ABSTRACT. This article studies the mean curvature flow of Lagrangian submanifolds. In particular, we prove the following global existence and convergence theorem: if the potential function of a Lagrangian graph in T^{2n} is convex, then the flow exists for all time and converges smoothly to a flat Lagrangian submanifold. We also discuss various conditions on the potential function that guarantee global existence and convergence.