Nickel & Nickel-Alloys

Auerhammer Metallwerk
Wickeder Group

1. Alloys

Alloy	Material | UNS No.	Standard
Ni99.6	2.4060	DIN 17740 / DIN 17750
LC-Ni99.6	2.4061	DIN 17740 / DIN 17750
Ni99.2	2.4066 / N02200	DIN 17740 / DIN 17750 / ASTM B162
LC-Ni99	2.4068 / N02201	DIN 17740 / DIN 17750 / ASTM B162
Ni233	N02233	ASTM F3
Ni300	N03300	ASTM F290

2. Chemical composition (Reference values in % w/w)

Alloy		Ni (+Co)	C	Cu	Fe	Mg	Mn	S	Si	Ti
Ni99.6	min.	99.6								
	max.		0.08	0.15	0.25	0.15	0.35	0.005	0.15	0.10
LC-Ni99.6	min.	99.6								
	max.		0.02	0.15	0.25	0.15	0.35	0.005	0.15	0.10
R-Ni99.2	min.	99.2								
	max.		0.10	0.25	0.40	0.15	0.35	0.005	0.25	0.10
LC-Ni99	min.	99.0								
	max.		0.02	0.25	0.40	0.15	0.35	0.005	0.25	0.10
Ni233	min.	99.0				0.01				
	max.		0.10	0.10	0.10	0.10	0.30	0.008	0.10	0.005
Ni300	min.	97.0				0.20				0.20
	max.		0.40	0.25	0.60	0.50	0.50	0.01	0.35	0.60

3. Physical properties

Alloy	Densitiy	Specific electrical resistivity at 20 °C	Average linear thermal expansion coefficient 20 °C - 100 °C	Curie temperature
	g/cm^3	$\Omega \cdot mm^2/m$	$10^{-6}/K$	°C
BR-Ni99.6	8.9	0.09	13	360
LC-Ni99.6				
R-Ni99.2				
LC-Ni99				
Ni233				
Ni300	8.75	0.16	13	-

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4. Mechanical properties (Reference values)

Alloy	Condition	Tensile strength	Elongation	Vickers hardness
		MPa	%	HV
BR-Ni99.6	annealed	min. 370	min. 40	max. 130
	quarter hard	min. 490	min. 15	ca. 150
	hard	min. 590	min. 2	ca. 200
LC-Ni99.6	annealed	min. 340	min. 40	max. 130
	quarter hard	min. 430	min. 15	ca. 150
R-Ni99.2	annealed	min. 370	min. 40	max. 130
	quarter hard	min. 490	min. 15	ca. 150
	hard	min. 590	min. 2	ca. 200
LC-Ni99	annealed	min. 340	min. 40	max. 130
	quarter hard	min. 430	min. 15	ca. 150
	hard	min. 540	min. 5	ca. 180
Nickel 233	annealed	min. 370	min. 40	max. 130
	quarter hard	min. 490	min. 15	ca. 150
	hard	min. 590	min. 2	ca. 200
Nickel 300	annealed	min. 600	min. 15	max. 180
	hard	min. 900	min. 2	ca. 320

5. Dimensions and tolerances: Thickness & Width (in mm)

Thickness	Width 10 -100	Width > 100 - 200	Width > 200 - 320
0.10 - 0.15	+/- 0.008	+/- 0.010	+/- 0.010
> 0.15 - 0.20	+/- 0.010	+/- 0.015	+/- 0.015
> 0.20 - 0.35	+/- 0.015	+/- 0.015	+/- 0.020
> 0.35 - 0.50	+/- 0.020	+/- 0.020	+/- 0.025
> 0.50 - 1.00	+/- 0.025	+/- 0.025	+/- 0.030
> 1.00 - 1.50	+/- 0.030	+/- 0.030	+/- 0.040
> 1.50 - 2.20	+/- 0.040	+/- 0.040	+/- 0.050
> 2.20 - 3.00	+/- 0.050	+/- 0.050	+/- 0.060

Width	Thickness 0.10 - 1.00	Thickness > 1.00 - 1.80	Thickness > 1.80 - 2.50	Thickness > 2.50 - 3.00
10 - 100	+ 0.2	+ 0.3	+ 0.5	+ 1.0
> 100 - 200	+ 0.3	+ 0.5	+ 0.7	+ 1.2
> 200 - 320	+ 0.6	+ 1.0	+ 1.2	+ 1.5

Length (in mm)

Thickness	Length 500 - 3000
0.4 - 2.00	+ 10

7. Delivery forms (in mm)

Form	Thickness	Width	Length	Coil-ID	Coil-OD
Coil	0.10 - 3.00	10 - 320		300 / 400 / 500	max. 1050
Strip / Sheet	0.40 - 2.00	50 - 320	500 - 3000		

Important Note: All data in this Material Data Sheet are only for information purposes. Other dimensions and features to customer specification on request. Guarantees relating to specific characteristics or purposes require always a special written agreement.

Soft-magnetic Iron-Nickel-Alloys

Auerhammer Metallwerk
Wickeder Group

1. Alloys

Alloy	Material | UNS No.	Standard
FeNi36	1.3910 / 1.3911	DIN 17745 / DIN 17405 / DIN EN 60404-8-6
FeNi48	1.3922 / 1.3926 / 1.3927 / K94840	DIN 17745 / DIN 17405 / DIN EN 60404-8-6 / ASTM A753
FeNi77CuMo	2.4530 / 2.4595 / 2.4596	DIN 17745 / DIN 17405 / DIN EN 60404-8-6
FeNi80Mo	2.4530 / 2.4595 / 2.4596 / N14080	DIN 17745 / DIN 17405 / DIN EN 60404-8-6 / ASTM A 753 / MIL-N-14411C

2. Chemical composition (Reference values in % w/w)

Alloy	Ni	Mn	Mo	S	Cr	Cu	C	Si	P	Fe
FeNi36	36	≤ 0.5	≤ 0.2	≤ 0.010	≤ 0.3	≤ 0.3	≤ 0.02	≤ 0.2	≤ 0.01	balance
FeNi48	48	≤ 0.5	≤ 0.2	≤ 0.010	≤ 0.3	≤ 0.3	≤ 0.02	≤ 0.2	≤ 0.01	balance
FeNi77CuMo	77	≤ 0.6	4.1	≤ 0.010	≤ 0.3	4.4	≤ 0.02	≤ 0.2	≤ 0.01	balance
FeNi80Mo	80	≤ 0.7	4.9	≤ 0.010	≤ 0.3	≤ 0.3	≤ 0.02	≤ 0.3	≤ 0.01	balance

3. Physical properties

Alloy	Density	B_s	T_C	H_C [1]	$\mu_{0.4}$ [1]	μ_{max} [1]	E-Modulus
	g/cm³	T	°C	A/m	DC-/AC	DC-/AC	GPa
FeNi36	8.15	1.2	240	10	6000 / 5000	25000 / 20000	135
FeNi48	8.25	1.5	470	4	10000 / 8000	150000 / 70000	150
FeNi77CuMo	8.76	0.75	410	0.5	200000 / 80000	300000 / 100000	195
FeNi80Mo	8.75	0.75	410	0.5	250000 / 100000	300000 / 150000	195

[1] measured on ring cores, thickness 0.2 mm

B_s = Saturation Flux Density | T_C = Curie Temperature | H_C = Coercive Field Strength
$\mu_{0.4}$ = Initial Permeability | μ_{max} = Maximum Permeability
DC = Direct Current | AC = Alternating Current f = 50 Hz

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4. Mechanical properties (Reference values)

Alloy	Condition	0.2 % Yield strength	Tensile strength	Vickers hardness
		MPa	MPa	HV
FeNi36	annealed hard	280 600	440 700	140 220
FeNi48	annealed hard	270 750	520 850	140 240
FeNi77CuMo	annealed hard	320 1000	630 1050	160 320
FeNi80Mo	annealed hard	300 1100	630 1150	160 340

5. Dimensions and tolerances: Thickness & Width (in mm)

Thickness	Width 10 - 50	Width > 50 - 200	Width > 200 - 320
0.10 - 0.20	+/- 0.010	+/- 0.015	+/- 0.020
> 0.20 - 0.50	+/- 0.020	+/- 0.020	+/- 0.030
> 0.50 - 1.00	+/- 0.030	+/- 0.030	+/- 0.040
> 1.00 - 2.00	+/- 0.040	+/- 0.040	+/- 0.050
> 2.00 - 2.50	+/- 0.050	+/- 0.050	+/- 0.060

Width	Thickness 0.10 - 0.20	Thickness > 0.20 - 0.50	Thickness > 0.50 - 1.00	Thickness > 1.00 - 2.50
10 - 50	+/- 0.1	+/- 0.2	+/- 0.2	+/- 0.3
> 50 - 200	+/- 0.2	+/- 0.3	+/- 0.3	+/- 0.4
> 200 - 320	+/- 0.3	+/- 0.4	+/- 0.5	+/- 0.6

Length (in mm)

Thickness	Length 500 - 3000
0.40 - 2.00	+ 10

6. Delivery forms (in mm)

Form	Thickness	Width	Length	Coil-ID	Coil-OD
Coil	0.10 - 2.50	10 - 320		300 / 400 / 500	max. 1050
Strip / sheet	0.40 - 2.00	50 - 320	500 - 3000		

Important Note: All data in this Material Data Sheet are only for information purposes. Other dimensions and features to customer specification on request. Guarantees relating to specific characteristics or purposes require always a special written agreement.

Sealing & Expansion Alloys

Auerhammer Metallwerk
Wickeder Group

1. Alloys

Alloy	Material | UNS No.	Standard
FeNi36	1.3912	SEW 385 / DIN 17745
FeNi41	1.3917 / K94100	DIN 17745 / ASTM F30
FeNi46	1.3920 / K94600	SEW 385 / DIN 17745 / ASTM F30
FeNi51	2.4478 / N14052	SEW 385 / DIN 17745 / ASTM F30
FeNi29Co18Mn	1.3981 / K94610	SEW 385 / DIN 17745 / ASTM F15
FeNi47Cr5Al		

2. Chemical composition (Reference values in % w/w)

Alloy	Ni	Co	Mn	Al	Cu	Cr	Si	Fe
FeNi36	36	≤ 0.10	≤ 0.50	≤ 0.05	≤ 0.3	≤ 0.3	≤ 0.30	balance
FeNi41	41	≤ 0.10	≤ 0.80	≤ 0.05	≤ 0.20	≤ 0.25	≤ 0.30	balance
FeNi46	46	≤ 0.10	≤ 0.80	≤ 0.05	≤ 0.20	≤ 0.25	≤ 0.30	balance
FeNi51	51	≤ 0.10	≤ 0.60	≤ 0.05	≤ 0.20	≤ 0.25	≤ 0.30	balance
FeNi29Co18Mn	29	17	≤ 0.50	≤ 0.05	≤ 0.20	≤ 0.20	≤ 0.20	balance
FeNi47Cr5Al	47	≤ 0.20	≤ 0.30	≤ 0.30	≤ 0.20	4.0 - 6.0	≤ 0.30	balance

3. Physical properties

Alloy	Density	Melting point	Specific electrical resistivity at 20 °C	Thermal conductivity at 20 °C	E-Modulus
	g /cm³	°C	Ω • mm²/m	10^{-6}/K	GPa
FeNi36	8.15	1435	0.79	13	137
FeNi41	8.20	1440	0.63	15	142
FeNi46	8.20	1450	0.55	16	152
FeNi51	8.25	1450	0.38	17	160
FeNi29Co18Mn	8.15	1450	0.46	17	157
FeNi47Cr5Al	8.25	1440	0.85		

4. Thermal expansion properties

Alloy	Average linear thermal expansion coefficient in 10^{-6}/K | Reference temperature 20 °C							Curie temperature
	100 °C	150 °C	200 °C	300 °C	400 °C	500 °C	600 °C	°C
FeNi36	1.5	1.9	2.6	5.3	8.1	9.9	11.1	230
FeNi41	4.6	4.4	4.2	4.2	5.8	7.9	9.4	340
FeNi46	7.9	7.8	7.7	7.4	7.3	8.6	9.7	400
FeNi51	10.3	10.3	10.2	10.1	9.9	10.0	10.9	500
FeNi29Co18Mn	6.5	6.2	5.9	5.4	5.1	6.2	7.8	435
FeNi47Cr5Al	8.8	8.9	8.9	9.0	9.4	10.6	12.0	345

Heat treatment 900 °C | Annealing time 0.5 h | Cooling time to 100 °C at least 10 h | Medium: hydrogen

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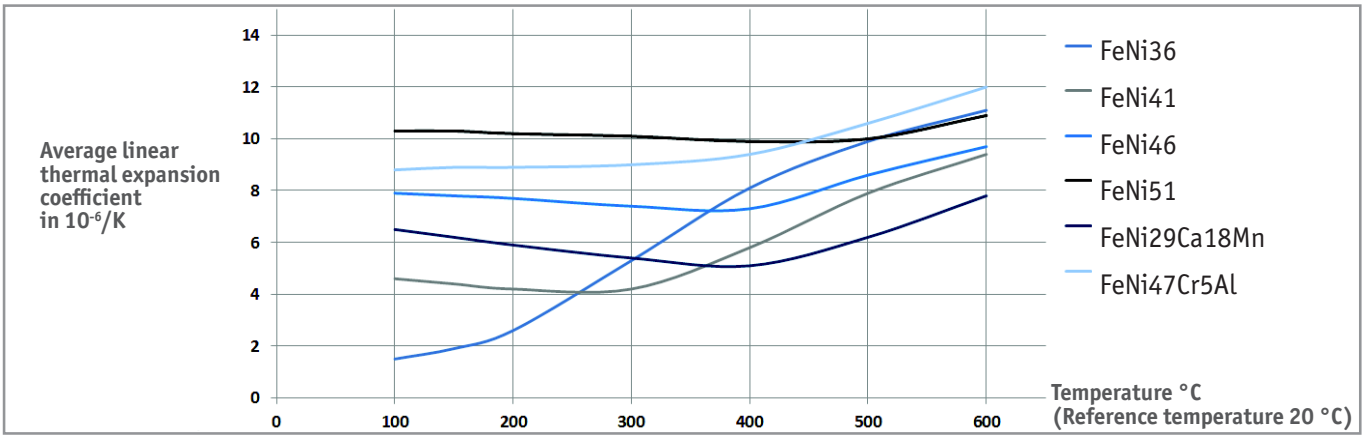
Expansion Curves



5. Mechanical properties (Reference values soft-annealed)

Alloy	0,2 % Yield strength	Tensile strength	Elongation	Vickers hardness
	MPa	MPa	%	HV
FeNi36	270	450	35	130
FeNi41	290	500	35	140
FeNi46	270	520	35	140
FeNi51	260	540	30	140
FeNi29Co18Mn	380	530	35	160
FeNi47Cr5Al	260	540	30	140

6. Dimensions and tolerances: Thickness & Width (in mm)

Thickness	Width 10 - 50	Width > 50 - 200	Width > 200 - 320
0.10 - 0.20	+/- 0.010	+/- 0.015	+/- 0.020
> 0.20 - 0.50	+/- 0.020	+/- 0.020	+/- 0.030
> 0.50 - 1.00	+/- 0.030	+/- 0.030	+/- 0.040
> 1.00 - 2.00	+/- 0.040	+/- 0.040	+/- 0.050
> 2.00 - 2.50	+/- 0.050	+/- 0.050	+/- 0.060

Width	Thickness 0.10 - 0.20	Thickness > 0.20 - 0.50	Thickness > 0.50 - 1.00	Thickness > 1.00 - 2.50
10 - 50	+/- 0.1	+/- 0.2	+/- 0.2	+/- 0.3
> 50 - 200	+/- 0.2	+/- 0.3	+/- 0.3	+/- 0.4
> 200 - 320	+/- 0.3	+/- 0.4	+/- 0.5	+/- 0.6

Length (in mm)

Thickness	Length 500 - 3000
0.40 - 2.00	+ 10

7. Delivery forms (in mm)

Form	Thickness	Width	Length	Coil-ID	Coil-OD
Coil	0.10 - 2.50	10 - 320		300 / 400 / 500	max. 1050
Strip / Sheet	0.40 - 2.00	50 - 320	500 - 3000		

Important Note: All data in this Material Data Sheet are only for information purposes. Other dimensions and features to customer specification on request. Guarantees relating to specific characteristics or purposes require always a special written agreement.

Nickel-Chrome-Alloys

Auerhammer Metallwerk
Wickeder Group

1. Alloys

Alloy	Material | UNS No.	Standard
LC-NiCr15Fe	2.4817	DIN 17742
NiCr15Fe	2.4816 / N06600	DIN 17742 / ASTM B168
NiCr23Fe	2.4851 / N06601	DIN 17742 / ASTM B168
NiCr9		

2. Chemical composition (Reference values in % w/w)

Alloy		Ni (+Co)	Cr	Al	C	Cu	Fe	Mn	Si	Ti
LC-NiCr15Fe	min.	72	14				6			
	max.		16	0.3	0.025	0.5	10	1.0	0.5	0.3
NiCr15Fe	min.	72	14		0.025		6			
	max.		17	0.3	0.1	0.5	10	1.0	0.5	0.3
NiCr23Fe	min.	58	21	1.0						
	max.	63	25	1.7	0.1	0.5	18	1.0	0.5	0.5
NiCr9	min.		9					0.2	0.1	
	max.	balance	10	0.1	0.1	0.1	0.3	0.4	0.2	0.1

3. Physical properties

Alloy	Density	Average linear thermal expansion coefficient 20 °C - 100 °C	Thermal conductivity at 20 °C	E-Modulus
	g/cm³	10^{-6}/K	W/m • K	GPa
LC-NiCr15Fe	8.5	14	11	
NiCr15Fe	8.5	14	11	
NiCr23Fe	8.2	14	11	207
NiCr9	8.3			

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4. Mechanical properties (Reference values soft-annealed)

Alloy	0.2 % Yield strength	Tensile strength	Elongation	Vickers hardness
	MPa	MPa	%	HV
LC-NiCr15Fe	300	630	35	150
NiCr15Fe	300	700	35	170
NiCr23Fe	350	740	40	180
NiCr9	280	600	35	145

5. Dimensions and tolerances: Thickness & Width (in mm)

Thickness	Width 10 - 100	Width > 100 - 200	Width > 200 - 320
0.20 - 0.35	+/- 0.020	+/- 0.020	+/- 0.030
> 0.35 - 0.60	+/- 0.030	+/- 0.030	+/- 0.040
> 0.60 - 1.00	+/- 0.040	+/- 0.050	+/- 0.050
> 1.00 - 1.50	+/- 0.050	+/- 0.060	+/- 0.070
> 1.50 - 2.50	+/- 0.060	+/- 0.070	+/- 0.080

Width	Thickness 0.20 - 1.00	Thickness > 1.00 - 1.80	Thickness > 1.80 - 2.50
10 - 100	+ 0.2	+ 0.3	+ 0.5
> 100 - 200	+ 0.3	+ 0.5	+ 0.7
> 200 - 320	+ 0.6	+ 1.0	+ 1.2

Length (in mm)

Thickness	Length 500 - 3000
0.40 - 2.00	+ 10

6. Delivery forms (in mm)

Form	Thickness	Width	Length	Coil-ID	Coil-OD
Coil	0.20 - 2.50	10 - 320		300 / 400 / 500	max. 1050
Strip / Sheet	0.40 - 2.00	50 - 320	500 - 3000		

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Welding Consumables

Auerhammer Metallwerk
Wickeder Group

1. Alloys

Alloy	Numeric abbreviations	Classifiaction	UNS-No.
DIN EN ISO 18274:2011		AWS 5.14:2011	
NiCr30Fe9	Ni 6052	EQNiCrFe-7	N06052
NiCr23Mo16	Ni 6059	EQNiCrMo-13	N06059
NiCr20Mn3Nb	Ni 6082	EQNiCr-3	N06082
NiCr22Mo9Nb	Ni 6625	EQNiCrMo-3	N06625
NiCr15Mo16Fe6W4	Ni 6276	EQNiCrMo-4	N10267
NiCu30Mn3Ti	Ni 4060	EQNiCu-7	N04060
NiTi3	Ni 2061	EQNi-1	N02061

Additional welding consumables according to DIN EN ISO 18274, AWS A5.14 or according to separate customer specifications are possible on request.

2. Chemical composition (Reference values in % w/w)

Alloy		Ni	Co	Cu	Fe	C	Cr	Mn	Si	Ti	Mo	Nb	Al	W	V
NiCr30Fe9	min.	54.0			7.0		28.0								
	max.			0.3	11.0	0.04	31.5	1.0	0.50	1.0	0.5	0.10			
NiCr23Mo16	min.	56.0					22.0				15.0		0.1		
	max.		0.3	0.5	1.5	0.01	24.0	0.5	0.10	0.5	16.5		0.4		0.30
NiCr20Mn3Nb	min.	67.0					18.0	2.5				2.00			
	max.			0.5	3.0	0.10	22.0	3.5	0.50	0.7		3.00			
NiCr22Mo9Nb	min.	58.0					20.0				8.0	3.15			
	max.			0.5	5.0	0.10	23.0	0.5	0.50	0.4	10.0	4.15	0.4		
NiCr15Mo16Fe6W4	min.	50.0			4.0		14.5				15.0			3.0	
	max.		2.5	0.5	7.0	0.02	16.5	1.0	0.80		17.0			4.5	0.35
NiCu30Mn3Ti	min.	62.0		28.0				2.0		1.5					
	max.			32.0	2.5	0.15		4.0	1.20	3.0		0.30	1.2		
NiTi3	min.	92.0								2.0					
	max.			0.2	1.0	0.15		1.0	0.70	3.5			1.5		

3. Dimensions and tolerances: Thickness & Width (in mm)

Thickness	Width 25 - 100	Width > 100 - 200	Width > 200 - 280
0.20 - 0.35	+/- 0.02	+/- 0.02	+/- 0.03
> 0.35 - 0.60	+/- 0.03	+/- 0.03	+/- 0.04
> 0.60 - 1.00	+/- 0.04	+/- 0.05	+/- 0.05
> 1.00 - 1.50	+/- 0.05	+/- 0.06	+/- 0.07
> 1.50 - 2.00	+/- 0.06	+/- 0.07	+/- 0.08

Width	Thickness 0.20 - 1.00	Thickness > 1.00 - 1.80	Thickness > 1.80 - 2.00
≤ 100	+ 0.2	+ 0.3	+ 0.5
> 100 - 200	+ 0.3	+ 0.5	+ 0.7
> 200 - 280	+ 0.6	+ 1.0	+ 1.2

The following tolerances apply to the standard dimension of hard-rolled strips for overlay welding:
Thickness 0.50 ± 0.035 mm
Width 30 - 180 ± 0.2 mm

4. Delivery forms (in mm)

Form	Thickness	Width	Coil-ID	Coil-OD
Strip - soft	0.20 - 2.00	25 - 280	300 / 400 / 500	max. 1050
Strip - hard	0.50	30 - 180	300 / 400 / 500	max. 1050

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Copper-Nickel-Alloys

Auerhammer Metallwerk
Wickeder Group

1. Alloys

Alloy	Material | UNS No.	Standard
CuNi8		
CuNi10	2.0811 / C70700	DIN 17471
CuNi15		
CuNi20	CN104 / C71000	BS 2870
CuNi30	C71580	
CuNi44Mn1	2.0842 / N04401 / C72150	DIN 17664
CuNi10Fe1Mn	CW352H / C70600	EN 1652 / ASTM B122
CuNi30Mn1Fe	CW354H / C71500	EN 1652 / ASTM B122

2. Chemical composition (Reference values in % w/w)

Alloy	Ni (+Co)	Cu	Fe	Mn	C
CuNi8	≤ 8.0	balance	≤ 0.1	≤ 0.3	
CuNi10	≤ 11.0	balance	≤ 0.1	≤ 0.3	
CuNi15	14.0 - 16.0	balance	≤ 0.3	≤ 0.5	
CuNi20	19.0 - 20.0	balance	≤ 0.2	≤ 0.5	
CuNi30	29.0 - 32.0	balance	≤ 0.5	≤ 0.3	≤ 0.1
CuNi44Mn1	43.0 - 45.0	balance	≤ 0.5	0.5 - 2.0	≤ 0.1
CuNi10Fe1Mn	9.0 - 11.0	balance	1.0 - 1.8	0.5 - 1.0	≤ 0.1
CuNi30Mn1Fe	30.0 - 32.0	balance	0.4 - 1.0	0.4 - 1.0	≤ 0.1

3. Physical properties

Alloy	Density	Specific electrical resistivity at 20 °C	Average linear thermal expansion coefficient 20 °C - 100 °C	Thermal conductivity at 20 °C
	g /cm³	Ω • mm²/m	10^{-6}/K	W/m • K
CuNi8	8.9	0.125	16	75
CuNi10	8.9	0.15	16	59
CuNi15	8.9	0.21		
CuNi20	8.9	0.265	15	49
CuNi30	8.9	0.37	15	39
CuNi44Mn1	8.9	0.49	13.5	22
CuNi10Fe1Mn	8.9	0.17	17	48
CuNi30Mn1Fe	8.9	0.37	16	25

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4. Mechanical properties (Reference values soft-annealed)

Alloy	0.2 % Yield strength	Tensile strength	Elongation	Vickers hardness
	MPa	MPa	%	HV
CuNi8	100	260	45	max. 80
CuNi10	115	270	45	max. 85
CuNi15	140	300	45	max. 85
CuNi20	150	330	40	max. 85
CuNi30	150	330	40	max. 85
CuNi44Mn1	200	460	30	max. 115
CuNi10Fe1Mn	150	340	40	max. 120
CuNi30Mn1Fe	180	400	45	max. 120

5. Dimensions and tolerances: Thickness & Width (in mm)

Thickness	Width 10 - 320
0.10 - 0.20	+/- 0.020
> 0.20 - 0.40	+/- 0.030
> 0.40 - 0.50	+/- 0.040
> 0.50 - 0.80	+/- 0.050
> 0.80 - 1.20	+/- 0.060
> 1.20 - 1.80	+/- 0.080
> 1.80 - 2.50	+/- 0.090
> 2.50 - 3.00	+/- 0.100

Width	Thickness 0.10 - 1.00	Thickness > 1.00 - 2.00	Thickness > 2.00 - 2.50	Thickness > 2.50 - 3.00
10 - 50	+ 0.2	+ 0.3	+ 0.5	+ 1.0
> 50 - 100	+ 0.3	+ 0.4	+ 0.6	+ 1.1
> 100 - 200	+ 0.4	+ 0.5	+ 0.7	+ 1.2
> 200 - 320	+ 0.6	+ 1.0	+ 1.2	+ 1.5

Length (in mm)

Thickness	Length 500 - 3000
0.40 - 2.00	+ 10

6. Delivery forms (in mm)

Form	Thickness	Width	Length	Coil-ID	Coil-OD
Coil	0.10 - 2.50	10 - 320		300 / 400 / 500	max. 1050
Strip / Sheet	0.40 - 2.00	50 - 320	500 - 3000		

Important Note: All data in this Material Data Sheet are only for information purposes. Other dimensions and features to customer specification on request. Guarantees relating to specific characteristics or purposes require always a special written agreement.

Nickel-Copper-Alloys

Auerhammer Metallwerk
Wickeder Group

1. Alloys

Alloy	Material | UNS No.	Standard
NiCu30Fe	2.4360 / N04400	DIN 17743 / ASTM B127
NiCu30Al	2.4375 / N05500	DIN 17743
NiCu45	N04404	ASTM F96

2. Chemical composition (Reference values in % w/w)

Alloy		Ni (+Co)	Al	C	Cu	Fe	Mn	Si	Ti
NiCu30Fe	min.	63			28	1.0			
	max.		0.5	0.15	34	2.5	2.0	0.5	0.3
NiCu30Al	min.	63	2.2		27	0.5			0.3
	max.		3.5	0.2	34	2.0	1.5	0.5	1.0
NiCu45	min.	54.5							
	max.	55.5	0.05	0.1	balance	0.3	0.1	0.1	

3. Physical properties

Alloy	Density	Average linear thermal expansion coefficient 20 °C - 100 °C	Curie temperature	Thermal conductivity at 20 °C
	g/cm³	10^{-6}/K	°C	W/m • K
NiCu30Fe	8.8	14	50	26
NiCu30Al	8.5	13.7	135	19
NiCu45	8.9	13		21

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4. Mechanical properties (Reference values)

Alloy	Condition	0.2 % Yield strength	Tensile strength	Elongation	Vickers hardness
		MPa	MPa	%	HV
NiCu30Fe	soft annealed	250	550	40	120
	hard		860	5	210
NiCu30Al	soft annealed	340	720	35	170
	hard	750 - 1100	850 - 1250	1 - 8	250 - 350
NiCu45	soft annealed	160	450	45	120

5. Dimensions and tolerances: Thickness & Width (in mm)

Thickness	Width 10 - 100	Width > 100 - 200	Width > 200 - 320
0.10 - 0.20	+/- 0.010	+/- 0.015	+/- 0.015
> 0.20 - 0.30	+/- 0.015	+/- 0.015	+/- 0.020
> 0.30 - 0.50	+/- 0.020	+/- 0.020	+/- 0.025
> 0.50 - 1.00	+/- 0.025	+/- 0.025	+/- 0.030
> 1.00 - 1.50	+/- 0.030	+/- 0.040	+/- 0.040
> 1.50 - 2.00	+/- 0.040	+/- 0.040	+/- 0.050
> 2.00 - 2.50	+/- 0.050	+/- 0.050	+/- 0.060

Width	Thickness 0.10 - 1.00	Thickness > 1.00 - 1.80	Thickness > 1.80 - 2.50
10 - 100	+ 0.2	+ 0.3	+ 0.5
> 100 - 200	+ 0.3	+ 0.5	+ 0.7
> 200 - 320	+ 0.6	+ 1.0	+ 1.2

Length (in mm)

Width	Length 500 - 3000
0.40 - 2.00	+ 10

7. Delivery forms (in mm)

Form	Thickness	Width	Length	Coil-ID	Coil-OD
Coil	0.10 - 2.50	10 - 320		300 / 400 / 500	max. 1050
Strip / Sheet	0.40 - 2.00	50 - 320	500 - 3000		

Important Note: All data in this Material Data Sheet are only for information purposes. Other dimensions and features to customer specification on request. Guarantees relating to specific characteristics or purposes require always a special written agreement.

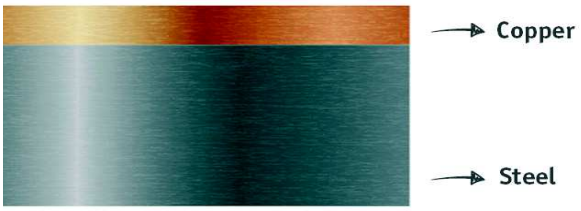
Clad Materials

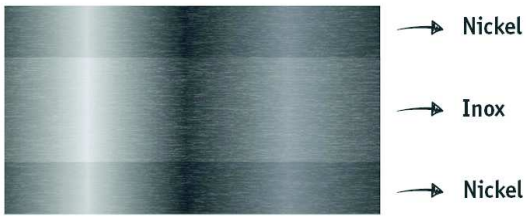
Auerhammer Metallwerk
Wickeder Group

Characteristics

Clad material consist of at least one base material and a clad material, which are joined together by cold rolling. In this way, the positive properties of the different metals can be combined. The deliveries are possible in soft, thermoformable or cold-strengthened conditions, depending on the intended use. Test criteria can be the yield strength, the tensile strength, the elongation, the hardness, the formability, the grain size, in special tests, the electrical resistance and the flare. Other properties by arrangement.

Samples of two layer and three layer





Material Options	
Copper	Cu-PHC, etc.
Nickel	Ni99,2 / LC-Ni 99 / LC-Ni 99,6, etc.
Yellow brass	CuZn10 / CuZn37 / CuZn25, etc.
Bronze	CuSn6, etc.
Alloys	Nickel, Iron-Nickel, Copper Alloys
Stainless Steel	1.4301 / 1.4306 / 1.4310 / 1.4541 / 1.4404 / 1.4512 / 1.4521 / 1.4571, etc.
Steel	DC04 / DD11 / DD14 / C10, etc.

You will find the range of material options online.

On www.clad-configurator.de you can create your individual cladding strip with up to five layers in different thickness ratios.

After configurating a cladding strip, the server calculates within seconds the associated material properties, such as mechanical, chemical and physical data.
You can send these data via an online formular to your own email address.

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Clad Materials

Auerhammer Metallwerk
Wickeder Group

Dimensions and tolerances: Thickness & Width (in mm)

Thickness	Width < 250		Width > 250 - 300	
	normal	fine	normal	fine
< 0.20	+/- 0.015	+/- 0.013	+/- 0.020	+/- 0.015
> 0.20 - 0.30	+/- 0.020	+/- 0.015	+/- 0.030	+/- 0.020
> 0.30 - 0.50	+/- 0.025	+/- 0.020	+/- 0.040	+/- 0.030
> 0.50 - 0.80	+/- 0.030	+/- 0.025	+/- 0.050	+/- 0.035
> 0.80 - 1.00	+/- 0.035	+/- 0.030	+/- 0.050	+/- 0.035
> 1.00 - 1.50	+/- 0.040	+/- 0.030	+/- 0.060	+/- 0.040
> 1.50 - 1.80	+/- 0.045	+/- 0.035	+/- 0.070	+/- 0.050
> 1.80 - 2.50	+/- 0.050	+/- 0.040	+/- 0.080	+/- 0.060
> 2.50 - 3.00	+/- 0.060	+/- 0.050	+/- 0.090	+/- 0.070

Width	Thickness ≤ 0,40	Thickness > 0,40 - 1,50	Thickness > 1,50 - 2,00	Thickness > 2,00 - 3,00
≤ 125	+ 0.3	+ 0.4	+ 0.6	+ 0.8
> 125 - 250	+ 0.4	+ 0.6	+ 0.8	+ 1.0
> 250 - 300	+ 0.6	+ 0.8	+ 1.0	+ 1.2

Length (in mm)

Thickness	Width 500 - 3000
0.40 - 2.00	+ 10

Delivery forms (in mm)

Form	Thickness	Width	Length	Coil-ID	Coil-OD
Coil	0.10 - 3.00	10 - 300		300 / 400 / 500	max. 1050
Strip	0.40 - 2.00	50 - 300	500 - 3000		

Surface finish

The strips receive a cold-rolled or brushed surface depending on the requirements of the customers.
The surface can also be oiled.

Important Note: All data in this Material Data Sheet are only for information purposes. Other dimensions and features to customer specification on request. Guarantees relating to specific characteristics or purposes require always a special written agreement.

Thermostatic Bimetals

1. Materials and Properties

	Grade	Spec. Thermal Curvature 20 °C - 130 °C 10^{-6}/K	Specific Thermal Deflection 20 °C - 100 °C 10^{-6}/K	Special 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 %				MnCu18Ni10	none		
3	TB 200/80	38.9± 5 %	20.8	0.82 ± 5 %					FeNi36/Ni		
4	TB 200/60	38.8 ± 5 %	20.6	0.58 ± 5 %				MnNi16Cu10	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 %					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 %				MnCu18Ni10	Cu	FeNi36	
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		
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	FeNi36	
24	TB150/78	27.6 ± 5 %	14.9	0.78 ± 5 %				FeNi20Mn6	none		

	Grade	Spec. Thermal Curvature 20 °C - 130 °C 10^{-6}/K	Specific Thermal Deflection 20 °C - 100 °C 10^{-6}/K	Special Electrical Resistivity at 20 °C Ω • mm^2/m	Linearity Range °C	Max. Operating Tempera-ture °C	Cladding Layer on high exp. side	High Expansion Side	Intermediate Layer	Low Expansion Side	Cladding Layer on low exp. side
25	TB145/78	26.9 ± 5 %	14.5	0.78 ± 5 %	-20 to 200	450	none	FeNi20Mn6	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 %					Ni		
28	TB150/55Fe	28.2 ± 5 %	15.0	0.55 ± 5 %					Fe		
29	TB150/50	28.0 ± 5 %	14.9	0.50 ± 5 %					Ni		
30	TB150/50Fe	28.0 ± 5 %	14.9	0.50 ± 5 %					Fe		
31	TB150/45	28.0 ± 5 %	14.9	0.45 ± 5 %					Ni		
32	TB150/45Fe	28.0 ± 5 %	14.9	0.45 ± 5 %					Fe		
33	TB148/35	27.4 ± 5 %	14.8	0.35 ± 5 %					Ni		
34	TB144/30	26.8 ± 5 %	14.4	0.30 ± 5 %					Ni		
35	TB140/25	26.1 ± 5 %	14.0	0.25 ± 5 %					Ni		
36	TB150/19	28.2 ± 5 %	15.0	0.19 ± 7 %		400			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 %					Cu		
42	TB130/06	26.2 ± 5 %	13.9	0.060 ± 10 %					Cu		
43	TB136/06	25.8 ± 5 %	13.6	0.059 ± 10 %		275	Cu		none		
44	TB132/03	24.6 ± 5 %	12.7	0.033 ± 15 %		275	none		Cu		
45	TB130/03	24.6 ± 5 %	12.7	0.030 ± 15 %		300			Cu		
46	TB147/79	27.7 ± 5 %	14.7	0.79 ± 5 %	-20 to 175	450		FeNi22Cr3	none		
47	TB140/80	27.6 ± 5 %	14.0	0.80 ± 5 %					none		
48	TB140/66	26.4 ± 5 %	14.0	0.668 ± 5 %					Ni		
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		

	Grade	Spec. Thermal Curvature 20 °C - 130 °C 10^{-6}/K	Specific Thermal Deflection 20 °C - 100 °C 10^{-6}/K	Special Electrical Resistivity at 20 °C Ω • mm^2/m	Linearity Range °C	Max. Operating Tempera-ture °C	Cladding Layer on high exp. side	High Expansion Side	Intermediate Layer	Low Expansion Side	Cladding Layer on low exp. side
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			FeNi20Mn6	none	FeNi39	
73	TB135/78B	25.5 ± 5 %	13.5	0.78 ± 5 %				X60Ni14Mn7	none		
74	TB125/09	25.0 ± 5 %	13.4	0.09 ± 7 %		400		FeNi22Cr3	Cu		
75	TB124/09	24.0 ± 5 %	12.9	0.09 ± 7 %		400			Cu		
76	TB134/75	25.5 ± 5 %	13.4	0.75 ± 5 %	70 to 230	450			none		
77	TB131/42	25.1 ± 5 %	13.3	0.416 ± 5 %	-20 to 250				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 %					Ni		

	Grade	Spec. Thermal Curvature 20 °C - 130 °C 10^{-6}/K	Specific Thermal Deflection 20 °C - 100 °C 10^{-6}/K	Special Electrical Resistivity at 20 °C Ω • mm²/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
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		FeNi20Mn6	none	FeNi42	
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		FeNi22Cr3	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	none	FeNi46	
96	TB100/65	18.6 ± 5 %	10.0	0.65 ± 5 %	-20 to 425	450		FeNi22Cr8.5	none		
97	TB100/65R	17.0 ± 5 %	9.0	0.62 ± 7 %	-20 to 425	450	CrNi-Steel	FeNi20Mn6	none		
98	TB180/108R	33.5 ± 5 %	17.5	1.08 ± 5 %	-20 to 200	350	FeNi22Cr3	MnCu18Ni10	none	FeNi36	
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 %			none	FeNi20Mn6	MnNi16Cu10		
101	TB155/78R	27.5 ± 5 %	14.5	0.78 ± 5 %		450	CrNi-Steel		none		
102	TB155/78RR	24.6 ± 5 %	13.0	0.75 ± 7 %	-20 to 225				none		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		FeNi18Cr12	none	FeNi31Co8Cr6	none
105	TB52/65	10.0 ± 7 %	5.2	0.65 ± 7 %	-20 to 600	550		CrNi-Steel	none	Cr-Steel	
106	TB103/81	19.4 ± 5 %	10.3	0.81 ± 5 %	-20 to 300	350		MnNi16Cu10	none	CuNi44Mn1	
107	TB97/16	18.2 ± 5 %	9.8	0.16 ± 5 %	-20 to 220	400		Ni	none	FeNi36	

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.

Thickness Tolerances (Snap disc strip)

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

Other thickness and tolerances on request.

Width Tolerances

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 thickness and tolerances on request.

Length Tolerances (Cut Length)

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

Other thickness and tolerances on request.

Product Forms / Delivery Forms

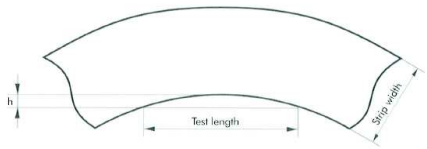
Form	Thickness	Width	Length	Coil-ID	Coil-OD
Strip	0.10 - 2.00	3 - 2.50		300 / 400 / 500	max. 1100
Cut length	0.60 - 2.00	8 - 250	500 - 3000		
Snap disc strip	0.1 - 0.4	10 - 60		300 / 400 / 500 (on core)	

(in mm) Other thickness and tolerances on request.

5. Dimension tolerances for tension-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.

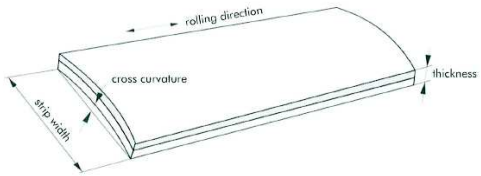


Tighter edge camber tolerance can be agreed.

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

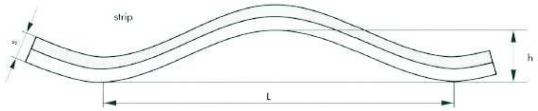
Surface flatness across strip width (cross curvature)

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 burr slit 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 can be agreed specially.

7. Packaging

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

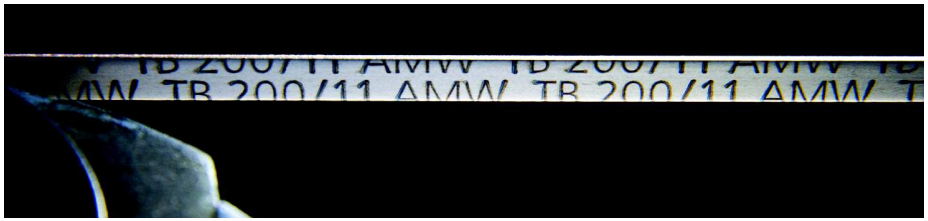
Standard Continental Packing:

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	covering stack
Labelling	each pallet

Standard Sea Freight Packing:

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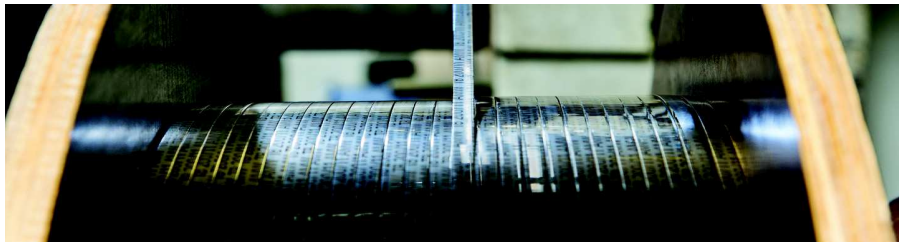

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Portfolio Auerhammer :

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