WMNŁ

INSPIRED BY METAL

COMMERCIAL OFFER

WALCOWNIA METALI NIEŻELAZNYCH „ŁABĘDY” S.A.

WMNŁ

Leading Polish manufacturer of non-ferrous metal products, alloys, including flat-rolled products made of copper and its alloys,casting alloys and silver

WMN "ŁABĘDY" S.A. belongs to the KGHM Polska Miedź S.A. Group
> 100 years on the non-ferrous metals market
Area > 75.000 m^2
3 production divisions: foundry, strips mill, sheet mill
Location: Gliwice (Łabędy), Poland

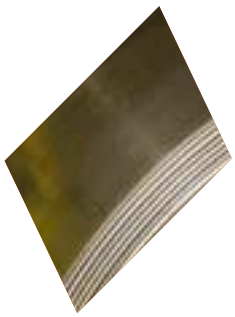
>180 employees

ca 4000 tons annually

> 30 % export

EXAMPLES OF PRODUCTS

COPPER
STRIPS AND SHEETS



BRASS
STRIPS AND SHEETS

BRONZE
STRIPS AND SHEETS

NICKEL SILVER
STRIPS AND SHEETS

CASTING ALLOYS

SUPPORTED INDUSTRIES

- ARMAMENTS INDUSTRY
- CONSTRUCTION
- AUTOMOTIVE INDUSTRY
- ENERGY
- ELECTRONICS
- ENGINEERING INDUSTRY
- ELECTRICAL ENGINEERING
- TELECOMMUNICATIONS
- CHEMICAL INDUSTRY

WMNŁ IN NUMBERS

CONTINUOUS CAST COILS FOR STRIP PRODUCTION
Max. weight – 2500 kg
Dimensions – 14 x 400 x 50000 mm

AMOUNT OF PRODUCTION OF FINISHED GOODS
4000 TONS/YEAR

AMOUNT OF STRIP PRODUCTION IN KM
13 880 KM/YEAR

Export OVER 30%

ROLLER OF THE 19TH CENTURY
for DUO cold rolling

100 YEARS of market presence

75 000 m² of company area

3 PRODUCTION DIVISIONS
- foundry
- strip mill
- sheet mill

3 PRODUCT GROUPS
- strips in coils
- sheets
- casting alloys in the form of ingots

>50 TYPES OF PRODUCTS

MAX. INGOT DIMENSIONS
200 x 700 x 2 850 mm
Weight – 3 500 kg

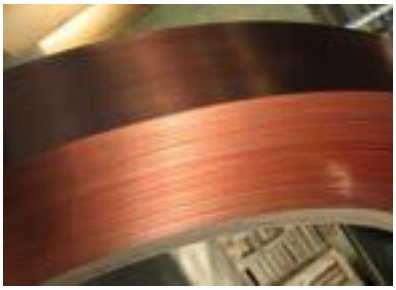
NUMBER OF CATS UNDER WMNŁ CARE
16

Cat leader:
Kuba
Sheet mill
BOSS

Number of employees
>180
(>25% women)

COPPER

STRIPS, SHEETS



APPLICATION	For example: ELECTRONICAL, ELECTROTECHNICAL, CHEMICAL AND ENGINEERING INDUSTRY, MOTORIZATION AND ARTISTIC METALWORK

GRADES

	PN-77/H-82120	Foreign standard equivalents					
		PN-EN 1652	PN-EN 13599	DIN 1787	ASTM B152	JIS H3100	BS 2870
Cu99,9	M1E	Cu-ETP, Cu-FRTP	Cu-ETP	E-Cu57, E-Cu58, SE-Cu	C11000	C1100	C101
	M1R	Cu-DLP		SW-Cu	C12000	C1200	-
	M2R	Cu-DHP	SF-Cu	SF-Cu	C12200	C1220	C106
Cu99,7	M2G		-	-	-	-	-
Cu99,95	-	-	Cu-HCP, Cu-PHC	-	C10300	-	-

STRAIN HARDENING

1. The mechanical properties of the strips and sheets for the states of reinforcement are specified in the table of standards.

2. Upon agreement for therecrystallized state of reinforcement, it is possible to produce strips with the grain size specified by the customer.

3. At the customer's request, it is possible to produce the strips in other states of reinforcement.

Strain hardening	Designation acc. to		Foregin standard equivalents			
	PN-79/ H-92710	PN-EN 1652	DIN 40500	ASTM B 152 M	BS 2870	JIS H 3100
1	2	3	4	5	6	7
hot rolled	pg					
recrystallized (anneled)	r	R200/R220	F20	H00	0	0
recrystallized up to required grain size	W...					
half - hard	z4	R240	F25	H02	1/2H	1/2H
hard	z6	R290/R360	F30/F37	H04	H	H

STRIPS

Thickness (mm)	Width (mm)	Stain hardening	Coil inside diameter (mm)
0,10 – 0,11	5 – 9	pz	260, 360
	10 – 310*		100, 200, 300, 400, 500
0,12 – 0,60	5 – 9	r, pz	260, 360
	10 – 310*		100, 200, 300, 400, 500
0,61 – 3,00	max 310*	r, pz	400, 500

* other widths available upon agreement pz - cold-rolled

COLD ROLLED SHEETS AND STRIPS

Thickness (mm)	Width (mm)	Length (mm)	Strain hardening
0,30 – 2,00	max 310*	max 2500	r, pz
2,20 – 10,00 2,20 – 10,00** 3,00 – 8,00	max 1000 max 650 max 1000	max 2200 max 2200 max 2000	r, pz
10,10 – 100,00**	max 1000	max 2500	pg

* other widths available upon agreement
** for a thickness of 2,20 – 2,69 mm - sheets in a soft hardened state (without surface grinding); for a thickness 10 mm only soft hardened state
*** width and length of plates after hot rolling with a thickness of 45 – 100 mm is produced after prior agreement
pz - cold-rolled

BRASS

STRIPS, SHEETS

APPLICATION For example: ELECTRONICS, TELE-AND RADIO-ENGINEERING, AUTOMOTIVE AND ELECTROTECHNICAL INDUSTRY

GRADES

PN-92/H-87025	Foreign standard equivalents				
	PN-EN 1652 PN-EN 1653*	DIN 17660	ASTM B36 ASTM B 171*	JIS H3100	BS 2870
M60	CuZn40	CuZn40	-	C2801	-
M63	CuZn37	CuZn37, CuZn36	C27200	C2720	CZ108
M67	CuZn33	CuZn33	C26800	C2680	CZ107
M70	CuZn30	CuZn30	C26000	C2600	CZ106
M80	CuZn20	CuZn20	C24000	C2400	CZ103
M85	CuZn15	CuZn15	C23000	C2300	CZ102
M90	CuZn10	CuZn10	C22000	C2200	CZ101
M95	CuZn5	CuZn5	C21000	C2100	CZ125
Mo59*	CuZn39Pb2*	CuZn39Pb2*	C36500	C3650*	CZ120*
MC62 / CuZn38Sn1*	CuZn39Sn1*	CuZn38Sn1*	C46400*	C4640*	CZ112*
*dimensions and strain hardening on request					

STRAIN HARDENING

1. The mechanical properties of the sheets and strips for the states of reinforcement are specified in the table of standards.

2. At the customer's request, it is possible to produce the strips and sheets in other states of reinforcement.

3. Upon agreement for the recrystallized state of the reinforcement, it is possible to produce sheets and strips with the grain size specified by the customer.

Grade	Strain hardening	Designation acc. to		Foregin standard equivalents			
		PN-80/ H-92816	PN-EN 1652	DIN 17670	ASTM B 36	BS 2870	JIS H 3100
1	2	3	4	5	6	7	8
CuZn10	recrystallized (annealed) half-hard hard	r z4 z6	R240 R280 R350	F24 F29 F35	 H02 H04	0 1/2H H	0 1/2H H
CuZn15	recrystallized (annealed) recrystallized up to required grain size half-hard hard spring-hard	r W... z4 z6 z8	R260 R300 R350 R410	F26 F31 F37 F46	 H02 H04 H06	0 1/2H H	0 1/2H H
CuZn20	recrystallized (annealed) recrystallized up to required grain size half-hard hard spring-hard	r W... z4 z6	R270 R320 R400	F27 F32 F39	 H02 H04	0 1/2H H	0 1/2H H
CuZn30	recrystallized (annealed) recrystallized up to required grain size half-hard hard spring-hard	r W... z4 z6 z8	R270 R350 R410 R480	F27 F35 F42 F52	 H02 H04 H06	0 1/2H H	0 1/2H H EH
CuZn33	recrystallized (annealed) recrystallized up to required grain size half-hard hard spring-hard	r W... z4 z6 z8	R280 R350 R420 R500	F28 F36 F43 F53	 H02 H04 H06	0 1/2H H EH	0 1/2H H EH
CuZn37	recrystallized (annealed) recrystallized up to required grain size half-hard hard spring-hard double spring-hard	r W... z4 z6 z8 z9	R300 R350 R410 R480 R550	F30 F37 F44 F54 F61	 H02 H04 H06	0 1/2H H EH	0 1/2H H

STRIPS

Thickness (mm)	Width (mm)	Strain hardening	Coil inside diameter (mm)
0,10 – 0,60	5 – 9		260, 360
	10 – 360	r, pz	100, 200, 300, 400, 500
0,61 – 3,00	max 360	r, pz	400, 500
* for thickness over 2,5 mm max. width 380 mm pz - cold-rolled			

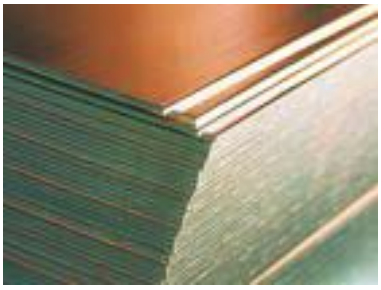
COLD ROLLED SHEETS AND STRIPS

Thickness (mm)	Width (mm)	Length (mm)	Strain hardening
0,30 – 2,00	max 360	max 2500	r, pz
2,20 – 10,00 2,20 – 10,00* 3,00 – 8,00	max 1000 max 650 max 1000	max 2500 max 2200 max 2000	r, pz
10,10 – 100,00*	max 1000	max 2500	pg

* for a thickness of 2,20 – 2,69 mm - sheets in a soft hardened state (without surface grinding); for a thickness 10 mm only soft hardened state
** width and length of plates after hot rolling with a thickness of 35 – 100 mm is produced after prior agreement
pz - cold-rolled

BRONZE

STRIPS, SHEETS



APPLICATION For example: ELECTRONICS, TELE-AND RADIO-ENGINEERING, AUTOMOTIVE AND ELECTROTECHNICAL INDUSTRY

GRADES

PN-92/H-87050		Foreign standard equivalents				
		PN-EN 1652	DIN 17662	ASTM B103, B97	JIS H3110	BS 2870
CuSn4	B4	CuSn4	CuSn4	C51100	C5111	PB101
-	-	CuSn5	-	C51000	C5212	Pb102
CuSn6	B6	CuSn6	CuSn6	C51900	C5191	PB103
CuSn8	B8	CuSn8	CuSn8	C52100	C5212	-
PN-92/H-87060						
CuSi3Mn1	BK31	-	-	C65500	-	C5101

	Grade	Strain hardening	Designation acc. to PN-77/ H-92815	Acc. to Polish Standard PN-EN 1652	Foreign standard equivalents			
					DIN 17670	ASTM B 103, B 97	BS 2870	JIS H3100
	1	2	3	4	5	6	7	8
STRAIN HARDENING 1. The mechanical properties of the strips and sheets for the states of reinforcement are specified in the table of standards. 2. At the customer's request, it is possible to producethe strips and sheets in other states of reinforcement.	CuSn4	recrystallized (annealed) half – hard hard spring - hard		R290 R390 R480 R540	F33 F38 F47 F54	060 H02 H04 H06 H08	0 1/2H H EH	0 1/2H H EH
	CuSn6	recrystallized (annealed) half – hard hard spring – hard double spring - hard	r z4 z6 z8 z9	R350 R420 R500 R560 R640	F35 F41 F48 F55 F63	060 H02 H04 H06 H08 H10	0 1/2H H EH SH	0 1/2H H EH
	CuSn8	recrystallized (annealed) half – hard hard spring – hard double spring - hard	r z4 z6 z8 z9	R370 R450 R540 R600 R660	F37 F45 F54 F59 F66	060 H02 H04 H06 H08 H10		0 1/2H H EH
	CuSi3Mn1	Hot rolled recystallized (annealed) hard spring - hard	r z6 z8			H70 H04 H08		

STRIPS

Thickness (mm)	Width (mm)	Strain hardening	Coil inside diameter (mm)
0,10 – 0,60	5 – 9	r, pz	260, 360
	10 – 360		100, 200, 300, 400, 500
0,61 – 2,00	20 – 360		400, 500
pz - cold-rolled			

COLD ROLLED SHEETS AND STRIPS

Grade	Thickness (mm)	Width (mm)	Length (mm)	Strain hardening
CuSn4,CuSn5, CuSn6, CuSn8, CuSi3Mn1	0,20 – 10,00	max 360	max 2000*	r, pz
CuSi3Mn1	5,00 – 30,00	max 600		pg
* for thickness 2,0 mm max. length 2500 mm pz - cold-rolled				

NICKEL SILVER

STRIPS, SHEETS

APPLICATION For example: ELECTRONICS, TELE AND RADIO-ENGINEERING, METALWORK

GRADES					
PN – 93/H-87027		Foreign standard equivalents			
		PN-EN 1652	DIN 17663 DIN 17664*	ASTM B122	BS 2870
CuNi18Zn27	MZN18	CuNi18Zn27	CuNi18Zn27	C77000	NS107
CuNi18Zn20	MZ20N18	CuNi18Zn20	CuNi18Zn20	C75200	NS106
CuNi12Zn24	MZN12	CuNi12Zn24	CuNi12Zn24	C76200	NS104
*dimensions and strain hardening on request					

STRAIN HARDENING

1. The mechanical properties of the strips and sheets for the states of reinforcement are specified in the table of standards.

2. At the customer's request, it is possible to produce belts, sheets and strips in reinforcement state H according to DIN17670.

3. At the customer's request, it is possible to produce strips, sheets and belts in other states.

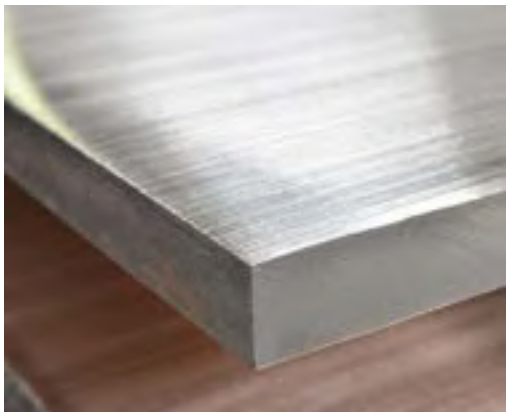
Grade	Strain hardening	Designation acc. to PN-77/ H-92815	Acc. to Polish Standard PN-EN 1652	Foreign standard equivalents		
				DIN 17670	ASTM B 122M	BS 2870
1	2	3	4	5	6	7
CuNi18Zn27	recrystallized (annealed) half – hard hard spring – hard double spring - hard	r z4 z6 z8	R390 R470 R540 R600	F39 F47 F54 F60	H01 H02 H04 H06	
CuNi12Zn24	recrystallized (annealed) half – hard hard spring – hard double spring - hard	r z4 z6 z8 z9	R360 R430 R490 R550 R620	F36 F43 F51 F56 F65	H01 H02 H04 H06 H08	0 1/2H H EH -
CuNi18Zn20	recrystallized (annealed) half – hard hard spring – hard double spring - hard	r z4 z6 z8 z9	R380 R450 R500 R580 R640	F38 F45 F52 F58 F68	H01 H02 H04 H06 H08	0 1/2H H EH

STRIPS			
Thickness (mm)	Width (mm)	Strain hardening	Coil inside diameter (mm)
0,10 – 0,60	5 – 9	r, pz	260, 360
	10 – 360		100, 200, 300, 400, 500
0,61 – 2,00	20 – 360		300, 400, 500
pz - cold-rolled			

COLD ROLLED SHEETS AND STRIPS			
Thickness (mm)	Width (mm)	Length(mm)	Strain hardening
0,20 – 5,00	max 360	max 2000*	r, pz
* for thickness 2,0 mm max. length 2500 mm pz - cold-rolled			

COPPER-NICKEL

STRIPS, SHEETS



APPLICATION For example: SHIPBUILDING AND MARINE INDUSTRIES , CHEMICAL INDUSTRY, PAPER INDUSTRY, AUTOMOTIVE

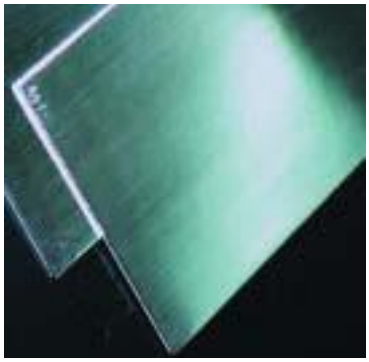
GRADES					
Designation	EN 1652	ASTM 171	DIN 17670-1	BS 2870	JIS H 3100
CuNi10	CuNi10Fe1Mn	C70600	CuNi10Fe1Mn	CN 102	C7060
CuNi30	CuNi30Mn1Fe	C71500/C71520	CuNi30Mn1Fe	CN 107	C7150

SPECIFICATION				
Grade	Thickness (mm)	Width (mm)	Length (mm)	Strain hardening
CuNi30Mn1 Fe/C71500	6,0-25,0	max 1200	max 2400	pg
CuNi30Mn1 Fe/C71500	25,0-33,0	max 1000	max 2000	pg
CuNi30Mn1 Fe/C71500	over 33,0	to be agreed individually	to be agreed individually	pg
CuNi10Mn1 Fe/C70600	3,0-8,0	max 1000	max 2000	pz
CuNi10Mn1 Fe/C70600	6,0-45,0	max 1200	max 2400	pg
CuNi10Mn1 Fe/C70600	over 45,0	to be agreed individually	to be agreed individually	pg

1. States of reinforcement:
pg - hot-rolled state
pz – cold-rolled state (to be agreed individually)
Surface finish: etched, ground, honed (in pz state)
Edge cutting: guillotine, saw
Strips in coils are produced after determining the technological parameters

BIMETAL SHEETS

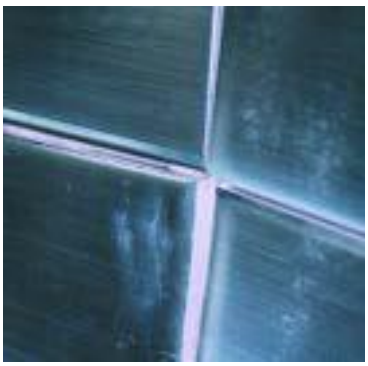
STRIPS, SHEETS



APPLICATION	For example: ELECTRONICS, CHEMICAL EQUIPMENT ELEMENTS AND ELEMENTS WORKING IN SEA WATER

SPECIFICATION				
Grades acc.to ZN-WMŁ-002/97	Strain hardening	Thickness (mm)	Width (mm)	Length (mm)
CuAl	z6	0,50 – 2,00	max 400	900 - 1100

SILVER FILLER METAL SILVER SHEETS



APPLICATION	For example: ELECTRONICS, FOR SOLDERING COPPER AND ITS ALLOY AS WELL AS CAST IRON AND CARBON AND LOW-ALLOY STEEL

SPECIFICATION				
1. Strain hardening: r – soft state pz – cold-rolled state (hard) 2. Upon agreement it is possible to manufacture with specific dimensional tolerances. 3. At the customer's request, it is possible to manufacture sheets/silver anodes with specific properties.				
Grades acc. to PN-80/M-69411	Strain hardening wg PN-80/M-69411	Thickness (mm)	Width (mm)	Length (mm)
LS 25	pz, r	0,50 – 2,00	max 400	max 500
LS 45				

CASTING ALLOYS

CASTING ALLOYS	Casting alloys are manufactured in accordance with: - the standard PN, EN, DIN - the additional Customer's requirements.

CAST BRASS

Designation	Grade acc. to PN-91/H-87026	Form	Dimensions (mm) (thickness x width x length)	Surface
CuZn34Al2Mn1Fe	MA58	pig-sows	80 x 90 x 400	raw
CuZn39Pb2	MO59	pig-sows flat bars	80 x 90 x 400 30 x 87 x 600	
CuZn38Pb2	MM47	pig-sows	80 x 90 x 400	
CuZn16Si3,5	MK80	flat bars pig-sows	30 x 87 x 600 80 x 90 x 400	

* copper alloys can be cast to customer's material specifications

CAST BRONZE

Designation	Grade acc. to PN-91/H-87026	Form	Dimensions (mm) (thickness x width x length)	Surface
CuSn10	B10	flat bars pig-sows	16 x 408 x 200 80 x 90 x 400	raw
CuSn10P	B101	flat bars pig-sows	16 x 408 x 200 80 x 90 x 400	
CuSn10Zn2	B102	pig sows	80 x 90 x 400	
CuSn12	B12	flat bars pig-sows	16 x 408 x 200 80 x 90 x 400	
CuSn16	B16	flat bars	12 x 200 x 1610	
CuSn10Pb10	B 1010	pig-sows	80 x 90 x 400	
CuSn5ZnPb5	B 555	flat bars pig-sows	30 x 87 x 600 80 x 90 x 400	
CuSn5ZnPb	RG5			
CuAl10Fe3Mn2	BA 1032	pig-sows	80 x 90 x 400	
CuAl10Fe4Ni4	BA 1044	pig-sows	80 x 90 x 400	
CuSi3Zn3Mn1	BK 331	pig-sows	80 x 90 x 400	

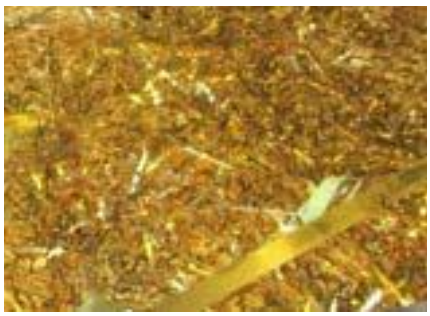
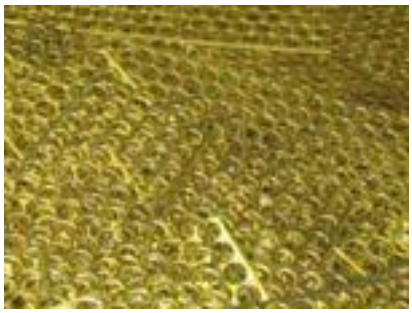
* copper alloys can be cast to customer's material specifications

INGOTS OF COPPER AND COPPER ALLOYS

Designation	Grade	Standard*	Form	Dimensions (mm)	Surface
Cu-DHP Cu-ETP CuZn37	CW 024 A CW 004 A CW 508 L	EN 12449	roll	fi 115 x max 2700 fi 128 x max 2700 fi 205 x max 2700	raw
CuZn39Pb3 CuZn40Pb2	CW 614 N CW 617 N	EN 12165	roll	fi 115 x max 2700 fi 128 x max 2700 fi 205 x max 2700	raw

* the possibility of casting ingots with the chemical composition for each grade mentioned in the referenced standards

NON-FERROUS METAL SCRAP

We operate closed-loop production processes. We process the waste generated during production into a diverse range of products.

We buy non-ferrous metal scrap:

- Copper scrap in grades: 1.01.1 ; 1.02.1
- Bi-component brass scrap: CuZn36 ; CuZn37 ; CuZn33 ; CuZn30 ; CuZn20 ; CuZn15; CuZn10; CuZn5
- Lead-brass scrap: CuZn39Pb2 and others
- Nickel brass scrap: CuNi12Zn24 ; CuNi18Zn20 ; CuNi15Zn27 ; CuNi15Zn21
- Copper-tin alloy scrap: CuSn6 ; CuSn8 ; CuSn10 ; B101 ; B102 ; B555 ; B1010 ; BK31 ; BA1032 and others
- Other grades by arrangement with the raw materials purchasing division

If you care about the environment and are willing to cooperate with us, you are welcome to contact our non-ferrous metal scrap experts, tel. +48 785 994 993

SERVICES

SCHELLING CIRCULAR SAW

PARAMETERS:

- Max cutting length 3100 mm
- Max cutting width 1500 mm
- Thickness from 3 to 60 mm
- Tolerance: +/- 1 mm

WIDE BELT WEBER SANDER

PARAMETERS:

- Dimensions of grinded sheets:
  - max 1300 x 2 500 x 50 mm
  - min 300 x 800 x 3 mm
- Maximum workpiece weight 1500 kg
- Waviness tolerance +/- 3 mm
- Surface roughness depends on the abrasive paper used

Mechanical polishing of sheets (grinder-polisher P-1200)	thickness	5 – 10 mm
	width	650 – 1200 mm
	length to	2000 mm

Annealing of sheets in chamber furnaces at temperatures of up to 700 °C	width	1400 mm
	length	max 3000 mm
	loading height	600 mm

Annealing strips in protective-atmosphere furnance	
outside diameter of coil	max 1500 mm
inside diameter	100 – 600 mm
width	10 – 420 mm
weight of coll	max 3000 kg
temeprature to	650 °C

Strip straightening	
thickness	0,15 – 0,80 mm
width	170 – 400 mm
weight of coil	max 3000 kg
diameter of uncoiler	300, 600 mm
diameter of coiler	600 mm

Strip straightening	
thickness	0,50 – 11 mm
width	25 – 1300 mm
length	min 500 – 2500 mm

Plasma cutting of Cu alloys	
thickness	5 – 50 mm
width	1200 mm
length to	2000 mm

Etching in H_2SO_4 solution	pickle tank size	3400 x 1100 x 1350 mm

Etching in HCL solution	pickle tank size	2750 x 1100 x 1250 mm

Longitudinal and cross cutting of strips and sheets

Hot rolling of ingots and cold rolling of strips and sheets

Thermal cutting with a numerically controlled YUN cutting machine equipped with a water table

Oxygen cutting of carbon and low alloy sheets

Plasma cutting of sheets of high-alloy steels and non-ferrous metals	maximum size of working field	8000 x 2000 mm
	thickness of oxygen-cutting	6 – 150 mm
	thickness of plasma cutting	4 – 70 mm

ROLLER GRINDING SERVICE

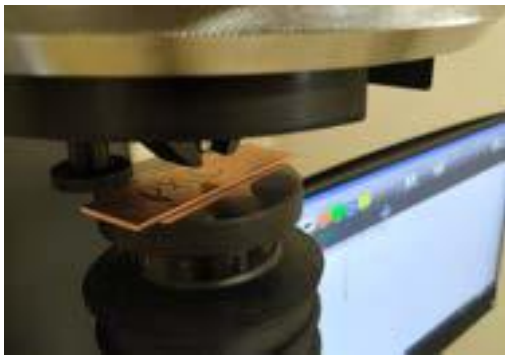
TECHNICAL DATA

- max. total length of ground roller 3000 mm
- max. length of ground roller 1300 mm
- diameter of ground roller 75–500 mm
- weight of ground roller max 3000 kg
- shape of roller after grinding:
  - cylinder
  - protrusion over a length of 1300 mm - max. 0,5 mm

TECHNICAL DATA

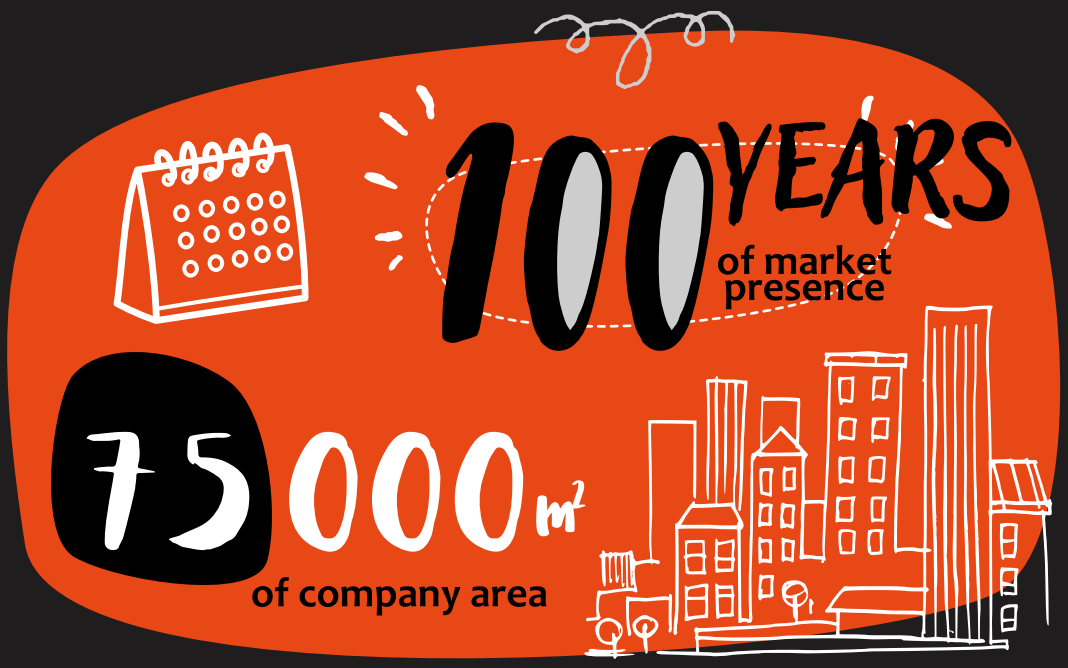
- max. total length of ground roller 3500 mm
- length of ground roller max. 2200 mm
- diameter of ground roller 300–900 mm
- weight of ground roller max. 9000 kg
- shape of roller after grinding:
  - cylinder
  - protrusion / depression over a length of 2200 mm
  - max 1,0 mm

LABORATORY SERVICES



We provide laboratory services using world-class suppliers.
The control and measurement instruments have the required periods of calibration, alignment and testing.

- statistical tensile test
- Vickers hardness
- Vickers microhardness
- surface roughness
- electrical conductivity by circulation current method
- chemical composition analysis



WMNŁ
INSPIRED BY METAL

Walcownia Metali Nieżelaznych „ŁABĘDY" S.A.
KGHM POLSKA MIEDŹ S.A. CAPITAL GROUP
ul. Metalowców 6, 44-109 Gliwice, Poland
VAT no.: PL 9691586199
www.wmn.com.pl

Sales Department
tel. +48 32 33 06 356
handel@wmn.com.pl

Secretariat
tel. +48 32 33 06 340
wmn@wmn.com.pl