

Thermostatic Bimetals

1. Materials and Properties

Grade	Specific Thermal Curvature 20 °C - 130 °C 10 ⁻⁶ /K	Specific Thermal Deflection 20 °C - 100 °C 10 ⁻⁶ /K	Specific Electrical Resistivity at 20 °C Ω • mm ² /m	Linearity Range °C	Max. Operating Temperature °C	Cladding Layer on high exp. side	High Expansion Side	Intermediate Layer	Low Expansion Side	Cladding Layer on low exp. side						
1	TB 230/110	43.0 ± 5 %	22.5	1.08 ± 5 %	+20 to 230		MnNi16Cu10	none	FeNi32Co6							
2	TB 208/110	39.0 ± 5 %	20.8	1.10 ± 5 %	-20 to 200	350	none	MnCu18Ni10	none	FeNi36	none					
3	TB 200/80	38.9 ± 5 %	20.8	0.82 ± 5 %				MnNi16Cu10	FeNi36/Ni							
4	TB 200/60	38.8 ± 5 %	20.6	0.58 ± 5 %					FeNi36/Ni							
5	TB 200/60Fe	38.8 ± 5 %	20.6	0.58 ± 5 %					Fe							
6	TB 200/40	38.5 ± 5 %	20.5	0.40 ± 5 %				FeNi36/Ni								
7	TB 200/40Cu	38.5 ± 5 %	20.5	0.40 ± 10 %				MnCu18Ni10	Cu							
8	TB 200/40Fe	38.5 ± 5 %	20.5	0.40 ± 5 %				MnNi16Cu10	Fe							
9	TB 200/30	38.6 ± 5 %	20.3	0.30 ± 7 %				MnCu18Ni10	Cu							
10	TB 200/25	38.6 ± 5 %	20.3	0.249 ± 7 %					Cu							
11	TB 200/20	38.5 ± 5 %	20.2	0.21 ± 7 %					Cu							
12	TB 200/17	38.4 ± 5 %	20.1	0.166 ± 7 %					Cu							
13	TB 200/15	38.4 ± 5 %	20.1	0.15 ± 7 %					Cu							
14	TB 200/11	37.8 ± 5 %	20.1	0.11 ± 7 %					Cu							
15	TB 200/10	37.5 ± 5 %	20.0	0.10 ± 7 %					Cu							
16	TB 185/08	37.5 ± 5 %	19.4	0.08 ± 10 %					Cu							
17	TB 180/05	33.8 ± 5 %	17.9	0.048 ± 10 %				Cu								
18	TB 175/05	32.4 ± 5 %	17.5	0.05 ± 10 %				Cu								
19	TB 170/03	31.6 ± 5 %	16.2	0.033 ± 15 %				MnNi16Cu10	Cu			FeNi32Co6				
20	TB 140/140	28.4 ± 5 %	14.6	1.40 ± 5 %				MnNi16Cu10	none			FeNi36				
21	TB 140/135	28.5 ± 5 %	14.7	1.35 ± 5 %				MnCu18Ni10	none							
22	TB155/78	28.5 ± 5 %	15.5	0.78 ± 5 %				FeNi20Mn6	none							
23	TB155/78B	28.5 ± 5 %	15.5	0.78 ± 5 %				X60Ni14Mn7	none							
24	TB150/78	27.6 ± 5 %	14.9	0.78 ± 5 %				450								

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25	TB145/78	26.9 ± 5 %	14.5	0.78 ± 5 %	-20 to 200	450	none	none	FeNi36	none
26	TB140/78	26.4 ± 5 %	14.2	0.78 ± 5 %				none		
27	TB150/55	28.2 ± 5 %	15.0	0.55 ± 5 %				none		
28	TB150/55Fe	28.2 ± 5 %	15.0	0.55 ± 5 %				none		
29	TB150/50	28.0 ± 5 %	14.9	0.50 ± 5 %				none		
30	TB150/50Fe	28.0 ± 5 %	14.9	0.50 ± 5 %				none		
31	TB150/45	28.0 ± 5 %	14.9	0.45 ± 5 %				none		
32	TB150/45Fe	28.0 ± 5 %	14.9	0.45 ± 5 %				none		
33	TB148/35	27.4 ± 5 %	14.8	0.35 ± 5 %				none		
34	TB144/30	26.8 ± 5 %	14.4	0.30 ± 5 %				none		
35	TB140/25	26.1 ± 5 %	14.0	0.25 ± 5 %		none				
36	TB150/19	28.2 ± 5 %	15.0	0.19 ± 7 %		400	FeNi20Mn6	Cu		
37	TB150/17	28.2 ± 5 %	15.0	0.17 ± 7 %				Cu		
38	TB150/15	28.1 ± 5 %	15.0	0.15 ± 7 %				Cu		
39	TB150/11	27.8 ± 5 %	15.0	0.11 ± 7 %				Cu		
40	TB145/11	26.9 ± 5 %	14.5	0.11 ± 7 %				Cu		
41	TB130/09	27.0 ± 5 %	14.2	0.09 ± 7 %		275	Cu	Cu		
42	TB130/06	26.2 ± 5 %	13.9	0.060 ± 10 %				none		
43	TB136/06	25.8 ± 5 %	13.6	0.059 ± 10 %				Cu		
44	TB132/03	24.6 ± 5 %	12.7	0.033 ± 15 %		300	none	Cu		
45	TB130/03	24.6 ± 5 %	12.7	0.030 ± 15 %	Cu					
46	TB147/79	27.7 ± 5 %	14.7	0.79 ± 5 %	-20 to 175	450	none	none		
47	TB140/80	27.6 ± 5 %	14.0	0.80 ± 5 %				none		
48	TB140/66	26.4 ± 5 %	14.0	0.668 ± 5 %				FeNi22Cr3		
49	TB140/58	26.4 ± 5 %	14.0	0.582 ± 5 %				Ni		
50	TB139/50	26.4 ± 5 %	14.0	0.500 ± 5 %				Ni		
51	TB139/50Fe	26.3 ± 5 %	14.0	0.500 ± 5 %				Fe		
52	TB138/42	26.3 ± 5 %	13.9	0.417 ± 5 %				Ni		

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53	TB138/42Fe	26.1 ± 5 %	13.9	0.417 ± 5 %	-20 to 175	450	none	FeNi22Cr3	Fe	FeNi36	none				
54	TB134/33	25.7 ± 5 %	13.5	0.332 ± 5 %					Ni						
55	TB130/29	25.3 ± 5 %	13.3	0.291 ± 5 %					Ni						
56	TB127/25	24.4 ± 5 %	13.0	0.245 ± 5 %					Ni						
57	TB127/25Cu	24.4 ± 5 %	13.0	0.245 ± 7 %					400			Cu			
58	TB119/21	23.2 ± 5 %	12.2	0.208 ± 7 %					450			Ni			
59	TB100/17	20.4 ± 5 %	10.7	0.166 ± 7 %					450			Ni			
60	TB138/17	26.3 ± 5 %	13.8	0.161 ± 7 %		400			Cu						
61	TB138/15	26.6 ± 5 %	14.1	0.150 ± 7 %					Cu						
62	TB137/12	26.2 ± 5 %	13.7	0.116 ± 7 %					Cu						
63	TB137/10	26.1 ± 5 %	13.6	0.097 ± 7 %					Cu						
64	TB135/08	25.9 ± 5 %	13.5	0.083 ± 10 %					Cu						
65	TB134/07	25.6 ± 5 %	13.4	0.066 ± 10 %					Cu						
66	TB131/06	25.5 ± 5 %	13.4	0.058 ± 10 %					Cu						
67	TB128/05	24.9 ± 5 %	13.0	0.050 ± 10 %					Cu						
68	TB124/04	24.7 ± 5 %	12.9	0.041 ± 10 %					Cu						
69	TB121/03	22.9 ± 5 %	12.0	0.033 ± 15 %					Cu						
70	TB64/02	12.6 ± 5 %	6.7	0.025 ± 15 %					300			Cu			
71	TB150/74	28.0 ± 5 %	15.1	0.74 ± 5 %					0 to 300			450	FeNi20Mn6	none	FeNi38
72	TB135/78	25.1 ± 5 %	13.5	0.78 ± 5 %					0 to 320			450	FeNi20Mn6	none	FeNi39
73	TB135/78B	25.5 ± 5 %	13.5	0.78 ± 5 %	400	X60Ni14Mn7	none								
74	TB125/09	25.0 ± 5 %	13.4	0.09 ± 7 %	400	Cu									
75	TB124/09	24.0 ± 5 %	12.9	0.09 ± 7 %	70 to 230	450	none								
76	TB134/75	25.5 ± 5 %	13.4	0.75 ± 5 %			FeNi22Cr3	Ni							
77	TB131/42	25.1 ± 5 %	13.3	0.416 ± 5 %			Ni								
78	TB130/33	24.9 ± 5 %	13.0	0.332 ± 5 %			Ni								
79	TB128/29	24.4 ± 5 %	12.8	0.291 ± 5 %			Ni								
80	TB118/21	22.7 ± 5 %	11.9	0.208 ± 7 %	-20 to 250	Ni									

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81	TB125/17	24.2 ± 5 %	12.7	0.166 ± 7 %	-20 to 250	400	none	FeNi22Cr3	Cu	FeNi39	none	
82	TB131/15	25.1 ± 5 %	13.2	0.150 ± 7 %					Cu			
83	TB131/12	25.0 ± 5 %	13.1	0.116 ± 7 %					Cu			
84	TB130/08	25.0 ± 5 %	13.0	0.088 ± 7 %					Cu			
85	TB128/08	24.5 ± 5 %	12.8	0.083 ± 8 %					Cu			
86	TB125/07	23.8 ± 5 %	12.4	0.066 ± 8 %					Cu			
87	TB115/05	22.4 ± 5 %	11.7	0.05 ± 10 %					Cu			
88	TB115/70	22.0 ± 5 %	11.7	0.70 ± 5 %	-20 to 380	450	none	FeNi20Mn6	FeNi42	none		
89	TB115/70B	22.0 ± 5 %	11.7	0.70 ± 5 %				450			X60Ni14Mn7	none
90	TB115/09	21.6 ± 5 %	11.5	0.09 ± 7 %				400			FeNi20Mn6	Cu
91	TB110/70	21.0 ± 5 %	11.1	0.70 ± 5 %				450				none
92	TB110/09	20.7 ± 5 %	11.0	0.09 ± 7 %				400				Cu
93	TB113/69	21.4 ± 5 %	11.3	0.69 ± 5 %	90 to 320	450	none	FeNi22Cr3	FeNi46	none		
94	TB98/72	18.5 ± 5 %	9.8	0.72 ± 5 %				500			FeNi22Cr8.5	none
95	TB81/66	15.3 ± 5 %	8.1	0.66 ± 5 %				120 to 370			540	FeNi22Cr8.5
96	TB100/65	18.6 ± 5 %	10.0	0.65 ± 5 %	-20 to 425	450	CrNi-Steel	FeNi22Cr8.5	FeNi46	none		
97	TB100/65R	17.0 ± 5 %	9.0	0.62 ± 7 %	-20 to 425	450		FeNi20Mn6			none	
98	TB180/108R	33.5 ± 5 %	17.5	1.08 ± 5 %	-20 to 200	350	FeNi22Cr3	MnCu18Ni10	FeNi36	none		
99	TB103/138R	19.8 ± 5 %	10.3	1.38 ± 5 %				FeNi22Cr3			MnCu18Ni10	none
100	TB135/91	25.5 ± 5 %	13.5	0.91 ± 5 %		450	CrNi-Steel	FeNi20Mn6			MnNi16Cu10	
101	TB155/78R	27.5 ± 5 %	14.5	0.78 ± 5 %							none	none
102	TB155/78RR	24.6 ± 5 %	13.0	0.75 ± 7 %	-20 to 225	450	CrNi-Steel	FeNi20Mn6	Cr-Steel			
103	TB60/20R	11.4 ± 5 %	6.0	0.20 ± 10 %	-20 to 450			none	none	Fe	Ni	
104	TB102/85	19.6 ± 5 %	10.2	0.85 ± 5 %	-20 to 180	525	none	FeNi18Cr12	FeNi31Co8Cr6	none		
105	TB52/65	10.0 ± 7 %	5.2	0.65 ± 7 %	-20 to 600			550	CrNi-Steel		Cr-Steel	
106	TB103/81	19.4 ± 5 %	10.3	0.81 ± 5 %	-20 to 300			350	MnNi16Cu10		CuNi44Mn1	
107	TB97/16	18.2 ± 5 %	9.8	0.16 ± 5 %	-20 to 220			400	Ni		FeNi36	

Thickness Tolerances (in mm)

Thickness	Width ≤ 75	Width > 75 - 125	Width > 125 - 250
0.10 - 0.15	± 0.010	± 0.010	± 0.020
> 0.15 - 0.25	± 0.010	± 0.015	± 0.020
> 0.25 - 0.40	± 0.015	± 0.020	± 0.025
> 0.40 - 0.60	± 0.020	± 0.025	± 0.030
> 0.60 - 1.00	± 0.025	± 0.030	± 0.040
> 1.00 - 1.50	± 0.030	± 0.040	± 0.050
> 1.50 - 2.00	± 0.050	± 0.050	± 0.060

Other thicknesses and tolerances on request.

Width Tolerances (in mm)

Width	Thickness ≤ 1.5	Thickness > 1.50 - 2.00
≤ 75	+ 0.2	+ 0.4
> 75 - 125	+ 0.3	+ 0.5
> 125 - 250	+ 0.5	+ 0.8

Other width and tolerances on request.

Product Forms / Delivery Forms (in mm)

Form	Thickness	Width	Length	Coil-ID	Coil-OD
Strip	0.10 - 2.00	3 - 2.50		300 / 400 / 500	max. 1100
Sheet	0.60 - 2.00	8 - 250	500 - 3000		
Snap action disc strip	0.1 - 0.4	10 - 60		300 / 400 / 500 (on core)	

Thickness Tolerances (Snap action disc strip) (in mm)

Thickness	Tolerances
≤ 0.2	± 0.004
> 0.2 - 0.4	± 2%

Other thicknesses and tolerances on request.

Length Tolerances (Cut Length) (in mm)

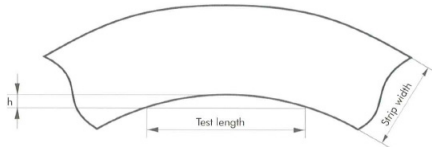
Thickness	Length 500 - 1000	Length > 1000 - 1300
0.60 - 2.00	+ 10	+ 1%

Other length and tolerances on request.

5. Dimension tolerances for stretch-levelled strip

Straightness of strip edge in longitudinal direction (edge camber)

The allowed straightness deviation is stipulated in DIN 1715 and measured on a test piece having a length of 1.000 mm.

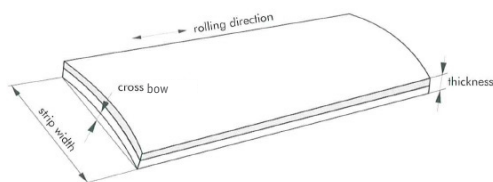


Tighter edge camber tolerance can be agreed.

strip width mm	max. deviation h from straight line mm
≤ 10	by arrangement
> 10 to 25	5
> 25 to 40	3.5
> 40 to 125	2.5
> 125	2

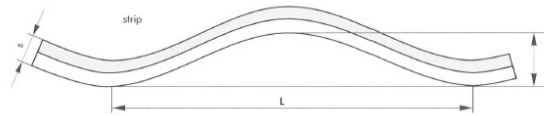
Surface flatness across strip width (cross bow)

The cross curvature can be agreed depending on strip width, strip thickness and material.



Surface flatness in rolling direction (waviness)

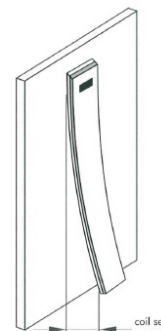
The waviness is the ratio of wave height h to wavelength L and stipulated in DIN 1715.



Thickness s mm	Waviness h/L %
≤ 1.00	max. 3
> 1.00	max. 2

Surface flatness in rolling direction (coil set)

Coil set can be agreed. It can be confirmed in rolling direction, in the opposite direction or with a +/- tolerance. The test is carried out on a 300 mm long test piece hanging on a measuring device.



Edge properties

The standard production route provides strip with low slitting burr edges. The burr must not exceed 10 % of the strip thickness for material having a strip thickness up to 0.50 mm. For a thickness above 0.50 mm, the burr must not exceed 0.050 mm in height. Deburred or rounded edges can be agreed for a strip thickness of 0.5 to 1.5 mm. The edge radius for rounded edges can be 10 % to 40 % of the strip thickness with a minimum radius of 0.1 mm and a maximum radius of 0.5 mm. The minimum edge radius tolerance can be agreed and represents +/- 0.05 mm of the nominal edge radius.

6. Marking

A permanent marking is applied to the high expansion side of the strip, preferable by an etching process. This marking must not affect the thermostatic bimetal properties. If required, the marking can be embossed on strip having a minimum thickness of 0.60 mm. Delivery of strip marked on the low expansion side or without any marking has to be agreed separately.

7. Packaging

The correct form of packaging is chosen to ensure protection of the strip quality. The strip is temporarily protected by an anti-corrosion oil.

Standard Continental Packing:

Pallet type (mm)	700 x 700, 800 x 800, 1000 x 1000, Euro pallet 800 x 1200
Ties	3 x plastic tie fastenings
Individual coil wrapping	none
Intermediate layers	cardboard disks
Stack height	max. 600 mm included pallet
Shrink-wrap foil	covering stack
Labelling	each pallet

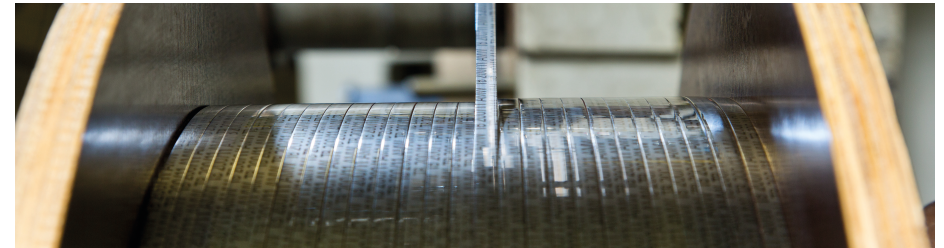
Standard Sea Freight Packing:

Pallet type	wooden box
Ties	3 x plastic tie fastenings
Individual coil wrapping	corrosion protective paper
Intermediate layers	none
Stack height	max. 600 mm incl. crate
Shrink-wrap foil	sealing stack completely
Labelling	each

Other packing as well as delivery on reels upon agreement.



All data contained in this document are for information purposes only. Other properties can be engineered according to customer specifications. Guarantees of specific characteristics or applications require special written agreement.



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Portfolio Auerhammer :

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