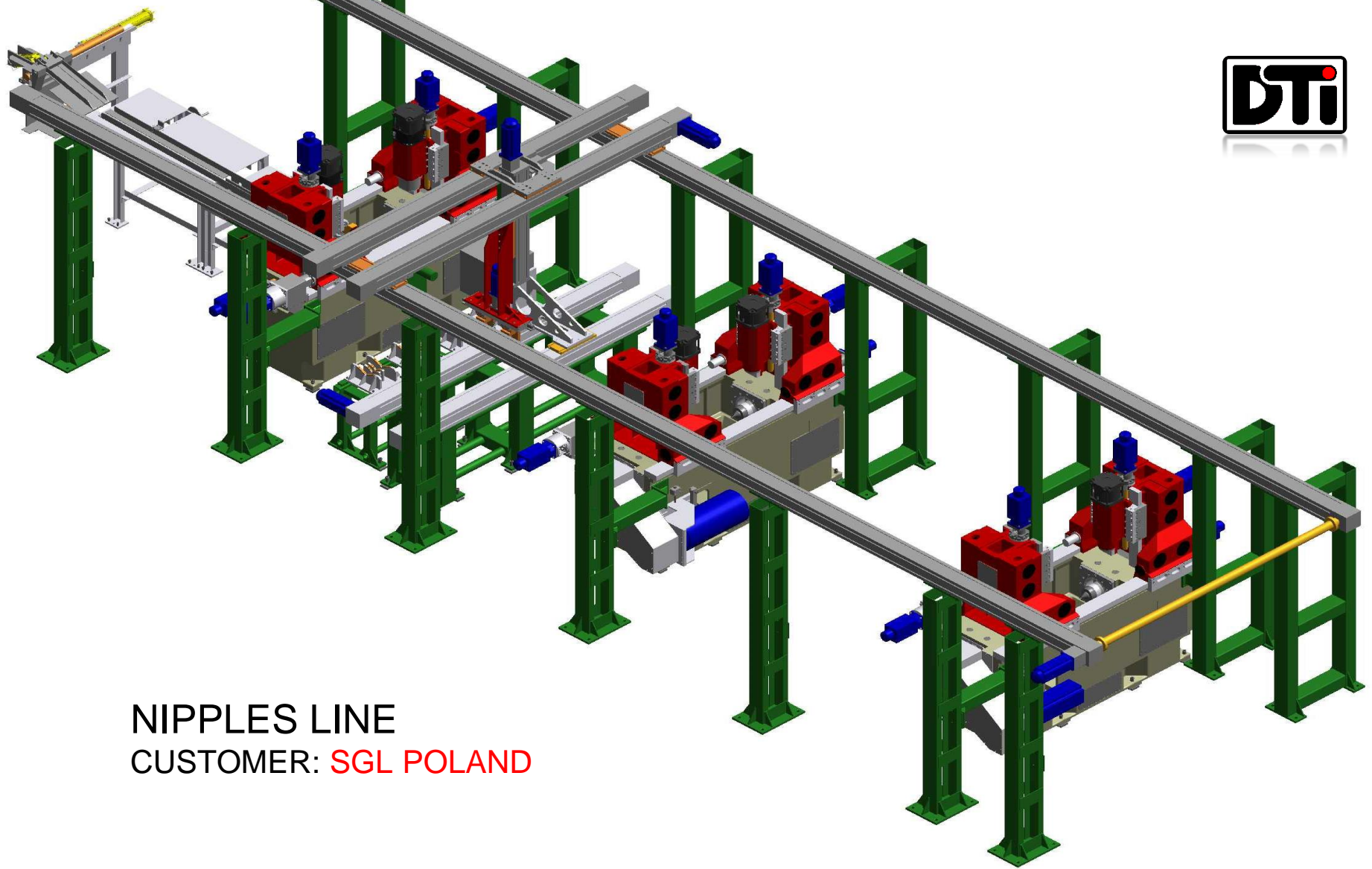




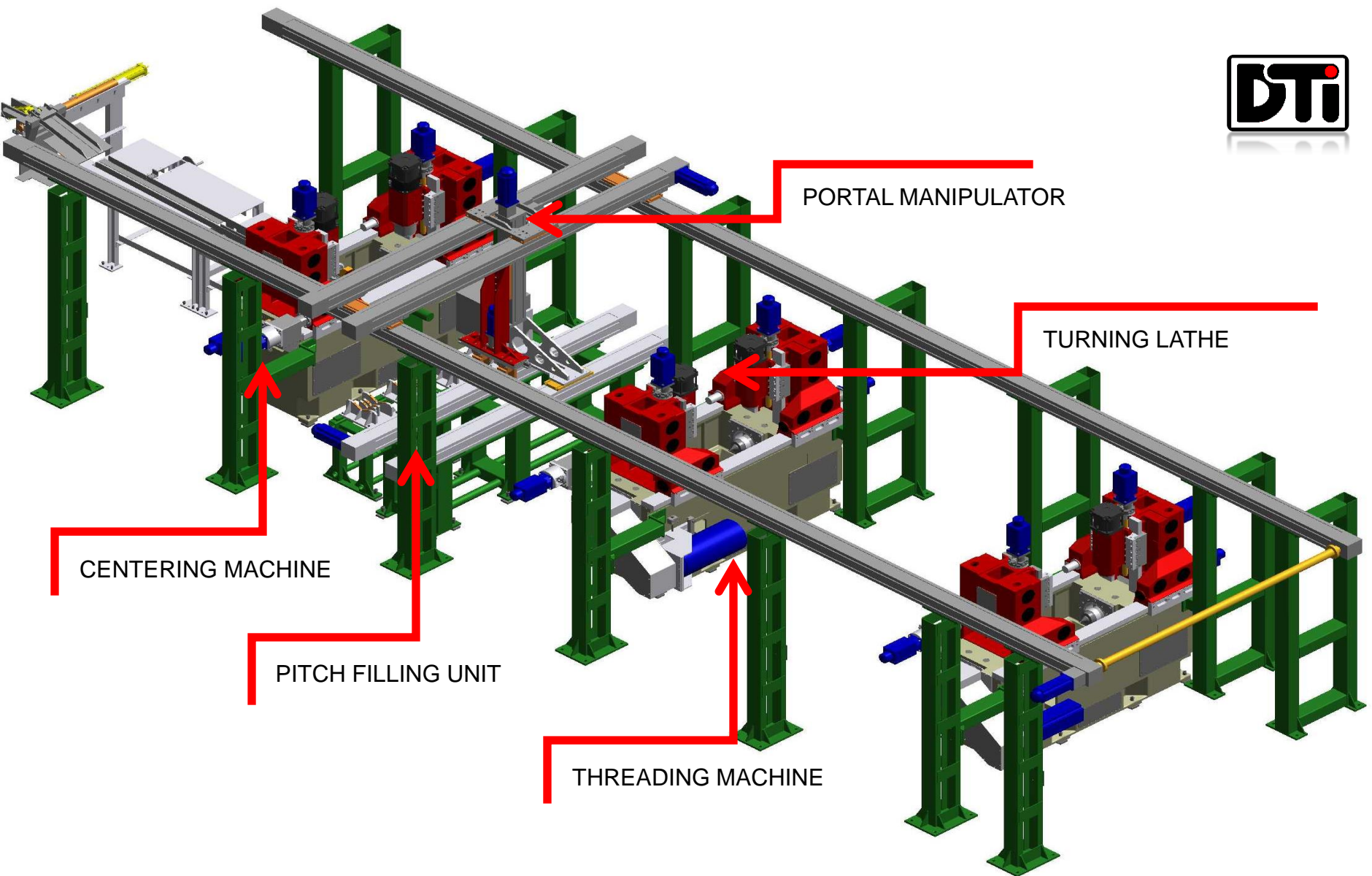
SMART SOLUTIONS
TO TOMORROW'S TOUGH APPLICATIONS

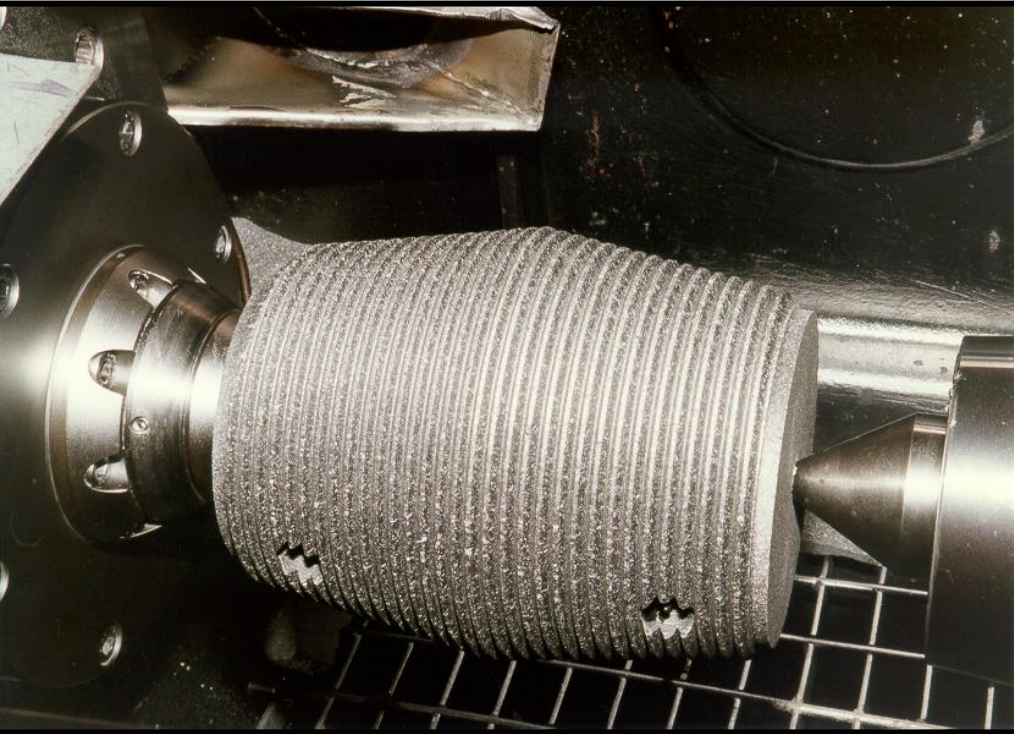


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NIPPLES LINE
CUSTOMER: SGL POLAND





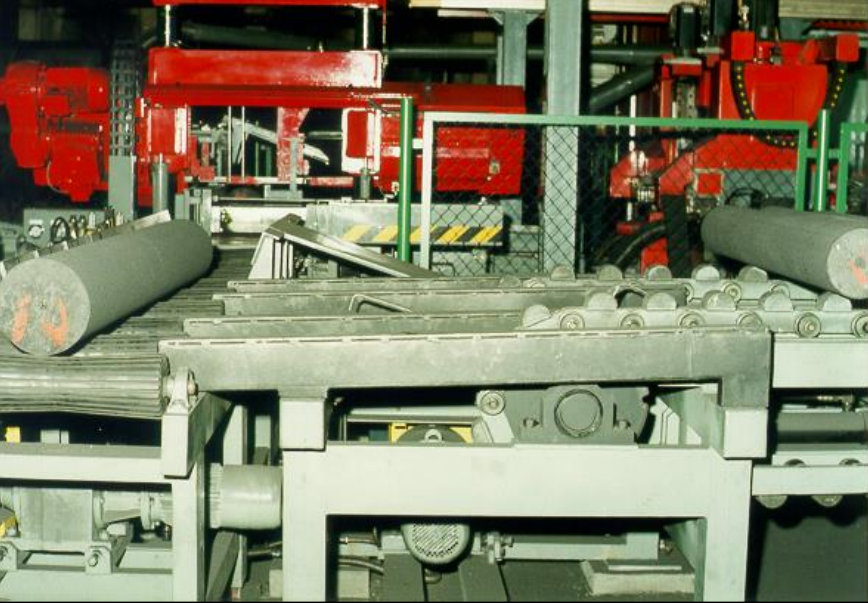
NIPPLE FOR CONNECTING CARBON ELECTRODES IN ELECTRIC FURNACES

Max workpiece diameter

317 mm

Max workpiece length

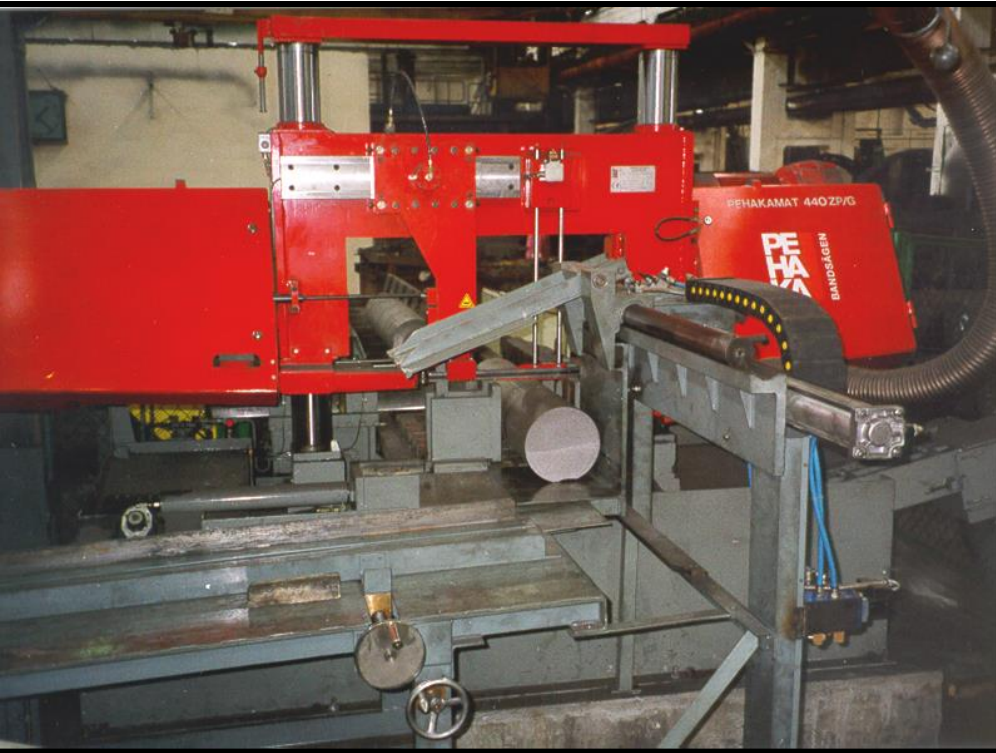
457 mm



LOADING STAND FOR SEMI-FINISHED PRODUCTS

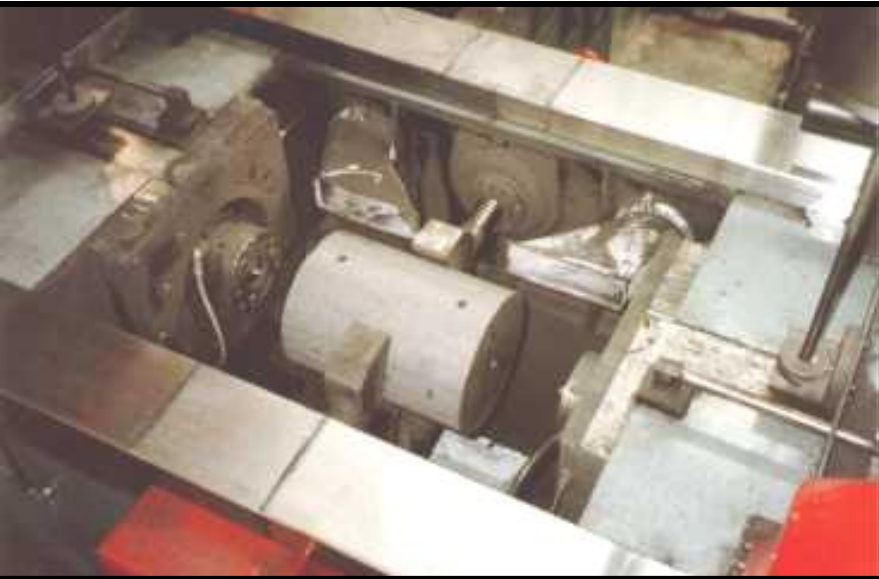


Semi-finished product in the form of preliminary machined blackleads is loaded on the conveyor. Perpendicular rolo conveyor delivers separate blackleads one by one to the band –saw.



BAND-SAW

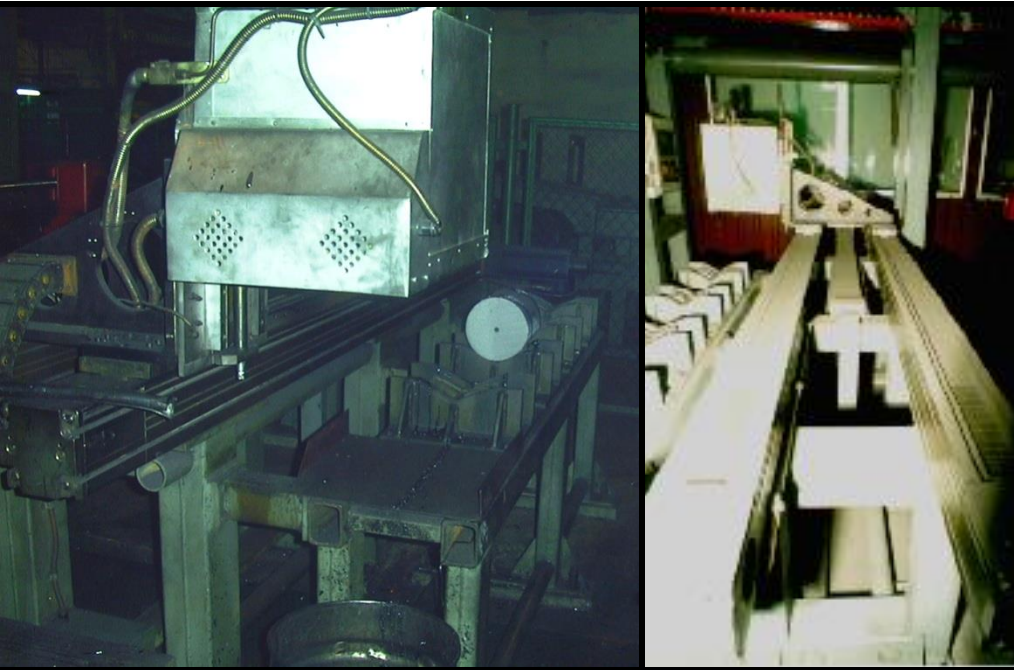
Band-saw cuts the blackleads automatically into the defined length. Cutting length depends on the nipple size. The cut pieces are picked up by the portal manipulator.



CENTERING & DRILLING UNIT

Workpiece is clamped in the centering device. Movable quills with centre drills position the workpiece, afterwards make the center holes. Two independent carriages with drilling heads make holes for pitch filling:

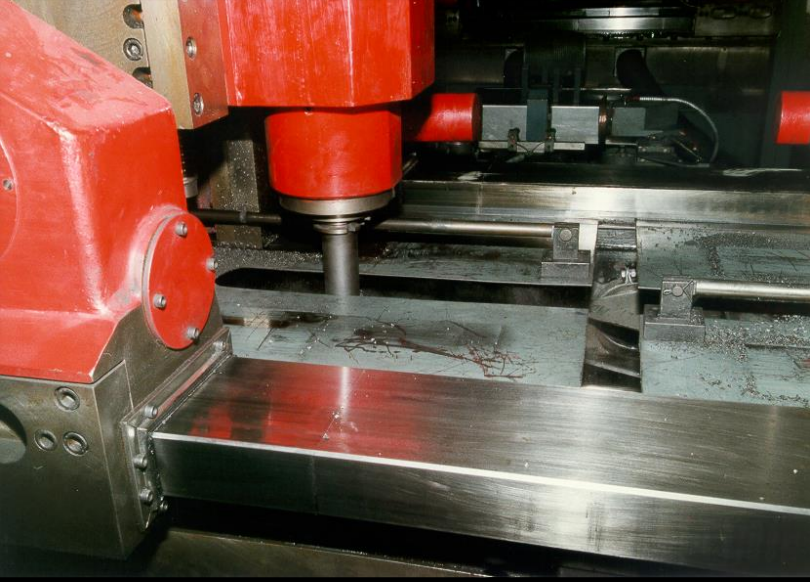
centering spindle speed	3000 rpm
centering quill stroke	233 mm
drilling head travel	„W” axis / „Z” axis: 555 mm
	„X” axis / „U” axis: 360 mm



PITCH FILLING STAND

Pitch filling stand is equipped with head and heated tank. It automatically positions itself above the nipple and fills the drilled holes with pitch.

The pitch seals the connection of the nipples to the electrodes and provides better electric conduction.

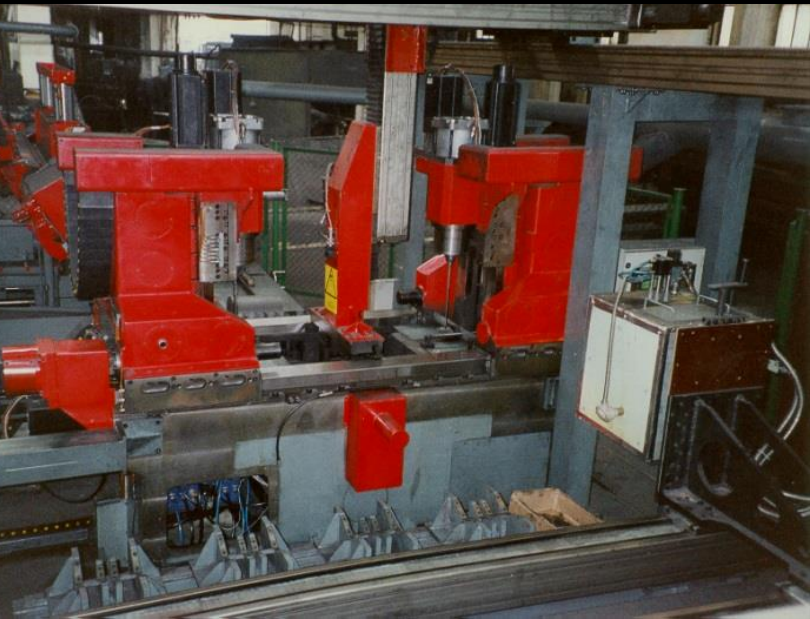


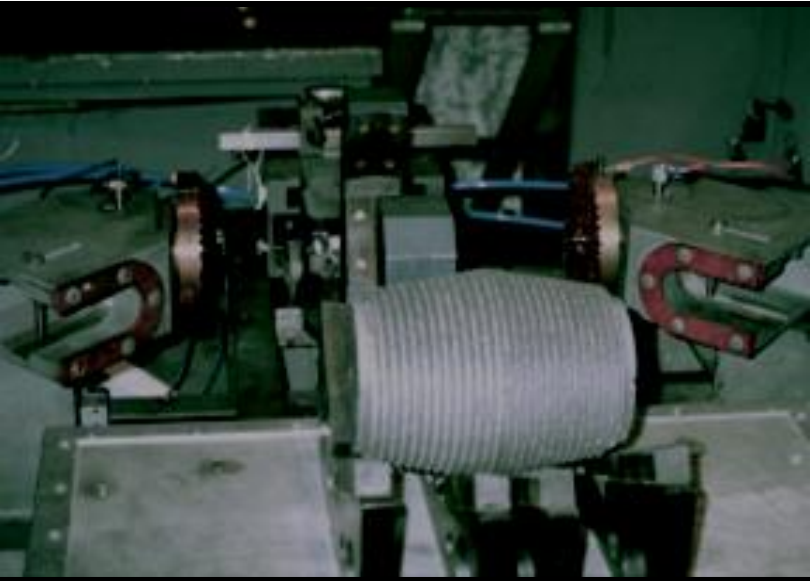
TURNING LATHE FOR THE SIDE SURFACE OF THE NIPPLE

Turning head for machining the side surface of the nipple:

spindle speed	1500 - 6000 rpm
spindle power	30 kW
travel	„W” axis / „Z” axis: 555 mm
	„X” axis / „U” axis: 360 mm
quill stroke	350 mm

Dust removal system and covers of the working area are installed.

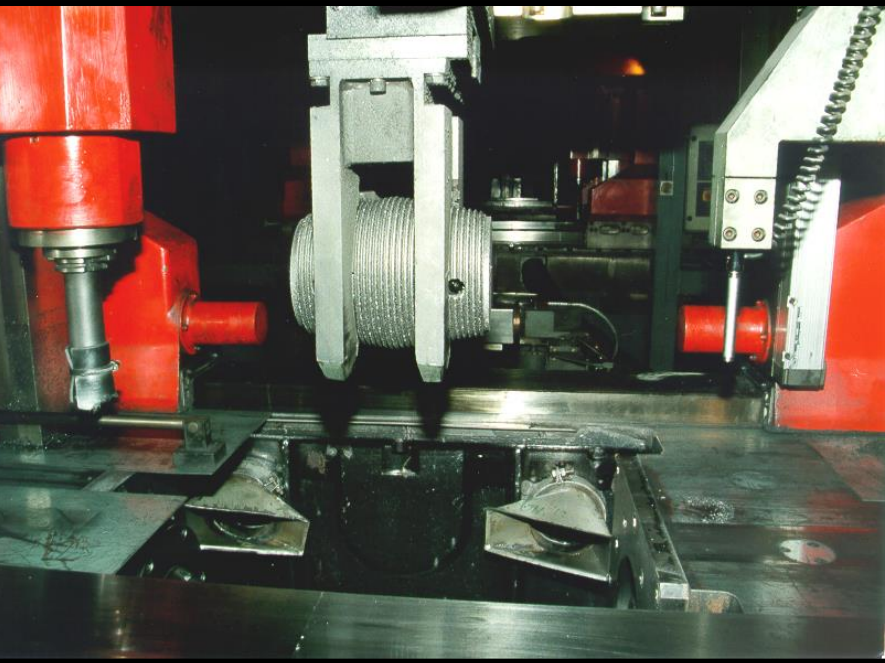




NIPPLE MEASURING STAND

The following parameters are verified on the measuring stand: nipple weight, electric resistance and structure (by ultrasonic heads).

All measurements are performed automatically.
If the nipple does not meet the requirements it is scrapped.

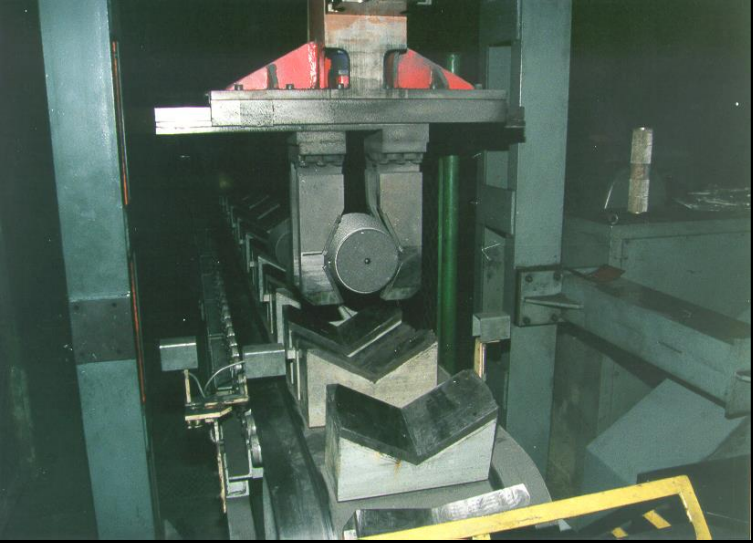


THREADING STAND

Portal manipulator loads the nipple on the threading stand. The threading head is also edging the side-surface of the nipple:

spindle speed	1500 - 9000 rpm
spindle power	9,5 kW
travel	„W” axis / „Z” axis: 625 mm
	„X” axis / „U” axis: 260 mm
quill stroke	350 mm

Dust removal system and covers of the working area are installed. Renishaw probe is installed on the second carriage to control the thread contour.



FINISHED NIPPLES

Portal manipulator puts the finished nipple aside on the carrier:

longitudinal travel „x”	12 000 mm
perpendicular travel „y”	3000 mm
vertical travel „z”	1000 mm

Electrically controlled gripping force.
Portal manipulator covers all the stands for the machining line.





THANK YOU FOR YOUR ATTENTION