

As a sharply defined beam of radiation,
ions precisely hit the diseased tissue

Full-service provider

Full-service provider for Industrial Automation and Digitalization

The Eckelmann Group presents itself as a full-service provider for Industrial Automation and Digitalization. As specialists for requirements in the pharmaceutical industry, biotechnology and medical technology, Eckelmann engineers offer industry-specific solutions from a single source:

- › Consulting
- › Customized hardware and software solutions
- › Turnkey automation systems
- › Lifecycle management
- › Smart Service
- › Vertical and horizontal system integration
- › Data analysis and Digital Twin: FactoryWare®
- › Optimizing productivity throughout the lifecycle

We meet high regulatory requirements

It goes without saying that we are **ISO 9001** certified. We also demonstrate quality management and certifications in the regulated environment, for example with **ISO 13485** as a supplier of medical technology, **ISO 62304** (medical device software), processes for **GMP/GAMP 5** and the manufacture of electrical equipment in accordance with **CE**, **UL** and **UKCA**.

In lifecycle management, we tailor organizational and technical service packages – and write the success story over the entire service life of machines and systems.

Eckelmann – Partner for Industrial Automation and Digitalization

National

- **Eckelmann AG**
Wiesbaden | Germany | Headquarters
Engineering | Software | Production | Lifecycle Service
- **Eckelmann FCS GmbH**
Herford | Germany | Subsidiary
Engineering | Software | Production | Lifecycle Service
- **Eckelmann IBE Software GmbH**
Wilhelmshaven | Germany | Subsidiary
CAD/CAM Solutions
- **REX Automatisierungstechnik GmbH**
Erfurt | Germany | Subsidiary
Engineering | Software | Production | Lifecycle Service

International

- **Eckelmann s.r.o.**
Tvrdonice | Czech Republic | Subsidiary
Engineering | Production | Order Processing
- **Eckelmann SAS**
Lyon | France | Subsidiary
Sales | Service
- **Eckelmann Industrial Automation Technologies Shanghai Co., Ltd.**
Shanghai | China | Subsidiary
Engineering | Order Processing | Lifecycle Service
- **Eckelmann Automation Technology Shanghai Co., Ltd.**
Shanghai | China | Subsidiary
Engineering | Order Processing | Lifecycle Service

Your direct contact

Talk to us!



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High-end controls enable tumor therapy

Development partner of the
Heidelberg Ion Beam Therapy Center (HIT)

Case Study
Medical
Technology



Heidelberg Ion Beam Therapy Center
Heavy ion and proton therapy
Control systems in the fight against tumors

The Heidelberg Ion Beam Therapy Center (HIT) treats tumors with heavy ion and proton therapy.

It makes it possible to reach tumors located deep in the body or in extremely sensitive areas with the utmost precision, while sparing surrounding healthy tissue.

Specialists from Eckelmann AG developed, implemented and supplied the control systems for the particle accelerator and the therapy area.



Targeted application of the defined ion beam

**Successful destruction of tumors:
Acceleration to 70% speed of light**

The HIT was the first therapy facility in Europe to use heavy ions and the first in the world to have a gantry – a movable beam guidance that allows the beam exit to rotate 360° around the patient for optimal irradiation. This gantry has a diameter of 13 meters, a length of 25 meters and weighs 670 tons.

Thanks to their special physical properties, ions pass through the tissue as a sharply defined beam of radiation. Only shortly before the particles come to a standstill, they develop their maximum biological effect directly in the tumor.

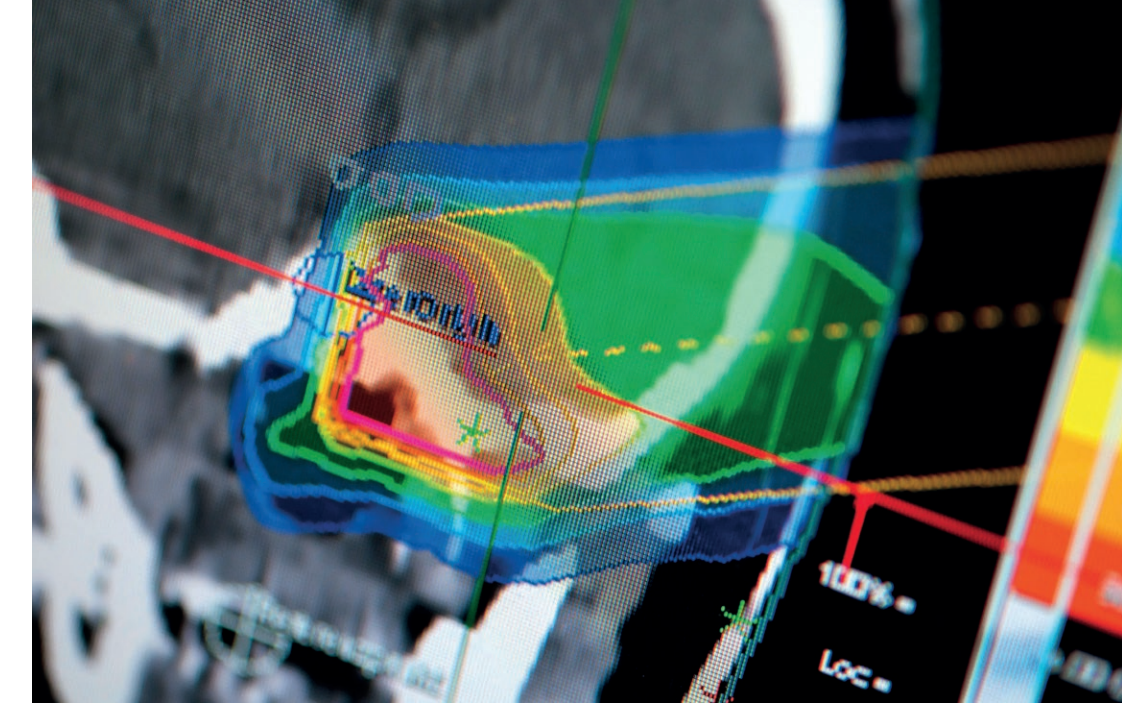
**Accelerator control system: beam guidance and diagnosis
fully under control**

The charged particles are accelerated to 70% of the speed of light and then sent precisely in the direction of the tumor. How far the beam penetrates into the tissue depends on its energy (= velocity): The higher the energy, the deeper it penetrates the body. More than 100,000 different combinations of beam parameters can be set on the accelerator control system. This control system operates a large number of electromagnets and HF systems that force ions into their orbits and accelerate them, as well as numerous beam diagnostic devices.

**Eckelmann therapy control system: precise and safe treatment
according to plan**

The main tasks of the therapy control system include the reservation and safe arbitration of treatment positions to the accelerator as well as the request and targeted application of defined ion beams according to predefined treatment plans. During treatment, the ion beam must be permanently monitored and analyzed; it can be automatically switched off within 200 millionths of a second in an emergency.

The therapy control system has been developed and produced according to the strict guidelines of the Medical Devices Act.



In the raster scan method, the heavy ion beam is deflected laterally with the help of magnetic fields and the insertion depth is adjusted from pulse to pulse via the energy of the ions. The beam remains on each point until the calculated target dose is reached.

1:1 service by engineers of the development team

Saving human lives comes first. In this case, this requires the highest availability of the life-saving therapy system.

In case of malfunction, the development team experts are available for the HIT twenty-four-seven and react within the shortest possible time upon request.

In addition, Eckelmann takes over the long-term support and further development of the existing systems as part of a long-term commitment.