

Sapphire crystals successfully grown

(Aslar, 28.03.2006) – CGS Crystal Growing Systems GmbH, Aslar, a wholly-owned subsidiary of PVA TePla AG, has successfully grown sapphire crystals in an innovative EFG crystal growing furnace, in collaboration with the Fraunhofer Institute for Integrated Systems and Device Technology (IISB) in Erlangen. Monocrystal sapphires plates measuring 6x40x300mm have now been grown.

Industrial growing of sapphire crystals, which belong to the category of oxide crystals, requires sophisticated technology due to their high melting point in excess of 2000°C. Due to the high standards of crystal quality required, it is also essential that control of growing processes is precise and very stable. The Czochralski process used until now, in which the solid, cylindrical crystals are pulled from the melt, led to enormous loss of material when sawing the transparent crystals into separate wafers. High production costs, casting doubt on whether oxide crystals can be industrially produced on a profitable basis, were the consequence of this previous production process.

Thanks to special integrated shapers, the EFG (Edge Defined Film Fed Growth) crystal growing system developed by CGS GmbH enables crystals with different geometries to be grown, such as plates, tubes and rods, without them having to be processed afterwards, with concomitant and enormous loss of material.

By developing and successfully testing the oxide crystal growing system, a number of new and growing markets are now opened up for CGS GmbH. Fields in which oxide crystals can be used include nuclear medicine, especially the very promising area of positron emission tomography (PET), a refinement of nuclear magnetic resonance spectroscopy (NMR) and computer tomography (CT). Oxide crystals can be deployed as scintillator (high-energy beam) detectors due to their physical properties and high luminosity

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Page 2 of 2

factor, high energy resolution and short decay times. Additional fields of application include the optoelectronics industry and high-energy physics. Another future market for the new crystal growing systems made by CGS GmbH is the luxury goods industry, one example being makers of high-quality watches and mobile telephones who set extreme requirements for impact-resistant and scratch-resistant glass made of sapphire.

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