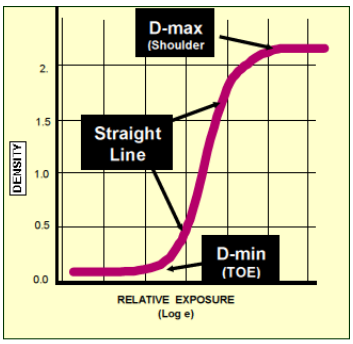
Why are we obsessed with a 1.00 density return for our processor and camera aims?

Microfilms are capable of providing extremely high-contrast images for a wide variety of documents. Documents of various contrast levels and color schemes can be successfully recorded by attaining proper density levels (level of contrast between text and background). Proper density levels are achieved by varying the amount of exposure used during the filming step.

Below is an example of a characteristic curve. The characteristic curve is a performance graph that shows the relationship between exposure and density under developing conditions.

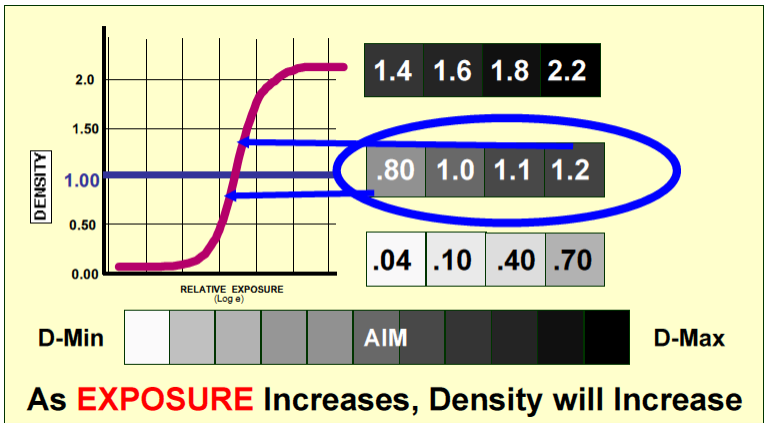


The Characteristic Curve

Exposure vs. Density

Exposure is the quantity of light allowed to act on a photographic material; a product of light intensity (controlled by the lens opening) and the duration of light striking the film or paper (controlled by the shutter speed or enlarging time). Density is the blackness of an area, in a negative or print, that determines the amount of light that will pass through it or reflect from it. Contrast is the density range of a negative, print, or slide; the brightness of a subject, or the scene lighting.

Shown below is an example of a document with a density range of .75 to 1.30. Density is in the center



of the curve.

Also shown is the image above, is the D-Min and D-Max. In Source Document microfilming, the D-Min (background density) and the D-Max (reference density) are the two most important areas of measurement. A correct D-Min (.03 to .06) assures us that the clear areas of the film are clear enough to provide sufficient contrast between the images and the background. A correct D-Max (closest to 1.00) assures us that the black areas are black enough. These density ranges are the rule of thumb for typical source documents exposed on rotary and planetary cameras and film writers. Of course, this rule of thumb may be superseded by other entities that may have their own density specifications.

The table below categorizes documents into 4 groups relative to contrast and quality.

Group	Document types	Density aim
1	• High-quality documents • Books • Black type face	**1.0 - 1.3**
2	• Pencil and ink drawings • Faded and very small print • Newspapers • Scenic checks	**.90 - 1.1**
3	• Low-contrast manuscripts • Drawings • Fine colored lines • Letters on worn, old, discolored paper	**.80 - 1.0**
4	• Very low contrast documents • Faded text • Very thin lines • Worst case, colored documents	**.75 - .85**

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