

Press release

November, 2021

Centenary of physicist Dr. Karl-Heinz Steigerwald, the inventor of modern electron beam technology

The electron beam is successfully used worldwide to process a wide range of materials. The most common metalworking applications are welding, drilling, surface treatment and additive manufacturing (EBAM). The electron beam is extremely versatile – a real allrounder – as it outperforms other processes in many areas. In joining technology, for example, where the seam quality is second to none due to the very small size of the heat-affected zone compared to other fusion welding methods. The fact that electron beam welding (EBW) is extremely energy efficient makes it the most sustainable, and therefore the most environmentally-friendly method. The future also looks promising, because not all its potential applications have been identified or researched thus far. The most recent example is welding copper for electromobility.

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Caption: Modern universal electron beam machine from Steigerwald Strahltechnik

When anyone mentions electron beam technology, the first thing that comes to mind is a success story. Let's look back at its beginnings.

The physicist Dr. Karl-Heinz Steigerwald was the inventor of electron beam technology for material processing. He built the world's first electron beam machine in 1952. Although research into electron beam technology began in the mid-19th century, Dr. Steigerwald ushered in a new era for materials processing in 1948, because at that time he was working on developing higher-performance electron beam sources. His attempts to use the electron beam as a thermal tool for drilling watch stones and soldering, melting and welding in a vacuum were very promising and meant that, from then on, the development of electron beam technology accelerated.



Caption: Dr. K.-H. Steigerwald and his early electron beam welding machines

Just four years later, in 1952, the physicist built the first electron beam processing machine. In 1958, he butt-welded 5mm thick Zircaloy together, thereby discovering the “deep welding effect”, which is still a guarantee of high-strength connections using the electron beam.

In 1963, Dr. Steigerwald founded Steigerwald Strahltechnik GmbH, which has since developed into one of the world's leading companies for electron beam technology. The company's continuous innovation, from the physicist's initial experiments through to the present day, meant Steigerwald Strahltechnik became known as **The Innovators of the Electron Beam.**

Customers and partners of **Steigerwald Strahltechnik GmbH** have benefited from the expertise and professional competence of the leading specialist in electron beam technology for over 60 years.

As a member of the GBT Group, Steigerwald Strahltechnik is able to draw on many years of experience, as well as a global presence and economic muscle. Today, the company divisions: **Steigerwald Strahltechnik GmbH** in Maisach near Munich, **PTR Strahltechnik** in Langenselbold near Frankfurt and **PTR Precision Technologies INC** in Enfield near Boston operate under the **Global Beam Technologies AG** umbrella as innovative partners to users of electron beam technology around the globe.

The GWT Group employs more than **860 people at more than 30 locations worldwide and is represented in 55 countries**. The **annual turnover** amounts to around **175 million euros**. Steigerwald Strahltechnik GmbH's global presence in sales and service and the outstanding support it offers – from the initial customer inquiry, through to the design and commissioning of the systems at customer premises – has enabled it to expand from a small company into a world-leading developer and manufacturer of electron beam machines. These include various types of electron beam welding machines for a wide range of applications, electron beam drilling machines, electron beam machines for surface treatment and electron beam machines for additive manufacturing.



Caption: Steigerwald Strahltechnik GmbH business premises in Maisach near Munich

For more information, visit: **www.sst-ebeam.com**.