Port films are essential for treatment verification. However, an improvement in film quality is greatly desired. The CEA imaging system, consisting of a stainless steel cassette with a front-mounted Hi+Plus screen was investigated. Either a CEA TLF or a TVS film may be used for the cassette depending on the application. Using a slit defined by two tungston blocks, the MTFs of the TLF and TVS films as well as the MTF of the portal imaging system were measured at different energies. To study the effect on image quality of different film-screen combinations (screen : stainless steel, copper and lead, film: CEA TLF, Cronex RXG), the MTF of each combination was determined, with and without the Hi-Plus screen. In addition, characteristic curves of the CEA imaging system was compared with those of the Cronex/RXG and the Kodak Hi-Plus systems. Clinical evaluation was performed by comparing the CEA portal films with those obtained with the Cronex/RXG and dthe Kodak Hi-Plus systems for a number of pelvic and lung patients. Our results indicate that the CEA portal imaging system out-performs consistently other systems. For example, for 6 MV x rays, the MTFs for the CEA/TLF system are 12% and 6.5% at 1 and 1.5 lp/mm respectively. For the Cronex/RXG system, they are 5% and 3% respecitvely. Clinically the CEA portal imaging system scored consistently higher than the Cronex/RXG system.