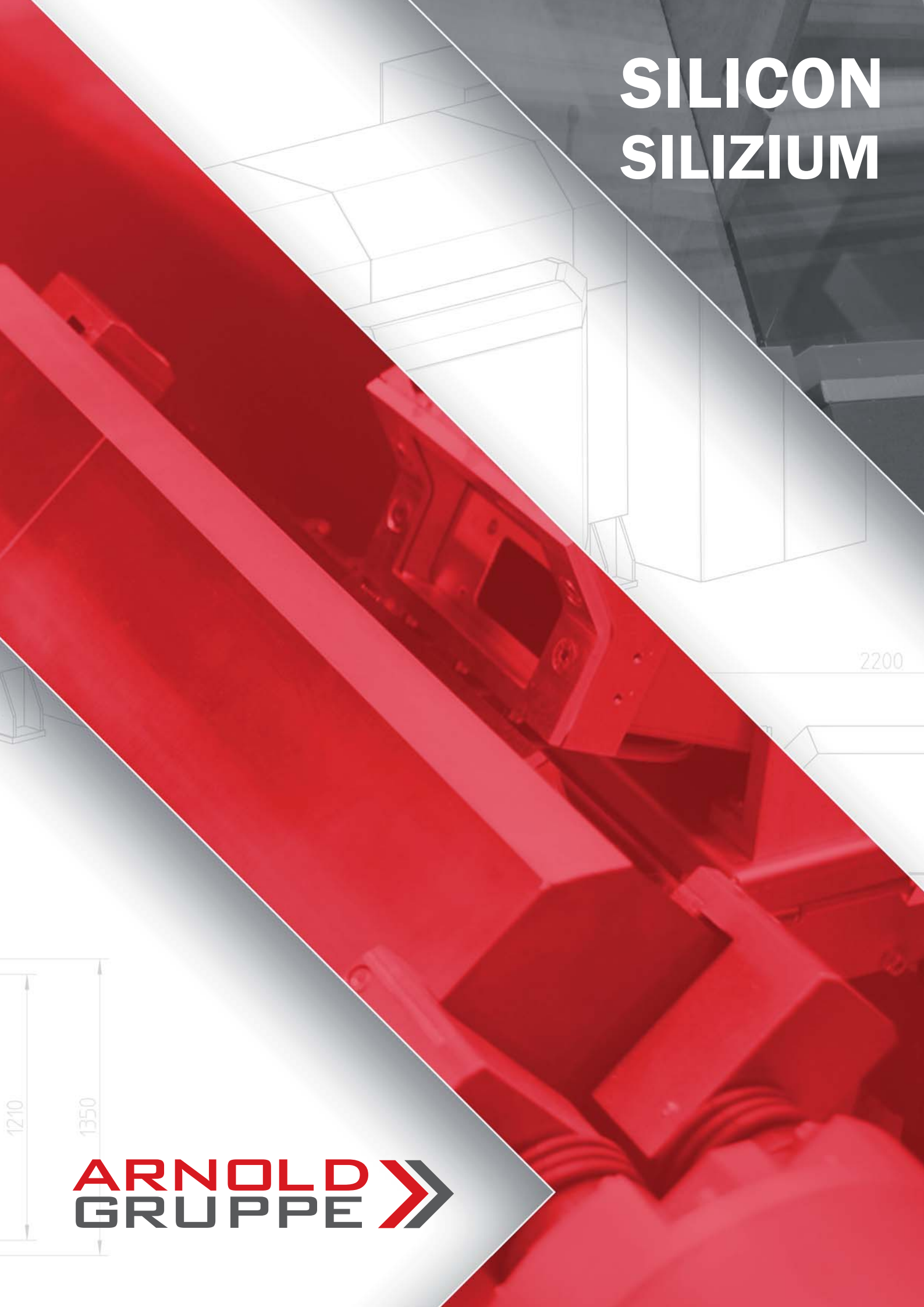
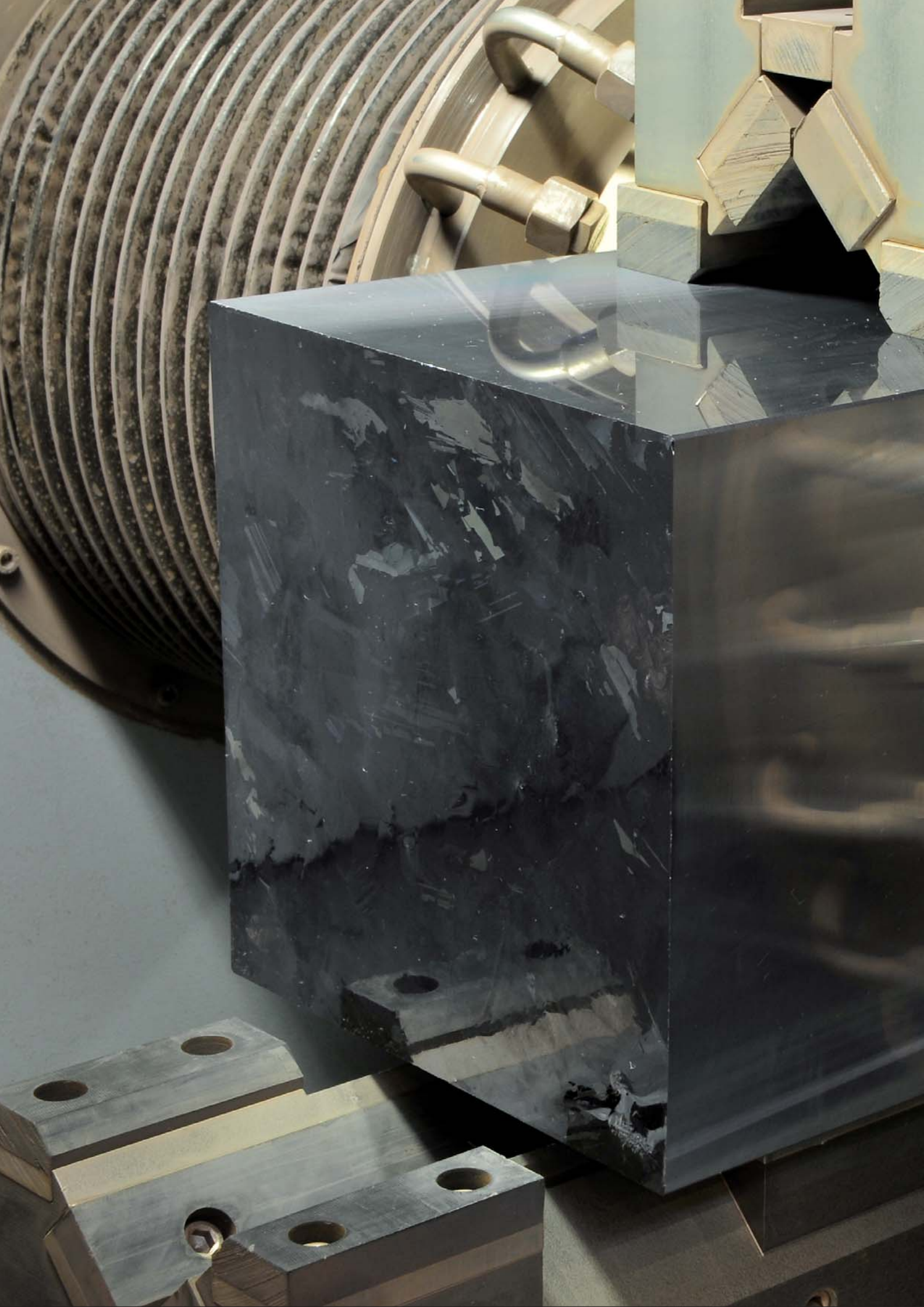
SILICON
SILIZIUM



ARNOLD GRUPPE



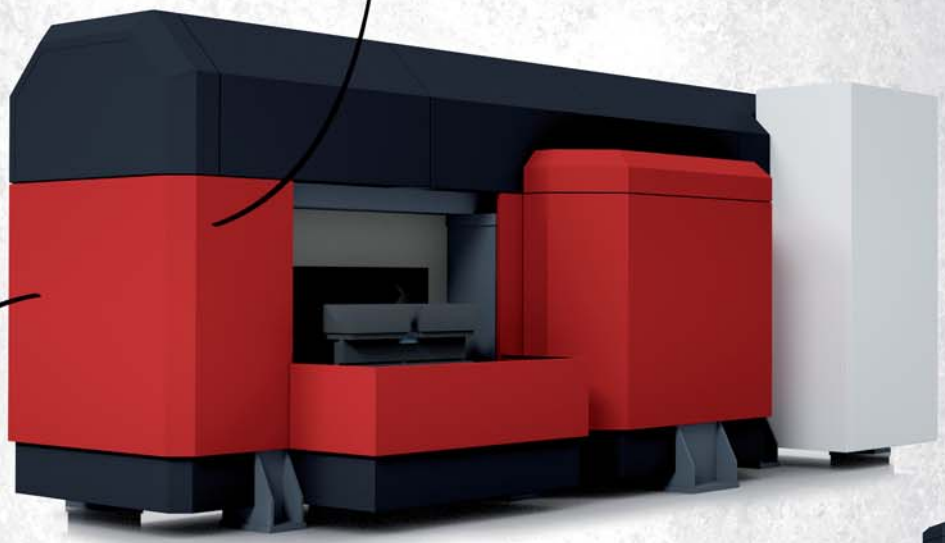
PHOTOVOLTAICS

Our core competence in photovoltaics and semiconductor poly-Si processing is the mechanic cutting, notch.-and roundgrinding, surface.- and chamfergrinding, squaring, rod.-and profilgrinding / polishing of silicon ingots.

Arnold can offer innovative, stand alone machines, as well as machines developed according to your individual requirements and specifications, such as complete processing centres and custom-tailored complete systems with an automatic linkage of all production processes and an intelligent assembly control system

length: 5850 mm
width: 2200 mm
hight: 2150 mm

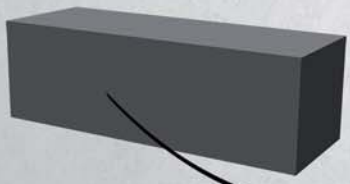
长: 5850 mm
宽: 2200 mm
高: 2150 mm



Low cycle times because
of 80 % higher cutting speed
(90m/s)
低加工周期
通过高出80%的切割速度
(90m/s)

Optional loading- and unloading
station, manual or with robot
可选的装载和卸载站
手动或带机器人

Reduction of maintenance
services and spare parts
减少维护操作
和备件



Auto-calibration
自动校准

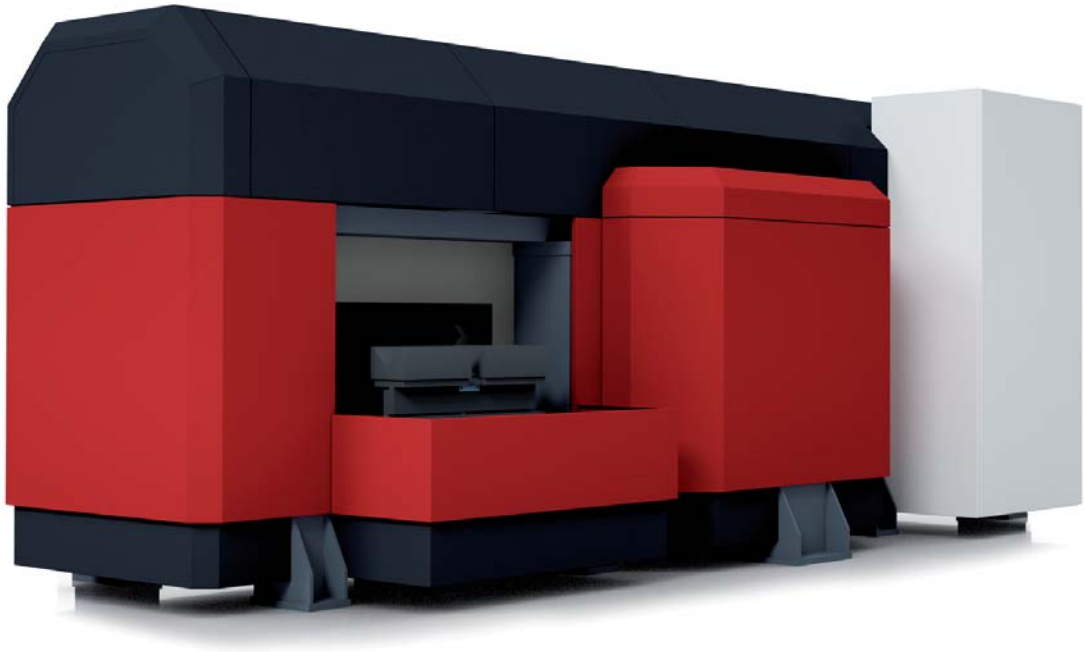
100 mm - 1000 mm
M0 - M4 / 155 mm - 165 mm

- High machine availability
  97% acc to SEMI E10
- Lowest COO
- Very fast integration
- 4x precision cup wheels

Current cycle time „Mono-Silicon“

Brick length	650,00 mm	=<	28,00 min
	325,00 mm	=<	18,00 min
	250,00 mm	=<	15,00 min

Maximal throughput 1,8 to/day



BG1000 BrickGrinder

Combination grinding machine for mono blocks (round chamfer) and multi blocks (45 ° chamfer) and grinding of the surface. Designed for manual or automatic assembly via robots.

Technical Data

Workpiece dimensions

■ format (width x height)	156 -162,7 mm (M0, M1, M2, M3, M4)
■ length	100 - 1000 mm
■ weight	max. 70 kg

Specifications surface / chamfer grinding:

- arithmetical surface roughness Ra <= 0,1 µm / 0,15 µm
- average surface roughness Rz <= 1,0 µm / 1,5 µm
- geometric toleranzes +/-0,04 mm by process capability index
- >=1,67
- angularity 90° +/-0,05° / +/-0,1 mm

Grinding spindle (4pcs)

Grinding wheel diameter	350 mm
Cutting speed	max. 90 m/s

Machine

■ length	approx. 5850 mm with control cabinet
■ width	max. 2200 mm
■ height	approx. 2150 mm
■ weight	approx. 8500 kg

Control cabinet

Two control cabinets mounted on the side of the machine.
The following components are installed amongst others in cabinet:

- network filter, sensoric, power supply, emergency off control
- 12 axes Lenze servo amplifier i700
- SPS Simatic - S7-1500, CPU 1515-2PN

Operating panel 15“ touch screen monitor

- software features:
- offset correction
- torque control

Equipment

Measuring device

- 6 pieces digital measuring sensor Keyence GT2
- 2 pieces of measurement amplifier unit
- 1 piece Profibus communication unit

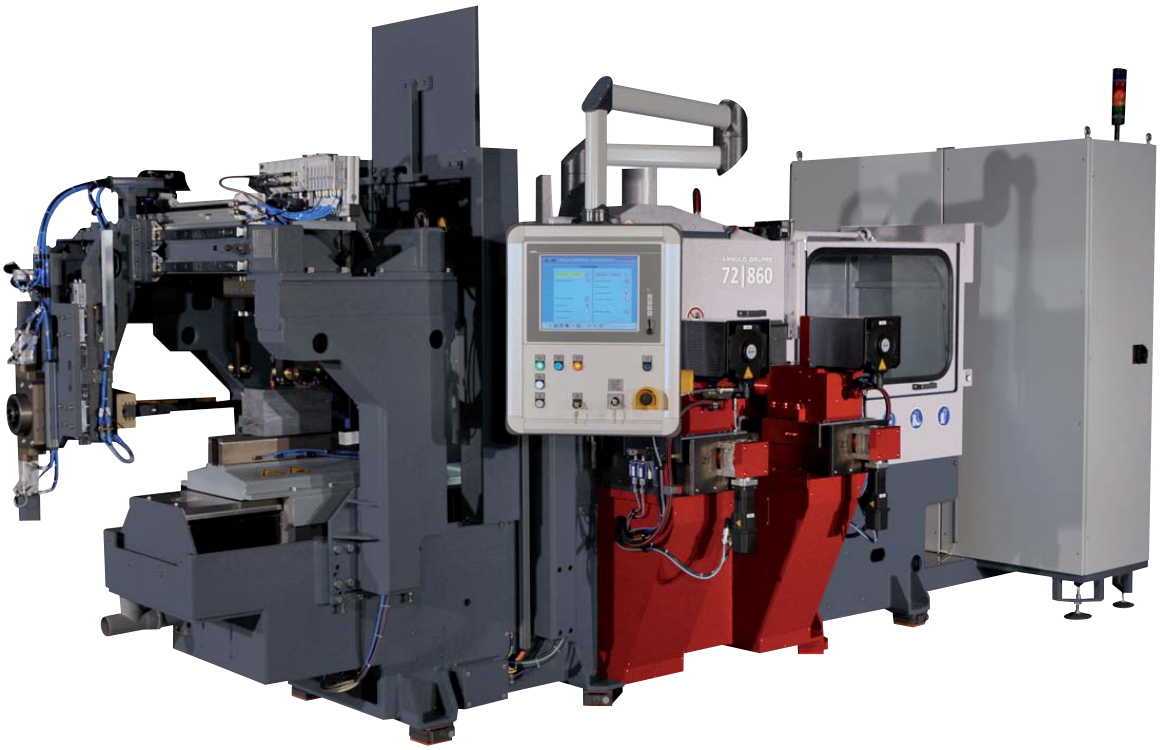
Automatic lubrication unit

Centralized lubrication for following lubrication points:

- Rail guiding system and ball screw X1 and X2 axis

Media (acc.to ARNOLD media spec)

■ feeding of cooling water	DN19; 50 l/min; 5 bar
■ discharge of cooling water	2 x 2“
■ compressed air	R 1/2“; 300 l/min; 6 bar
■ coolant control cabinet	DN 13; 200 l/h at 15°C
■ exhaust air connection	DN 150; 300 m³/h



72/860 - Surface Grinding Machine

The 72/860 is suitable for grinding of the lateral surfaces of squared mono- and multi crystalline silicon work pieces in the format 125 x 125 mm and 156 x 156 mm, with four parallelly arranged grinding aggregates (2x pre- and 2x fine grinding). Work piece lengths of 180 up to 1000 mm can be processed.

The fully automatic machine excels by following advantages:

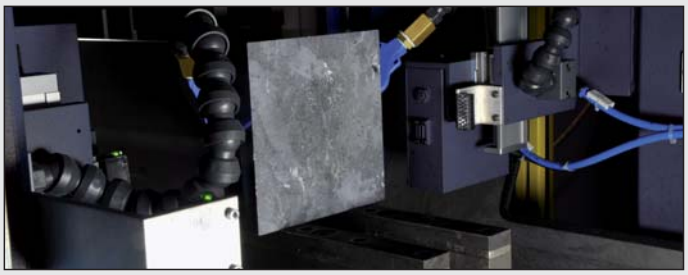
- highly flexible machine concept for mono & multi Si
- fully automatic machine concept
- adaptive Grinding Process Control
- automatic change of work piece format (125/156)
- equipped with two loading zones for manual and fully automatic loading, for instance with the help of an industrial robot
- geometric correction by parallel arrangement of grinding aggregates
- very high repeatability
- fully automatic pneumatic clamping and centering of work piece
- squared ingot/brick can be processed without preparation
- automatic wheel correction
- high process stability
- high machine availability 97% acc. to SEMI E10
- automatic adjustment of grinding tools with block detection for optimized cycle time by using high-resolution measuring systems
- detection and evaluation of the work piece specific quality data after grinding, for instance geometric measures, angularity etc.
- high throughput, even when a high removal is achieved by using 4 grinding disks and separate pre- and fine grinding processes

Specifications:

- arithmetical surface roughness Ra <= 0,1µm[1]
- average surface roughness Rz <= 1,0 µm[1]
- geometric toleranzes +/-0,05 mm by process capability index >=1,67[2]
- angularity 90° +/-0,05°

Throughput

- cycle time <= 7,9 Minuten (incl. loading, truning and unloading)
- rough size 157,00mm x 157,00mm x 300mm (WxHxL)
- final size 156,00mm x 156,00mm x 300mm (WxHxL)



72/852 - Chamfer Grinding Machine

The machine is suitable for chamfering of squared mono- or multi crystalline silicon work pieces in the format of 125 x 125 mm and 156 x 156 mm with two parallelly arranged grinding aggregates (2x combined pre- and fine grinding).
Work piece lengths of 180 up to 1000 mm can be processed.

The fully automatic machine excels by following advantages:

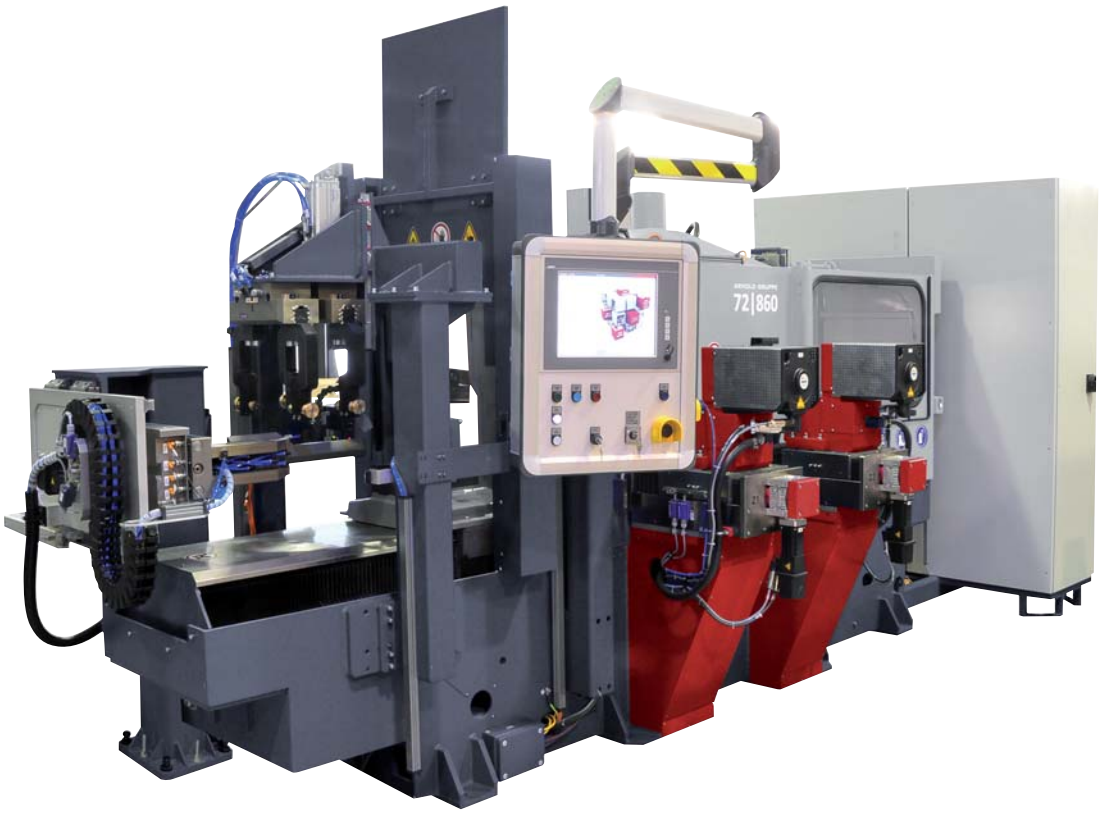
- edge grinding of chamfers 45°
- fully automatic machine concept
- adaptive Grinding Process Control
- equipped with two loading areas for manual and fully automatic loading, for instance via industrial robot
- fully automatic pneumatic clamping and centring of work piece
- automatic edge detection and adjustment of grinding tools with block length detection for optimized cycle time by using high-resolution measuring systems
- detection and evaluation of work piece specific quality data after grinding, for instance size of chamfer, chippings and unground chamfer sections
- automatic wheel correction
- high process stability
- high machine availability 97% acc. to SEMI E10
- high throughput even when a high removal is achieved by using 2 combined pre- and fine grinding wheels

Specifications:

- arithmetical surface roughness Ra <= 0,15 µm[1]
- average surface roughness Rz <= 1,5 µm[1]
- geometric toleranzes +/-0,05 mm
- angularity 90° +/-0,1°

Throughput:

- cycle time <= 4,7 Minuten (incl. loading, truning and unloading) for a chamfer width up to 2,0 mm and a work piece length of 300 mm



72/855 - Combined Surface & Chamfer Grinding Machine

The 72/855 is suitable for grinding of the lateral surfaces of squared mono- and multi crystalline silicon work pieces in the format 125 x 125 mm and 156 x 156 mm, with four parallelly arranged grinding aggregates (2x pre- and 2x fine grinding). Work piece lengths of 180 up to 500 mm can be processed.

The fully automatic machine excels by following advantages:

- highly flexible machine concept for mono & multi Si
- fully automatic machine concept
- adaptive Grinding Process Control
- automatic change of work piece format (125/156)
- equipped with two loading zones for manual and fully automatic loading, for instance with the help of an industrial robot
- geometric correction by parallel arrangement of grinding aggregates
- very high repeatability
- fully automatic pneumatic clamping and centering of work piece
- squared ingot/brick can be processed without preparation
- automatic wheel correction
- high process stability
- high machine availability 97% acc. to SEMI E10
- automatic adjustment of grinding tools with block detection for optimized cycle time by using high-resolution measuring systems
- detection and evaluation of the work piece specific quality data after grinding, for instance geometric measures, angularity etc.
- high throughput, even when a high removal is achieved by using 4 grinding disks and separate pre- and fine grinding processes

Specifications surface / chamfer grinding:

- arithmetical surface roughness Ra <= 0,1 µm[1] / 0,15 µm[1]
- average surface roughness Rz <= 1,0 µm[1] / 1,5 µm[1]
- geometric toleranzes +/-0,05 mm by process capability index >=1,67[2]
- angularity 90° +/-0,05° / +/-0,1°

Throughput:

- cycle time <= 12 Minuten (incl. loading, truning and unloading)
- rough size 157,00mm x 157,00mm x 300mm (width x height x length)
- final size 156,00mm x 156,00mm x 300mm (width x height x length)
- chamfer width of 2mm

72/865 - Combined Surface & Chamfer Grinding Machine

The machine is suitable for grinding lateral surfaces and chamfering squared multi crystalline silicon work pieces in the format 125 x 125 mm and 156 x 156 mm, with four parallelly arranged grinding aggregates (2x pre- and 2x fine grinding). Work piece lengths of 180 up to 550 mm can be processed.

The fully automatic machine excels by following advantages:

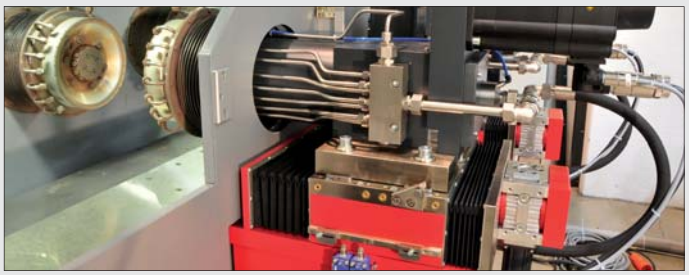
- automatic change of format (125/156)
- fully automatic machine concept
- adaptive Grinding Process Control
- The machine has an extremely solid and rigid three-piece welded steel bed. The middle region, where the four grinding units are arranged is filled with Polymere concrete. This results not only in a higher rigidity but has further advantages like vibration damping or vibration formation.
- pneumatic clamping and centering of work piece
- equipped with two loading zones for manual and fully automatic loading, for instance with the help of an industrial robot
- automatic wheel correction
- high throughput, even when a high removal is achieved by using 4 grinding disks and separate pre- and fine grinding process
- geometric correction by parallel arrangement of grinding aggregates
- high process stability
- high machine availability 97% acc. to SEMI E10
- detection and evaluation of the work piece specific quality data after grinding, for instance geometric measures, angularity etc.
- high maintainability - minimisation of maintenance points, reduction of maintenance intervals as well as accessibility of all maintenance points from the outside, even when integrated into automated machine centers

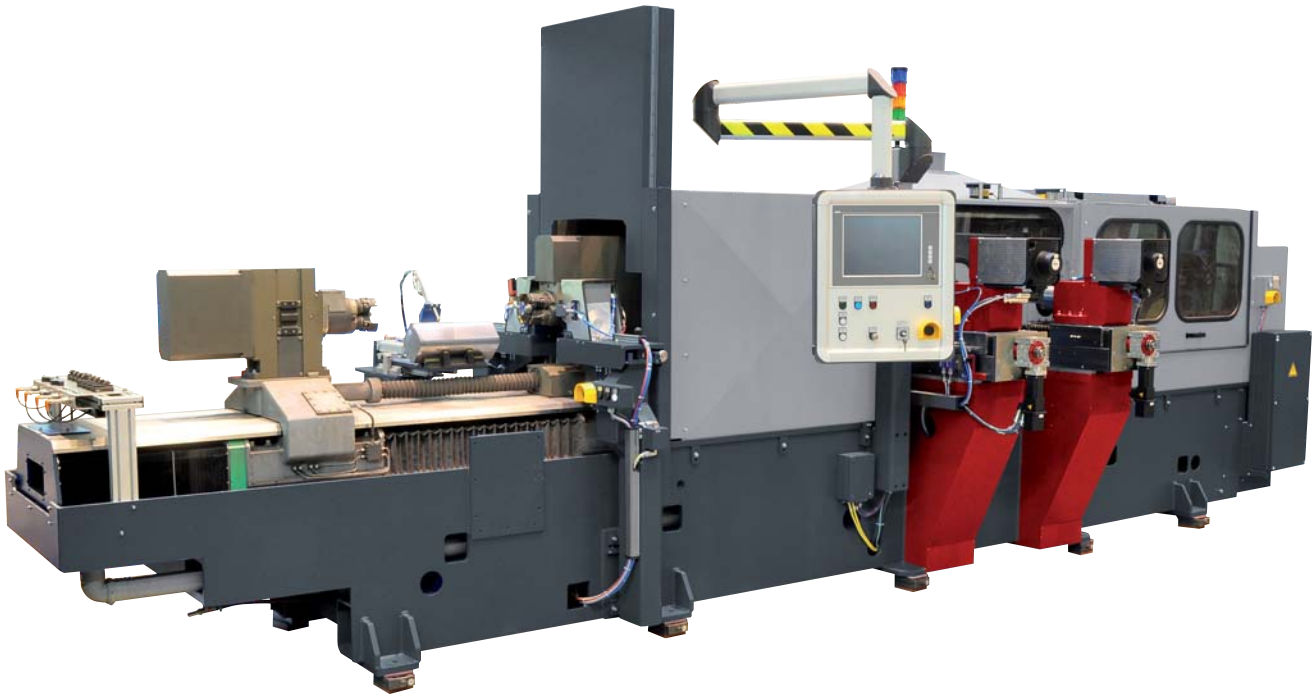
Specifications surface / chamfer grinding:

- arithmetical surface roughness Ra <= 0,1 µm[1] / 0,15 µm[1]
- average surface roughness Rz <= 1,0 µm[1] / 1,5 µm[1]
- geometric toleranzes +/-0,04 mm by process capability index >=1,67[2]
- angularity 90° +/-0,05° / +/-0,1 mm

Throughput:

- cycle time <= 10,6 Minuten (incl. loading, truning and unloading)
- rough size 157,00mm x 157,00mm x 300mm (width x height x length)
- final size 156,00mm x 156,00mm x 300mm (width x height x length)
- chamfer width of 2mm





72/856 - Chamfer & Round Grinding Machine

This machine is suitable for chamfer and round grinding of squared mono-crystalline silicon work pieces in the format of 125 x 125 mm and 156 x 156 mm, with three grinding aggregates (2x pre-, 1x fine grinding) and one additional grinding aggregate for OD grinding. Work piece lengths of 180 up to 1000 mm can be processed.

The fully automatic machine excels by following advantages:

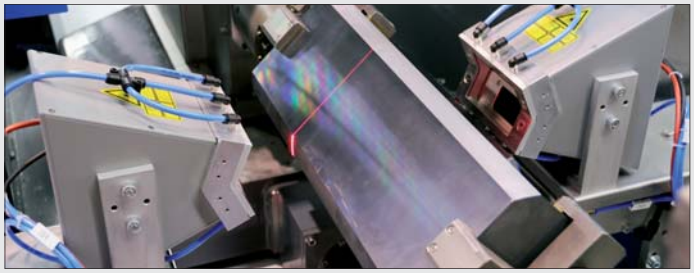
- edge grinding of flat (45°) and round chamfers
- fully automatic machine concept
- adaptive Grinding Process Control
- unique, pneumatic clamping and centring of the work pieces, even in case of a rectangular brick shape
- the squared ingots can be processed without preparation (for instance glueing of centering or clamping pieces)
- automatic edge detection and adjustment of grinding tools with ingot length detection, for an optimized cycle time, by using high-resolution measurement systems
- detection and evaluation of the work piece specific quality data after grinding, for instance chamfer size, chipping and unground chamfer sections
- automatic wheel correction
- high process stability
- high machine availability 97% acc. to SEMI E10
- equipped with two loading zones for manual and fully automatic loading, for instance with the help of an industrial robot
- high throughput, even when a high removal of silicon is achieved by using 4 grinding wheels with a separate pre-, fine- and finish grinding process

Specifications:

- arithmetical surface roughness Ra <= 0,15µm[1]
- average surface roughness Rz <= 1,5 µm[1]
- geometric toleranzes +/-0,05 mm
- angularity 90° +/-0,05°

Throuhgput round grinding:

- cycle time <= 13,5 minutes (incl. loading, truning and unloading)
- diameter as grown ø 210 mm, grinded diameter ø 200 mm and a work piece length of 500mm



72/360 - OD Cropping Machine

This machine is suitable for cutting squared multi and mono crystalline silicon work pieces with a length of 50 up to 550 mm. The shortest cut off length is 10 mm.

- equipped for manual and fully automatic loading, for instance with help of an industrial robot
- thin blade water hydraulic guidance for thin diamond cutting discs ➔ kerf loss < 1.7 mm
- compact design
- very low tool costs ➔ wheel life time between 12.000 and 15.000 cuts
- high process stability
- low investment costs
- high machine availability 97% acc. to SEMI E10
- cutting force control for an optimized cutting process and to avoid tool damages caused by SiC-inclusions
- cut off less than 10mm with vacuum chuck possible

Specifications:
- arithmetical surface roughness Ra <= 0,8 µm
- average surface roughness Rz <= 8 µm
- parallelism <0,2mm
- angle tolerance <0,3mm
- eveness <0,1mm

Throughput:
- cycle time <= 10 minutes per cut (incl. loading, unloading)
- for work piece format 156 mm x 156 mm

72/454 - OD Cropping Machine

This machine is suitable for cutting squared and as grown mono crystalline silicon work pieces with a length of 1.200 up to 3.000 mm. The Maximal diameter of ingot is 230 mm, the cut off length is between 200 mm up to 1020mm.

- equipped for fully automatic cropping process of complete ingot that means,
  automatic feed in of ingot, positioning and cutting of top/tail, slug(s) and segments and unloading without manual interference.
- thin blade water hydraulic guidance for thin diamond cutting discs ➔ kerf loss < 1.7 mm
- compact design
- high machine availability 97% acc. to SEMI E10
- very low tool costs ➔ wheel life time between 12.000 and 15.000 cuts
- high process stability
- low investment costs
- cutting force control for an optimized cutting process and to avoid tool damages
- Integrated vacuum chuck for top/tail and slug cut.

Specifications:
- arithmetical surface roughness Ra <= 0,8 µm
- average surface roughness Rz <= 8 µm
- angle accuravy 90°+/-0,1° (by square work piece)

Throuhgput:
- cycle time <= 90 Minuten per ingot (incl. loading, unloading)
- 6 cuts per ingot
- ingots as grown lenght 2400 mm
- usable ingot length 2000 mm, average segement lenght 500 mm
- 5 cuts for segments & 1 slug (test wafer) cut

72/476 - Squaring Saw

With two parallelly arranged diamond precision cutting discs. Machine is suitable for squaring monocrystalline ingots with of workpiece diameter of 150 - 230 mm (wafer format 125 x 125 mm or 156 x 156 mm). Segment lengths of 200 – 2500 mm can be processed. With water hydraulic guidance for thin diamond cutting discs as well as cutting force and automatic feed control.

- equipped for manual and fully automatic loading, for instance with help of an industrial robot
- high flexible machine concept
- flexible and easy processing of different ingot and segment lengths and diameters
- low investment costs
- high process stability
- high machine availability 97% acc. to SEMI E10
- low tool costs ➔ high lifetime of cutting discs
- thin blade water hydraulic guidance for thin diamond cutting discs ➔ kerf loss < 2.0 mm
- cutting force control for an optimized cutting process
- ingots as grown can be processed without preparation

Further information is available on our homepage or your ARNOLD contact person.

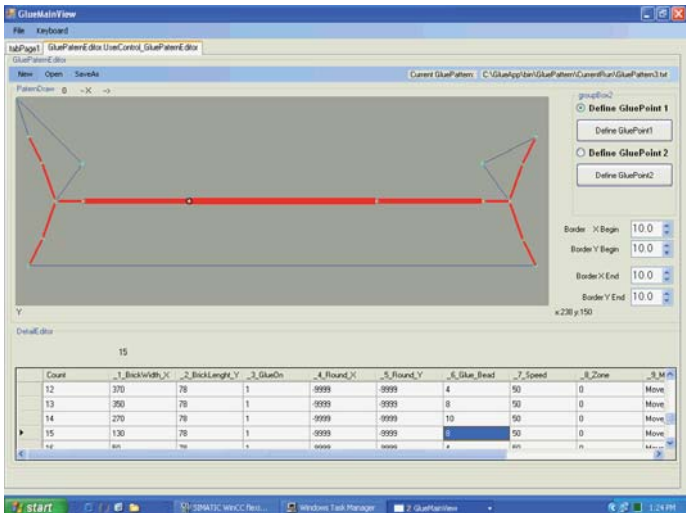
ARNOLD GLUEING CENTER

OUR AMBITION IS: THE PERFECT LINE

Exact glueing of bricks on the wire-saw beam as pre-stage to subsequent wafer processing is of high significance. High yield at wafer cutting can only be achieved through a continuous repeatable and stable adhesive joint. Nowadays still about 90% of glueing work in industry is still carried out manually and is therefore, to a great extent, dependant to the machine operator.

Reduction of Costs by Process Automation and Yield Optimization

ARNOLD offers a complete production line of automated glueing systems tailored to your requirements. Regardless whether it is your goal just to automate the adhesive application process or whether you seek handling of the entire process starting from cleaning of the brick also covering glueing up to assembling of brick pieces: We provide an adequate solution to you. It is up to your choice to decide for integration of the glueing station into our automated brick processing line (in-line-system) or for a stand-alone system – operating independently from the prior mechanic brick processing. Your advantage: Automated adhesive application leads to substantial reduction of processing costs resulting in a surplus of yield → up to 3 %.



Our Ambition is: The Perfect Line
System components of high quality in combination with optimized adaptation are the basis of a stable production process. The dosing system, a volumetric dosing unit working on the principle of endless-screw as well as adhesive application and brick handling via industrial robot are common standard for all system options.

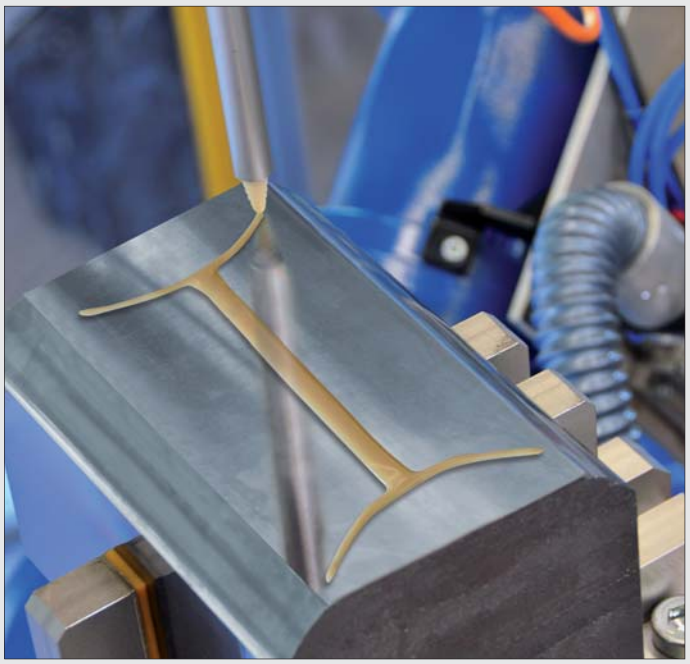
Your Advantages:

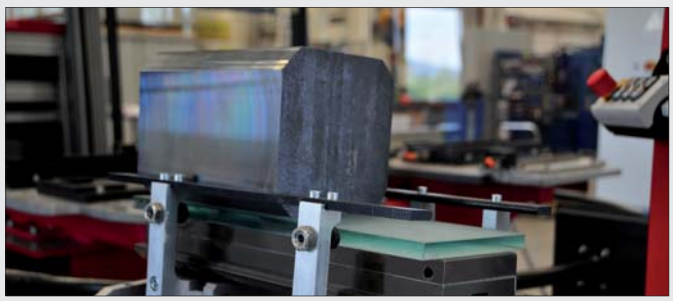
- extremely low material irritation by dosing – no shearing of adhesive
- high precision dosing system reduces adhesive consumption
- continuous monitoring of all necessary process parameters (e.g. dosing pressure, application volume) for continuous quality control
- exact positioning of bricks and glass plates via robot

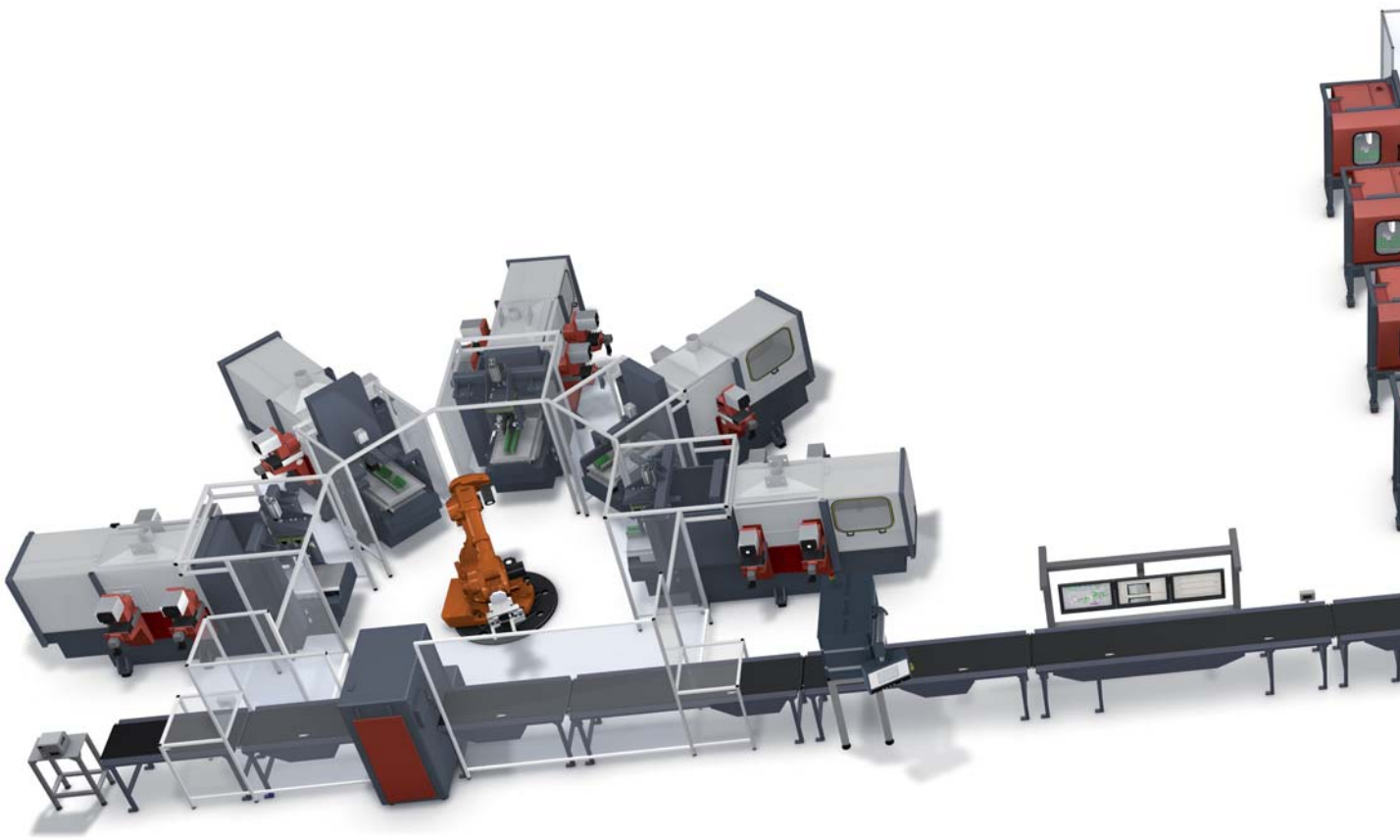
Compared to manual dosing this enables a reduction of adhesive of about 50%. Our **AEPS** – **A**RNOLD **E**asy **P**anel **S**ystem - is a unique software tool to configurate application of adhesive beadings in a completely free and individual manner – irrespective of any programming knowledge. In addition **ARPAT** – the **A**RNOLD **R**emote **P**roduction **A**nalysis **T**ool – collects, visualizes and analyses production and process data in real time. Thus any process related production parameter will be at your disposal and even the operator is able to optimize his work systematically and continuously in the so-called „close loop process “leading to further reduction of production costs and moving you ahead in competitiveness.

Arnold Automation Technology: Experience for Profitability

As automation experts for automobile and photovoltaic business ARNOLD has been a reliable partner in industry for over 20 years now. Thanks to the expertise in intelligent monitoring and process control systems ARNOLD is in a position to optimize the entire wafer production process in a step spanning manner. With respect to the adhesive process e.g. an intelligent choice and positioning of the cropped brick pieces - produced in the prior process step - on the wire saw beam is the basis for optimized utilisation of wafer saws in the subsequent wafer cutting process.







Grid Parity through Automation

Efficient wafer production already starts within the brick manufacturing process. Automated manufacturing processes are the basis for reproducible production quality, a high production volume as well as reduction of material losses and is as consequence the main driver to reduce production costs. ARNOLD is the leading manufacturer of automated production systems for processing mono and multi crystalline silicon bricks. Flexible and intelligent manufacturing centres for fully automated brick production are counted among the core competences.

ARNOLD offers a modular system concept of process machines and manufacturing automation – everything from one source:

- grinding and cutting machines with fully automated manufacturing processes and outstanding process stability
- robot-based handling systems for automatic loading and unloading of the process machines
- robotic brick glueing systems including fully automated assembly of silicon bricks on wire saw beams
- conveyor systems for automated brick transportation to the individual machine centres
- 100% quality monitoring of all bricks produced for continuous recording of brick geometry, SiC-inclusions as well as carrier-lifetime
- intelligent process supervisory control for a precise acquisition and analysis of production and quality related data.

Assure your competitive ability by integrated automation solutions made by ARNOLD. You will benefit from the following advantages:

- significant improvement of material balance (= yield) in production process by
  - smooth handling of silicon bricks via robot systems – reduced handling losses
  - individual and accurate brick positioning within the cropping saw – based on brick quality data measurements - to cut out defective brick zones for recycling purposes
  - reduction of wafer breakage within the wire saw due to reproducible glueing process

- additional cost savings can be achieved by
  - considerable reduction of labour costs
  - miniumum 50% savings of adhesive material
  - optimal machine utilization during a continuous 24 hour operation

- possibility for a self-driven and continuous optimization of the production process by means of systematic process- and quality data analysis tools

The ARNOLD customers trust in competence and 20 years of experience in automated process solutions for brick manufacturing.

Process Control

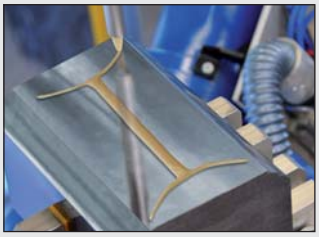
The ARNOLD central computer system is specialized in coordinating all production clusters in block processing centres. The advantage is that all available measuring information (for instance lifetime, SiC-inclusions, block geometry) will be evaluated directly in the production centre, so an anticipatory, loss-optimized cut planning during cropping is possible.

Furthermore it is possible to collect and evaluate construction-part specific data from pre-located and downstream production systems, in order to optimize the whole process. Additionally the central computer includes software tools for foresighted maintenance and service planning.

The central computer system consists of a SQL-organized data base as well as an HMI-server system for data input and output, as well as visualization of plant and operating conditions according to SEMI E10 standard. An appealing graphical user interface enables an intuitive navigation through the production cluster along the material flow.

Search functions enable the component-specific tracing of measuring-, process- and production data during the whole process. A visualization of production information is possible on plant level but also on remote PCs in office surroundings, so one can for instance analyse the information on technological and planning level.

Naturally a central linking of the individual production clusters/machines with the MES/ERP systems via standardized SECS/GEM, XML, OPC or other interfaces is possible. It is an advantage that a complete functionality of the processing centre is possible, without a MES-connection, including the securing of all production- and process data.



SEMICONDUCTOR

Arnold is machine & equipment producer for semi-conductor poly Si processing since 1983. We are specialized for grinding technology, cutting technology, drilling technology and automised solution.

Grinding applications like for example:

- rod preparation for float zone process
- filament end processing (groove, cone …)
- OD-grinding to target diameter
- OD-grinding geometric centreline acc. to crystal centreline

Cutting applications with Outer Diameter blades (OD) or band saw cutting like for example:

- U-rod cropping
- Rod cutting into filaments
- Filament cutting into specified length

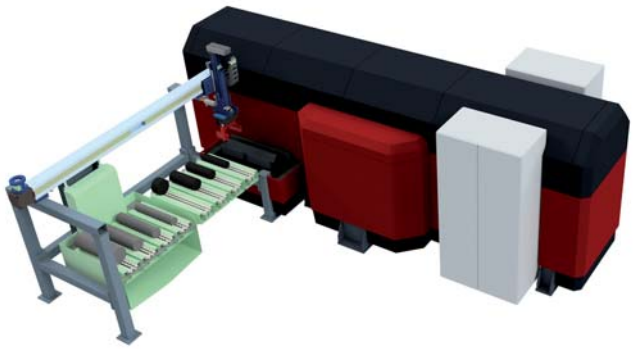
Drilling applications like for example:

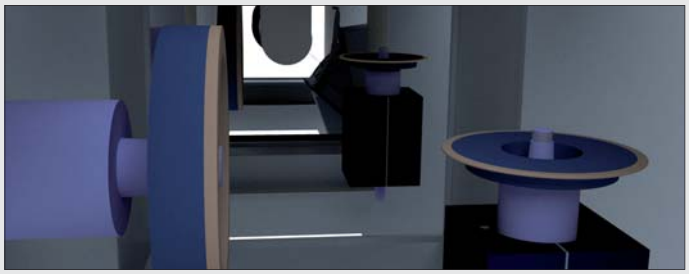
- seed production
- rod quality control
- filament end processing

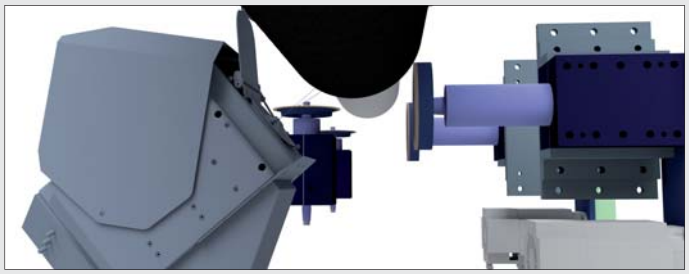
RG608 / RG 612 - Roundgrinder

This machine is suitable for grinding SiC ingots of 4 -12“ with a max. length of 600 mm and straight notch and Flat grinds. Centering of parts is done automatically.

- Ingot dimension:
  - Diamter: 4 – 12“
  - Length: 30 mm - 600 mm
- XRD orientation measurment:
  - Inline inspection 4-12“
  - Orientations (111), (100), (110)
  - Measurement of the flat/notch position
  - Measurement of emergency depth, flat depth or width
  - Dia.-measurement on raw- and ground rodspread detector
- Notch grinding wheels:
  1-2 Grinding wheels for the different variant of the notches or pre.- and finegrinding
- Load- and Unloading station:
  - Automatical load- and unloading
  - Scan of the Ingot ID







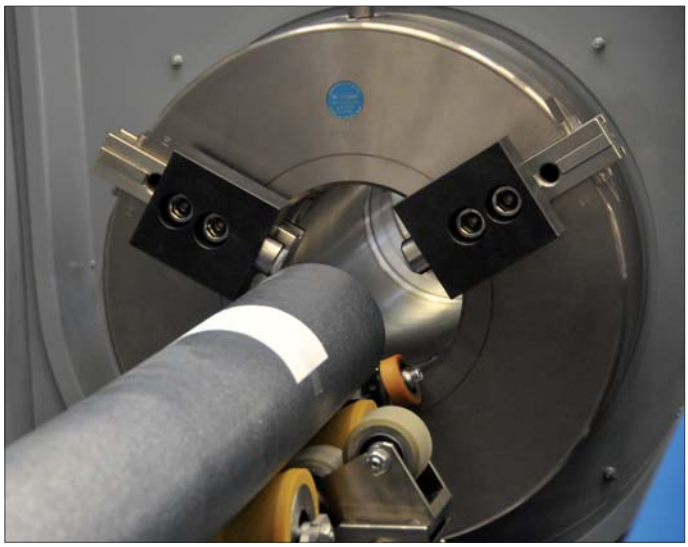
NC 559/200 - Poly-Silicon Processing

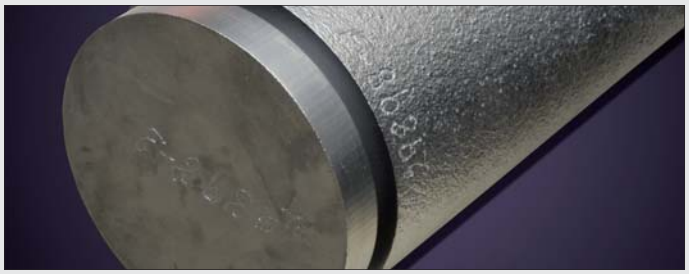
Automatic grinding of cone and groove for preperation of poly crystal rod for float zone processing.

The machine is suitable for automatic grinding of cone and croove for preperation of poly crystal rod for flot zone processing. The work piece length of 500 up to 3000 mm with are maximal diamater from 200mm can be processed. The grinding length is between 500 and 1000mm.

- fully automatic machine concept
- high process stability
- very simple operation
- low cycle time – very high throughput
- low production tolerances, high surface quality
- high repeatability
- less machines required, smaller facility area required
- high machine avaibility 97% acc. to SEMI E10

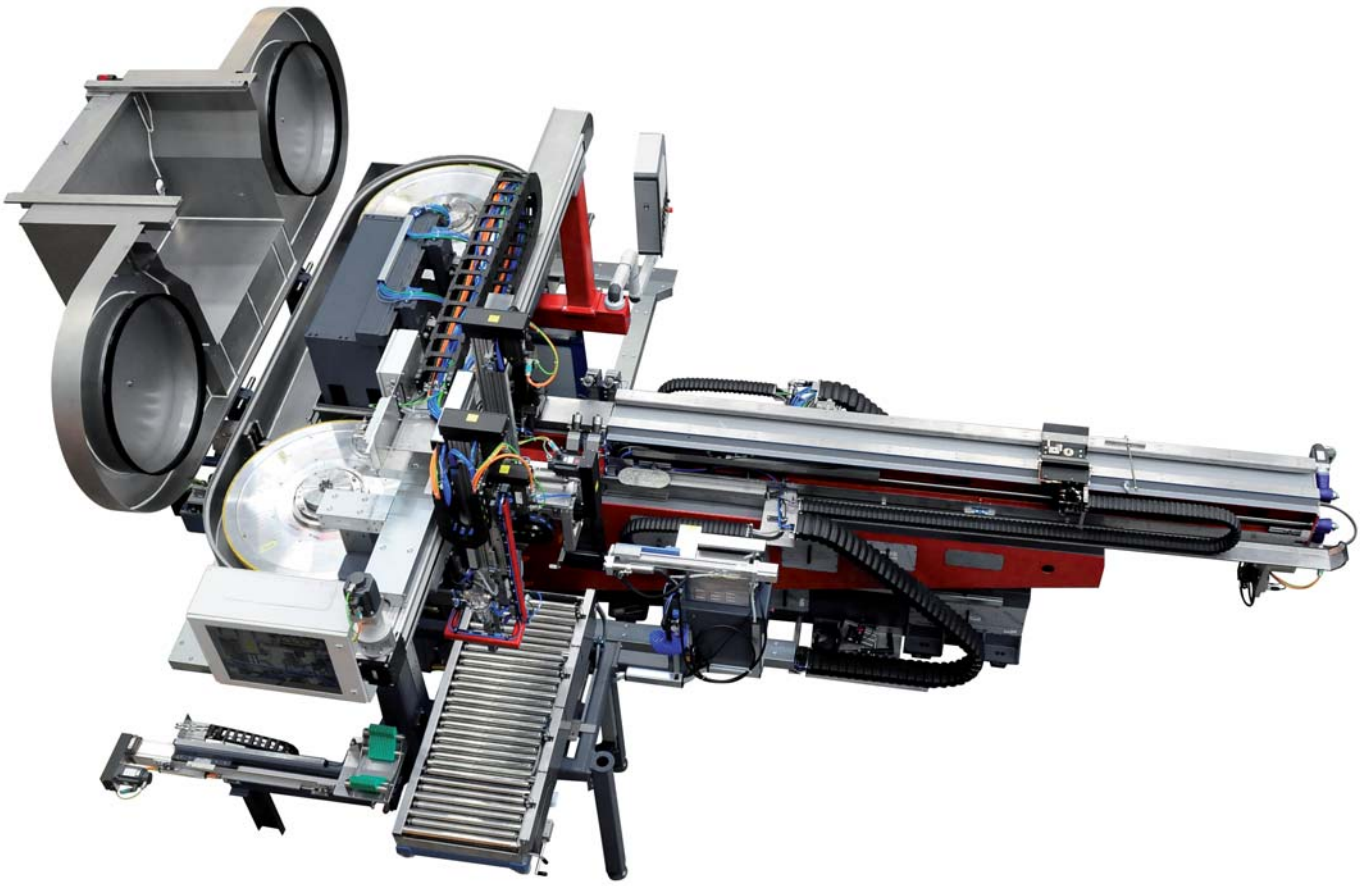
Further information is available on our homepage or your ARNOLD contact person.





72/1500 - Filamant Cutting Machine

72/1540 - U-Rod Cutting Machine

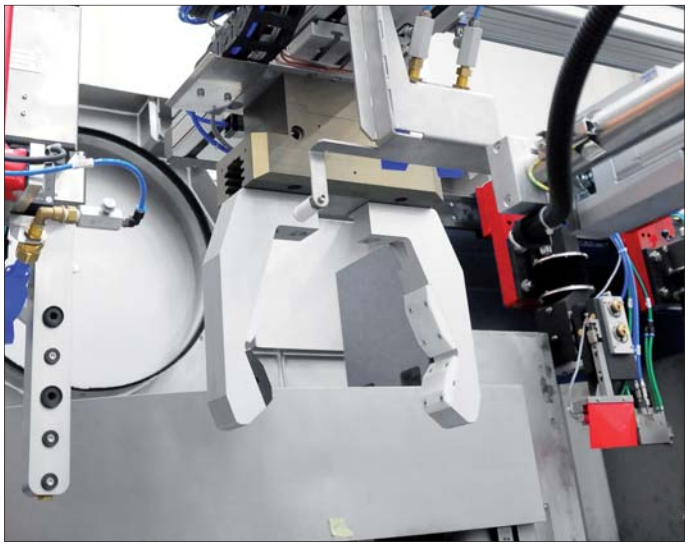


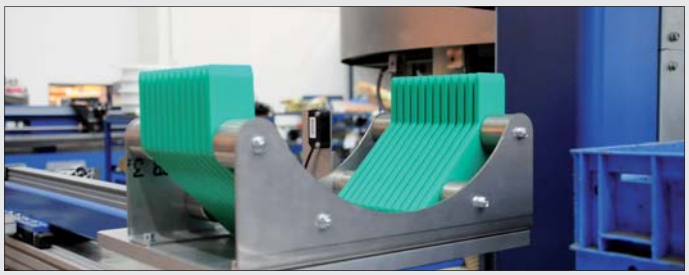
BS4000/320 A - Bandsaw

for cutting from monocrystalline Ingot´s up to a Ø 320 mm

Work piece:
- Length: 700 - 4000 mm
- Length cylindrical part: 3500 mm
- Length of cone: 2x 300 mm
- Diameter: 300 - 320 mm
- Block lenghts: 70 - 400 mm
- Test wafer thickness: 1 - 3 mm
- Weight: 5 - 600 kg + 50 kg for holder

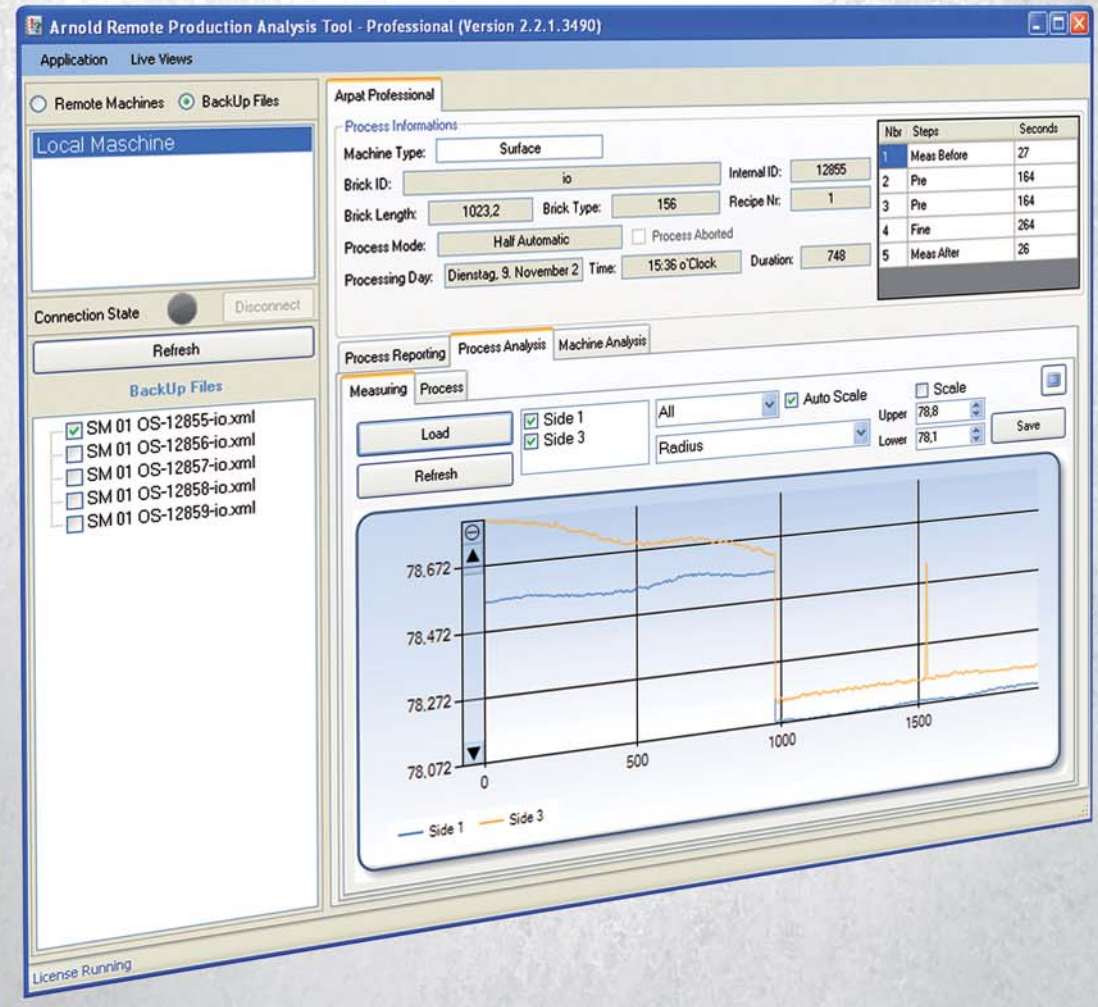
Saw belt:
- Length: 8550 mm +/-30 mm
- Width: 40 - 41 mm
- Thickness: 0,5 +/- 0,02 mm
- Pre-tension: 5-40 kN
- Speed: 0 - 60 m/s



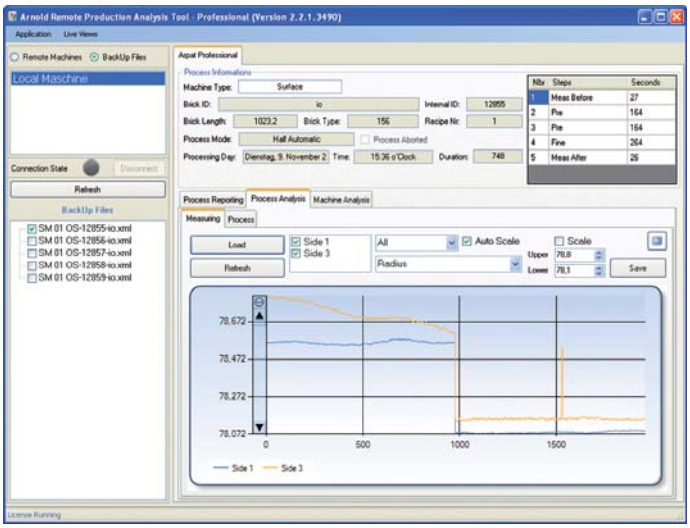


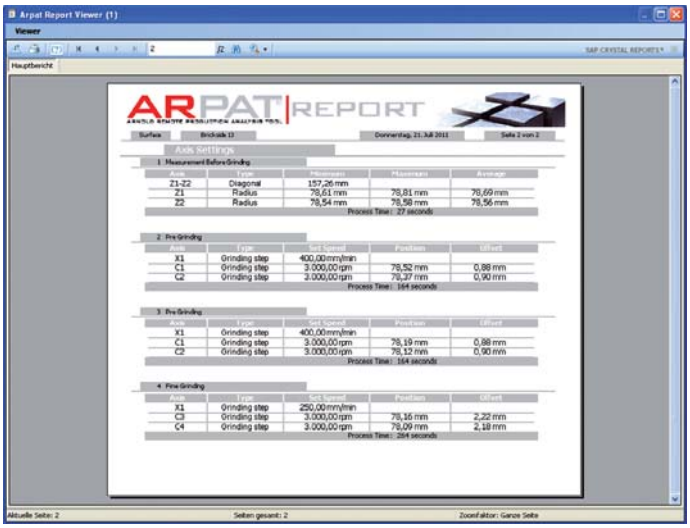
ARPAT©

ARNOLD REMOTE PRODUCTION ANALYSES TOOL



SOFTWARE





The unique **A**RNOLD-**R**emote-**P**roduktion-**A**nalysis-**T**ool „**ARPAT**“ for transparent production processes and for a constant improvement of production quality and cost efficiency - achievable by the so-called „Closed Loop Process-Optimization”.

Data recording is starting again with the modified production and process recipes. Thus closing the loop of continuous process optimization. This systematic approach constitutes a significant improvement of overall cost efficiency.

ARPAT consists of two main Software modules:

1. ARPAT Recorder – Production- and Process-Data collector:
This above mentioned software collects continuously all relevant production- and process data of each processed work piece, like for instance:

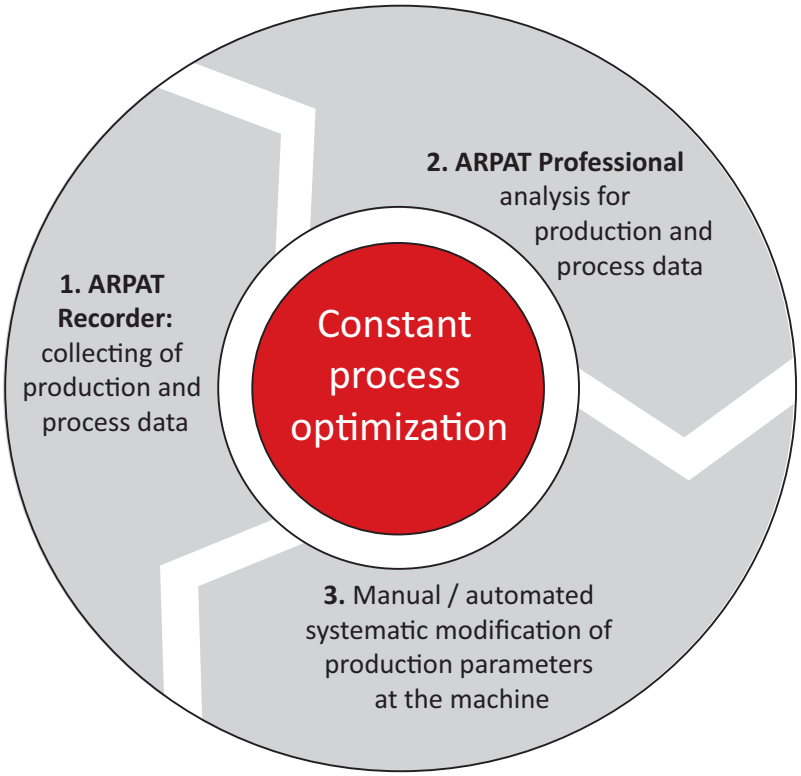
- general customer-specific work piece information (i.e. brick-ID)
- geometric measuring data before the process starts
- geometric measuring data after the process is finished
- media consumption values for power, water, compressed air - per processing cycle
- recipe and process parameters
- positions of axes, cycle time, auxiliary process times
- machine status acc. to SEMI E10

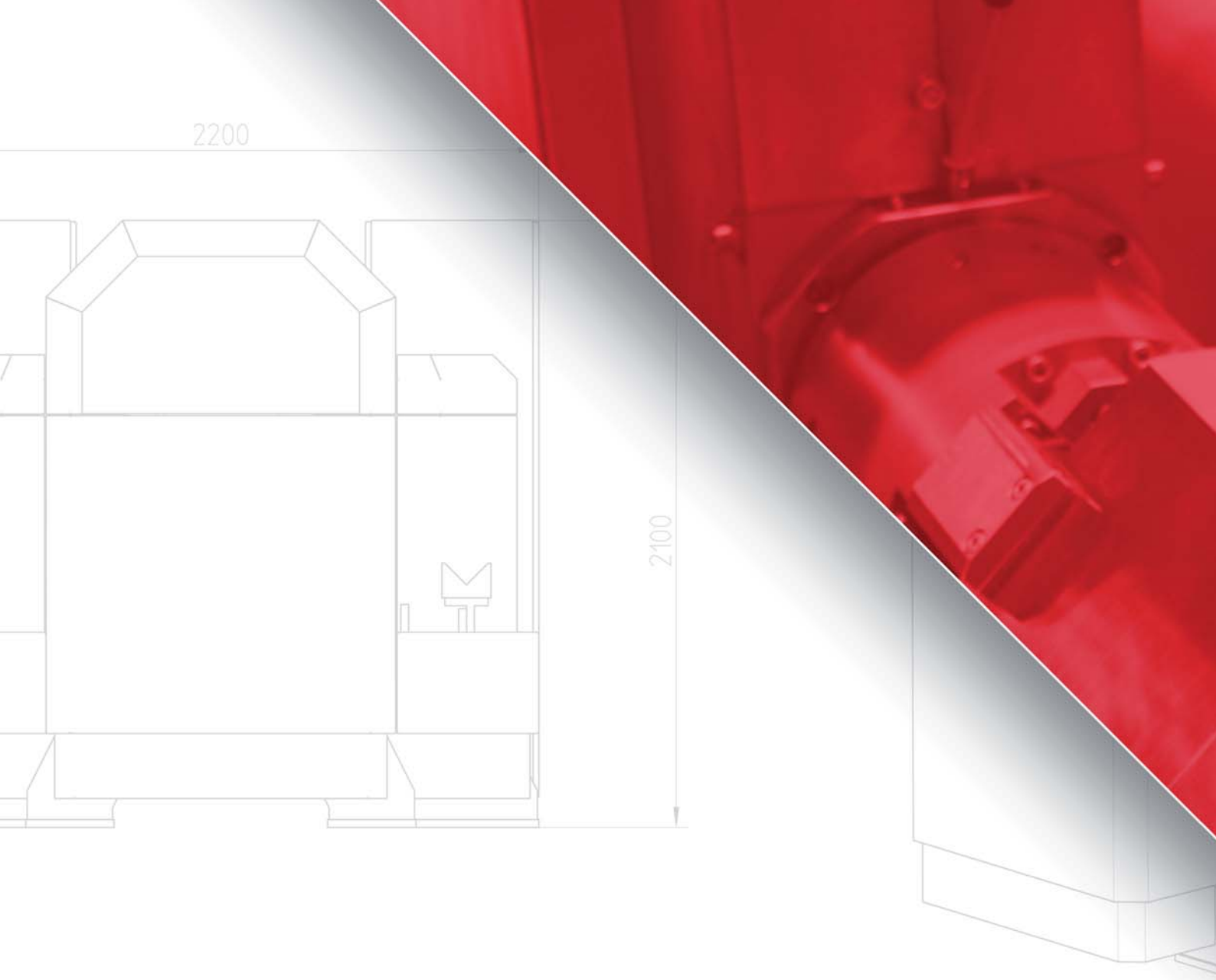
2. ARPAT Professional – Data visualization and analysis:
Provided, that access is authorised to the ARPAT software (i.e. process engineers, production management etc.) all recorded data are visualized – graphically and in tabular form – on standard PC workstations. They can easily be exported to all common file formats (Word, Excel, pdf etc.) in order to enable other persons to get access to the data and to create customer-specific reports or analysis.

Modification of process recipes
Based on the results of the process analysis obtained with ARPAT Professional, the process engineer has all relevant information on hand to change the production parameters in order to examine cause and effect of recipe changes to production quality and cost efficiency in a systematic approach.

This later data recording closes the loop process and the optimization course starts again.

Thus ARPAT is an extremely powerful SW-tool compared with conventional process optimization tools and offers – simultaneously – an extended MES- functionality.





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Die tatsächliche Lackierung kann von den Abbildungen abweichen.
The actual paint may vary from those shown.

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