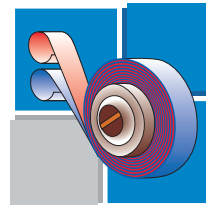
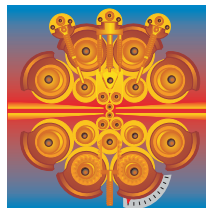


Thermostatic Bimetals

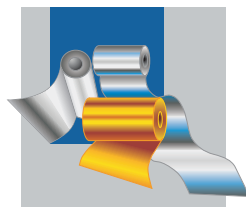


Clad Materials



Metal Strips

- Soft-magnetic Iron-Nickel-Alloys
- Sealing and Expansion Alloys
- Nickel
- Nickel-Chromium-Alloys
- Nickel-Copper-Alloys
- Copper-Nickel-Alloys
- Nickel-Manganese-Alloys



Metallic Foils

Product group:

Thermostatic Bimetals

1. MATERIALS AND PROPERTIES

NUMBER	TYPE	SPEC. THERMAL CURVATURE 20 °C - 130 °C	SPECIFIC DEFLECTION 20 °C - 100 °C	ELECTRICAL RESISTIVITY AT 20 °C	LINEARITY RANGE	MAX. OPERATING TEMPERATURE
		10 ⁻⁶ /K	10 ⁻⁶ /K	μΩ • m	°C	°C
1	TB 230/110	43.0 ± 5 %	22.5	1.08 ± 5 %	+20 up to 230	350
2	TB 210/10	39.0 ± 5 %	20.8	0.10 ± 7 %	-20 up to 200	350
3	TB 208/110	39.0 ± 5 %	20.8	1.10 ± 5 %	-20 up to 200	350
4	TB 200/108	37.5 ± 5 %	20.0	1.08 ± 5 %	-20 up to 200	350
5	TB 200/80	38.9 ± 5 %	20.8	0.82 ± 5 %	-20 up to 200	350
6	TB 200/60	38.8 ± 5 %	20.6	0.58 ± 5 %	-20 up to 200	350
7	TB 200/60Fe	38.8 ± 5 %	20.6	0.58 ± 5 %	-20 up to 200	350
8	TB 200/40	38.5 ± 5 %	20.5	0.40 ± 5 %	-20 up to 200	350
9	TB 200/40Cu	38.5 ± 5 %	20.5	0.40 ± 10 %	-20 up to 200	350
10	TB 200/40Fe	38.5 ± 5 %	20.5	0.40 ± 5 %	-20 up to 200	350
11	TB 200/30	38.6 ± 5 %	20.3	0.30 ± 7 %	-20 up to 200	350
12	TB 200/25	38.6 ± 5 %	20.3	0.249 ± 7 %	-20 up to 200	350
13	TB 200/20	38.5 ± 5 %	20.2	0.21 ± 7 %	-20 up to 200	350
14	TB 200/17	38.4 ± 5 %	20.1	0.166 ± 7 %	-20 up to 200	350
15	TB 200/15	38.4 ± 5 %	20.1	0.15 ± 7 %	-20 up to 200	350
16	TB 200/11	37.8 ± 5 %	20.1	0.11 ± 7 %	-20 up to 200	350
17	TB 200/10	37.5 ± 5 %	20.0	0.10 ± 7 %	-20 up to 200	350
18	TB 185/08	37.0 ± 5 %	19.0	0.08 ± 10 %	-20 up to 200	350
19	TB 180/05	33.8 ± 5 %	17.9	0.048 ± 10 %	-20 up to 200	350
20	TB 175/05	32.4 ± 5 %	17.5	0.05 ± 10 %	-20 up to 200	350
21	TB 170/03	31.6 ± 5 %	16.2	0.033 ± 15 %	-20 up to 200	350
22	TB 140/140	28.4 ± 5 %	14.6	1.40 ± 5 %	-20 up to 200	350
23	TB 140/135	28.5 ± 5 %	14.7	1.35 ± 5 %	-20 up to 200	350
24	TB 155/78	28.5 ± 5 %	15.5	0.78 ± 5 %	-20 up to 200	450
25	TB 155/78B	28.5 ± 5 %	15.5	0.78 ± 5 %	-20 up to 200	450
26	TB 150/78	27.6 ± 5 %	14.9	0.78 ± 5 %	-20 up to 200	450
27	TB 145/78	26.9 ± 5 %	14.5	0.78 ± 5 %	-20 up to 200	450
28	TB 140/78	26.4 ± 5 %	14.2	0.78 ± 5 %	-20 up to 200	450
29	TB 150/55	28.2 ± 5 %	15.0	0.55 ± 5 %	-20 up to 200	450
30	TB 150/55Fe	28.2 ± 5 %	15.0	0.55 ± 5 %	-20 up to 200	450
31	TB 150/50	28.0 ± 5 %	14.9	0.50 ± 5 %	-20 up to 200	450
32	TB 150/50Fe	28.0 ± 5 %	14.9	0.50 ± 5 %	-20 up to 200	450
33	TB 150/45	28.0 ± 5 %	14.9	0.45 ± 5 %	-20 up to 200	450
34	TB 150/45Fe	28.0 ± 5 %	14.9	0.45 ± 5 %	-20 up to 200	450
35	TB 148/35	27.4 ± 5 %	14.8	0.35 ± 5 %	-20 up to 200	450
36	TB 144/30	26.8 ± 5 %	14.4	0.30 ± 5 %	-20 up to 200	450
37	TB 140/25	26.1 ± 5 %	14.0	0.25 ± 5 %	-20 up to 200	450
38	TB 150/19	28.2 ± 5 %	15.0	0.19 ± 7 %	-20 up to 200	400
39	TB 150/17	28.2 ± 5 %	15.0	0.17 ± 7 %	-20 up to 200	400
40	TB 150/15	28.1 ± 5 %	15.0	0.15 ± 7 %	-20 up to 200	400
41	TB 150/11	27.8 ± 5 %	15.0	0.11 ± 7 %	-20 up to 200	400
42	TB 145/11	26.9 ± 5 %	14.5	0.11 ± 7 %	-20 up to 200	400
43	TB 130/09	27.0 ± 5 %	14.2	0.09 ± 7 %	-20 up to 200	400
44	TB 130/06	26.2 ± 5 %	13.9	0.060 ± 10 %	-20 up to 200	400
45	TB 136/06	25.8 ± 5 %	13.6	0.059 ± 10 %	-20 up to 200	275
46	TB 132/03	24.6 ± 5 %	12.7	0.033 ± 15 %	-20 up to 200	275
47	TB 130/03	24.6 ± 5 %	12.7	0.030 ± 15 %	-20 up to 200	400
48	TB 140/80	26.4 ± 5 %	14.0	0.800 ± 5 %	-20 up to 175	450
49	TB 140/66	26.4 ± 5 %	14.0	0.668 ± 5 %	-20 up to 175	450
50	TB 140/58	26.4 ± 5 %	14.0	0.582 ± 5 %	-20 up to 175	450
51	TB 139/50	26.3 ± 5 %	14.0	0.500 ± 5 %	-20 up to 175	450
52	TB 138/42	26.1 ± 5 %	13.9	0.417 ± 5 %	-20 up to 175	450
53	TB 138/42Fe	26.1 ± 5 %	13.9	0.417 ± 5 %	-20 up to 175	450
54	TB 134/33	25.7 ± 5 %	13.5	0.332 ± 5 %	-20 up to 175	450
55	TB 130/29	25.3 ± 5 %	13.3	0.291 ± 5 %	-20 up to 175	450
56	TB 127/25	24.4 ± 5 %	13.0	0.245 ± 5 %	-20 up to 175	450
57	TB 127/25Cu	24.4 ± 5 %	13.0	0.245 ± 7 %	-20 up to 175	400
58	TB 119/21	23.2 ± 5 %	12.2	0.208 ± 7 %	-20 up to 175	450

Table continued overleaf !

NUMBER	TYPE	SPEC. THERMAL CURVATURE 20 °C - 130 °C	SPECIFIC DEFELCTION 20 °C - 100 °C	ELECTRICAL RESISTIVITY AT 20 °C	LINEARITY RANGE	MAX. OPERATING TEMPERATURE
		10 ⁻⁶ /K	10 ⁻⁶ /K	μΩ · m	°C	°C
59	TB 100/17	20.4 ± 5 %	10.7	0.166 ± 7 %	-20 up to 175	450
60	TB 138/17	26.3 ± 5 %	13.8	0.161 ± 7 %	-20 up to 175	400
61	TB 138/15	26.3 ± 5 %	13.8	0.150 ± 7 %	-20 up to 175	400
62	TB 137/12	26.2 ± 5 %	13.7	0.116 ± 7 %	-20 up to 175	400
63	TB 137/10	26.1 ± 5 %	13.6	0.097 ± 7 %	-20 up to 175	400
64	TB 135/08	25.9 ± 5 %	13.5	0.083 ± 10 %	-20 up to 175	400
65	TB 134/07	25.6 ± 5 %	13.4	0.066 ± 10 %	-20 up to 175	400
66	TB 131/06	25.5 ± 5 %	13.4	0.058 ± 10 %	-20 up to 175	400
67	TB 128/05	24.9 ± 5 %	13.0	0.050 ± 10 %	-20 up to 175	400
68	TB 124/04	24.7 ± 5 %	12.9	0.041 ± 10 %	-20 up to 175	400
69	TB 121/03	22.9 ± 5 %	12.0	0.033 ± 15 %	-20 up to 175	400
70	TB 64/02	12.5 ± 5 %	6.6	0.025 ± 15 %	-20 up to 175	400
71	TB 150/74	28.0 ± 5 %	15.1	0.74 ± 5 %	0 up to 300	450
72	TB 135/78	25.1 ± 5 %	13.5	0.78 ± 5 %	0 up to 320	450
73	TB 135/35	25.1 ± 5 %	13.5	0.35 ± 5 %	0 up to 320	450
74	TB 125/09	25.0 ± 5 %	13.4	0.09 ± 7 %	0 up to 320	400
75	TB 124/09	24.0 ± 5 %	12.9	0.09 ± 7 %	0 up to 320	400
76	TB 131/42	25.1 ± 5 %	13.3	0.416 ± 5 %	-20 up to 250	450
77	TB 130/33	24.9 ± 5 %	13.0	0.332 ± 5 %	-20 up to 250	450
78	TB 128/29	24.4 ± 5 %	12.8	0.291 ± 5 %	-20 up to 250	450
79	TB 118/21	22.7 ± 5 %	11.9	0.208 ± 7 %	-20 up to 250	450
80	TB 125/17	24.2 ± 5 %	12.7	0.166 ± 7 %	-20 up to 250	400
81	TB 131/15	25.1 ± 5 %	13.2	0.150 ± 7 %	-20 up to 250	400
82	TB 131/12	25.0 ± 5 %	13.1	0.116 ± 7 %	-20 up to 250	400
83	TB 128/08	24.5 ± 5 %	12.8	0.083 ± 8 %	-20 up to 250	400
84	TB 125/07	23.8 ± 5 %	12.4	0.066 ± 8 %	-20 up to 250	400
85	TB 115/05	22.4 ± 5 %	11.7	0.05 ± 10 %	-20 up to 250	400
86	TB 115/70	22.0 ± 5 %	11.7	0.70 ± 5 %	-20 up to 380	450
87	TB 115/70B	22.0 ± 5 %	11.7	0.70 ± 5 %	-20 up to 380	450
88	TB 115/09	21.6 ± 5 %	11.5	0.09 ± 7 %	-20 up to 380	400
89	TB 110/70	21.0 ± 5 %	11.1	0.70 ± 5 %	-20 up to 380	450
90	TB 110/09	20.7 ± 5 %	11.0	0.09 ± 7 %	-20 up to 380	400
91	TB 100/65	18.6 ± 5 %	10.0	0.65 ± 5 %	-20 up to 425	450
92	TB 180/108R	33.5 ± 5 %	18.0	1.08 ± 5 %	-20 up to 200	350
93	TB 155/78R	27.5 ± 5 %	14.5	0.78 ± 5 %	-20 up to 200	450
94	TB 155/78RR	24.6 ± 5 %	13.0	0.75 ± 7 %	-20 up to 225	450
95	TB 100/65R	17.0 ± 5 %	9.0	0.62 ± 7 %	-20 up to 425	450
96	TB 60/20R	11.4 ± 5 %	6.0	0.20 ± 10 %	-20 up to 450	450
97	TB 102/85	19.6 ± 5 %	10.2	0.85 ± 5 %	-20 up to 180	525
98	TB 52/65	10.0 ± 7 %	5.2	0.65 ± 7 %	-20 up to 600	550
99	TB 103/81	19.4 ± 5 %	10.3	0.81 ± 5 %	-20 up to 300	350
100	TB 97/16	18.6 ± 5 %	9.8	0.16 ± 5 %	-20 up to 220	400

Other types and tolerances on request. Properties without indication of tolerances are standard values.

2. COMPONENTS AND ADDITIONELL LAYERS

NUMBER	TYPE	CLADDING LAYER ON HIGH EXP. SIDE	HIGH EXPANSION SIDE	INTERMEDIATE LAYER	LOW EXPANSION SIDE	CLADDING LAYER ON LOW EXP. SIDE
1	TB 230/110	none	MnNi16Cu10	none	FeNi32Co6	none
2	TB 210/10	none	MnNi16Cu10	Cu	FeNi36	none
3	TB 208/110	none	MnCu18Ni10	none	FeNi36	none
4	TB 200/108	none	MnCu18Ni10	none	FeNi36	none
5	TB 200/80	none	MnNi16Cu10	FeNi36/Ni	FeNi36	none
6	TB 200/60	none	MnNi16Cu10	FeNi36/Ni	FeNi36	none
7	TB 200/60Fe	none	MnNi16Cu10	Fe	FeNi36	none
8	TB 200/40	none	MnNi16Cu10	FeNi36/Ni	FeNi36	none
9	TB 200/40Cu	none	MnCu18Ni10	Cu	FeNi36	none
10	TB 200/40Fe	none	MnNi16Cu10	Fe	FeNi36	none
11	TB 200/30	none	MnCu18Ni10	Cu	FeNi36	none
12	TB 200/25	none	MnCu18Ni10	Cu	FeNi36	none
13	TB 200/20	none	MnCu18Ni10	Cu	FeNi36	none
14	TB 200/17	none	MnCu18Ni10	Cu	FeNi36	none
15	TB 200/15	none	MnCu18Ni10	Cu	FeNi36	none
16	TB 200/11	none	MnCu18Ni10	Cu	FeNi36	none
17	TB 200/10	none	MnCu18Ni10	Cu	FeNi36	none
18	TB 185/08	none	MnCu18Ni10	Cu	FeNi36	none
19	TB 180/05	none	MnCu18Ni10	Cu	FeNi36	none
20	TB 175/05	none	MnCu18Ni10	Cu	FeNi36	none
21	TB 170/03	none	MnNi16Cu10	Cu	FeNi32Co6	none
22	TB 140/140	none	MnNi16Cu10	none	FeNi36	none
23	TB 140/135	none	MnCu18Ni10	none	FeNi36	none
24	TB 155/78	none	FeNi20Mn6	none	FeNi36	none
25	TB 155/78B	none	X60Ni14Mn7	none	FeNi36	none
26	TB 150/78	none	FeNi20Mn6	none	FeNi36	none
27	TB 145/78	none	FeNi20Mn6	none	FeNi36	none
28	TB 140/78	none	FeNi20Mn6	none	FeNi36	none
29	TB 150/55	none	FeNi20Mn6	Ni	FeNi36	none
30	TB 150/55Fe	none	FeNi20Mn6	Fe	FeNi36	none
31	TB 150/50	none	FeNi20Mn6	Ni	FeNi36	none
32	TB 150/50Fe	none	FeNi20Mn6	Fe	FeNi36	none
33	TB 150/45	none	FeNi20Mn6	Ni	FeNi36	none
34	TB 150/45Fe	none	FeNi20Mn6	Fe	FeNi36	none
35	TB 148/35	none	FeNi20Mn6	Ni	FeNi36	none
36	TB 144/30	none	FeNi20Mn6	Ni	FeNi36	none
37	TB 140/25	none	FeNi20Mn6	Ni	FeNi36	none
38	TB 150/19	none	FeNi20Mn6	Cu	FeNi36	none
39	TB 150/17	none	FeNi20Mn6	Cu	FeNi36	none
40	TB 150/15	none	FeNi20Mn6	Cu	FeNi36	none
41	TB 150/11	none	FeNi20Mn6	Cu	FeNi36	none
42	TB 145/11	none	FeNi20Mn6	Cu	FeNi36	none
43	TB 130/09	none	FeNi20Mn6	Cu	FeNi36	none
44	TB 130/06	none	FeNi20Mn6	Cu	FeNi36	none
45	TB 136/06	Cu	FeNi20Mn6	none	FeNi36	none
46	TB 132/03	none	FeNi20Mn6	Cu	FeNi36	none
47	TB 130/03	none	FeNi20Mn6	Cu	FeNi36	none
48	TB 140/80	none	FeNi22Cr3	none	FeNi36	none
49	TB 140/66	none	FeNi22Cr3	Ni	FeNi36	none
50	TB 140/58	none	FeNi22Cr3	Ni	FeNi36	none
51	TB 139/50	none	FeNi22Cr3	Ni	FeNi36	none
52	TB 138/42	none	FeNi22Cr3	Ni	FeNi36	none
53	TB 138/42Fe	none	FeNi22Cr3	Fe	FeNi36	none
54	TB 134/33	none	FeNi22Cr3	Ni	FeNi36	none
55	TB 130/29	none	FeNi22Cr3	Ni	FeNi36	none
56	TB 127/25	none	FeNi22Cr3	Ni	FeNi36	none
57	TB 127/25Cu	none	FeNi22Cr3	Cu	FeNi36	none
58	TB 119/21	none	FeNi22Cr3	Ni	FeNi36	none
59	TB 100/17	none	FeNi22Cr3	Ni	FeNi36	none
60	TB 138/17	none	FeNi22Cr3	Cu	FeNi36	none
61	TB 138/15	none	FeNi22Cr3	Cu	FeNi36	none
62	TB 137/12	none	FeNi22Cr3	Cu	FeNi36	none
63	TB 137/10	none	FeNi22Cr3	Cu	FeNi36	none
64	TB 135/08	none	FeNi22Cr3	Cu	FeNi36	none
65	TB 134/07	none	FeNi22Cr3	Cu	FeNi36	none
66	TB 131/06	none	FeNi22Cr3	Cu	FeNi36	none
67	TB 128/05	none	FeNi22Cr3	Cu	FeNi36	none
68	TB 124/04	none	FeNi22Cr3	Cu	FeNi36	none
69	TB 121/03	none	FeNi22Cr3	Cu	FeNi36	none
70	TB 64/02	none	FeNi22Cr3	Cu	FeNi36	none
71	TB 150/74	none	FeNi20Mn6	none	FeNi38	none
72	TB 135/78	none	FeNi20Mn6	none	FeNi39	none
73	TB 135/35	none	FeNi20Mn6	Ni	FeNi39	none
74	TB 125/09	none	FeNi20Mn6	Cu	FeNi39	none
75	TB 124/09	none	FeNi20Mn6	Cu	FeNi39	none
76	TB 131/42	none	FeNi22Cr3	Ni	FeNi39	none
77	TB 130/33	none	FeNi22Cr3	Ni	FeNi39	none

Table continued overleaf !

NUMBER	TYPE	CLADDING LAYER ON HIGH EXP. SIDE	HIGH EXPANSION SIDE	INTERMEDIATE LAYER	LOW EXPANSION SIDE	CLADDING LAYER ON LOW EXP. SIDE
78	TB 128/29	none	FeNi22Cr3	Ni	FeNi39	none
79	TB 118/21	none	FeNi22Cr3	Ni	FeNi39	none
80	TB 125/17	none	FeNi22Cr3	Cu	FeNi39	none
81	TB 131/15	none	FeNi22Cr3	Cu	FeNi39	none
82	TB 131/12	none	FeNi22Cr3	Cu	FeNi39	none
83	TB 128/08	none	FeNi22Cr3	Cu	FeNi39	none
84	TB 125/07	none	FeNi22Cr3	Cu	FeNi39	none
85	TB 115/05	none	FeNi22Cr3	Cu	FeNi39	none
86	TB 115/70	none	FeNi20Mn6	none	FeNi42	none
87	TB 115/70B	none	X60Ni14Mn7	none	FeNi42	none
88	TB 115/09	none	FeNi20Mn6	Cu	FeNi42	none
89	TB 110/70	none	FeNi20Mn6	none	FeNi42	none
90	TB 110/09	none	FeNi20Mn6	Cu	FeNi42	none
91	TB 100/65	none	FeNi20Mn6	none	FeNi46	none
92	TB 180/108R	FeNi22Cr3	MnCu18Ni10	none	FeNi36	none
93	TB 155/78R	CrNi-steel	FeNi20Mn6	none	FeNi36	none
94	TB 155/78RR	CrNi-steel	FeNi20Mn6	none	FeNi36	Cr-steel
95	TB 100/65R	CrNi-steel	FeNi20Mn6	none	FeNi46	none
96	TB 60/20R	none	FeNi20Mn6	none	Fe	Ni
97	TB 102/85	none	FeNi18Cr12	none	FeNi31Co8Cr6	none
98	TB 52/65	none	CrNi-steel	none	Cr-steel	none
99	TB 103/81	none	MnNi16Cu10	none	CuNi44Mn1	none
100	TB 97/16	none	Ni	none	FeNi36	none

Other types on request.

3. DIMENSIONS AND TOLERANCES

(mm)

THICKNESS TOLERANCES

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 thickness and tolerances on request.

WIDTH TOLERANCES

WIDTH	THICKNESS ≤ 1.50	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.

LENGTH TOLERANCES (CUT LENGTH)

THICKNESS	LENGTH 500 - 1000	LENGTH > 1000 - 3000
0.60 - 2.00	+ 10	+ 1 %

Other tolerances on request.

4. PRODUCT FORM

(mm)

FORM	THICKNESS	WIDTH	LENGTH	COIL-ID	COIL-OD
Strip	0.10 - 2.00	3 - 250		300/400/500	max. 1100
Cut length	0.60 - 2.00	8 - 250	500 - 3000		

Other form on request.

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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