

• TOLERANCES

THICKNESS TOLERANCES FOR ALUMINIUM

NOMINAL THICKNESS (mm)		Thickness tolerances for nominal widths (W) of (mm)				
		Cold-rolled: EN-485-4				Hot-rolled: EN-485-3
		W≤1000		1000<W≤1250		1000<W≤1250
>	≤	EN AW-1050 A / EN AW-1200 / EN AW-3003	EN AW-5022 / EN AW-5754	EN AW-1050 A / EN AW-1200 / EN AW-3003	EN AW-5022 / EN AW-5754	All
0.20	0.40	±0.020	±0.030	±0.040	±0.050	
0.40	0.50	±0.030	±0.030	±0.040	±0.050	
0.50	0.60	±0.030	±0.040	±0.050	±0.060	
0.60	0.80	±0.030	±0.040	±0.060	±0.070	
0.80	1.00	±0.040	±0.050	±0.060	±0.080	-
1.00	1.20	±0.040	±0.050	±0.070	±0.090	
1.20	1.50	±0.050	±0.070	±0.090	±0.100	
1.50	1.80	±0.060	±0.080	±0.100	±0.110	
1.80	2.00	±0.060	±0.090	±0.110	±0.120	
2.00	2.50	±0.070	±0.100	±0.120	±0.130	
2.50	3.00	±0.080	±0.110	±0.130	±0.150	±0.28

WIDTH TOLERANCES FOR ALUMINIUM

NOMINAL THICKNESS (mm)		Width tolerances for nominal widths (W) of (mm)			
		EN 485-4			
		W<100	100≤W<300	300≤W<500	500≤W<1250
>	≤				
0.10	0.20	-	-	-	-
0.20	0.40	0;+0.30	0;+0.40	0;+0.60	0;+1.50
0.40	0.60	0;+0.30	0;+0.50	0;+1.00	0;+1.50
0.60	1.00	0;+0.40	0;+0.70	0;+1.20	0;+2.00
1.00	1.50	0;+1.00	0;+1.00	0;+1.50	0;+2.00
1.50	2.00				
2.00	2.50				
2.50	3.00				

THICKNESS TOLERANCES FOR COPPER AND COPPER ALLOYS

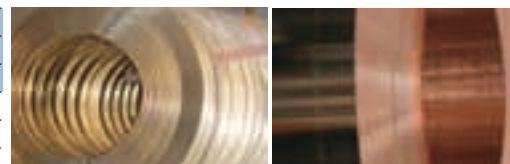
NOMINAL THICKNESS (mm)		Width tolerances for nominal widths (W) of (mm)			
		EN 1652			
		W≤350	350<W≤700	700<W≤1000	1000≤W<1250
>	≤				
0.10	0.20	±0.018	-	-	-
0.20	0.40	±0.022	±0.030	±0.040	-
0.30	0.40	±0.025	±0.040	±0.050	±0.070
0.40	0.50	±0.030	±0.050	±0.060	±0.080
0.50	0.80	±0.040	±0.060	±0.070	±0.090
0.80	1.20	±0.050	±0.070	±0.090	±0.100
1.20	1.50				
1.50	1.80	±0.060	±0.080	±0.100	±0.110
1.80	2.00				
2.00	2.50	±0.070	±0.090	±0.110	±0.130
2.50	2.80				
2.80	3.00	±0.080	±0.100	±0.130	±0.170

WIDTH TOLERANCES FOR COPPER AND COPPER ALLOYS

NOMINAL THICKNESS (mm)		Width tolerances for nominal widths (W) of (mm)						
		EN 1652						
		W<50	50<W≤100	100<W≤200	200<W≤350	350<W≤500	500<W≤700	700<W≤1250
>	≤							
0.10	0.40	0;+0.20	0;+0.30	0;+0.40	0;+0.60	0;+1.00	0;+1.50	0;+2.00
0.40	1.00							
1.00	1.50	0;+0.30	0;+0.40	0;+0.50	0;+1.00	0;+1.20	0;+1.50	0;+2.00
1.50	2.00							
2.00	2.50	0;+0.50	0;+0.60	0;+0.70	0;+1.20	0;+1.50	0;+2.00	0;+2.50
2.50	3.00	0;+1.00	0;+1.10	0;+1.20	0;+1.50	0;+2.00	0;+2.50	0;+3.00

STRAIGHTNESS TOLERANCES

NOMINAL WIDTH (mm)	Maximum deviation	
	2000 mm	
	Thickness (t)	
	t ≤ 1.20 mm	t > 1.20 mm
3 ≤ W < 6	10.00	15.00
6 ≤ W < 10	8.00	12.00
10 ≤ W < 20	4.00	6.00
20 ≤ W < 350	2.00	4.00



VINCO

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NON-FERROUS METAL STRIP

The data herein is merely for information purposes and do not imply contractual terms of supply. Unless there is an error or omission.



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Other grades and specifications of strips available through the Sales Department.

• **ALUMINIUM**

APPROXIMATE EQUIVALENCE			CHEMICAL COMPOSITION										
DESIG. EN			DIN DESIG.	ASTM DESIG.	Si %	Fe %	Cu %	Mn %	Mg %	Cr %	Zn %	Ti %	Al. min. (%)
Numeric	Symbolyc	Standard											
EN AW-1050A	EN AW-AI 99.5	EN 573	Al 99.5	1050A	0.25	0.40	0.05	0.05	0.05	-	0.07	0.05	99.5
EN AW-1200	EN AW-AI 99.0	EN 573	Al 99.0	1200	Σ= 1.00		0.05	0.05	-	-	0.10	0.05	99.00
EN AW-3003	EN AW-AI Mn1Cu	EN 573	AlMn1Cu	3003	0.60	0.70	0.05-0.20	1.0-1.5	-	-	0.10	-	rest
EN AW-5052	EN AW-AI Mg2.5	EN 573	AlMg2.5	5052	0.25	0.40	0.10	0.10	2.2-2.8	0.15-0.35	0.10	-	rest
EN AW-5754	EN AW-AI Mg3	EN 573	AlMg3	5754	0.40	0.40	0.10	0.50(*)	2.6-3.6	0.30(*)	0.20	0.15	rest

(*) Mn+Cr: 0.10-0.60

MECHANICAL SPECIFICATIONS

ALUMINIUM GRADE			Yield point R _{po2}	Tensile strength R _m			Minimum elongation % (according to growing thickness)	Approximate density
Designation	Standard	Status	N/sq mm	N/sq mm		A _{50mm}		
			Min.	Min.	Max.			
EN AW-1050A	EN 485	0/H111	20	65	95	20-35	2.7 g/cm³	
		H14	85	105	145	2-6		
		H16	100	120	160	1-3		
		H18	120	140	-	1-2		
		H24	75	105	145	3-8		
EN AW-1200	EN 485	0/H111	25	75	105	19-33	2.7 g/cm³	
		H14	95	115	155	2-6		
		H18	130	150	-	1-2		
		H19	140	160	-	1		
		H24	90	115	155	3-9		
EN AW-3003	EN 485	0/H111	35	95	135	15-24	2.7 g/cm³	
		H14	125	145	185	2-5		
		H18	170	190	-	1-2		
		H24	115	145	185	4-8		
EN AW-5052	EN 485	0/H111	65	170	215	12-19	2.7 g/cm³	
		H14	180	230	280	3-5		
		H18	240	270	-	1-2		
		H24	150	230	280	4-9		
EN AW-5754	EN 485	0/H111	80	190	240	12-18	2.7 g/cm³	
		H14	190	240	280	3-5		
		H18	250	290	-	1-2		
		H24	160	240	280	6-10		

STATUS DEFINITION

Symbol	Definition	Second figure
O	Annealed status. The status is generally softer than what can be obtained by keeping the product at a certain temperature that does not change it. Temperature permanence is not followed by flattening or straightening.	
H1	Tempered status, products hardened by plastic cold-rolling until the set mechanical specifications are met without subsequent heat treatment of any kind.	2- Status 1/4 hard 4- Status demi-hard 6- Status 3/4 hard 8- Status hard 9- Status extra hard
H2	Tempered status, product hardened by plastic cold-rolling until a higher level than the set mechanical specifications is reached, followed by softening by keeping it at the right temperature (stabilization). The level of set specifications for each status is identical to H1 in strength and an yield point with a higher elongation.	

The states below are equivalent:: H2=H12=H22 H4=H14=H44 H8=H18=H28 H9=H19=H29

• **COATINGS FOR COPPER AND COPPER ALLOY**

SINGLE LAYER COATINGS	MULTIPLE LAYER COATINGS
100/100 tin	Copper+Tin
Silver	Copper+Silver
Nickel	Copper+Nickel+Silver
	Copper+Nickel+Silver+Gold
	Nickel+Tin
	Nickel+Silver



• **COPPER AND LIGHTLY ALLOYED COPPER**

APPROXIMATE EQUIVALENCE			CHEMICAL COMPOSITION											Approx. Density
DESIG. EN			DIN DESIG.	ASTM DESIG.	Cu %	Bi %	O %	P %	Zn %	Fe %	Pb %	Others %		
Symbolyc	Numeric	Standard												
Cu-ETP	CW0004A	EN 1652	E-Cu58	C11000	≥ 99.90	≤ 0.0005	0.040	-	-	-	≤ 0.005	≤ 0.03 except Ag y 0	8.9 g/cm³	
Cu-DHP	CW024A	EN 1652	SF-Cu	C12200	≥ 99.90	-	-	0.015-0.040	-	-	-	-	8.9 g/cm³	
Cu Fe 2P	CW111C	EN 1654	Cu Fe 2P	C19400	reste	-	-	0.015-0.15	0.050-0.2	2.1-2.6	≤ 0.03	≤ 0.20	8.9 g/cm³	

MECHANICAL CHARACTERISTICS

GRADE			Yield point R _{po2}	Tensile strength R _m	Hardness	Minimum elongation A _{50mm}			
Designation	Standar	Status	N/sq mm	N/sq mm		HV	%		
				Min.	Max.		thickness ≤ 2.5 mm	thickness > 2.5 mm	
Cu-ETP y Cu-DHP	EN 1652	Annealed	R200/H040	≤ 100	200	250	40-65	-	t.>2.5mm:42
		1/2 Hard	R220/H040	≤ 140	220	260	40-65	t.≤2.5mm:33	t.>2.5mm:42
		Hard	R240/H065	≥ 180	240	300	65-95	t.≤2.5mm:8	t.>2.5mm:15
		Extra Hard	R290/H090	≥ 250	290	360	90-110	t.≤2.5mm:4	t.>2.5mm:6
Cu Fe 2P	DIN 1654	1/2 Hard	R340/H100	≥ 240	340	390	100-120	t.:0.10-0.25mm:≥8	t.:0.25-1.00mm:≥10
		Hard	R370/H120	≥ 330	370	430	120-140	t.:0.10-0.25mm:≥4	t.:0.25-1.00mm:≥6
		Extra Hard	R420/H130	≥ 380	420	480	130-150	-	t.:0.25-1.00mm:≥3
		Spring	R470/H140	≥ 440	470	-	≥ 140	-	-

• **LAITON**

APPROXIMATIVE EQUIVALENCE			CHEMICAL COMPOSITION											Approx. Density
DESIG. EN			DIN DESIG.	ASTM DESIG.	Cu %	Al %	Fe %	Ni %	Pb %	Sn %	Zn %	Autres %		
Symbolyc	Numeric	Standard												
CuZn15	CW502L	EN 1652	CuZn15	C-23000	84.0-86.0	≤ 0.02	≤ 0.05	≤ 0.3	≤ 0.05	≤ 0.1	rest	≤ 0.1	8.8 g/cm³	
CuZn30	CW505L	EN 1652	CuZn30	C-26000	69.0-71.0	≤ 0.02	≤ 0.05	≤ 0.3	≤ 0.05	≤ 0.1	rest	≤ 0.1	8.5 g/cm³	
CuZn33	CW506L	EN 1652	CuZn33	C-28800	66.0-68.0	≤ 0.02	≤ 0.05	≤ 0.3	≤ 0.05	≤ 0.1	rest	≤ 0.1	8.5 g/cm³	
CuZn37	CW508L	EN 1652	CuZn37	C-27200	62.0-64.0	≤ 0.05	≤ 0.1	≤ 0.3	≤ 0.1	≤ 0.1	rest	≤ 0.1	8.4 g/cm³	

MECHANICAL CHARACTERISTICS

GRADE			Yield point R _{po2}	Tensile strength R _m	Hardness	Minimum elongation A _{50mm}			
Designation	Standard	Status	N/sq mm	N/sq mm		HV	%		
				Min.	Max.		thickness ≤ 2.5 mm	thickness > 2.5 mm	
CuZn15	EN 1652	Annealed	R260/H055	≤ 170	260	310	55-85	36	45
		1/2 Hard	R300/H085	≥ 150	300	370	85-115	16	25
		Hard	R350/H105	≥ 250	350	420	105-135	4	12
		Extra Hard	R410/H125	≥ 360	410	-	≥ 125	-	-
CuZn30	EN 1652	Annealed	R270/H055	≤ 160	270	350	55-90	40	50
		1/2 Hard	R350/H095	≥ 170	350	430	95-125	21	33
		Hard	R410/H120	≥ 260	410	490	120-155	9	15
		Extra hard	R480/H150	≥ 430	480	-	≥ 150	-	-
CuZn33	EN 1652	Annealed	R280/H055	≤ 170	280	380	55-90	40	50
		1/2 Hard	R350/H095	≥ 170	350	430	95-125	22	31
		Hard	R420/H125	≥ 300	420	500	125-125	6	13
		Extra hard	R500/H155	≥ 450	500	-	≥155	-	-
CuZn37	EN 1652	Annealed	R300/H055	≤ 180	300	370	55-95	38	48
		1/2 Hard	R350/H095	≥ 170	350	440	95-125	19	28
		Hard	R410/H120	≥ 300	410	490	120-155	8	12
		Extra hard	R480/H150	≥ 430	480	560	150-180	3	-
Spring	R550/H170	≥ 500	550	-	≥ 170	-	-		

• **BRONZE**

APPROXIMATE EQUIVALENCE			CHEMICAL COMPOSITION											Approx. Density
DESIG. EN			DIN DESIG.	ASTM DESIG.	Cu %	Fe %	Ni %	P %	Pb %	Sn %	Zn %	Others %		
Symbolyc	Numeric	Standard												
CuSn4	CW450K	EN 1652	CuSn4	C-51100	rest	≤ 0.1	≤ 0.2	0.01-0.4	≤ 0.02	3.5-4.5	≤ 0.2	≤ 0.2	8.9 g/cm³	
CuSn6	CW452K	EN 1652	CuSn6	C-51900	rest	≤ 0.1	≤ 0.2	0.01-0.4	≤ 0.02	5.5-7.0	≤ 0.2	≤ 0.2	8.8 g/cm³	
CuSn8	CW453K	EN 1652	CuSn8	C-52100	rest	≤ 0.1	≤ 0.2	0.01-0.4	≤ 0.02	7.5-8.5	≤ 0.2	≤ 0.2	8.8 g/cm³	
CuSn3Zn9	CW454K	EN 1652	CuSn3Zn9	-	rest	≤ 0.1	≤ 0.2	≤ 0.2	≤ 0.1	1.5-3.5	7.5-10	≤ 0.2	8.8 g/cm³	

MECHANICAL CHARACTERISTICS

GRADE			Yield point R _{po2}	Tensile strength R _m	Hardness	Minimum elongation A _{50mm}			
Designation	Standard	Status	N/sq mm	N/sq mm		HV	%		
				Min.	Max.		thickness ≤ 2.5 mm	thickness > 2.5 mm	
CuSn4	EN 1652	Annealed	R290/H070	≤ 190	290	390	70-100	40	50
		1/2 Hard	R390/H115	≥ 210	390	490	115-155	11	13
		Hard	R480/H150	≥ 420	480	570	150-180	4	5
		Extra hard	R540/H170	≥ 490	540	630	170-200	3	-
		Spring	R610/H190	≥ 540	610	-	≥ 190	-	-
CuSn6	EN 1652	Annealed	R350/H080	≤ 300	350	420	80-110	45	55
		1/2 Hard	R420/H125	≥ 260	420	520	125-165	17	20
		Hard	R500/H160	≥ 450	500	590	160-190	8	10
		Extra hard	R560/H180	≥ 500	560	650	180-210	5	-
		Spring	R640/H200	≥ 600	640	730	200-230	3	-
Extra hard for spring	R720/H220	≥ 690	720	-	≥ 220	-	-		
CuSn8	EN 1652	Annealed	R370/H090	≤ 300	370	450	90-120	50	60
		1/2 Hard	R450/H135	≥ 280	450	550	135-175	20	23
		Hard	R540/H170	≥ 460	540	630	170-200	13	15
		Extra Hard	R600/H190	≥ 530	600	690	190-220	5	7
		Spring	R660/H210	≥ 620	660	750	210-240	3	-
Extra hard for spring	R740/H230	≥ 700	740	-	≥ 230	2	-		
CuSn3Zn9	EN 1652	Annealed	R320/H080	≤ 230	320	380	80-110	25	30
		1/2 Hard	R380/H110	≥ 200	380	430	110-140	16	22
		Hard	R430/H140	≥ 330	430	520	140-170	6	8
		Extra Hard	R510/H160	≥ 430	510	600	160-190	3	-
		Spring	R580/H180	≥ 520	580	690	180-210	-	-
Extra hard for spring	R660/H200	≥ 610	660	-	≥ 200	-	-		

• **NICKEL SILVER**

APPROXIMATE EQUIVALENCE			CHEMICAL COMPOSITION											Approx. Density
DESIG. EN			DIN DESIG.	ASTM DESIG.	Cu %	Fe %	Mn %	Ni %	Pb %	Sn %	Zn %	Others %		
Symbolyc	Numeric	Standard												
CuNi12Zn24	CW403J	EN 1652	CuNi10Zn24	C-75700	63.0-66.0	≤ 0.3	≤ 0.5	11.0-13.0	≤ 0.03	≤ 0.03	reste	≤ 0.2	8.7 g/cm³	
CuNi18Zn20	CW403J	EN 1652	CuNi18Zn20	C-76400	60.0-63.0	≤ 0.3	≤ 0.5	17.0-19.0	≤ 0.03	≤ 0.03	reste	≤ 0.2	8.7 g/cm³	
CuNi18Zn27	CW410J	EN 1652	CuNi18Zn27	C-77000	53.0-56.0	≤ 0.3	≤ 0.5	17.0-19.0	≤ 0.03	≤ 0.03	reste	≤ 0.2	8.7 g/cm³	

MECHANICAL CHARACTERISTICS

GRADE			Yield point R _{po2}	Tensile strength R _m	Hardness	Minimum elongation A _{50mm}			
Designation	Standard	Status	N/sq mm	N/sq mm		HV	%		
				Min.	Max.		thickness ≤ 2.5 mm	thickness > 2.5 mm	
CuNi12Zn24	EN 1652	Annealed	R360/H080	≤ 230	360	430	80-110	35	45
		1/2 Hard	R430/H110	≥ 230	430	510	110-150	8	15
		Dur	R490/H150	≥ 400	490	580	150-180	-	8
		Extra hard	R550/H170	≥ 480	550	640	170-200	-	-
		Spring	R620/H190	≥ 580	620	-	≥ 190	-	-
CuNi18Zn20	EN 1652	Annealed	R380/H085	≤ 250	380	450	85-115		