

PRECISION FOR
A SUSTAINABLE TOMORROW.

UNTERSCHUTZ

Sondermaschinenbau

Automated Anode Rod Straightening System

Automatic inspection, evaluation, and
precision straightening of reusable
anode rod assemblies.



MEASURE
Automatically



EVALUATE
Intelligently



STRAIGHTEN
Precisely

FOR A MORE EFFICIENT
AND SUSTAINABLE
ALUMINIUM INDUSTRY.

Process Context

Anode Rods — Designed for Reuse

In aluminium electrolysis, the carbon anode is consumed while the rod assembly is reused. During operation, the assembly deforms. Geometry must be restored before a new carbon anode is attached.

Bent Anode Rod

Deformed Yoke

Misaligned Pins

For:

- ✓ Aluminium Electrolysis
- ✓ Primary Aluminium Production Plants
- ✓ Rodding Shops

Electrolysis

Anode
Consumed

Rod
Returned

Inspection
&
Straightening

New Anode
Attached

ENGINEERING IN EVERY DIMENSION.

From Operator Judgement to Defined Geometry

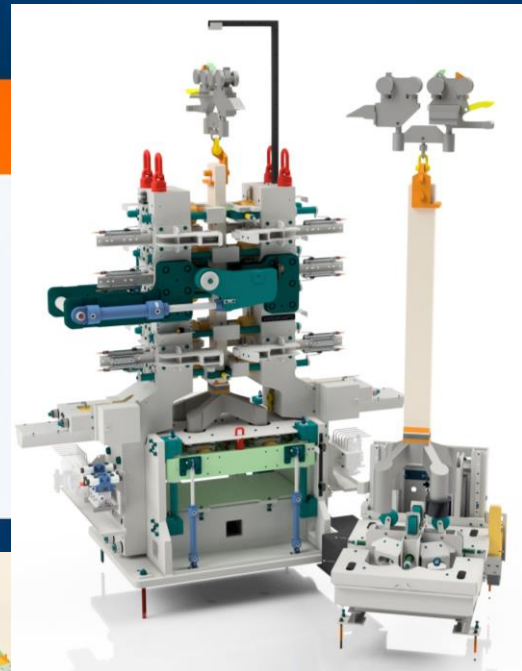
Previous Process

- Straightening decisions made manually
- Visual judgement, no measurement standard
- Pin correction in one direction only
- High manual workload
- Poorly integrated equipment



Unterschütz Solution

- Automatic geometry measurement
- Defined tolerances, consistent standard
- Multi-directional controlled correction
- Straightening only when required
- Fully integrated inline process



The Machine Knows When Straightening Is Required

The upstream Yoke Measurement Station determines actual geometry automatically – eliminating manual inspection.



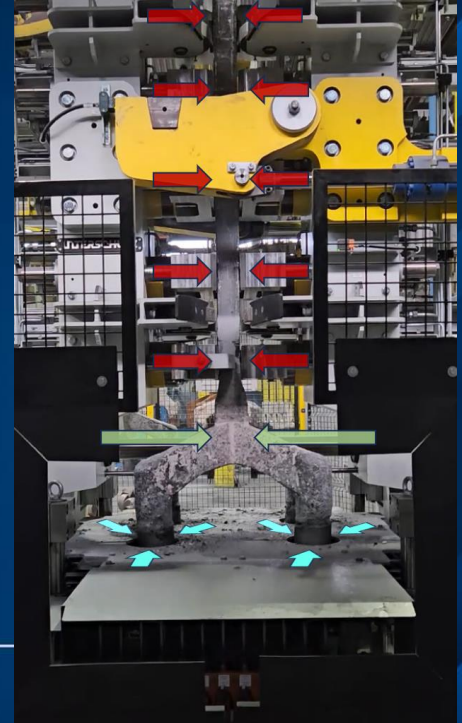
Within Tolerance

Assembly bypasses straightening and continues directly to production.



Outside Tolerance

Full automatic straightening cycle is initiated for rod, yoke, and pins.



STRAIGHTENING MACHINE

Controlled Straightening in Multiple Directions

Anode Rod

Corrects axial deformation of the main rod body.

Anode Yoke

Restores yoke geometry to defined target values.

Individual Pins

Precision correction of each anode pin position.

- ~23 hydraulic cylinders – each with integrated force measurement and absolute position feedback
- Inline / pass-through design – integrated into the existing suspended chain conveyor system

Better Geometry. Less Manual Work. More Consistent Production.



Quality

- Consistent, defined geometry
- Reproducible straightening results
- Reduced operator dependence



Productivity

- Automatic inspection & bypass logic
- Straightening only when necessary
- Reduced manual repair work



Safety

- Reduced manual intervention
- Less handling of cast iron residue
- Improved operator working conditions



Process

- Easier pin insertion into carbon anode
- Reduced excess cast iron risk
- More consistent anode assembly quality
- Reduced energy consumption
- Improved electrical and geometrical conditions contribute to lower specific energy consumption per ton of aluminium produced

Contact Us



We are happy to discuss
your application and find the
best solution for your production.



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