



PLANT AND MACHINES

Graphit and carbon machining

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Graphite and carbon machining

Processing machines for cathodes, anodes, electrodes, connecting nipples.
The machines are all designed for dry operation.

Extensions, options:

- automatic loading and unloading systems, as well as integration into a complete plant
- Robotics
- Quality assurance
- Measurement
- Labelling, marking
- Extraction, water treatment
- Manual or automatic adjustment

DESIGN ACCORDING TO CUSTOMER REQUIREMENTS

All plants and machines are designed and manufactured according to the specified requirements of the customer and the product.



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Cathode processing line

The entire production line consists of 4 processing machines that are connected to each other via corresponding transport devices.

The cathodes are placed in a magazine and fed to the centring station via rollers. An automatic measuring device determines the width of the cathode. The lateral pressure beams centre the cathode exactly. Then the transport into machine 1+2 is released.

In machine 1+2, the block is positioned via a light barrier. The length is measured automatically. The cathode is clamped on the coated transport chains with rubberised punches. The grinding units of the machine move into position and grind both vertical long sides of the cathode to the desired dimension. The cathode is then released and transported back to the centring station.

The centring station is additionally equipped with a turning device. The cathode is rotated 90° around the longitudinal axis and set down again. The measuring device determines the centre again and the cathode is aligned accordingly.

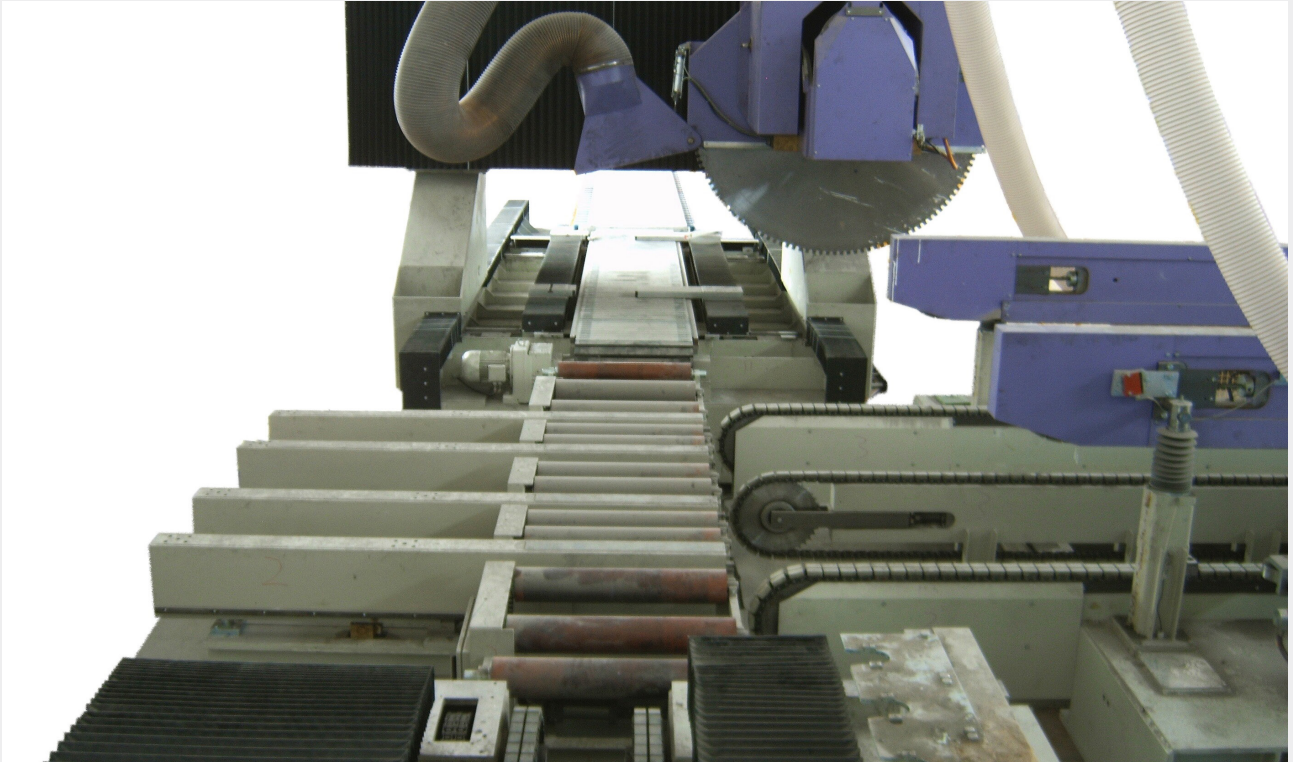
The transport into machine 1+2 is released. There the cathode is again automatically stopped, clamped and the remaining 2 long sides are ground flat and profiled. Then the transport to machine 3 is released. ▶



Machine 3 is equipped with a groove milling unit and a groove profiling unit. The cathode is clamped laterally in machine 3. The longitudinal groove is pre-milled and then profiled. Machine 3 has an automatic tool change magazine. After the groove has been milled, it is automatically measured. The measured value is recorded. The cathode is transported out of machine 3 and taken over by the cross transport of machine 4.

Machine 4 processes the end faces of the cathodes. The transport system of machine 4 is equipped with cam chains for angular feeding of the blocks. A travelling pressure unit clamps the cathodes on the transport chains during machining. If the protrusion to be machined is too large for machine 4, the block is transported to machine 5. Machine 5 is a CNC-controlled sawing centre.

Here, the cathodes are shortened if they are too long, and special shapes are sawn. The saw blade with a diameter of 2,000 mm can be turned and swivelled to cut at any desired angle. The milling and grinding dust produced by the processing is extracted by a central suction system.

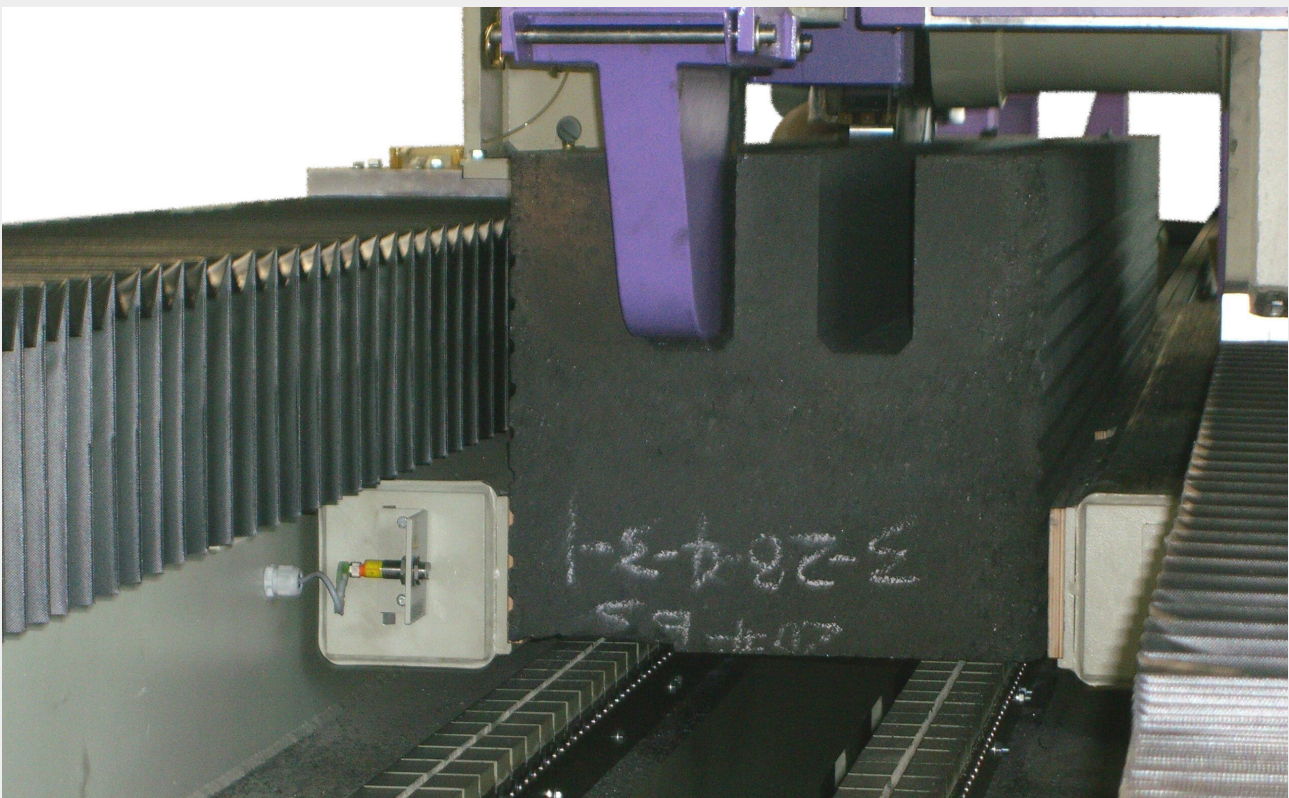


Examples of machines





Examples of machines





Electrode machining

The electrode processing line is designed according to the customer's requirements. The electrode is positioned centrally in front of the line and picked up by gripper 1 and deposited in station 1. In station 1, the box is pre-milled. At Station 2, a fully automatic bending test is carried out on both sides of each electrode in accordance with DIN. The electrode is then transferred to station 3, where the lateral surfaces and both end faces are milled at the same time. In station 4, the box thread is then milled and an adjustable bevel is milled onto the end faces. The electrodes are then tested at various stations (resistance, weight, ultrasound) and other customer-specific requirements are met.

The machining tolerances achieved with this system are in the range of hundredths of a millimetre. For all electrode diameters, only one tool is required at each station. This means that set-up times are negligible. The cycle time for a normal electrode is about 5 minutes. The surface finish of the shell surface can be varied as desired.



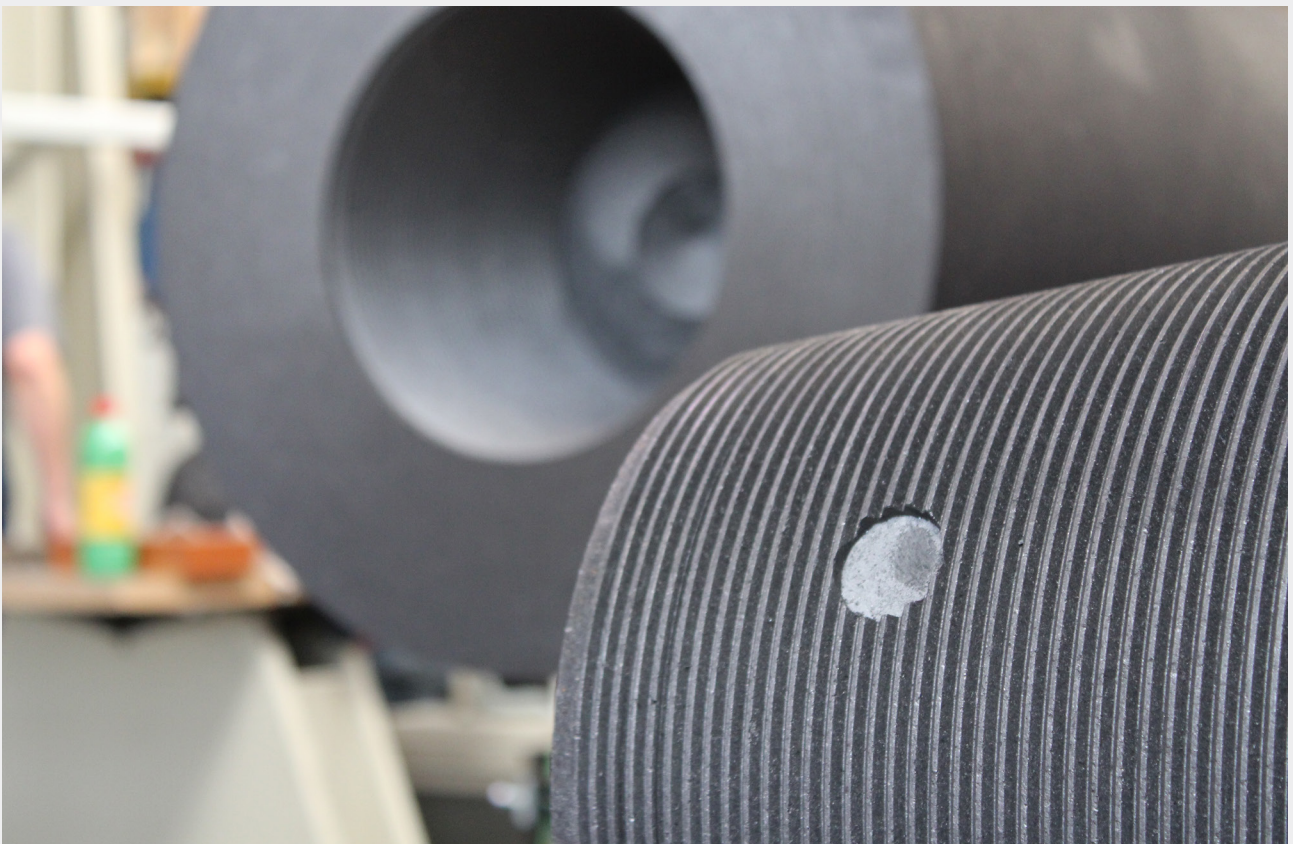
Examples of machines



Nipple machining

Nipple machining can be offered in various expansion stages. A complete nipple processing line consists of a raw bar magazine, shell lathe, cut-to-length saw, threading lathe, 3D measurement, ultrasonic and resistance testing, scales, drilling units, thread locking, product tracking, labelling and packaging.

The nipples are inserted into the various stations by a total of 4-6 robots. The complete automation is developed, designed and programmed according to the specifications. With the appropriate safety devices and light barriers, the system is delivered completely CE-compliant. The tolerances achieved and the cycle times are market-leading.



Electrode cleaning line

The electrode cleaning machine removes production-related crusts and foreign bodies from the circumference and the front sides of the graphite electrodes.

The GE is placed on the roller conveyor of the cleaning machine by a heavy-duty transport (length 5 m). The transport moves the GE to the fettling station.

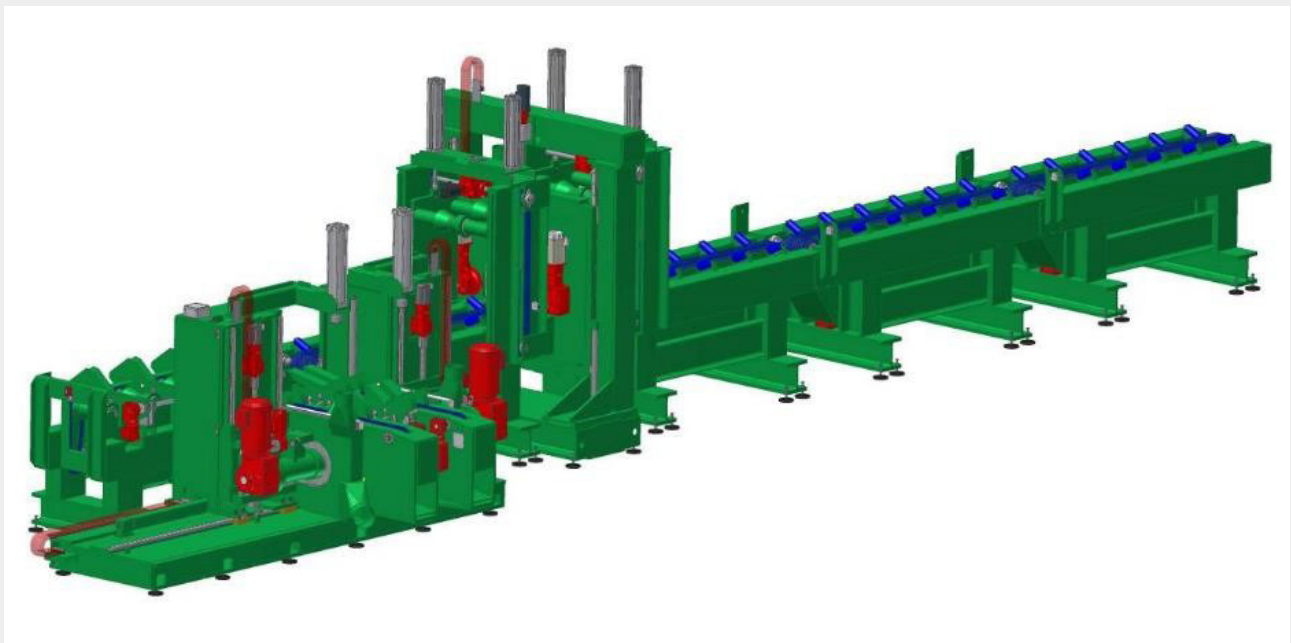
After entering the diameter of the GE, the machine adjusts to the desired dimension. The GE moves through the cleaning unit, whereby all foreign bodies adhering to the circumference are removed by special tools. Pressure rollers from above press the GE so hard onto the transport that the GE cannot rotate.

After machining the circumference, the GE is inserted into the face milling station by an angular transfer.

There, 2 units mill the end faces according to the entered parameters.

The machining parameters for the circumference and the end faces can be stored as a recipe in the control.

The removal of the GE from the end face milling station can be automated if desired.





Overview of info material:

- Single sided grinding machines
- Two-sided and three-sided grinding machines
- CNC-controlled machines
- Sawing machines
- Drilling machines
- Complete refractory systems, technical ceramics
- **Complete systems for graphite machining**
- Plants for building materials and ceramics
- Lamination machines

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