

LCM

Products - Metals - Sputtering Targets...

The very high oxidation potential of rare earth metals and the propensity for fine alloy powders to absorb oxygen (and nitrogen) from the atmosphere, cause the production of high quality sputtering targets to be a serious challenge.

Commercial uses of sputtering targets containing rare earths tend to use powder metallurgy methods that are served by LCM alloy powder production methods. (Please see Product Data Sheets on Magneto-Optic Alloys and Cast SmCo Alloys).

LCM provides a service for supplying pure metals or alloys as sputtering targets. The benefit of using a cast target is the possibility of keeping a very low impurity level of oxygen or nitrogen. In offering to produce new alloys as sputtering targets, full consideration is given to the potential physical properties of the alloy based on knowledge of the materials and assessment of the appropriate phase diagram.

Form

Targets are produced complete, bonded to a copper back plate as specified by the customer.

Pure metals or alloys are melted using methods dependant upon their vapour pressure, purity and quantity. These are part-machined (chemical analysis samples are taken of the target material at this time) and bonded to the copper back-plate. The target is finish-machined on the back-plate.

Vacuum Induction Melted Alloys

The physical properties of the rare earth alloy composition selected by the customer for a sputtering target will determine the feasibility of producing a cast target. For example, an NdFeB alloy is likely to be a possible cast target product due to the relatively tough cast ingot; in comparison a pure intermetallic compound, such as SmCo₅ or LaNi₅ are extremely brittle and should be considered as a sintered powder product.

Rare Earth Metals

Sputtering targets can be prepared from most of the rare earth metals though some of these are susceptible to oxidation in normal atmosphere.

Quantity

Pure rare earth metal and cast alloy targets are not common.

Individual customer requirements need careful consideration. Preparation of these targets may well form part of a Research and Development project and will be produced as single items.

Packaging

Vacuum packing in multilayer aluminised laminate.

Quality assurance

Manufacturing processes are part of our quality management system – certified to ISO9001: 2000 standard. Each target is supplied with a Certificate of Conformance detailing the results from chemical analysis.