

MAGNETIC SPUTTER TARGETS MANUFACTURED USING DIRECTIONAL SOLIDIFICATION

ABSTRACT OF THE DISCLOSURE

A sputter target includes a metal alloy having a target surface, a rear surface and a thickness between the target and rear surfaces. The target surface and rear surface are outer surfaces of the metal alloy. The metal alloy has a thickness direction substantially along the thickness. The target surface is substantially normal to the thickness direction. The metal alloy has a single substantially homogenous microstructural zone across substantially the entire thickness. The metal alloy further includes dendrites. The dendrites at the target surface are oriented along substantially one direction, and the dendrites at a center plane of the metal alloy are oriented along substantially the same one direction. A sputter target may include a metal alloy which is a cobalt (Co) based, and may have a [0001] hexagonal close-packing (HCP) direction oriented substantially normal to the target surface. The sputter target may be formed by directional solidification at near-equilibrium temperature conditions by withdrawing the metal alloy at a first rate through a temperature gradient. The sputter target is for forming one or more magnetic layers on a substrate for, among other purposes, data storage.