caused by overexposure or poor light geometry, drying in of ink, or the choice of a low resolution photostencil.
- The merging of dots, or thickening of the join between dots, indicates 'dot gain'. This is due to flooding, which may be caused by over-thinning of ink, or by use of a photostencil with poor edge definition.

Before starting a print run with half-tones, it is always recommended that a test strip is printed, which contains a full range of tones values in the selected dot count.

*Positives with square dots are not recommended for half tone printing.

SHELF LIFE & STORAGE

Store sealed containers in a cool dry place away from heat, ignition sources and other reactive chemicals.

Shelf life is 2 years when stored at 0 to 30℃.

Note – All data contained herein is based upon limited testing of pre-production material and should not be taken as representative of the eventual mass produced product.

Suggestions concerning working practices and procedures are based on the practices adopted by existing users of the products and are made in good faith. IT IS THE RESPONSIBILITY OF THE USER TO ENSURE THAT ALL RELEVANT HEALTH AND SAFETY LAWS AND REGULATIONS ARE COMPLIED WITH. CPS – Chemical Products and Services does not provide any advice on such laws and regulations and accepts no responsibility, express or implied, for breach of such regulations.

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August 2010