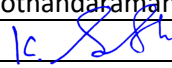
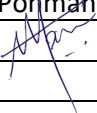

	Description SPECIFICATION – ETP COPPER COIL, BAR AND SHEET				Document Number 9100000508
	Division:	Business Unit:	Department:	Rev No	01
	AED	STD LVDB – AE05	D&D1	Date	19-Aug-2021

Revision History

Rev	Date DD.MM.YYYY	Modification	Prepared By	Approved by
01	19-Aug-2021	Format change and PO text updated	Suresh Kothandaraman 	Thiagarajan Ponmani 

First Issue	Date	Name
Prepared by	10 June 2018	Thiagarajan Ponmani
Approved by	10 June 2018	Mohammed Habibullah Junaid

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Description	Specification
Material Type	ETP Copper
Format	Coil/Bar
Thickness	1.0 - 10.0mm
Width	10 - 100mm
Designation	BAR EN 13601-CU-ETP-H065-SH
Denomination	Bar
Standard Reference	BS EN 13601
Material Designation Symbol/Number	Cu-ETP / CW004A
Material Condition	H065
Type of Corner	Sharp Edge (0.3-0.5MM RADIUS)
Conductivity	Minimum 100% IACS
Cross Section	Rectangular
Surface Treatment / Finish	Unplated
Purity	99.90%
Coil ID / OD	Coil ID 500mm & Coil OD 800mm
Packing Type	Export, sea worthy & water tight
Declaration of Conformity	As per EN 1655 Type D is Required
Inspection Documentation	As per EN 10204 Type 3.1 is Mandatory for each Shipment

Marking: The coil/bar shall be packed and marked with the following details:


1. Product Designation (i.e BAR EN 13601-CU-ETP-H065-SH)
2. Dimensions in millimeters
3. Quantity of Product (mass, number of rods or bars or coils of wire)
4. European Standard Number (EN 13601)
5. Manufacturer's name
6. Manufacturer identification (e.g. ticket, coil number, etc.)
7. Alfanar order number
8. Alfanar item number
9. Coil size (for coil)

Bend test: as per EN ISO 7438

Bend for 180°. No internal spacing (Flat on itself).

Acceptance criterion:

No visible crack on outside of bend portion without the use of magnifying aids

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Tolerances: Width and Thickness Tolerance (mm)


Nominal width		Tolerance on width	Tolerance on nominal thickness for range of thickness					
over	up to and including		from 0,5 up to and including 3	over 3 up to and including 6	over 6 up to and including 10	over 10 up to and including 18	over 18 up to and including 30	over 30 up to and including 40
1	10	± 0,08	± 0,05	± 0,06	± 0,08	-	-	-
10	18	± 0,10	± 0,05	± 0,06	± 0,08	± 0,10	-	-
18	30	± 0,15	± 0,05	± 0,07	± 0,09	± 0,10	± 0,15	-
30	50	± 0,20	± 0,06	± 0,09	± 0,10	± 0,12	± 0,15	± 0,20
50	80	± 0,25	± 0,09	± 0,10	± 0,12	± 0,15	± 0,18	± 0,25
80	120	± 0,30	-	± 0,12	± 0,15	± 0,18	± 0,23	± 0,30
120	160	± 0,40	-	-	± 0,18	± 0,20	± 0,25	± 0,35
160	200	± 0,50	-	-	± 0,20	± 0,25	± 0,30	± 0,40

Fixed Length Tolerance for BAR:

Ordered length		Tolerance
over	up to and including	
—	3 000	+5 0
3 000	6 000	+10 0
6 000	10 000	+15 0

Composition: % (Mass Fraction)

Element	Min.	Max.
Cu	99.9%*	-
Ag	-	-
Bi	-	0.0005%
O	-	0.0400%
P	-	-
Pb	-	0.0050%
Other Elements (Total)		0.0300%
NOTE: The total of other elements (than copper) is defined as the sum of As, Bi, Cd, Co, Cr, Fe, Mn, Ni, P, Pb, S, Sb, Se, Si, Sn, Te and Zn		
*Including silver, up to a maximum of 0,015 %.		

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Hardness test:

accordance with either EN ISO 6506-1 or EN ISO 6507-1

	Min.	Max.
Brinell (HBW)	65	90
Vickers (HV)	70	95

Form Tolerances:

Twist Tolerance:

Measurement and Tolerances

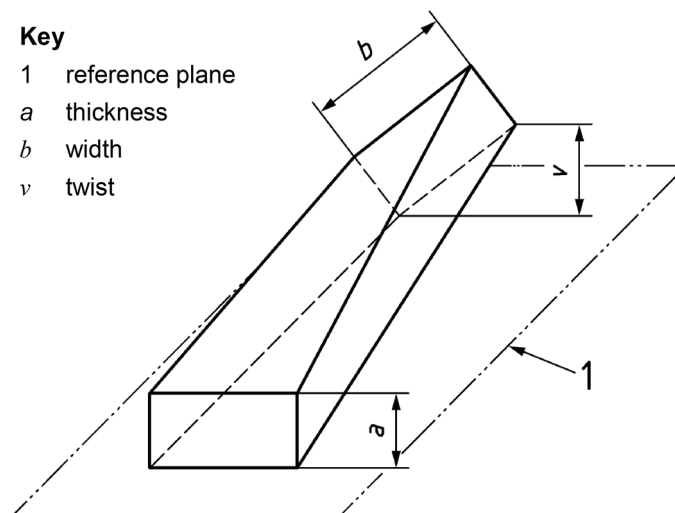
Nominal width mm		Maximum permitted twist v mm	
over	up to and including	in any 1 m length	in total length L (in m) ^b
10 ^a	18	1,0	$1,0 \times L$
18	30	1,5	$1,5 \times L$
30	50	2,0	$2,0 \times L$
50	80	3,0	$3,0 \times L$
80	120	4,5	$4,5 \times L$
120	200	6,0	$6,0 \times L$
^a Including 10.			
^b Up to 4 m. Over 4 m, the maximum twist is subjected to agreement.			

Maximum twist

Twist v shall be measured as indicated in Figure 4

Key

- 1 reference plane
- a thickness
- b width
- v twist




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Figure 4 — Measurement of twist

Straightness:

Measurement and Tolerances

Nominal diameter, width across-flats, thickness or width	Maximum deviation from straightness (see 6.7.3)		
	h_2	h_1	
	in any length l_2 of 400 mm	for total length l_1 from 1 m up to and including 4 m	over 4 m
≥ 10 mm	0,8 mm	2,0 mm × l_1	by agreement

Straightness of rod and bar

Straightness h_1 and h_2 shall be measured as indicated in Figure 5

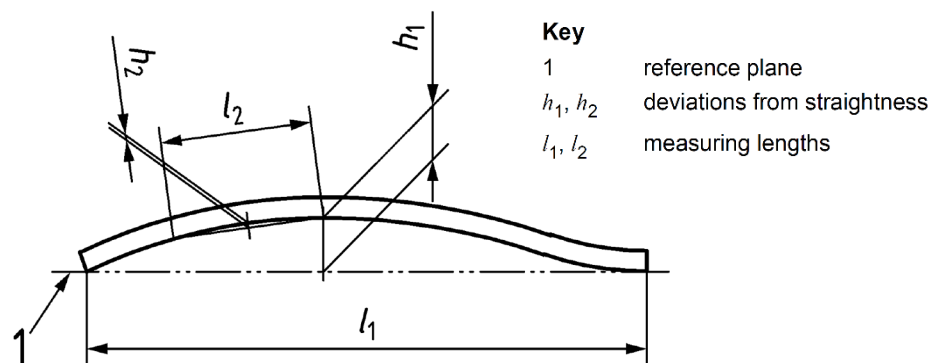



Figure 5 — Measurement of straightness

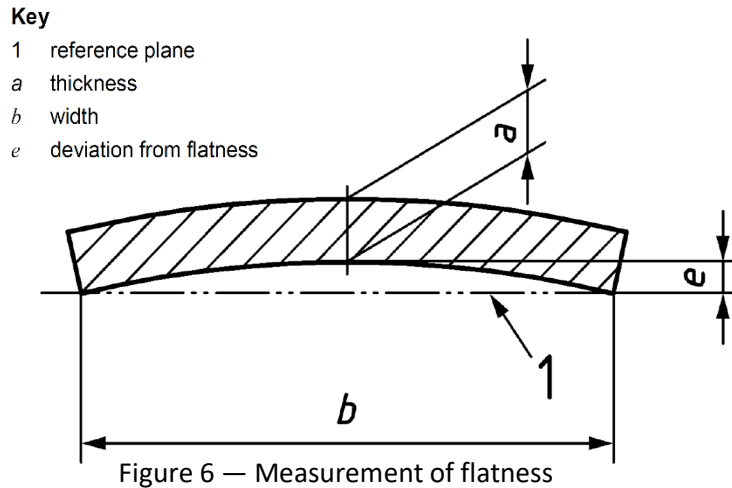
Flatness of bar:

Measurement and Tolerances as per

Nominal width ^a		Maximum deviation from flatness ^e for nominal thickness	
over	up to and including	from 1 up to and including 6	over 6 up to and including 40
10 ^b	30	0,2	0,15
30	50	0,3	0,2
50	80	0,4	0,25
80	120	0,5	0,3
120	200	—	0,5
^a Where the ratio nominal width: nominal thickness is greater than 15:1, the deviation from flatness shall be agreed between the purchaser and the supplier. ^b Including 10.			


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The deviation from flatness e of bar shall be measured as indicated in Figure 6



ETP Copper Sheet:

Description	Specification
Material Type	ETP Copper
Format	Sheet
Thickness	0.2 - 10.0mm
Designation	SHEET EN 13599-CU-ETP-H065-SH
Denomination	Sheet
Standard Reference	BS EN 13599
Material Designation Symbol/Number	Cu-ETP / CW004A
Material Condition	H065
Type of Corner	Sharp Edge (0.3-0.5MM RADIUS)
Conductivity	Minimum 100% IACS
Cross Section	Rectangular
Surface Treatment / Finish	Unplated
Purity	99.90%
Packing Type	Export, sea worthy & water tight
Declaration of Conformity	As per EN 1655 Type D is Required
Inspection Documentation	As per EN 10204 Type 3.1 is Mandatory for each Shipment

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Marking: The sheet shall be packed and marked with the following details

1. Product Designation (i.e Sheet EN 13599-CU-ETP-H065-SH)
2. Dimensions in millimeters
3. Quantity of Product (mass/number of sheets)
4. European Standard Number (EN 13599)
5. Manufacturer's name
6. Manufacturer identification (e.g. ticket, sheet number, etc.)
7. Alfanar order number
8. Alfanar item number

Bend test: as per EN ISO 7438:


Bend for 180°. No internal spacing (Flat on itself).

Acceptance criterion:

No visible crack on outside of bend portion without the use of magnifying aids

Tolerances: Thickness Tolerance (mm)

Nominal Thickness		Tolerance on thickness for nominal widths					
		from 10 up to and including 200		Over 200 up to and including 350	Over 350 up to and including 700	Over 700 up to and including 1000	Over 1000 up to and including 1250
Over	Up to and including	normal	special				
0.1	0.2	± 0.010	± 0.007	± 0.015	-	-	-
0.2	0.3	± 0.015	± 0.010	± 0.020	± 0.03	± 0.04	-
0.3	0.4	± 0.018	± 0.012	± 0.022	± 0.04	± 0.05	± 0.07
0.4	0.5	± 0.020	± 0.015	± 0.025	± 0.05	± 0.06	± 0.08
0.5	0.8	± 0.025	± 0.018	± 0.030	± 0.06	± 0.07	± 0.09
0.8	1.2	± 0.030	± 0.022	± 0.040	± 0.07	± 0.09	± 0.10
1.2	1.8	± 0.035	± 0.028	± 0.06	± 0.08	± 0.10	± 0.11
1.8	2.5	± 0.045	± 0.035	± 0.07	± 0.09	± 0.11	± 0.13
2.5	3.2	± 0.055	± 0.040	± 0.08	± 0.10	± 0.13	± 0.17
3.2	4.0	-	-	± 0.10	± 0.12	± 0.15	± 0.20
4.0	5.0	-	-	± 0.12	± 0.14	± 0.17	± 0.23
5.0	6.0	-	-	± 0.14	± 0.16	± 0.20	± 0.26
6.0	7.0	-	-	± 0.16	± 0.19	± 0.23	± 0.29
7.0	8.0	-	-	± 0.18	± 0.22	± 0.26	± 0.32
8.0	9.0	-	-	± 0.20	± 0.25	± 0.29	± 0.35
9.0	10.0	-	-	± 0.22	± 0.28	± 0.32	± 0.38

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Nominal Thickness		Tolerance on width for nominal widths	
Over	Up to and including	Up to and including 350	Over 350 up to and including 1250
0.05	2	+ 2.0 0	+ 6.0 0
2	5	+ 4.0 0	+ 8.0 0
5	10	+ 8.0 0	+ 10.0 0
10	25	+ 10.0 0	+ 12.0 0


Hardness test:

Accordance with EN ISO 6507-1

Vickers (HV) : 65 min.
: 95 max.

Composition: % (Mass Fraction)

Element	Min.	Max.
Cu	99.9%*	-
Bi	-	0.0005%
O	-	0.0400%
Pb	-	0.0050%
Other Elements (Total)		0.0300%
NOTE: The total of other elements (than copper) is defined as the sum of As, Bi, Cd, Co, Cr, Fe, Mn, Ni, P, Pb, S, Sb, Se, Si, Sn, Te and Zn		
*Including silver, up to a maximum of 0,015 %.		

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Fixed Length Tolerance:

Nominal Thickness	Tolerance on length
Up to and including 5	+10 0
Over 5 Up to and including 10	+15 0
Over 10 Up to and including 25	+20 0

Note: Every shipment must be verified for the requirements