DMLC is an efficient means of delivering IMRT. Intensity distributions generated by IMRT optimization are converted into trajectories of leaves. The basic algorithm is simple. However, the shape and transmission characteristics of leaves must be considered appropriately to ensure that the dose distribution is accurate. These characteristics include leaf transmission, rounded edges of leaves, tongue-and-groove design, and scattering from the treatment head and the MLC leaves. If ignored, these characteristics can lead to a significant discrepancy between measured and planned dose, the magnitude of which depends upon the inter-leaf gap and the relative number of monitor units delivered at each point. For a simple case of creating a 10x10 cm^2 uniform field with a 0.5 cm dynamic gap, for instance, we found that the dose delivered was 96% greater than anticipated with an "ideal" leaf shape and zero transmission. We also found that the effective leaf transmission was significantly higher than expected from simple linear attenuation of incident photons. The effects of some of these characteristics (e.g. tongue-and-groove effect) can be eliminated by special algorithms while empirical corrections for others can be applied. The overall discrepancy can be reduced to under 2%, even in extreme conditions. This paper will present experimental data showing the magnitude of each effect under varying conditions and the results of corrective actions.