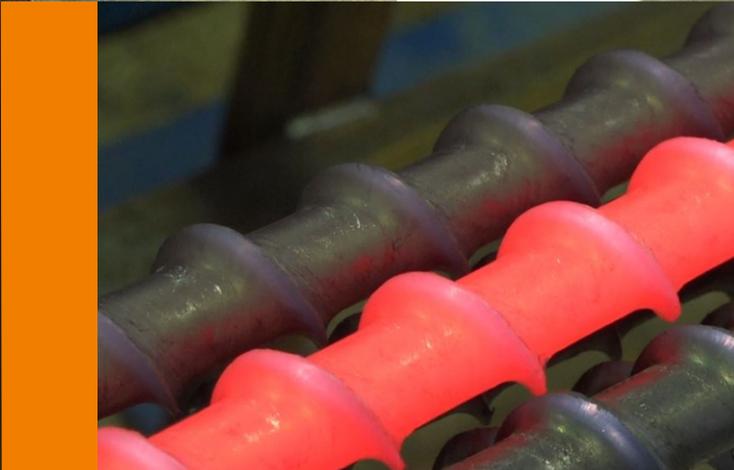


AUTOMATIC LINE

FLAT CROSS WEDGE ROLLING
THREE-ROLL HELICAL ROLLING

METAL FORMING SYSTEM



GENERAL PROCESS CHARACTERISTICS

With continuous increase in raw materials prices, economic advantages of metal forming need not to be proven. Cross Wedge Rolling is a logical solution to this problem, as there is a wide range of products, which can't be produced by any other method with the same high level of productivity and cost saving.

Machining Method Type	Conventional	Cross Wedge Rolling
Overall saving of material		
Loaded blank, kg	6,3	3,3
Formed blank (preform), kg	2,7	3,1
Waste, kg	3,6	0,6
Waste, %	57,14	18,18

MACROSCOPIC STRUCTURE FOR CROSS WEDGE ROLLING TECHNOLOGY



The changing of fibers form is typically for macrostructure. A new macrostructure is formed under cross wedge rolling:

- + Fibers are continuous over billet;
- + Fibers smoothly envelop protrusions and slots;
- + Fibers are compressed to the surface.

The macrostructure produced by cross wedge rolling makes it possible to improve operating characteristics of workpieces.



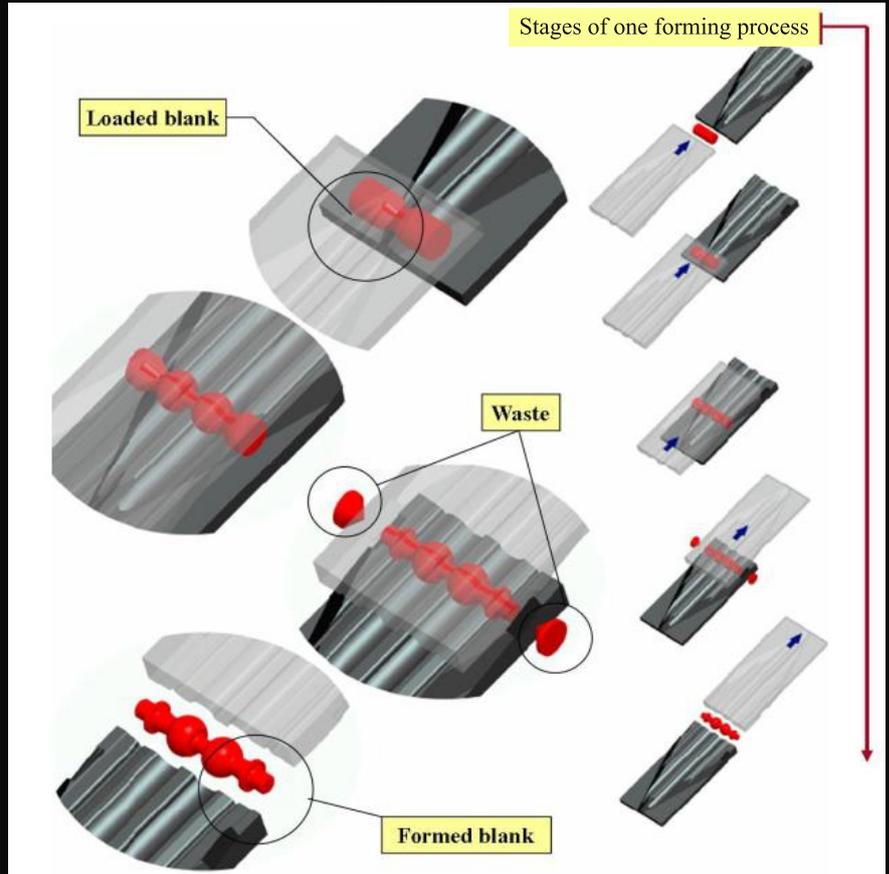
Cross Wedge Rolling Line



Helical Rolling Line

CROSS WEDGE ROLLING METHOD

Our Metal Forming Process has the capability of forming complex parts from rare metals (such as titanium) or high-strength steel (such as 52100), with ease. A technological breakthrough that until now could only be imagined. If round or cylindrical type solid products are a part of your manufacturing program, then this method of forming parts, previously produced through the application of most difficult, costly and numerous operations, will permanently change the way you approach your manufacturing process.



An exceptionally stable base together with extra-long dies give all Cross Wedge Rolling machines the capability of producing complex shapes and forms in one simple operation.

Old method



New method



Comparison of the preform and scale dimensions made by old and new methods



WRL and WRL TS Series:

Innovative FLAT Wedge Rolling with Process Control

The WRL and WRL..TS Series lines from AMTEngineering that are based on Cross Wedge Rolling technology meet the constantly increasing market demands with three key features:

- Simplification of tool settings, optimized machine guarding concept
- Further improvement of workpiece quality
- Increase in flexibility, analysis of the forming process with the aid of FEA simulation

WRL and WRL TS use advanced technical solutions

This results in special advantages to the customer:

- Fully automated Cross Wedge Rolling process
- High capacity, innovative tool design to increase tool life
- Mechanical or hydraulic power pack
- Vertical feed during rolling (dimensional correction via control system off-sets)
- Rolling speeds are individually programmable speeds

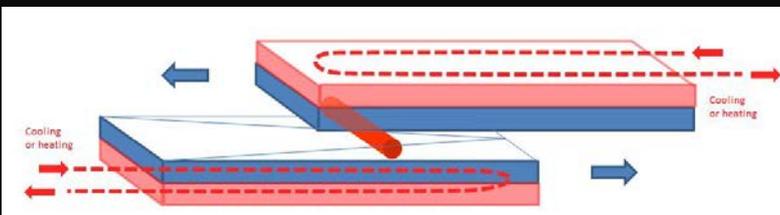
WRL series with one movable slide for production of parts Ø6-100mm parts

	WRL 1206	WRL 2510	WRL 4012	WRL 6010	WRL 6312	WRL 8012	WRL 10016
Max. part Ø, mm	12	25	40	60	63	80	100
Max. part L, mm	200	350	350	350	350	350	420
Output, pcs/hour	1200	500-720	450	600	300-450	240-300	200-300
Tool length, mm	630	1000	1200	1000	1200	1200	1600



WRL TS series with two movable slides for production of parts Ø6-300mm parts

	WRL 2510TS	WRL 6316TS	WRL 9018TS	WRL 8020TS	WRL 10025TS	WRL 13030TS	WRL 20035TS	WRL 30060TS
Max. part Ø, mm	25	63	90	80	110	130	200	300
Max. part L, mm	250	350	500	500	600	600	1200	2800
Output, pcs/hour	720-900	450-600	360-500	360-450	120-240	90-180	60-180	60-120
Tool length, mm	1000	1600	1800	2000	2500	3000	3500	6300



WRL and WRL TS cooling tools:

WRL lines use an efficient automatic cooling or heating system for rolling tools

HRL Series:

Innovative THREE-ROLL HELICAL ROLLING with Process Control

The HRL series helical rolling lines are characterized by the presence of a three-roll or two-roll (for the production of mining balls) driven moving tool. The degree of compression of the rolled workpieces is controlled by a control program from the operator panel by bringing together or spreading the rotating tool rolls. Production of parts with a diameter of 6-120 mm, length blank of 150-15000 mm. Full automation of the production process from a bar or blank to the finished product. On request, the lines are equipped with an induction heating unit and feed automation.

HRL use advanced technical solutions

This results in special advantages to the customer:

- Fully automated heating and Rolling process
- High capacity, innovative tool design to increase tool life
- Electrical mechanical driven tool, optional hydraulic flexible tools
- Programmable degree of compression (rollers bringing and spreading apart)
- Rolling speeds are individually programmable speeds

New approaches have been taken to optimize this technology:

- Optimized machine guarding concept
- Analysis of the rolling process with the aid of FEA simulation
- Simulation of the rolling process to determine the optimal shape of the rolling rolls and the workpiece reduction program;
- In-house design and production of rolling rolls and tools.
- Industrial testing of equipment before shipment to the customer



HRL two contour cooling system:

HRL lines use an efficient automatic two separate contour cooling system for THREE-ROLL tools and Induction Heater

HRL series with THREE-ROLL movable slide for production of parts Ø6-320 mm parts

	HRL 1815	HRL 3020	HRL 8010	HRL 10035	HRL 25020	HRL 32020	
Max. part Ø, mm	18	30	80	100	250	320	
Max. part L, mm	1500	2000	1000	3500	2000	2000	
* Output, pcs/hour	60-360	60-360	120	60-100	20-40	20	
Rolls diameter, mm	60-80	120	150	200	400	500	

* Productivity depends on the heating rate of the blank workpieces



Example of parts manufactured on the WRL series line:



Railway track screw



Automotive components



Ceramic insulator rods for high-voltage power lines



Body of mining cutters,
road milling machines



Electric motor shafts

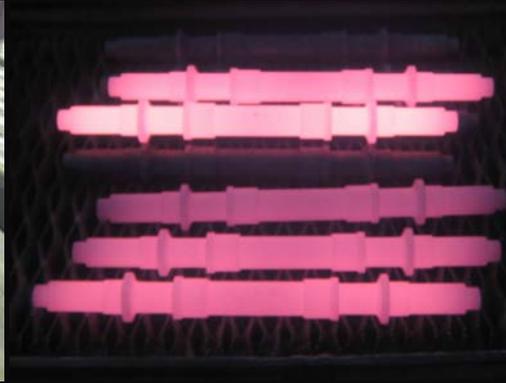


Single and pair rolling
of wrench forgings

Example of parts manufactured on the WRL TS series line:



Pair rolling of gearbox shaft



Gearbox shaft



Rolling of forgings for steering and gearbox preform parts



Suspension preform parts



Triple, double rolling of hydraulic gear pump forgings



Mining balls

Example of parts manufactured on the HRL series line:



Gearbox shafts, car suspension parts, rock mining balls



Calibrated reduction
non-ferrous metal rods



Mining bolting



Preform railway axle



CROSS WEDGE ROLLING TOOL

The tool is the most important component of the forging production. AMTEngineering employs experienced specialists in tool design and tool production which allows us to produce high quality tools for CWR machines. Along with the tool itself, we provide our customers with a set of drawings and make proper adjustments after trial runs at our plant. Customer personnel may be trained at our facility where they will receive all the necessary knowledge or rolling technology, tool design, and CWR line servicing.



INDUCTION HEATERS

Induction heater systems produced by our company can operate both with rolling machines any forging machine or used independently (induction heater power varies from 20 to 1600 kW). Resistance furnaces of special design are produced for warm rolling (around 700 °C).

Per customer request we equip our machines with heaters by own production or other.



ANCILLARY EQUIPMENT

To solve special production tasks of Cross Wedge Rolling a wide range of ancillary equipment is produced: feeding mechanisms, induction heaters, conveyors, cooling systems, and other special equipment of various types.

Cross Wedge Rolling lines feature various feeding devices depending on the customer's production program: from simple storage devices with manual feeding to complex hoppers that can store up to 5 tons of billets that would ensure rolling for 408 hours without additional feeding and any operator's involvement.



SERVICING

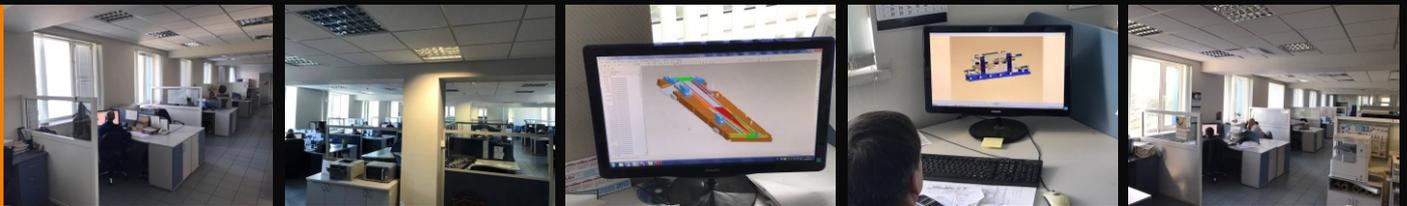
We take servicing very seriously. When you buy a line from AMTEngineering our relationship doesn't terminate when the line is delivered; it's just the beginning. We're committed to making sure you get the most use of equipment supplied by us. The service provided is the best in the business. Just ask our customers. We can quickly respond to problems by performing system diagnostics via telephone and Internet.

WARRANTY

We realize that a warranty is only as good as the company that stands behind it. That's why we don't simply stock "critical" parts or wear items. We back up our warranty with an extensive inventory of spare parts that allow most items to be shipped the same day you call.

DESIGN

We use the latest CAD and solid modeling software to design our systems. While the systems we produce are built to order, the individual machines that make up our systems are based on standard designs. In order to provide you with a system that meets your specifications, we simply choose the appropriate components from our standard equipment. The result is a custom-built line produced from standard components that are competitively priced.



MANUFACTURING

We are one of only a few companies in our industry that actually manufactures in house our own equipment. Most vendors outsource manufacturing to subcontractors and simply assemble the finished components. We design, manufacture, and assemble the entire line. We invest in the state-of-the-art fabrication equipment. Consequently, our manufacturing costs are lower and we have parts readily available if you need a replacement. Rest assured, when you buy from AMTEngineering the highest quality is in every system we manufacture.



AUTOMATIC CONTROL SYSTEMS

The purpose of the automatic control systems is automation of the Cross Wedge Rolling process and adjustment of its parameters depending on main features of the part to be rolled. Frequency converters ensure accurate control of tool drives over a wide range of settings and have a high overload resistance.

Programmable logical controllers represented by a wide variety of base and add-on modules are used for configuration of automatic control system in order to meet the technological process requirements. Operator control panels are used to provide more efficient production process control and adjust the required parameters.

Automatic control system elements and electrical equipment are assembled in RITTAL cabinets.

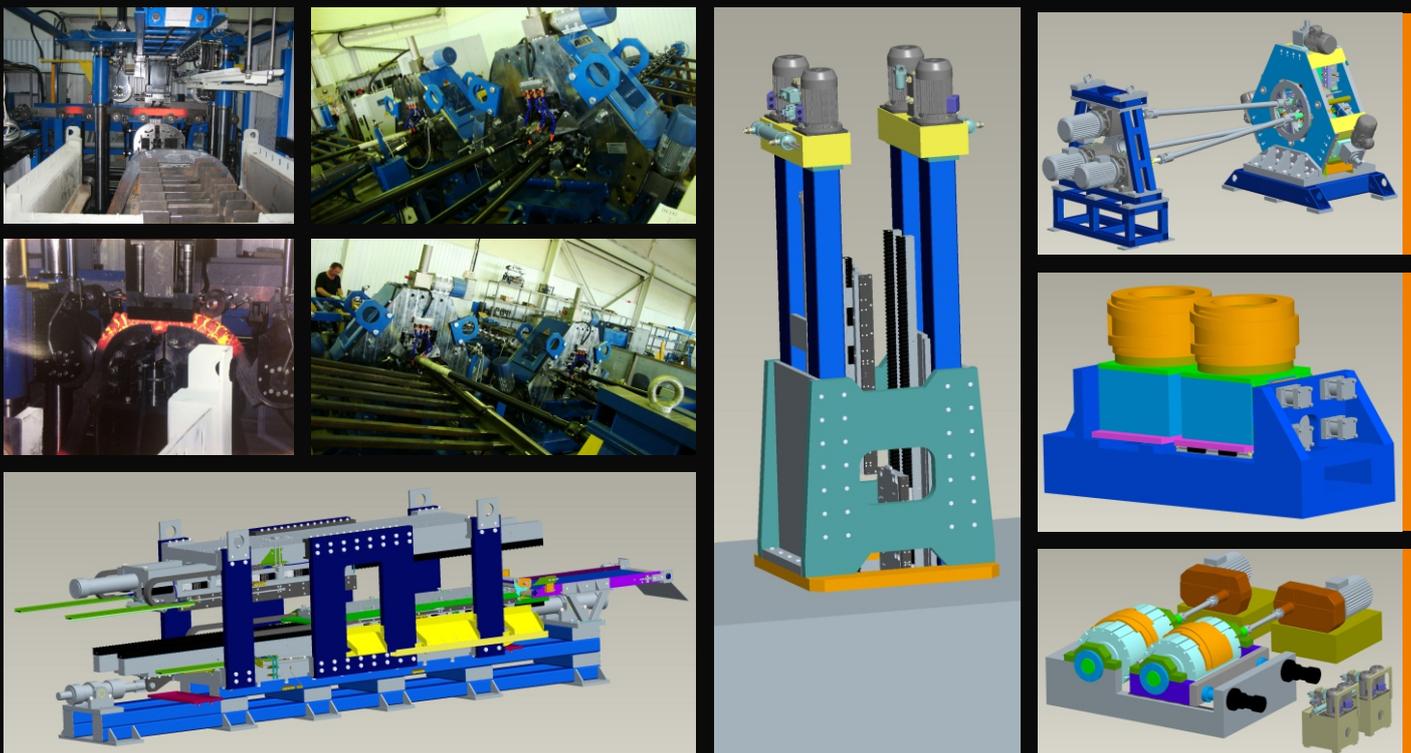
Components produced by such world-famous manufacturers as Mitsubishi, Omron, Hitachi, Siemens, and Allen-Bradley are used in AMT automatic control systems.



OUR NEW DEVELOPMENT

In addition to traditional rolling we have developed new machines for metal forming by pressure:

- Roller Cross Wedge Rolling lines with vertical and horizontal installation of rolls
- Cross Wedge Rolling lines with flat tool installed on a vertical surface
- Three-roll Helical Rolling lines
- Special Bending Machines for hot parts bending



AMTEngineering specializes in design, engineering and manufacturing of equipment for the metal-working industry.

Over the years of successful operation AMTEngineering has assisted its customers in increasing profitability and discovering new business opportunities. AMT's main goal is to meet and exceed its customers' expectations and become the most advanced and respected metalworking equipment supplier worldwide. The AMTEngineering's floor space, including its engineering center. At present, the company employs nearly 190 people (including 76 design engineers). Many years of research activities and design developments are reflected in the high quality of AMT's equipment.

The equipment manufactured by AMTEngineering is successfully working at factories of some leading enterprises of the world: "STANLEY BLACK & DECKER INC." (USA), "DANAHER Tool Group", "Metaldyne" (USA), "American Axle & Manufacturing" (Mexico), "Severstal", "Gorky Automobile Plant", "Kama Automobile Plant", "Minsk Tractor Works", Chernigov Plant "Avtodetal", "Vinnitsa Plant of Tractor Units", Dimitrovgradskiy Plant "Hydrosila" (Ukraine), and others.

Always ready to answer all your questions.

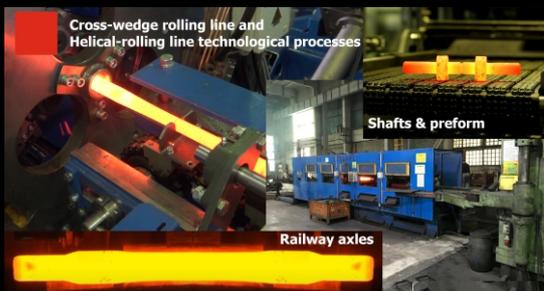
**Production, supply, launch, tool design,
technical support and service worldwide.**

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