**Cross–Wedge Rolling is a cost-saving technology for production of complexly-shaped parts.**

# CROSS–WEDGE ROLLING MACHINES

Cross–Wedge Rolling Machines are used for forming axisymmetric parts by altering their cross section. AMTengineering manufactures three baseline types of Cross–Wedge Rolling Machines that use different rolling methods: cold, warm and hot cross–wedge rolling. To meet our customers' individual demands AMTengineering produces specialized equipment. Due to special modular design of all models of rolling machines, their functional capabilities and automation level can be widened step by step. Special purpose machines may also be produced using separate parts. All models of Cross–Wedge Rolling Machines can be equipped with an automatic die change device, which allows to reduce the die change time to 5-10 minutes.

## WRL Series

**WRL machines** are designed to produce parts like solids of revolution by the method of cold, warm (t=500-700°C) and hot (t=1000-1250°C) rolling.
Warm rolling is used for production of finished parts or preforms with minimum stock for further machining (grinding). The dimensional accuracy and surface quality are insignificantly lower than in cold rolling.
Hot rolling is applied to form complexly-shaped parts with a 4-5 draft ratio for one travel. Dimensional accuracy and surface quality are determined by wider tolerances, compared to cold or warm rolling, and as a rule, require further machining.
WRL machines have one (upper) moving die. A slider is installed on rolling-contact bearings with automatic clearance adjustment allowing to minimize friction losses and avoid clearance in guides when the slide is heated during the rolling process.
All the machine components which are in contact with a hot billet have intense water cooling, allowing to minimize the time required for the thermodynamic process stabilization. A pyrometer adapted to any presence of scale on the billet provides for high-accuracy control of the billet temperature and to produce high-precision parts.

| Series | WRL | | | | |
|---|---|---|---|---|---|
| Model | WRL2510 | WRL3512 | WRL6009 | WRL6312 | WRL8012 |
| Preform diameter, mm | 15-25 | 20-40 | 30-60 | 30-65 | 40-80 |
| Preform max. length, mm | 350 | 350 | 350 | 350 | 320 |
| Single-piece rolling output (depending on RF current heating power), parts/hour* | 500-720 | 450-600 | 300-400 | 360-450 | 240-300 |

* The output of pair rolling is doubled.

## WRL TN Series

**WRL TN machines** is a further development of WRL Series designed to produce parts like solids of revolution by the method of warm and hot rolling. WRL TN machines have two movable dies that allows to use wedge die up to 3.5m in length, and produce preforms up to 200 mm in diameter.

| Series | WRL TN | | | | | | |
|---|---|---|---|---|---|---|---|
| Model | WR L2507 TN | WRL 6316 TN | WRL 8020 TN | WRL 10025 TN | WRL 1 3030TN | WRL 16030TN | WRL 20035 TN |
| Preform diameter, mm | 7-25 | 30-65 | 40-80 | 60-110 | 70-130 | 80-160 | 100-200 |
| Preform max. length, mm | 250 | 350 | 500 | 600 | 600 | 800 | 1200 |
| Single-piece rolling output (depending on RF current heating power), parts/hour* | 720-900 | 450-600 | 360-450 | 120-240 | 90-180 | 70-150 | 49-90 |

* The output of pair rolling is doubled.

## GENERAL PROCESS CHARACTERISTICS

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

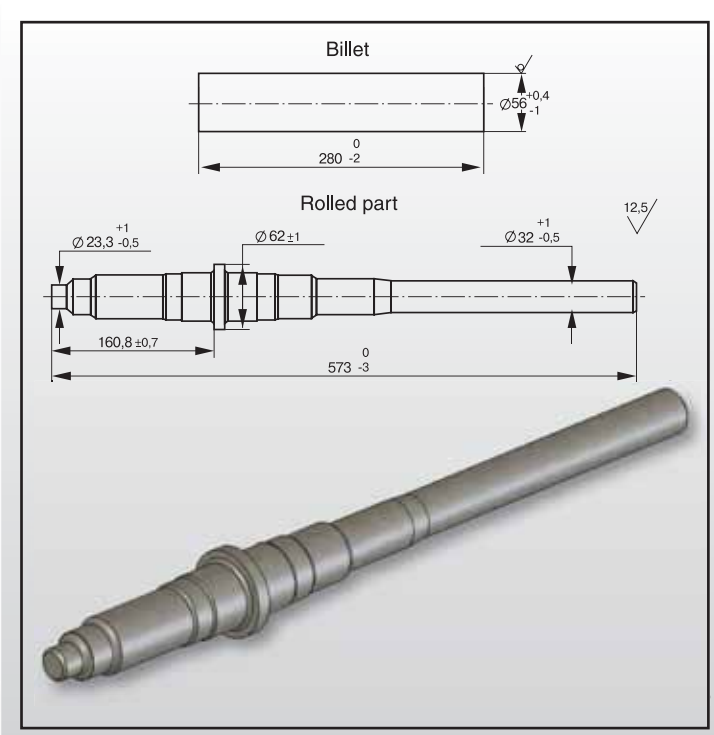
## THE MAIN ADVANTAGES ARE AS FOLLOWS:

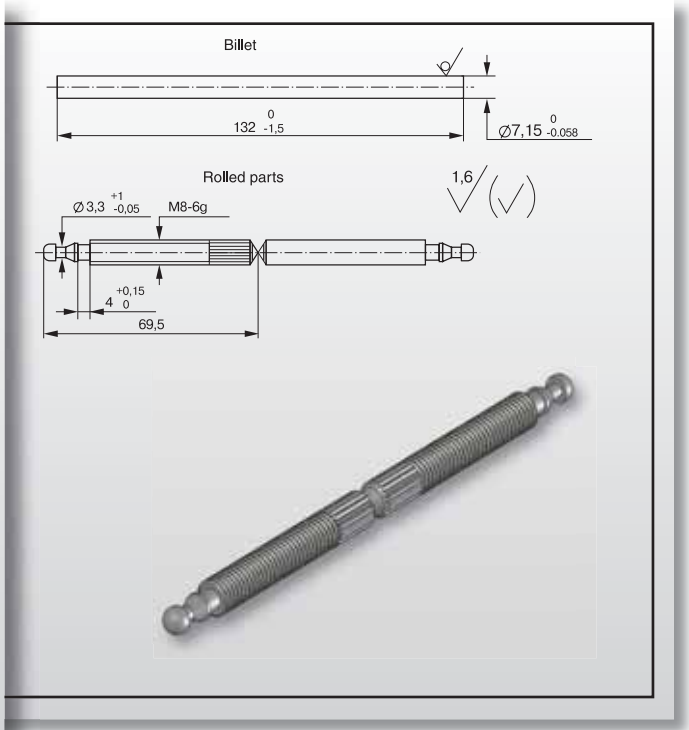
– a hot-rolled rod that does not need to be pre-formed for the rolling process is used as a billet;
– high equipment production capacity (up to 1000 parts/hour);
– favorable structure of material fibers;
– ease of maintenance;
– high accuracy and maximum proximity to required dimensions of finished products (Net Shape Technology);
– minimum waste (billet use coefficient is as high as 0.98);
– opportunities to produce a wide product range using the same equipment;
– die change-over time between profiles is reduced to 5 minutes;
– unique patented die design;
– high die life (up to 1 000 000 parts);

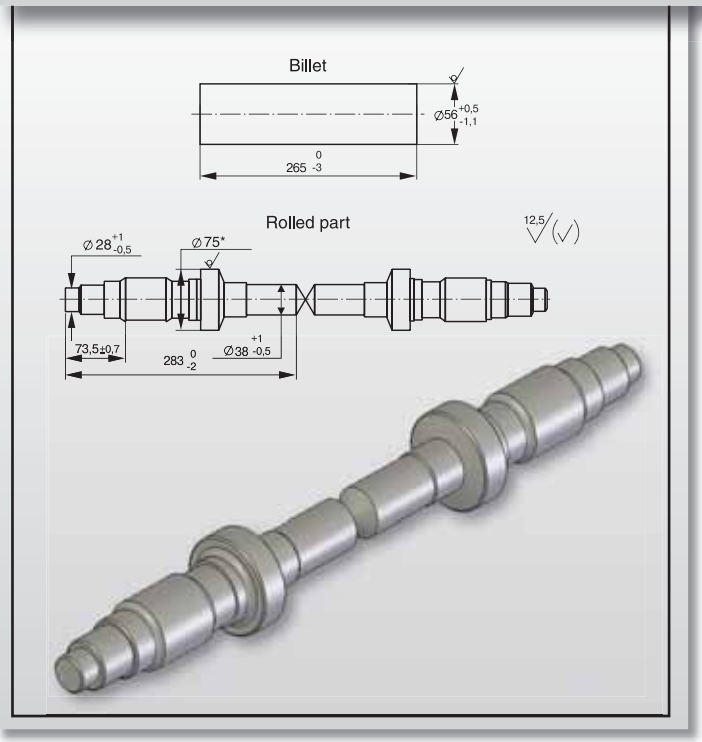

# Cross–Wedge Rolling Tool

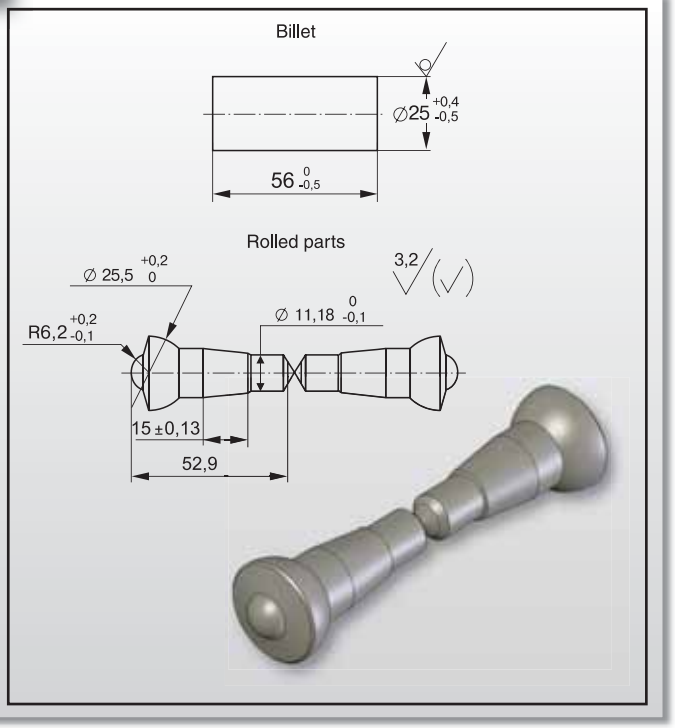
The tool is the most important component of the forging production. AMTengineering employs experienced specialists in tool design and tool production, which allows us to produce high quality tools for CWR machines. Along with the tool itself, we provide our customers with a set of drawings and make proper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


## Typical part samples



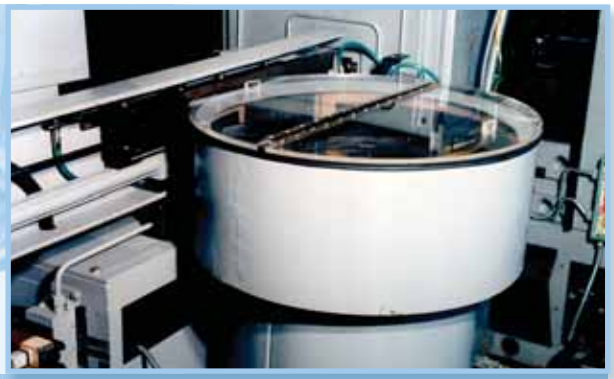



# SUPPLEMENTARY EQUIPMENT

To solve special production tasks of cross-wedge rolling a wide range of supplementary 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 up to complex bin systems that can store up to 5 tons of billets that would ensure rolling for 4-8 hours without additional feeding and any operator's involvement.



## *Induction heaters*

Induction heater systems produced by our company can operate both with rolling machines and with 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 produced by INDUCTOHEAT.



# SERVICE

**We take service very seriously**. When you buy a line from AMTengineering, our relationship doesn't end when the line is delivered; it's just the beginning. We're committed to making sure you get the most out of your new line. The service provided is the best in the business. Just ask our customers. We can quickly respond to problems by performing system diagnostics via the telephone.

# 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 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 system 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 line of equipment. The result is a custom built line produced from standard components that's competitively priced.

# MANUFACTURING

**We are one of only a few companies in our industry that actually manufactures their equipment**. Most vendors job out manufacturing to subcontractors and simply assemble the finished components. We design, manufacture, and assemble the entire line. We've invested heavily in the newest state of the art fabrication equipment. Consequently, our manufacturing costs are lower and we have parts readily available if you need a replacement. You're assured that when you buy from AMTengineering, the highest quality goes into every system we manufacture.