

With emergence of high-energy proton beam therapy, the design improvement and utilization of MLC is expected to increase as it provides economical, environmental friendly, fast, accurate and digital field shaping for complex treatments. A commercially available ion beam MLC used clinically for proton treatment is evaluated for its geometric and dosimetric characteristics. The MLC is made out of rust proof iron, 14 cm long with 0.5mm indentation at 7 cm and 3.75 mm width at isocenter. There are 40 pairs of leaves that make a maximum field of 15x15 cm² and have an over-travel 5 cm past isocenter with a speed of 12 mm/s. MLC leaves are parallel without divergence. There are no additional jaws except MLC for field shaping with positional accuracy of ± 0.5 mm and field tolerance of ± 1 mm. The inter- and intra-leaf leakage and dose undulation at leaf edge for various angle and beam energies were studied using film and ion chamber measurements. Results show that leakage is $< 0.5\%$ and undulation is visible only at surface. The dose undulation increases with beam energy and MLC leaves angle. The undulation width is < 1 mm proximal to SOBP and no visible undulation at SOBP. Unlike photon beam MLC that has significant dose undulation due to large width and photon transport, the proton MLC has no undulation at treatment depths. It is concluded that the ion beam MLC design provide similar dosimetric characteristics that of a brass collimator but gives accuracy and electronic flexibility in designing and treating patients.