

Designation	DIN	EN Nr.	UNS (ASTM)	AISI	LMSA
<b>CuNi15Sn8</b>	-	-	C72900	-	B860/B865

### Chemical composition (weight %)

Cu*	Ni	Sn	Pb
Remainder	14.5 - 15.5%	7.5 - 8.5%	0.02% max.

\* Copper plus additions equal to 99.5% minimum.

In order to achieve maximum homogeneity and consistent quality, the actual tolerances on both alloy components and impurities, are significantly tighter and more precisely defined than the standard analysis indicated.

### Main technical properties

A copper-nickel-tin alloy, which can be cold, worked, and heat-treated to reach very high tensile strengths or hardnesses and in addition it has an excellent corrosion resistance. The Brush Wellman alloy Toughmet 3 is produced using a rapid solidification technique: the EquaCast® process which avoids an excessive chemical segregation. It is suitable for stamping before or after heat treatment (spinodal decomposition). Toughmet 3 is delivered in various tempers: soft annealed, cold deformed and mill hardened. The bendability of the temper TB00, TD01, TD02 and TM00 is excellent in good and bad way. Toughmet 3 is particularly resistant to thermal stress relaxation and to alternate stresses (high fatigue strength). It also offers remarkable dimensional stability after the spinodal decomposition (no-distortion, caused by differential shrinkage).

### Manufacturing range

	Thickness (mm)	Width (mm)	Length (mm)
<b>Rolled products</b> Strips in coils <sup>1)</sup>	0.015 - 2.000	1.5 - 200.0	-
Strips, sheets in <sup>1)</sup>	0.015 - 1.500	10.0 - 200.0	100 - 3000

1) All our production possibilities are not presented here. Other dimensions or other product forms upon request. Certain combinations of thicknesses and widths are not possible.

### Physical properties

Modulus of elasticity, E	kN/mm <sup>2</sup>	127 (18.4 ksi)
Poisson ratio		0.285
Density (specific gravity)	kg/dm <sup>3</sup>	8.94 (0.323lbs/in <sup>3</sup> )
Melting range	°C	950 - 1115 (1742 - 2040°F)
Coefficient of thermal expansion lin. (20-300°C)	/ °C	0,000016
Thermal conductivity at 20°C	W/m °K	28
Electrical resistivity	μΩcm	25,0 - 16,7
Electrical conductivity	MS/m	4 - 6
Electrical conductivity	% IACS	6 - 10
Magnetic properties		non magnetic (slightly diamagnetic to slightly paramagnetic μ = 1,0000 +/- 0,005)

### Typical uses

Toughmet 3 offers a range of mechanical and physical properties making it ideal for the production many parts used in various field of applications field, such as the connector industry (spring contacts, clips, etc.) the watch industry (hands, wheels, bridge, etc.) and the automotive industry.



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## Mechanical properties of strips

<b>Explanations</b>	TB00	Solution heat treated
	TD01-08	Solution heat treated + cold formed
	TX00	TB00+ thermal treatment at customer's plant (370°- 2h-4h)
	TS01-TS08	TD01-TD08 + thermal treatment at customer's plant (TS01-TS03: 370°- 2h-4h; TS04-TS08: 360°- 2h-4h)
	TM00-08	Mill-hardened (no further heat treatment is needed)

Temper				Heat treatment	Rp <sub>0.2</sub> (N/mm <sup>2</sup> )	Rm (N/mm <sup>2</sup> )	A <sub>50mm</sub> (%)	HV
TB00	R440	H100	soft	-/-	170-310	440-590	≥ 32	100-160
TD01	R510	H150	¼ hard	-/-	350-480	510-690	≥ 18	150-220
TD02	R590	H170	½ hard	-/-	450-580	590-760	≥ 8	170-240
TD03	R660	H190	¾ hard	-/-	620-800	660-830	-/-	190-260
TD04	R690	H200	hard	-/-	650-820	690-900	-/-	200-280
TD08	R840	H250	spring	-/-	700-950	840-1000	-/-	250-330

### Mill-hardened tempers

Temper				Heat treatment	Rp <sub>0.2</sub> (N/mm <sup>2</sup> )	Rm (N/mm <sup>2</sup> )	A <sub>50mm</sub> (%)	HV
TM00	R760	H190		Mill-hardened	520-660	760-860	≥ 26	190-270
TM02	R830	H250		tempers. No further	620-760	830-920	≥ 20	250-290
TM04	R900	H260		heat treatment is	720-860	900-980	≥ 14	260-310
TM06	R970	H280		needed.	830-1000	970-1070	≥ 8	280-330
TM08	R1030	H300			960-1170	1030-1230	≥ 6	300-390

### Heat treatment at customer's plant

Temper				Heat treatment	Rp <sub>0.2</sub> (N/mm <sup>2</sup> )	Rm (N/mm <sup>2</sup> )	A <sub>50mm</sub> (%)	HV
TX00	R720	H200	soft + hardened	2h-4h / 370°C	410-700	720-960	≥ 10	200-300
TS01	R850	H250	¼ hard + hardened	2h-4h / 370°C	620-810	850-1050	≥ 6	250-330
TS02	R900	H260	½ hard + hardened	2h-4h / 370°C	720-880	900-1080	≥ 5	260-340
TS04	R1000	H290	hard + hardened	2h-4h / 370°C	900-1050	1000-1180	≥ 3	290-380
TS08	R1100	H320	spring + hardened	2h-4h / 360°C	1050-1210	1100-1360	-/-	320-430

## Bendability

Ratio R/t (radius of curvature/thickness)

G: Good way / B: Bad way

Temper	90°		180°	
	G	B	G	B
<b>TB00</b>	0	0	0	0
<b>TD01</b>	0	0	0	0
<b>TD02</b>	0	0	0	0
<b>TD04</b>	2	3	4	7
<b>TD08</b>	5	10	-	-

Temper	90°		180°	
	G	B	G	B
<b>TM00</b>	0	0	0-0.5	0-1.0
<b>TM02</b>	0-0.5	0-0.5	0-0.5	1-2
<b>TM04</b>	0-2	0-2	1-2	2-3
<b>TM06</b>	1-4	1-7	1-6	2-10
<b>TM08</b>	-	-	-	-



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### Tolerances

Thickness	Thickness (mm)		EN Standard		Lamineries MATTHEY SA		
	≥	<	10140 Precision	10258 Precision	LMSA Standard	LMSA Precision	LMSA Extrem
<p>The table shown is an outline of our typical thickness tolerances available, which are tighter than industry standards.</p> <p>Upon request: our "Precision" and "Extreme" tolerances are also available.</p>		0.025	-	-	-	-	± 0.001
	0.025	0.050	-	-	± 0.003	± 0.002	± 0.0015
	0.050	0.065	-	± 0.003	± 0.003	± 0.0025	± 0.002
	0.065	0.100	-	± 0.004	± 0.004	± 0.0035	± 0.003
	0.100	0.125	± 0.005	± 0.006	± 0.005	± 0.004	± 0.003
	0.125	0.150	± 0.005	± 0.006	± 0.005	± 0.005	± 0.004
	0.150	0.250	± 0.010	± 0.008	± 0.008	± 0.006	± 0.004
	0.250	0.300	± 0.010	± 0.009	± 0.009	± 0.007	± 0.005
	0.300	0.400	± 0.010	± 0.010	± 0.010	± 0.007	± 0.005
	0.400	0.500	± 0.015	± 0.012	± 0.012	± 0.008	± 0.006
	0.500	0.600	± 0.015	± 0.014	± 0.014	± 0.010	± 0.007
	0.600	0.800	± 0.015	± 0.015	± 0.015	± 0.010	± 0.007
	0.800	1.000	± 0.015	± 0.018	± 0.018	± 0.012	± 0.009
	1.000	1.200	± 0.020	± 0.020	± 0.020	± 0.015	± 0.012
	1.200	1.250	± 0.020	± 0.020	± 0.020	± 0.015	± 0.012
1.25	1.500	± 0.020	± 0.020	± 0.020	± 0.015	± 0.014	

### Width

Our width tolerance is + 0.2 -0.0 mm (or ± 0.1 mm upon request). They are available for slit widths < 125 mm and thicknesses < 1.00 mm. Special tolerances upon request.

### Camber

	Width (mm)		Camber max. (mm/m)			
	>	≤	LMSA standard		LMSA extrêmes	
			≤ 0.5 mm	> 0.5 mm	≤ 0.5 mm	> 0.5 mm
<p>Our tolerance "standard" respects the EN Standard 1654 (Length of measurement 1000 mm).</p> <p>Other tolerances upon request.</p>	3	6	12	-	6	-
	6	10	8	10	4	5
	10	20	4	6	2	3
	20	250	2	3	1	1.5

### Surface

Special surface qualities upon request

### Flatness

Special requirement on the longitudinal or transversal flatness upon request