

**Novel thermal analysis helping the development
and understanding of
HD DVD rewritable disc corresponding to higher transfer rate**

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Abstract

We have been studying a novel thermal analysis helping the design of rewritable HD DVD disc, in order to meet a demand for higher transfer rate and dual layer structure. The thermal analysis mainly consists of two processes, understanding of temperature distribution in the layer structure by thermal simulation and judgment for phase transition after melting of recording layer. For the thermal simulation, we considered the boundary thermal resistance between a recording layer and interface layers. We consider that the idea of boundary thermal resistance may realize true temperature distribution in the multi-layer structure, in which thermal diffusion along the vertical direction is suppressed. For the judgment of phase transition, we should consider nucleation frequency and crystal growth individually especially in the case of pseudo-binary GeSbTe alloy when the alloy is melted and solidified after laser beam irradiation. With these considerations, the thermal analysis showed better agreement with experimental results obtained from measuring the disc properties. We also tried various boundary thermal resistances in virtual in the thermal simulation and compared some of them with experimental results. We will report the results on the day.