



Figure 3.1: Reflectance spectra for cyan, magenta, yellow, and black inks shown as solid lines, and the corresponding densitometer transmittance filter functions, as defined by DIN 16536 shown as dashed lines. Example of transmittance spectra for the red, green, and blue filters for a CCD-camera are shown as dotted lines.

### 3.1.2 Gray Bars

*Gray Bars* are test patches made up of two fields. One gray balance field and one black field. *Gray-bars* are assembled to be an easy aid for an operator to, without the use of any instrument, determine the amount of the inks deposited on the substrate in respect to each other. Figure 3.2 shows a *gray-bar* commonly used in newspaper printing industry. The *gray-bars* are not suited for determining the overall level of ink using only the naked eye.

The idea behind the gray balance field is that the right amount of the three chromatic inks, cyan, magenta, and yellow, will produce a neutral colour. If cyan, magenta, and yellow inks are printed with the same halftone screen the result is a brownish tint. The solution in that case is to increase the amount of cyan with approximately 5-10%.

The halftone value in the black field has to be selected so that the black field appears as dark as the gray balance field when the two fields are printed with the right amount of inks. One common combination of halftone values for a *gray-bar* used in newsprint is 30% cyan, 22% magenta, 22% yellow, and 33% black. The use of *gray-bars* for monitoring the amount of ink has become very popular in the newsprint industry lately [13] even though using the the naked eye only an unbalance between