SPUTTER HEAD

PVD coating system; technical university

PROJECT DESCRIPTION

In a PVD coating system at a university site in Germany, a sputter head is needed for non-standard, rectangular targets. In addition to the target holder, this sputter head must fulfil various different functions. These include a high and homogeneous magnetic flux density up to 44 μTesla, a high-voltage bushing and shielding as well as an efficient cooling system for peak loads up to 2 kilowatt.

CHALLENGE

As an aggravating factor, the installation space is extremely small: The magnetic flux densities and the high-voltage shielding have to be accommodated on an area of only 55 mm x 120 mm. Therefore, the materials used must be temperature resistant, strongly ferromagnetic, featuring a high thermal conductivity and electrical insulation. It must be possible to handle the entire assembly in a glove box.

REUTER TECHNOLOGIE’S SOLUTION

The sputter head developed by REUTER TECHNOLOGIE consists of a layer of ferromagnetic steel with an arrangement and state of magnetization that generate the required flux densities. Two further layers of copper and the technical ceramic boron nitride (BN) are joined face to face in a brazing process. Despite the largely different thermal elongation behaviours of these two materials, a durably bonded and temperature resistant joint was achieved successfully in the brazing process.

FUNCTION

Target holder with integrated high-voltage bushing, cooling and magnetic field source

MATERIAL COMBINATION

Cu/BN/steel (vacuum brazing technology)

SPECIAL FEATURE

• Homogeneous, highly magnetic flux density in extremely narrow space
• Stable Cu ceramic joint despite strongly differing thermal elongation behaviours
• Glove-box suitable design

APPLICATION

PVD system at university

SERVICES

REUTER TECHNOLOGIE

• Design/development
• Mechanical machining
• Prototyping & test runs
• Firmly bonded face-to-face brazing based on vacuum brazing technology

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