

Designation	DIN	EN Nr.	UNS (ASTM)	AISI	LMSA
CuNi15Sn8	-	-	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 Materion alloy BrushForm® 158 (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). BrushForm® 158 (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. BrushForm® 158 (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)
Rolled products	Strips in coils ¹⁾	0.015 - 2.000	1.5 - 200.0	-
	Strips, sheets in ¹⁾	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 ²	127 (18.4 ksi)
Poisson ratio		0.285
Density (specific gravity)	kg/dm ³	8.94 (0.323lbs/in ³)
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

BrushForm® 158 (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

Explanations	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)
	TM00-12	Mill-hardened (no further heat treatment is needed)

Temper	Heat treatment	Rp _{0.2} (N/mm ²)	Rm (N/mm ²)	A _{50mm} (%)	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 _{0.2} (N/mm ²)	Rm (N/mm ²)	A _{50mm} (%)	HV
TM00 R655 H190	Mill-hardened tempers. No further heat treatment is needed.	515-655	655-795	> 22	190-290
TM02 R725 H215		620-760	725-860	> 15	215-315
TM04 R795 H245		725-860	795-930	> 10	245-345
TM06 R895 H270		825-1000	895-1035	> 6	270-370
TM08 R1035 H305		970-1170	1035-1235	> 2	305-405
TM10 R1205 H370		1140-1345	1205-140	> 1	370-450
TM12 R1240 H380		1205 min.	1240 min.	> 1	380 min.

Heat treatment at customer's plant

Temper	Heat treatment	Rp _{0.2} (N/mm ²)	Rm (N/mm ²)	A _{50mm} (%)	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
TB00	0	0	0	0
TD01	0	0	0	0
TD02	0	0	0	0
TD04	2	3	4	7
TD08	5	10	-	-

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

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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	± 0.0012
	1.200	1.250	± 0.020	± 0.020	± 0.020	± 0.015	± 0.0012
1.25	1.500	± 0.020	± 0.020	± 0.020	± 0.015	± 0.0014	

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
Our tolerance "standard" respects the EN Standard 1654 (Length of measurement 1000 mm).	3	6	12	-	6	-
	6	10	8	10	4	5
	10	20	4	6	2	3
Other tolerances upon request.	20	250	2	3	1	1.5

Surface

Special surface qualities upon request

Flatness

Special requirement on the longitudinal or transversal flatness upon request