Press Release

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PVA TePla supplies giant ion source for fusion research

(Wettenberg, April 27, 2011) – PVA TePla AG, Wettenberg, a manufacturer of high-temperature vacuum systems and a specialist in the construction of crystal-growing systems, is to supply an ion source for plasma (fusion) research to the Max Planck Institute for Plasma Physics in Garching. This ion source is the largest of its kind and, in a major physical experiment, is intended to produce new findings on the generation of high-energy ion beams with large cross-sections for nuclear fusion. This is an important step on the path towards obtaining energy in a way that is clean and compatible with mankind and the environment.

In this ion source, a hydrogen gas discharge is generated by irradiation of high frequency. The resultant ions are extracted by high voltage and accelerated through a system of grids towards the test plant. The aim is to optimize the parameters of the ion beam, which in a few years shall be used to heat a fusion plasma up to 80 million degrees Celsius.

PVA TePla has been building ion sources of this type for worldwide plasma and fusion research for many years. The ion source now manufactured for the Max Planck Institute boasts 2.5 times the extraction area of previous sources. While ion sources were initially used more in basic research into plasma physics, in recent years they have become an integral part of application-oriented research into fusion facilities.

In a fusion facility a process takes place similar to that which occurs in the Sun, in which heavy and superheavy hydrogen isotopes, deuterium and tritium, are fused to create helium. This releases enormous amounts of energy. The technology required for this process is complex, but is fundamentally different from nuclear fission with its environmental effects and incalculable risks. Deuterium is abundant in water, while tritium is generated in the fusion process from lithium, which is similarly abundant on Earth. The planet's available reserves of this fuel could meet energy needs for hundreds of thousands of years.

The ITER experimental facility is under construction in Cadarache in southern France since 2009. The objective of this collaborative international project,

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once completed in 8-10 years, is to prove that it is possible to obtain power efficiently from the fusion of light atomic nuclei. The ion source built by

PVA TePla is a precursor to those planned for ITER, which will be twice the size again.

As a supplier of crystal-growing systems for the solar industry, PVA TePla has been active in the field of renewable energy for many years. With this component for fusion research, the company is taking part in another crucial project for environmentally friendly energy generation of the future.

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