

## A Circular Slide Rule to Compute Exposure Values by 1/3 of a f-stop

Simply print the slide rule on any paper size, glue the rotating part on a light piece of cardboard, the fixed part should be glued on anything thicker and more rigid to allow pinning the rotating circle at the centre of the fixed circle. On an A4- or letter- paper size at 100%, graduations are very legible, but it is possible to print smaller.

The red triangular index gives the value of the exposure value EV (“lumination index in French”) for the selected position of the f-number disc.

The yellow triangular index in front of f-number 16 gives the value of the speed corresponding to the rule of f/16 per bright sun (“sunny-16 rule”).

Principle of the “sunny-16 rule”: The basic, starting value, for the exposure time required to record a photographic image in bright sunlight with an ISO=125 sensitivity detector is 1/125th of a second with an aperture (f-number)  $N=16$ . This corresponds to an exposure value EV 15, all equivalent speed / f-number combinations are read all at a glance on the graduations.

Referring to the incident solar illuminance graduations engraved at the back of the Gossen<sup>TM</sup> Lunasix<sup>TM</sup> exposure meters, we find that the sunny-16 rule assumes an illumination of 70000 lux, i.e. the absolute  $19+2/3$  graduation of the scale in classic Lunasix CdS meters.

Generally speaking:

**Sunny-16 rule, for a solar illumination of approximately 70000 lux**

**Expose  $1/S_{\text{ISO}}$ -th of a second with  $N = 16$  by bright sunshine  
with a detector (film or silicon) of ISO-rating  $S_{\text{ISO}}$**

**When changing the f-number to  $N_2$  instead of  $N_1$ ,  
exposure time should be changed according to the ratio  $(N_2/N_1)^2$**

All speed / f-number combinations giving the same exposure value are read at once. Hence yielding the same exposure, within the limits of reciprocity law deviations (non-reciprocity corrections are not indicated on this slide rule, they vary for each film, see manufacturer’s specifications).

The old speed graduations between 1/5s and 1/400s are indicated, we notice that they differ from the modern standard series only by a third of an EV.

The f-number scale shows all intermediate values per one third of an EV from f/0.7 up to f/1440, which covers most applications to pinhole photography.

