Effect of Ink Density Changes on Lab Values

Most press operators are unfamiliar with the relationship between ink density changes and CIELab. The following chart shows roughly what will happen to L*, a*, and b* values when traditional ink density is increased or decreased.

Ink Color	More Density	Less Density	Comments
All	L* down	L* up	L* moves opposite to density
Yellow	L* down, b* up	L* up, b* down	b* moves much faster than L*
Magenta	L* down, a*b* up	L* up, a*b* down	
Cyan	L* down, b* up	L* up, b* down	a* doesn't move much
Black	L* down	L* up	a* and b* hardly move at all

Two-color Overprints

Two-color overprints are difficult to control independently of the single ink solids, however the following hints will help preserve the vital HUE characteristic of two-color overprints.

Overprint	Comment
Red	If b* is higher than target, decrease yellow or increase magenta.
Green	If b* is higher than target, decrease yellow or increase cyan.
Blue	If a* is higher than target, decrease magenta or increase cyan.

Two color overprints can be seriously flawed when running too much water on one o the units or with a paper with poor ink or water receptivity. Another common cause of flawed two-color readings while solid CMY values are good, is printing with an incorrect ink sequence. The sequence K-C-M-Y is strongly recommended for wet-trap 4-color offset printing, but may not be optimum for other processes like offset with inter-station UV curing, gravure, flexo, etc.