

# ROHRWERK MAXHÜTTE



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## CORPORATE GUIDING PRINCIPLES

### What we want . . . . .

**MH-Rohr** stands for seamless high-quality pipes from Bavaria, produced at competitive prices and delivered exactly on time to established customers around the world.

**Our** guiding principle is an adequate return on capital coupled with highly-satisfied customers and employees.

**Our** dealings with each other are marked by openness and fairness. Maximum employee motivation is our declared goal.

**Highest** product and process quality, as well as sustained cost-effectiveness are attained by continuous improvement – at all levels and in all areas. At the same time, we focus on optimal work safety and appropriate environmental protection.

**Rohrwerk Maxhütte**  
We are committed to continuing the long-standing tradition of Sulzbach-Rosenberg steel!





## CERTIFICATIONS AND LICENCES

Rohrwerk Neue Maxhütte produces hot and cold finished seamless pipes in a wide variety of grades. This brochure will show you our range of dimensions and grades.

The quality of our products is a prerequisite for our long-term success. Our primary objective is to meet our customers' expectations with products of superior quality. This includes continuous optimisation of the quality and the technology as well as individualised customer consultation.

For this purpose, we introduced a comprehensive quality management system which complies with the DIN/EN-ISO standards 9000-9004 and is DIN/EN-ISO 9001 certified. This quality management system guarantees high process safety and quality of our products.

Rohrwerk Neue Maxhütte has been certified and licensed by the following classification societies:

- certified by TÜV CERT in compliance with DIN/ISO 9001
- by TÜV Süddeutschland in compliance with AD-W0/TRD100
- by LGA in compliance with ÜHP Building Rules List
- by LGA in compliance with DVGW directives
- by UDT (TÜV Poland)
- by Lloyd's Register of Shipping (LRS)
- by Germanischer Lloyd (GL)
- by Det Norske Veritas (DNV)
- by Deutsche Bundesbahn AG (DB)
- by Russian Maritime Register of Shipping

On request, we will also supply products in compliance with the regulations of additional classification societies.



Germanischer Lloyd



BUREAU  
VERITAS





# PRODUCTION PROCESSES



## HOT ROLLED PIPE MANUFACTURING

Hot rolled pipe manufacturing is carried out using the push bench process (Erhardt). Square billets are used as feedstock. They are cut into feedblocks on billet shears or on a carbide-tipped saw and heated in a rotary hearth furnace. After removal from the furnace the blocks are sized and descaled and then pierced to form a shell in a punching press. The pierced shell is rolled out by approximately 80% in a downstream pre-push bench.

With a pushing force of 90 metric tons, a 15.5 m mandril bar and up to 16 grooved rolls, the sleeve is rolled out on a push bench at the same temperature to form a hollow tube. The hollow tube is slightly expanded between rolls in a reeler. The mandril rod is then withdrawn in a two-high mandril stripper. Hot saws downstream cut off the base and rear end of the hollow tube.

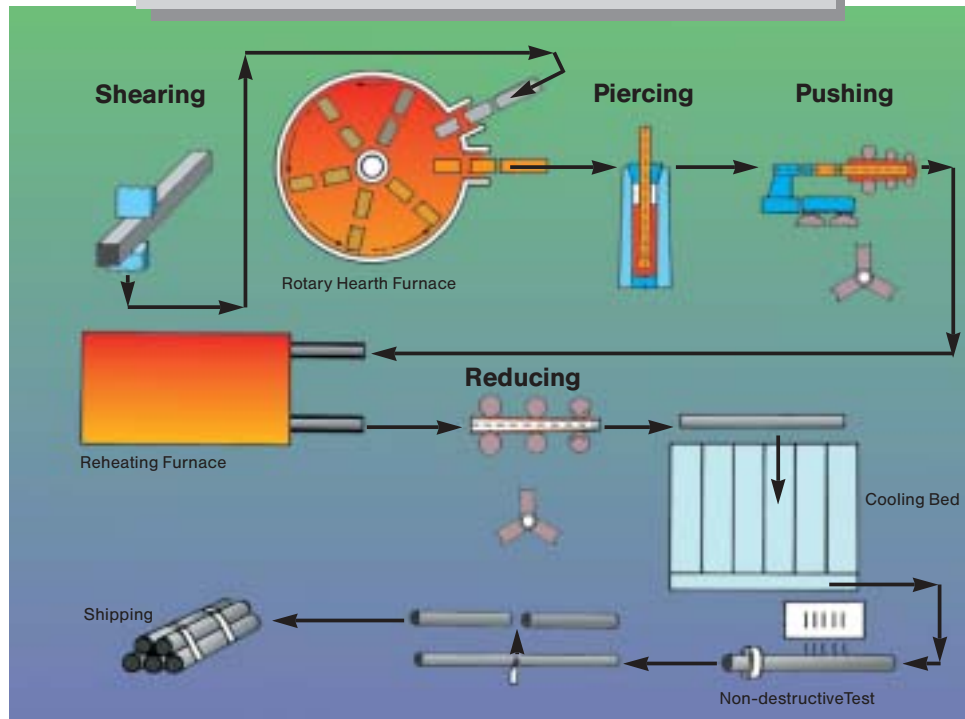
After reheating the hollow tubes in a walking beam furnace, they are rolled out with state-of-the-art rolling technology in a six-high sizing mill and a subsequent 28-high stretch-reducing mill to finished pipe dimensions of 21.3 to 139.7 mm external diameter.

Hot rolling is followed up in pipe finishing shops where all tubes are reeled, tested for surface irregularities and density by means of non-destructive tests, cut to stock lengths and commissioned in compliance with the respective order. Plain-end "black" tubes then are sent directly to the warehouse. Orders of hot galvanized threaded pipes are finished on-site in the galvanizing plant.





## Hot Rolled Pipe Manufacturing – Flow Chart





# PRODUCTION PROCESSES



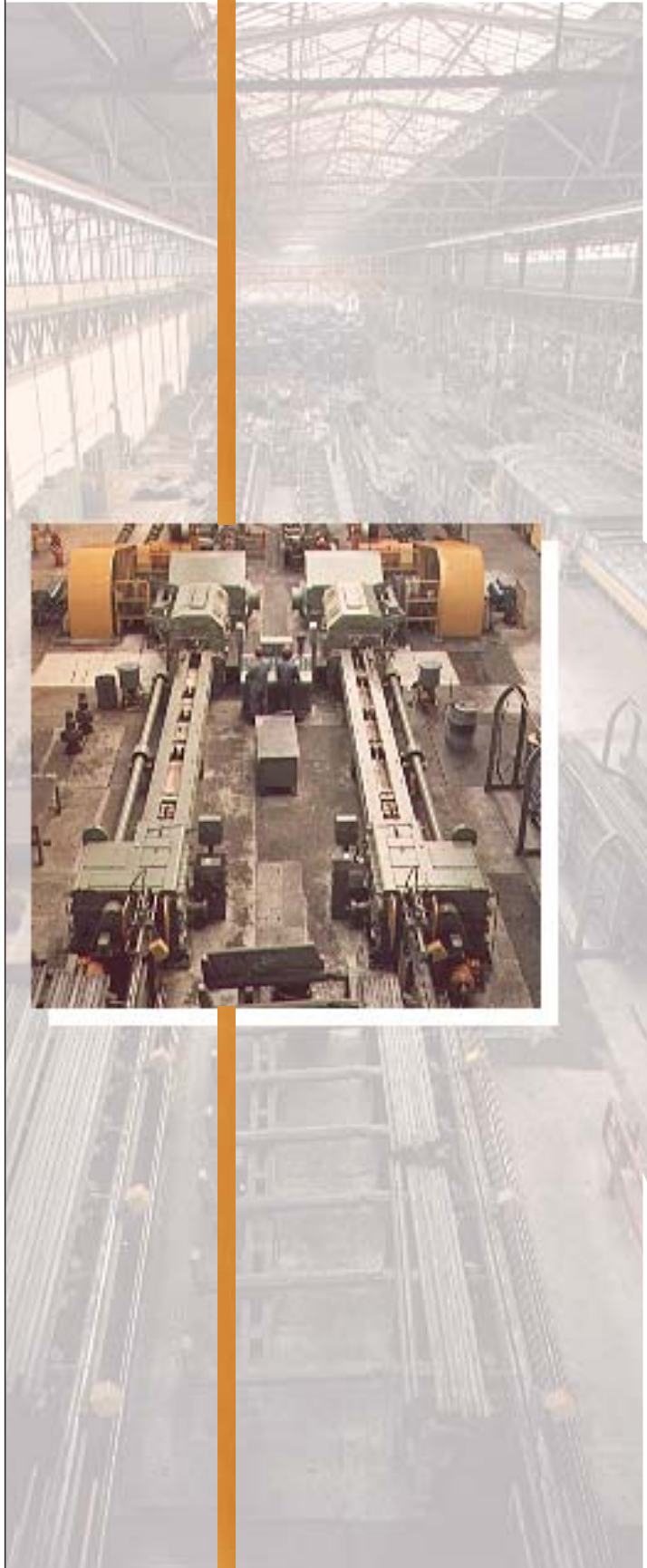
## COLD ROLLED PIPE MANUFACTURING

Cold rolled pipes are produced by cold pilger rolling (cold rolling), a process particularly suitable for shaping alloy steels.

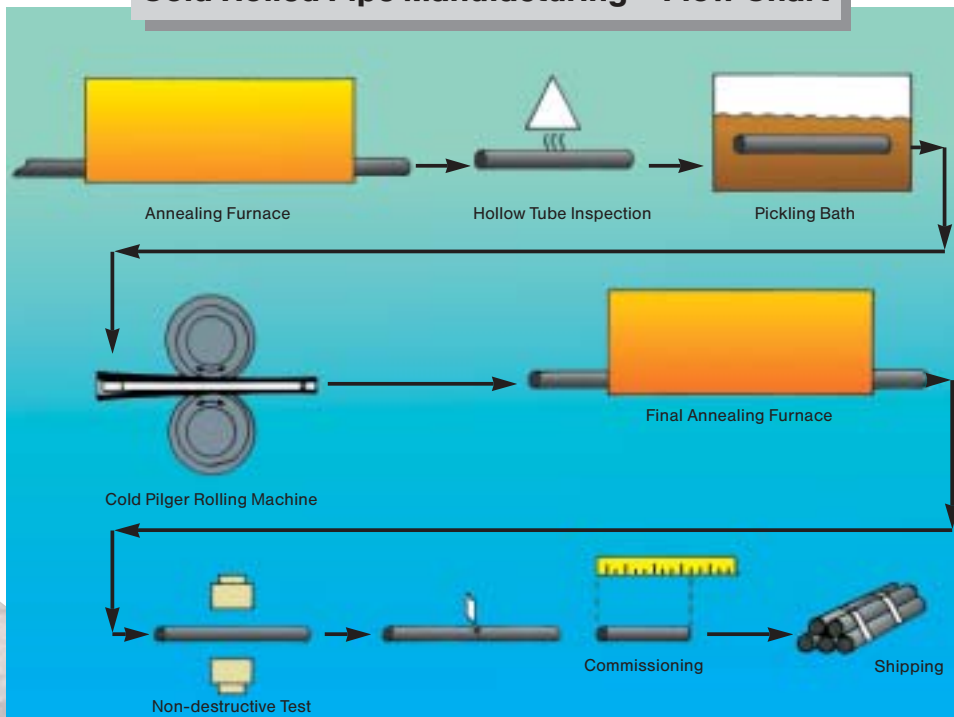
After appropriate heat treatment with optional carburising and the pre-treatment of the feedpipes in a fully-automatic hydrochloric acid pickling plant with subsequent phosphate coating and greasing, the hollow tubes are rolled out in two cold pilger rolling plants to finished pipe dimensions of 20.75 to 66 mm external diameter.

In cold pilger rolling, the tube blanks are rolled out over a stationary conical mandril through a two-high stand designed in such a way that, over a determined section of the roll circumference, the grooved cross-section is gradually reduced to the finished pipe diameter. The tube blanks are tapered to the desired external diameter and wall thickness by the to-and-fro movement of the stand in the cold pilger rolling machine.

The subsequent heat treatment of the cold pilgered tubes is conducted with protective gas. The pipes are then reeled, subjected to non-destructive tests for surface irregularities and to a dimensional inspection, cut to stock lengths and, following technological approval, commissioned for shipping in compliance with the respective order.



## Cold Rolled Pipe Manufacturing – Flow Chart





# PRODUCTION PROCESSES

## TESTING

The non-destructive testing of the pipes is conducted in the finishing shops on state-of-the-art testing lines using stray flux or ultrasonic in combination with eddy current testing and verification inspection equipment.

The testing equipment is licensed in compliance with SEP 1915, 1918, 1925, PRP-02-74, EN 10246-1, EN 10246-07; the testing personnel is qualified and certified in compliance with EN 473 and/or EN 10256. On request, we will also test our products in compliance with additional national and international regulations.

A hydraulic test can be conducted up to a testing pressure of 500 bar. Additional mobile analytic equipment is available for the verification inspection.

The mechanical and technological properties of the pipes are determined using appropriate systems, such as computer-controlled universal tensile testing machines.

Special tests for surface roughness, waviness, magnetism, layer thickness, etc., are also conducted using appropriate equipment.

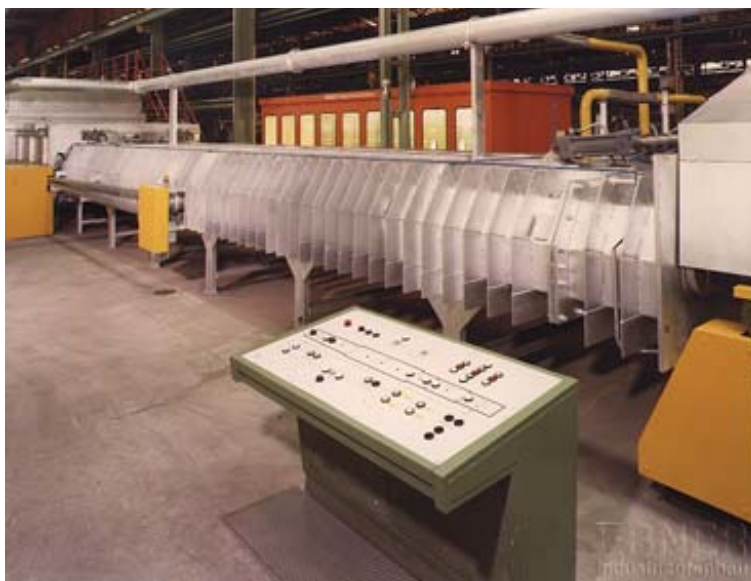


## HEAT TREATMENT FACILITIES

Our continuous furnaces enable us to meet our customers' requirements regarding microstructure, mechanical/technological properties and surface finish.

We offer the following heat-treatment options:

- normalised under protective gas	NBK
- annealed under protective gas	GBK
- heat-treated for ferrite/pearlite microstructure	BG
- heat-treated for strength	BF
- spheroidised	GKZ
- soft-annealed	G
- air-treated	V



# PRODUCT OFFERINGS

Type of pipe	Delivery specification <sup>1)</sup>	Steel grade
<b>Seamless threaded pipes black or hot galvanized</b>	DIN 2440/2441/2442 galvanized in accordance with DIN EN 10240 and DIN-DVGW directives NW 15-80 (1/2"-3")	St33/St37.0
<b>Seamless carbon, low-alloy and low-temperature steel pipes</b>		
Pipes for general use	ASTM A53, A120 NFA 49112	
Pipes for special requirements	DIN 1629, EN 10216-1, EN 10224	St37.0, St44.0, St52.0
Pipes for very demanding requirements	DIN 1630, EN 10216-1	St37.4, St44.4, St52.4
Pipes made of general structural steels for steel construction	DIN 17121, EN 10210-1	St37-2, St 37-3, St 44-2, St 44-3, St 52-3
Pipes made of fine grained structural steels for steel construction	DIN 17124, EN 10210-1	StE/TStE/EstE -255/285/355
Pipes for long-distance pipelines for combustible liquids and gases	DIN 17172 / TRbF301, DIN 2470-1/-2, EN 10208-1/-2	StE 210.7, 240.7, 290.7, 320.7, 360.7, 385.7, 415.7
Low-temperature steel pipes	DIN 17173, ASTM A333, ASTM A334, EN 10216-4	TtSt35 test category 1+2
Pipes of fine grained structural steels for special requirements	DIN 17179, EN 10216-3	StE/WStE/TStE/EstE- 255/285/355
<b>High-temperature steel pipes</b>		
Boiler and superheater tubes	DIN 17175 grades I and III, EN 10216-2 NFA 49212, NFA 49213 ASTM A106, A192, A209, A210, A213, A335	St35.8, St45.8, 15Mo3, 13 CrMo 44, 10 CrMo 910 T and P grades
<b>Cold-finished quality pipes</b>		
Ball bearing tubes	DIN 17230	Ball bearing steels
Engineering tubes and mechanical tubing	DIN 17200, DIN 17210, EN 10083-1/-2/-3 DIN 2391	Case-hardening and heat-treatable steels
		Additional steel grades available upon request

<sup>1)</sup> additional national and international delivery specifications upon request

# PRODUCTION RANGES

## Water-boiler tubes, steel line pipes and boiler tubes grade I

External diameter (mm)			Standard wall (mm)	Wall thickness (mm)					
Series 1	Series 2	Series 3		2.00	2.30	2.60	2.90	3.20	3.60
21.3			2	x	x	x	x	x	
	25		2		x	x	x	x	
26.9			2.3		x	x	x	x	x
		30	2.6			x	x	x	x
	31.8		2.6			x	x	x	x
33.7			2.6			x	x	x	x
	38		2.6			x	x	x	x
42.4			2.6			x	x	x	x
		44.5	2.6			x	x	x	x
48.3			2.6			x	x	x	x
	51		2.6			x	x	x	x
	57		2.9				x	x	x
60.3			2.9				x	x	x
	63.5		2.9				x	x	x
	70		2.9				x	x	x
76.1			2.9				x	x	x
		82.5	3.2					x	x
88.9			3.2					x	x
	101.6		3.6						x
		108	3.6						x
114.3			3.6						x
		121	4						
	127		4						
	133		4						
139.7			4						


## Boiler tubes grade III hot rolled

External diameter (mm)			Standard wall (mm)	Wall thickness (mm)					
Series 1	Series 2	Series 3		2.00	2.30	2.60	2.90	3.20	3.60
	25		2			x	x	x	
26.9			2.3			x	x	x	x
		30	2.6			x	x	x	x
	31.8		2.6			x	x	x	x
33.7			2.6			x	x	x	x
	38		2.6			x	x	x	x
42.4			2.6			x	x	x	x
		44.5	2.6			x	x	x	x
48.3			2.6			x	x	x	x
	51		2.6				x	x	x
	57		2.9				x	x	x
60.3			2.9				x	x	x
	63.5		2.9				x	x	x
	70		2.9				x	x	x
76.1			2.9				x	x	x
		82.5	3.2					x	x
88.9			3.2					x	x
	101.6		3.6						x
		108	3.6						x
114.3			3.6						x
		121	4						
	127		4						
	133		4						

St 35.8 and St 45.8 only

St 35.8 to 15Mn





**St 35.8 to 10 CrMo 910**

# PRODUCTION RANGES

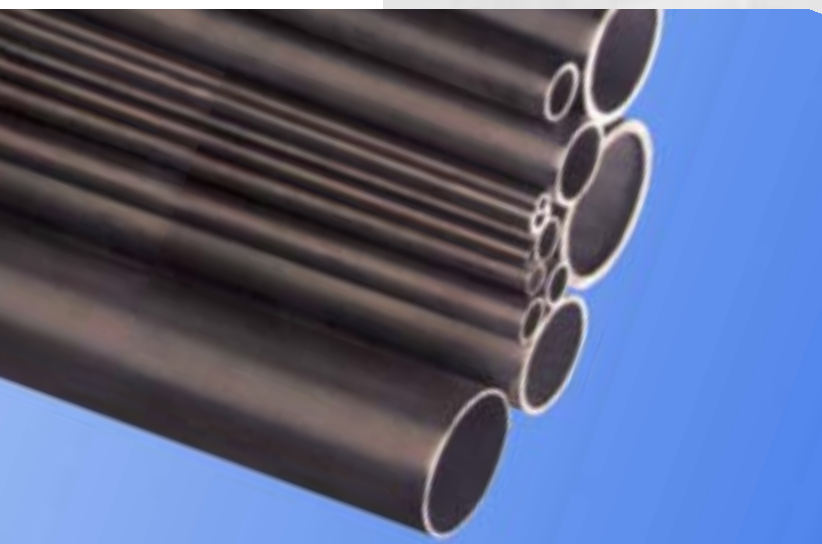
## Ball bearing tubes 100 Cr 6

6	External diameter (mm)	Wall thickness (mm)														
		2.8	3.0	3.5	4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0	
	20.75	x	x	x	x	x										
	25		x	x	x	x	x	x	x							
	27		x	x	x	x	x	x	x	x						
	35		x	x	x	x	x	x	x	x	x	x	x	x	x	
	45			x	x	x	x	x	x	x	x	x	x	x*	x*	
	65				x	x	x	x	x	x	x	x	x	x*		
	66					x	x	x	x	x	x	x	x			

\* available upon request

## Boiler tubes cold rolled 13 CrMo 44 + 10 CrMo 910

	External diameter (mm)	Wall thickness (mm)								
		3.2	3.6	4.0	4.5	5.0	5.6	6.3	7.1	8.0
	25.0	x	x	x	x	x				
	25.4	x	x	x	x	x				
	26.9	x	x	x	x	x				
	30.0	x	x	x	x	x				
	31.8	x	x	x	x	x	x	x		
	33.7	x	x	x	x	x	x	x		
	38.0	x	x	x	x	x	x	x	x	x
	42.4	x	x	x	x	x	x	x	x	x
	44.5	x	x	x	x	x	x	x	x	x
	48.3		x	x	x	x	x	x	x	x
	51.0		x	x	x	x	x	x	x	x
	54.0		x	x	x	x	x	x	x	x
	57.0		x	x	x	x	x	x	x	x
	60.3		x	x	x	x	x	x	x	x
	63.5		x	x	x	x	x	x	x	x





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