

Purpose: The anti-scatter grid is often neglected during acceptance testing or is only examined for damage, non-uniformities, and centering. Other important performance parameters are being overlooked, including grid ratio. The grid ratio is an important parameter that determines the ability of a grid to improve contrast, and should be verified during acceptance.

Materials and methods: We developed an analytical method for calculating the grid ratio from simple measurements. An image of the grid is acquired at an SID not equal to the focal distance, and mean pixel values are measured in three regions of interest in the resulting image – at the center and equal distances to either side of the center. These data, along with the known focal distance of the grid and the SID used to acquire the image, are used to calculate the grid ratio for each half of the grid. Grid ratios were measured for four DR systems – three identical systems and one from a different manufacturer.

Results: Measured ratios were in some cases substantially less than nominal ratios. In several cases, different ratios were measured for each side of a grid. Our results identified one of the three grids from the identical systems as having a higher ratio than the others. Measurements made at distances greater than the focus distance yielded more reproducible results than ones made at distances less than the focus distance. Two stand-alone grids were measured, then disassembled to measure the actual grid ratio for comparison.

Conclusions: This method can be used to measure ratios for both DR and CR systems and other grids. The method can be extended to use screen-film as the receptor. Our results indicate that the actual grid ratios for many grids in use at our institution are less than the stated ratio, resulting in reduced image quality.