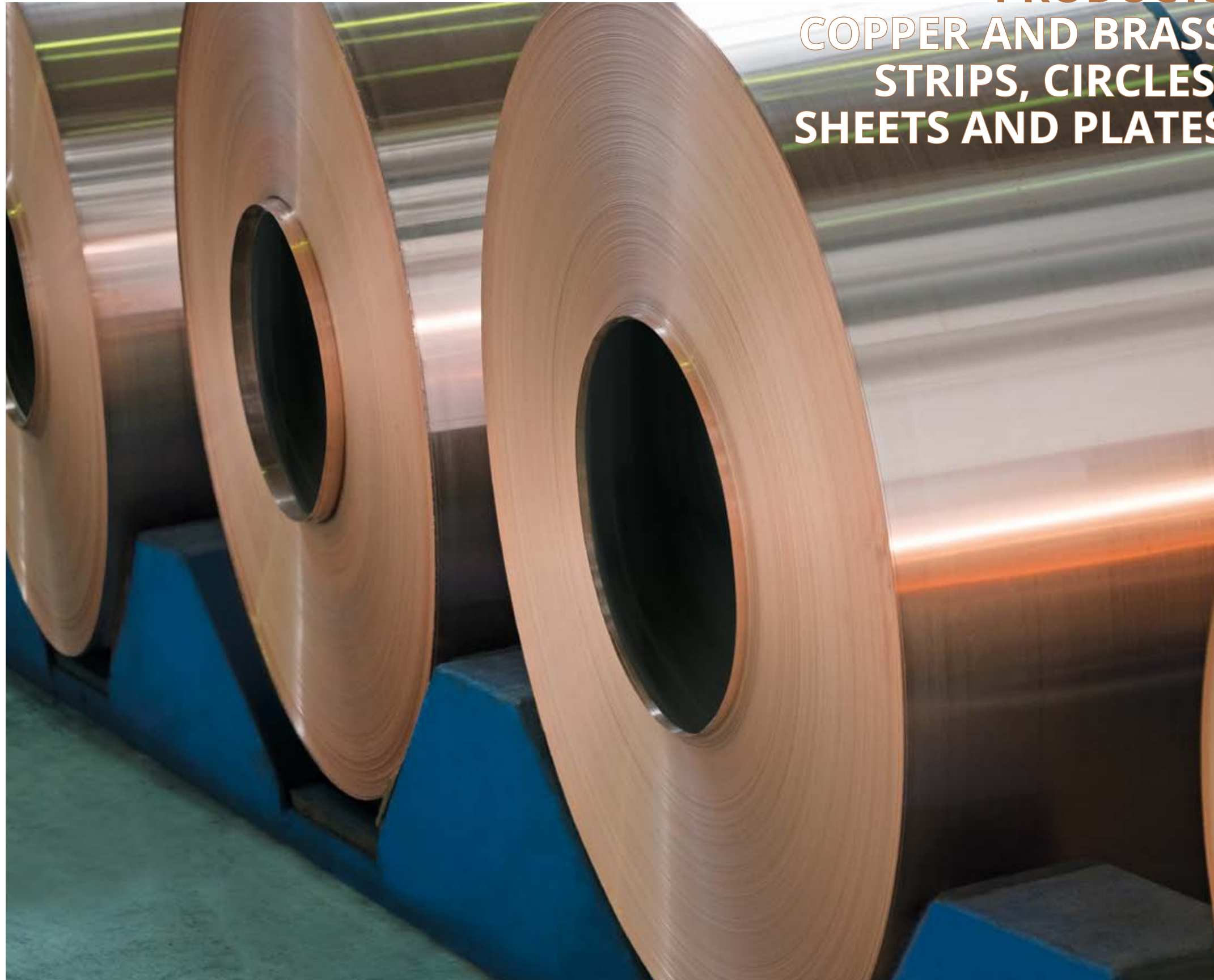


SOFIA MED



INDUSTRIAL ROLLED PRODUCTS

INDUSTRIAL ROLLED PRODUCTS COPPER AND BRASS STRIPS, CIRCLES, SHEETS AND PLATES



SOFIA MED

Sofia Med is a producer of a wide range of rolled and extruded copper and copper alloy products such as sheets, strips, plates, circles, disks, bare and plated copper bus bars, rods, profiles, components, fabricated parts and wire that are used in a wide variety of building and industrial applications.

Sofia Med is part of the ElvalHalcor Hellenic Copper and Aluminium industry S.A., a leading global manufacturer of aluminium and copper rolled and extrusion products.

Sofia Med is situated in Sofia, Bulgaria, on a 250 000 m² area and has three production units: Foundry, Rolling and Extrusion.

With more than 80 years of manufacturing experience and significant investments, **Sofia Med** has evolved into a competitive modern European company with customers globally.

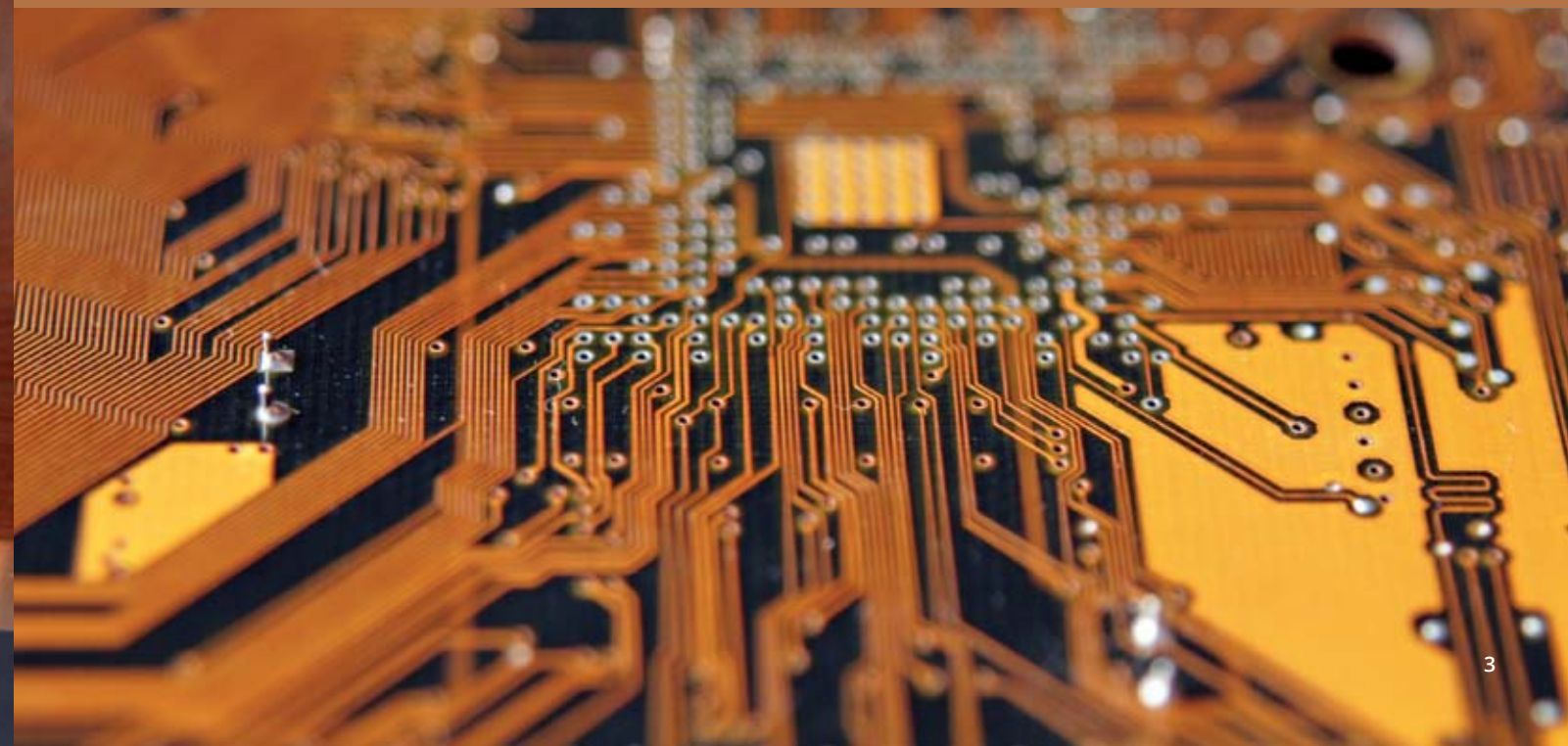
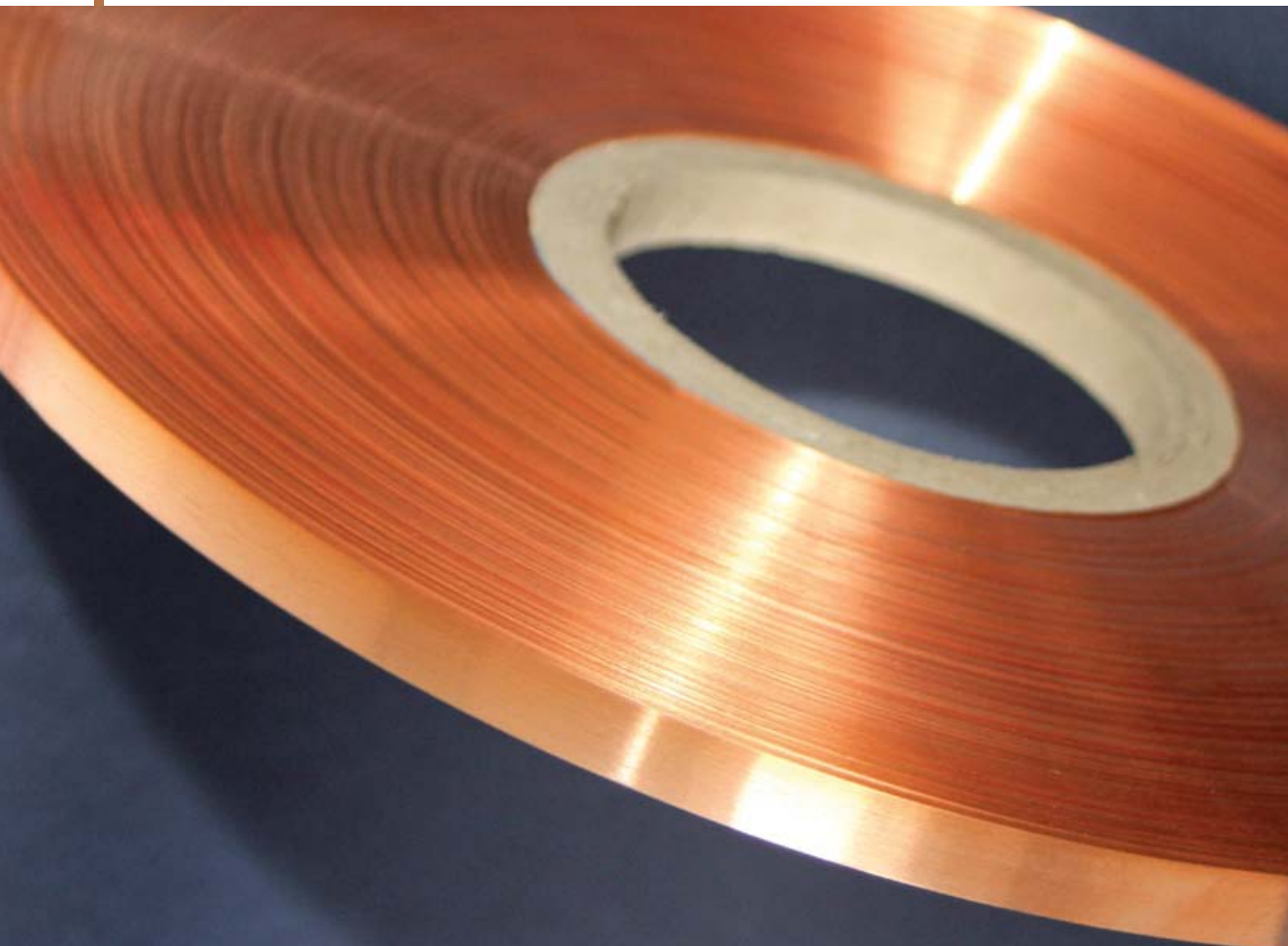
Sofia Med operates under strict quality, environmental, as well as health and safety management systems, in compliance with ISO 9001:2015, IATF 16949:2016, ISO 14001:2015, OHSAS 18001:2017, ISO 50001:2011, as well as follows the guidelines of ISO 26000:2010 for social responsibility.

The wide product range of **Sofia Med** meets the requirements of the Unified European standards (EN), as well as BS, DIN, ASTM, JIS standards, or any other specific customer request.

GENERAL APPLICATIONS

Due to their excellent mechanical and physical characteristics, the industrial rolled copper, brass and HP-alloy products are widely used in the manufacturing of electrical and electronic equipment, springs, parts and components for the automotive industry, boilers, solar energy collectors and panels, heat exchangers, electrical transformers, connectors, radiators, pre-rolled, high frequency cables, deep drawing quality, wrapping for fire resistance cables, electrical cable wrapping, lighting, coinage.

They are suitable also for marine applications, petrol-chemical, electrical, nuclear&medical industries, as well as for machining and special tools, cooking utensils, art and decoration.



INDUSTRIAL ROLLED COPPER PRODUCTS



CHARACTERISTICS

Products can also be supplied in conformance to respective international standards, such as DIN and ASTM series, as well as JIS series.
Copper rolled products can be supplied with tolerance tighter than the specified in above standards upon request.



SPECIFICATIONS

in coils on pallets with max. 12 kg/mm width

General applications	EN 1652
Industrial applications	EN 1653 (for boilers) EN 13599 (for electrical- electronic applications)

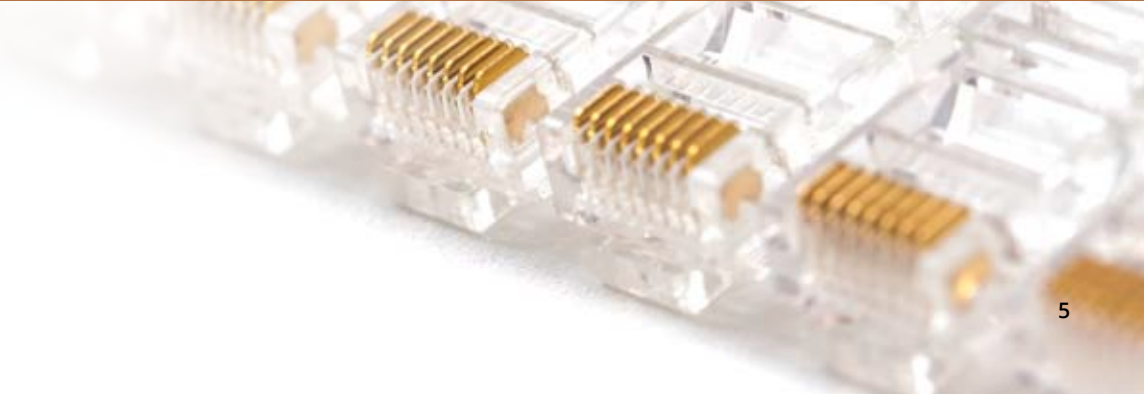
GENERAL PROPERTIES

ALLOYS ACCORDING TO EN 1652 STANDARD					
SOFIA MED	Name	DIN	Cu{%-min)	P (%-Range)	O (%-max)
SM1100	Cu-ETP	CW004A	99.90	-	0,040
SM1201	Cu-DLP	OF - Cu	99.90	0,005 - 0,013	-
SM1220	Cu-DHP	CW024A	99.90	0,015 - 0,040	-

ALLOYS ACCORDING TO EN 13599 STANDARD					
SOFIA MED	Name	DIN	Cu(%-min)	P (%-Range)	O (%-max)
SM1030	Cu-PHC	CW020A	99.95	0,001 - 0,006	-
SM1031	Cu-HCP	CW021A	99.95	0,002 - 0,007	-

PHYSICAL PROPERTIES (at Ambient Temperature of 20°C)		CU
Density (gr/cm³)		8,93
Melting Point (L/S* în °C)		1083
		<small>*L/S = Liquid/Solid</small>

TYPICAL MECHANICAL PROPERTIES OF Cu					
Alloy	Temper	Tensile Strength (MPa)	Yield Strength (MPa)	Elongation (%)	Hardness (HV)
Cu	R200	200 - 250	100 max	-	-
	R220	220 - 260	140 max	33	-
	H040	-	-	-	40 - 65
	R240	240 - 300	180 min	8	-
	H065	-	-	-	65 - 95
	R290	290 - 360	250 min	4	-
	H090	-	-	-	90 - 110
	R360	360 min	320 min	2	-
	H110	-	-	-	110 min



COPPER STRIPS

CHARACTERISTICS

MANUFACTURING RANGE - PACKING

Thickness (mm)	Width (mm)	Temper	Coil Internal Diameter	Coil size
0,075 - 0,19	8 - 460	R200, R290 R360	80, 100, 150, 200, 300, 400, 500	3 kg/mm
0,20 - 0,29	8 - 1000	R200, R240 R290, R360	80, 100, 150, 200, 300, 400, 500	3 kg/mm
0,30 - 0,39	8 - 1250	R200, R240 R290, R360	80, 100, 150, 200, 300, 400, 500	6 kg/mm
0,40 - 0,49	12 - 1250	R200, R240 R290, R360	80, 100, 200, 300, 400, 500	14 kg/mm
0,50 - 1,50	12 - 1250	R200, R240 R290, R360	80, 100, 200, 300, 400, 500	14 kg/mm
1,51 - 2,50	25 - 1250	R220, R240 R290, R360	400, 500	14 kg/mm
2,51 - 3,50	50 - 1250	R220, R240 R290, R360	400, 500	14 kg/mm
3,51 - 4,00	80 - 1250	R200, R240, R290	400, 500	14 kg/mm
4,01 - 5,00	100 - 1000	R200, R240	400, 500	14 kg/mm



TRANSFORMER STRIPS (ALLOY - ETP)

Dimensions

Standard range (mm)

Thickness	0,30 to 2,5
Width	200 to 1250
Temper	Soft R200, R220
Electrical conductivity	100% IACS
	58 MS/m
Mechanical properties	EN 13599

COPPER SHEETS

CHARACTERISTICS

Copper sheets can be supplied in lengths from 400 to 3500 mm.

MANUFACTURING RANGE - PACKING

Thickness (mm)		Width (mm)		Packing
Temper				
	Soft (R220)	Half Hard (R240)	Hard (R290)	
0,20 - 0,40*		100 - 1000	100 - 1000	Wooden crates of 500 to 2000 kg with or without paper interleaving
0,41 - 4,00	100 - 1250	100 - 1250	100 - 1250	
4,01 - 5,00	100 - 1250	100 - 1250	100 - 1250	

*Upon special agreement.

COPPER CIRCLES

CHARACTERISTICS

PACKING

In pallets or wooden cases of 500 kg.

PRODUCT RANGE

(Circles Diameters in mm)

50	180	310	455
56,8	183	311,2	457,2
60	184,1	315	460
61,1	185	315,9	465
63,5	187,3	317,5	470
65	190	320	473
68	190,5	325	475
70	195	330	296
74	196,9	333,4	480
75	200	335	482,6
76,2	203,2	336,5	485
77,8	205	340	490
80	210	342,9	495
82,6	215	345	500
85	215,9	350	505
88,9	220	355	508
90	222,3	355,6	510
95	225	360	515
100	228,6	365	520
101,6	230	368,3	525
103,2	235	370	530
105	240	374	533,4
108	241,3	375	535
110	242	377,8	536,6
115	245	380	540
117,5	247,7	381	550
120	250	385	560
125	254	387,4	570
127	255	390	580
130	260	393,7	600
133,4	265	395	610
135	266,7	398	620
140	270	400	635
145	275	405	650
148	276,2	406,4	690
150	279,4	410	700
152,4	280	415	735
155	285	419,1	750
156	290	420	*
158,8	292,1	423	
160	292,9	425	
165	295	430	
170	296	431,8	
171,5	298,5	435	
175	300	440	
177	304,8	444,5	
177,8	305	450	

* other sizes from 400 mm up to 1.200 mm can be produced upon request.

COPPER PLATES in mm

CHARACTERISTICS

ALLOYS: CuDHP, CuETP, CuSe, CuSn0,15

MANUFACTURING RANGE

Thickness	Width	Lenght	Temper
8 - 8,99	50 - 1250	200 - 6000	Soft, DDQ, ½ hard, hard, hard as rolled, hot rolled
9 - 38	50 - 1250	200 - 6000	Soft, DDQ, ¼ hard, ½ hard, hard, hard as rolled, hot rolled
38 - 180	100 - 1250	200 - 6000	Hot rolled (soft)

Above 100 mm - upon request



COPPER PLATES in inches

CHARACTERISTICS

ALLOYS: C122, C110, C103, C144

MANUFACTURING RANGE

Thickness	Width	Lenght	Temper
0,314 - 0,354	1,968 - 49,212	7,874 - 157,480	Soft, DDQ, ½ hard, hard, hard as rolled, hot rolled
0,354 - 1,496	1,968 - 49,212	7,874 - 157,480	Soft, DDQ, ¼ hard, ½ hard, hard, hard as rolled, hot rolled
1,496 - 3,937	3,937 - 49,212	7,874 - 157,480	Hot rolled (soft)



INDUSTRIAL ROLLED BRASS PRODUCTS

Specifications

General applications (sheets & strips) Industrial applications (typical for strips) Strips and discs for deep drawing quality products are made in conformance to client's requirements.	EN 1652 EN 1652
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Products can also be supplied in conformance to respective international standards, such as ASTM series, as well as JIS series. Tolerances, tighter than the specified in the above standards, are available upon request.

MOST FREQUENTLY USED ALLOYS

SOFIA MED	Name	DIN	Cu(%-min)
SM301	CuZn0,5	CW119C	99,5
SM305	CuZn10	CW501L	89 - 91
SM310	CuZn15	CW502L	84 - 86
SM328	CuZn28	2.0261 (DIN 17660)	
SM330	CuZn30	CW505L	69 - 71
SM333	CuZn33	CW506L	66 - 68
SM335	CuZn35	C26800 (ASTM)	64 - 68,5
SM336	CuZn36	CW507L	63,5 - 65,5
SM337	CuZn37	CW508L	62 - 64
SM340	CuZn40	CW509L	59,5 - 61,5

GENERAL PROPERTIES

MECHANICAL PROPERTIES

Alloy	Temper	Tensile Strength	Yield Strength	Elongation (min)	Hardness
CuZn0,5	R220	220 - 260	140 min	33	-
	H040	-	-	-	40 - 65
	R240	240 - 300	180 min	8	-
	H065	-	-	-	65 - 95
	R290	290 - 360	250 min	-	-
	H085	-	-	-	85 - 115
	R360	360 min	320 min	-	-
CuZn10	H110	-	-	-	110 min
	R240	240 - 290	140 min	36	-
	H050	-	-	-	50 - 80
	R280	280 - 360	200 min	13	-
	H080	-	-	-	80 - 110
CuZn15	R350	350 min	290 min	4	-
	H110	-	-	-	110 min
	R260	260 - 310	170 min	36	-
	H055	-	-	-	40 - 65
	R300	300 - 370	150 min	16	-
	H085	-	-	-	65 - 95
	R350	350 - 420	250 min	4	-
CuZn28 (2.0261) (according to DIN)	H105	-	-	-	85 - 115
	R410	410 min	360 min	-	-
	H125	-	-	-	110 min
	F27	270 - 350	160 max	45	-
	H55	-	-	-	55 - 90
	F35	350 - 420	200 min	30	-
	H90	-	-	-	90 - 125
CuZn30	F42	420 - 520	340 min	12	-
	H125	-	-	-	125 - 160
	F52	520 min	470 min	5	-
	H160	-	-	-	160 min
	R270	270 - 350	160 min	40	-
	H055	-	-	-	55 - 90
	R350	350 - 430	170 min	21	-
CuZn33	H095	-	-	-	95 - 125
	R410	410 - 490	260 min	9	-
	H120	-	-	-	120 - 155
	R480	480 min	430 min	-	-
	H150	-	-	-	150 min
	R280	280 - 380	170 max	40	-
	H055	-	-	-	55 - 95
CuZn36 & CuZn37	R350	350 - 440	170 min	19	-
	H095	-	-	-	95 - 125
	R420	420 - 500	300 min	6	-
	H125	-	-	-	125 - 155
	R500	500 min	450 min	-	-
	H155	-	-	-	155 min
	R300	300 - 370	180 max	38	-
CuZn40	H055	-	-	-	55 - 95
	R350	350 - 440	170 min	19	-
	H095	-	-	-	95 - 125
	R410	410 - 490	300 min	8	-
	H120	-	-	-	120 - 155
	R480	480 - 560	430 min	3	-
	H150	-	-	-	150 - 180
CuZn40	R550	550 min	500 min	-	-
	H170	-	-	-	170 min
	R340	340 - 420	240 max	33	-
	H085	-	-	-	85 - 115
	R400	400 - 480	200 min	15	-
	H110	-	-	-	110 - 140
	R470	> 470	390 min	6	-
CuZn40	H140	-	-	-	140 min

Other high performance and coinage alloys: according to international or customer specification

BRASS STRIPS

CHARACTERISTICS

MANUFACTURING RANGE - PACKING				
Thickness (mm)	Width (mm)	Temper	Coil Internal Diameter	Packing (mm)
0,10 - 0,14	8 - 460	Soft or Hard	80, 100, 150, 200, 300, 400, 500	3 kg/mm
0,15 - 0,19	8 - 460	All tempers	80, 100, 150, 200, 300, 400, 500	3 - 6 kg/mm
0,20 - 0,29	8 - 1250	All tempers	80, 100, 150, 200, 300, 400, 500	3 - 6 kg/mm
0,30 - 0,39	8 - 1250	All tempers	80, 100, 200, 300, 400, 500	3 - 6 kg/mm
0,40 - 0,49	12 - 1250	All tempers	80, 100, 200, 300, 400, 500	11 kg/mm
0,50 - 1,50	12 - 1250	All tempers	80, 100, 200, 300, 400, 500	11 kg/mm
1,51 - 2,35	25 - 1000	All tempers	80, 100, 200, 300, 400, 500	11 kg/mm
2,36 - 3,50	50 - 1000	All tempers	400, 500	11 kg/mm
3,51 - 4,00	80 - 1000	Soft, ½H, DDQ	400, 500	11 kg/mm
4,01 - 5,00	100 - 1000	Soft, ½H	400, 500	11 kg/mm

BRASS SHEETS

CHARACTERISTICS



Brass sheets can be supplied in lengths from 400 to 3500 mm.

MANUFACTURING RANGE - PACKING				
Thickness (mm)	Width (mm)		Packing	
	Temper			
	Soft (R220)	Half Hard (R240)	Hard (R290)	
0,20 - 0,40*	100 - 1000	100 - 1000	100 - 1000	Wooden crates of 500 to 2000 kg with or without paper interleaving
0,41 - 4,00	100 - 1250	100 - 1250	100 - 1250	
4,01 - 5,00	100 - 1000	100 - 1000	100 - 1000	

*up to 2000 mm

BRASS CIRCLES

CHARACTERISTICS

Thickness Diameter	0,27 mm - 2,5 mm 40 mm - 750 mm
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PACKING

In pallets or wooden cases of 500 kg.



Specifications

General applications	EN 1652
Industrial applications (typical)	EN 1652

Products can also be supplied in conformance to respective international standards, such as ASTM series, as well as JIS series.

THICK DISCS

CuZn30 can be supplied in the form of precision cut discs for deep drawing process.

Thickness Width	6 mm - 30 mm 40 mm - 280 mm
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(Circles Diameters in mm)

50	180	310	455
56,8	183	311,2	457,2
60	184,1	315	460
61,1	185	315,9	465
63,5	187,3	317,5	470
65	190	320	473
68	190,5	325	475
70	195	330	296
74	196,9	333,4	480
75	200	335	482,6
76,2	203,2	336,5	485
77,8	205	340	490
80	210	342,9	495
82,6	215	345	500
85	215,9	350	505
88,9	220	355	508
90	222,3	355,6	510
95	225	360	515
100	228,6	365	520
101,6	230	368,3	525
103,2	235	370	530
105	240	374	533,4
108	241,3	375	535
110	242	377,8	536,6
115	245	380	540
117,5	247,7	381	550
120	250	385	560
125	254	387,4	570
127	255	390	580
130	260	393,7	600
133,4	265	395	610
135	266,7	398	620
140	270	400	635
145	275	405	650
148	276,2	406,4	690
150	279,4	410	700
152,4	280	415	735
155	285	419,1	750
156	290	420	*
158,8	292,1	423	
160	292,9	425	
165	295	430	
170	296	431,8	
171,5	298,5	435	
175	300	440	
177	304,8	444,5	
177,8	305	450	

* other sizes from 400 mm up to 1.200 mm can be produced upon request.

BRASS PLATES

CHARACTERISTICS

Alloys: CuZn37, CuZn36, CuZn33, CuZn30, CuZn15, CuZn10, CuZn35, CuZn28, CuZn38Sn1, CuZn28Sn1
C142, C706, C715, C210, C220, C240, C260, C280, C464, C443

MANUFACTURING RANGE in mm			
Thickness	Width	Lenght	Temper
8 - 9,99	50 - 1250	200 - 6000	UPON AGREEMENT
10 - 38	50 - 1250	200 - 6000	SOFT / ¼, ½, HARD AS ROLLED, HOT ROLLED
38 - 180	100 - 1250	200 - 6000	HOT ROLLED (SOFT)

Above 100 mm - upon request



MANUFACTURING RANGE in inches			
Thickness	Width	Lenght	Temper
0,314 - 0,354	1,968 - 49,212	7,874 - 157,480	UPON AGREEMENT
0,354 - 1,496	1,968 - 49,212	7,874 - 157,480	SOFT / ¼, ½, HARD AS ROLLED, HOT ROLLED
1,496 - 3,937	3,937 - 49,212	7,874 - 157,480	HOT ROLLED (SOFT)

Above 100 mm - upon request

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