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Whom it may concern

Ube Material Industries, Ltd. Inc.
8-1, Aioi-cho, Ube-shi, Yamaguchi-ken

Nippon Tungsten Co., Ltd. Inc.
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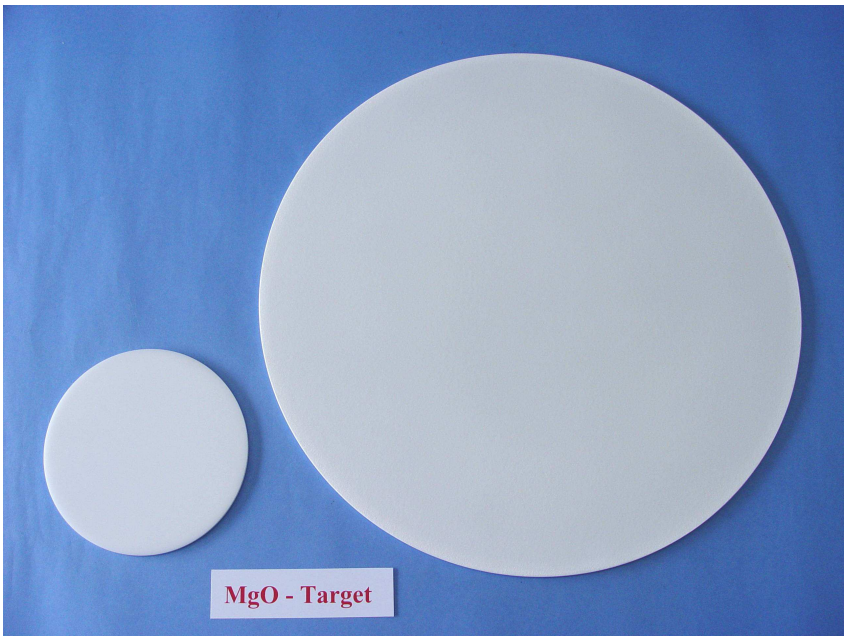
Ube Material Industries, Ltd. Inc. and Nippon Tungsten Co., Ltd. Inc. succeeded in development of the world's largest class 18inch/460mm-MgO target.

Ube Material Industries, Ltd. Inc. (President, Kenichi Abe) and Nippon Tungsten Co., Ltd. Inc. (President, Shozo Yoshida) had succeeded in scaling up the target size from 7inch to the world's largest class 18inch (460mm) which is indispensable for spintronics applications.



Comparison of mass product size(left) and developed large size(right)

Ube Material Industries, Ltd. and Nippon Tungsten Co., Ltd. had been in collaborative frameworks for development of MgO targets. We had succeeded in development of the high purity (more than 99.995% or actually 99.999%) and high-density (more than 99% or actually 99.4%) for MgO target of 7 inch size in 2008 and entered into the MgO target business.

By reviewing both manufacturing process which had accumulated technology over the years, the sintering material size was reached to the world's largest class 18inch / 460mm with keeping the same purity and the same density this time. The present available amounts of supplies are 120 units per year.

The MgO targets are used in the field of HDD magnetic heads and nonvolatile memory MRAM. MgO insulation film deposited by sputtering process is required for the formation of a Magnetic Tunneling Junction (MTJ). The full market of the MgO targets will be formed by next generation type large-capacity MRAM (spin RAM). Since the quality of MgO thin homogeneous films in the large areas particularly affects the yield for memory applications, the quality of MgO targets should be required to be more severe.

It has been noted that in the future, the size of Si wafer semiconductor use will be enlarging from 300mm to 450mm. We also think that the needs of sputtering target size will be enlarging coupled more with the Si wafer size. We had carried out development of size expansion strategically against these backgrounds.

Based on these backgrounds, Ube Material Industries, Ltd. and Nippon Tungsten Co., Ltd. had been continued to develop its expansion in larger size and kept with its high quality (high purity, high density) in advance. Then, we finally accomplished to get successful result.

We will aim at the cooperated evaluating with the MRAM users to develop in forming the full market from now on. Additionally, we are going to make active efforts toward application deployment in new semiconductor process. We will carry forward with preparing the samples to work corresponding to a variety of shapes and sizes.

In addition, please apply any inquiries on Product and Material to Ube Material which has become a distributor, on Fabrication Technology to Nippon Tungsten which becomes a manufacturer.

Contact Information

Products and material : Ube Material Industries,Ltd. Corporate Research & Development
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Fabrication technology : Nippon Tungsten Co.,Ltd. Ceramics Division
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— **Company summary** —

【 Ube Material Industries,Ltd. 】

Ube Material Industries, Ltd. is the biggest manufacturer of calcia related products derived from limestone which is abundant raw material in Japan and the domestic sole manufacturer of magnesia clinker (refractory material) which is made from magnesium raw material taken from seawater.

In recent years, Ube Material has been concentrating on the specialty products, especially on the MgO fine products by original synthetic technology to ensure a stable supply of high quality MgO products to a market including most advanced electronic material and PDP protective.

【 Nippon Tungsten Co.,Ltd. 】

Nippon Tungsten Co., Ltd. is the well developed manufacturer such as tungsten, cemented carbide, engineering ceramics products based on powder metallurgy technology.

Especially the alumina-titanium carbide (Al_2O_3－TiC) ceramics substrate material made by full use of original sintering technology has been widely used for magnetic heads in the world, and has obtained high acclaim. It has become standard of the magnetic head substrate materials for Hard Disks Drive (HDD).