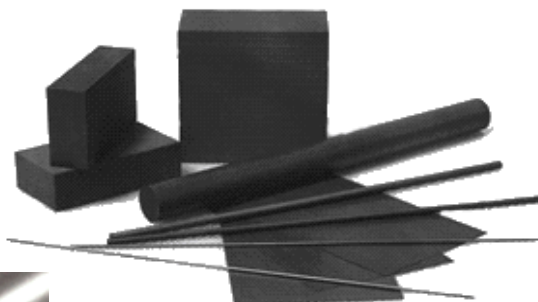



ELECTRODE PRODUCTION MATERIAL



Electrode production material


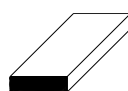
E-Cu ELECTROLYTIC COPPER

ISO: Cu-ETP, STN/ČSN: 423001, EN: CW004A, DIN: 2.0065/E-Cu58 2.0060/E-Cu57

ROUND BARS (diameter mm)												
ROUND BARS 	3	4	5	6	8	10	12	14	15	16	20	25
	30	36	40	50	60	70	80	90	100	110	130	


Length: We cut the bars to your required length.

Information about delivery of other diameters are available on request.

DRAWN BARS FLAT, SQUARE (diameter mm)										
SQUARE BARS 	10x10	15x15	20x20	25x25	30x30	35x35	40x40	50x50	50x50	
FLAT BARS 	20x5	20x10	30x10	40x10	50x10	60x10	80x10	100x10	120x10	
	30x20	40x20	50x20	50x30	60x30					

Length: We cut the bars to your required length.

Information about delivery of other diameters are available on request.

ROLLED SHEETS (PLATES) (thickness mm)						
ROLLED SHEETS (PLATES) 	15	20	25	30	40	50
	60	70	80	90	100	

Length and width:

The standard stock plate sizes are 500mm wide x 1200mm long and are available in all the thicknesses shown above. We supply the plates cut exactly to your required length and width*.

* Note: Orders using the full width of 500mm are supplied at discounted prices as there is no wastage

Information about delivery of other diameters are available on request.

Available also other materials such as CuCr1Zr, CuCo2Be, CuCoNiBe, CuBe2, Cu-DHP, Cu-OF, ...

Electrode production material

G R A P H I T E

Advantages of using Graphite:

- ⇒ **Thermal independence** For long and very thin electrodes there is no warping due to heat during EDM die-sinking.
- ⇒ **Light weight** For very big electrodes, the graphite electrode is significantly less weight than the same size copper electrode.
- ⇒ **High efficiency** Greater efficiency can be achieved in EDM die-sinking when using graphite electrodes instead of copper. The large range of graphite compositions available ensures that we can supply the ideal electrode material for all your requirements. From heavy roughing to extra fine finishing, a suitable graphite electrode is available from us.
- ⇒ **Lower price** Graphite is cheaper than copper, copper-thungsten, silver-thungsten

TOYO TANSO and IBIDEN (Japan), and SGL Carbon (Germany)

Characteristics

Item No.	Density (g/cm ³)	Hardness (Shore)	Specific electrical resistance (μΩcm)	Flexural strength (MPa)	Thermal Expansion (x 10 ⁻⁶ / K)	Medium grain size (μm)	Maximum dimensions (mm)
ISEM-2	1,78	55	1100	41	4,6	10	305 x 620 x 1000
ISEM-8	1,78	63	1340	52	5,6	8	305 x 620 x 1000
ISO-63	1,78	76	1500	65	5,6	5	230 x 540 x 1000
TTK-55	1,79	72	1420	63	5,8	5	230 x 540 x 1000
TTK-4	1,78	72	1400	73	5	4	210 x 510 x 950
ED-3	1,80	65	1400	58,8	4,9	10	300 x 500 x 1000
EX-60	1,8	62	1300	80	5	10	305 x 610 x 1200
EX-70	1,85	70	1500	68,6	6	6	235 x 440 x 1000
EX-75	1,80	68	1600	79	4,7	5	310 x 620 x 1220
R 8340	1,72	80 HR _{10/100}	1200	45	2,9	15	400 x 500 x 1300
R 8500	1,77	70 HR _{5/100}	1400	50	3,9	10	400 x 500 x 1300
R 8510	1,83	95 HR _{5/100}	1300	60	4	10	400 x 500 x 1300
R 8710	1,88	110 HR _{5/100}	1300	85	4,7	3	190 x 390 x 610

Graphite materials are according to their specific properties suitable for heavy roughing, for roughing, for medium machining and finishing, for fine finishing, or for extra fine finishing.

The suitability of using electrodes made from graphite raw material in the EDM machining process is shown in the table on the following page.

Electrode production material

G R A P H I T E

Using

Item No.	Heavy roughing	Roughing	Medium machining and finishing	Fine finishing	Extra fine finishing
ISEM-2	x	xx	xx	x	
ISEM-8		x	xx	xx	x
ISO-63		x	xx	xx	x
TTK-55		x	x	xx	xx
TTK-4			x	xx	xx
ED-3	xx	xx	x		
EX-60		x	xx	xx	x
EX-70		x	x	xx	xx
EX-75		x	x	xx	xx
R 8340	xx	xx	x		
R 8500	x	xx	xx	x	
R 8510	x	xx	xx	x	
R 8710			x	xx	xx

x – suitable xx - ideal

Dimensions: We supply the graphite cut to your requirements.

We are pleased to recommend a suitable type of graphite electrode to meet your requirements.

Note: For machining graphite electrodes, it is necessary to use a fully enclosed machine with a strong suction for dust extraction and suitable machining tools.

Notice:

Copper, copper-tungsten, graphite and other electrodes for EDM are suitable for gluing. Also is possible gluing electrodes to clamping pallets. More information how to glue electrodes you can find in the end of chapter.

Electrode production material

GRAPHITE

Finished graphite blocks **ISEM-8** ready for immediate collection from our warehouse.
 More cost-effective than when cutting to a specific size.

Item No.	Dimensions [mm]
ISEM-8 /Sp1	50 x 50 x 120
ISEM-8 /Sp3	70 x 150 x 150
ISEM-8 /Sp2	100 x 100 x 200
ISEM-8 /Sp11	20 x 200 x 550
ISEM-8 /Sp31	25 x 200 x 550
ISEM-8 /Sp12	30 x 200 x 550
ISEM-8 /Sp13	40 x 200 x 550
ISEM-8 /Sp14	50 x 200 x 550
ISEM-8 /Sp15	60 x 200 x 550
ISEM-8 /Sp16	70 x 200 x 550
ISEM-8 /Sp17	80 x 200 x 550
ISEM-8 /Sp18	90 x 200 x 550
ISEM-8 /Sp19	100 x 200 x 550

Item No.	Dimensions [mm]
ISEM-8 /Sp20	200 x 200 x 550
ISEM-8 /Sp21	20 x 200 x 270
ISEM-8 /Sp32	25 x 200 x 270
ISEM-8 /Sp22	30 x 200 x 270
ISEM-8 /Sp23	40 x 200 x 270
ISEM-8 /Sp24	50 x 200 x 270
ISEM-8 /Sp25	60 x 200 x 270
ISEM-8 /Sp26	70 x 200 x 270
ISEM-8 /Sp27	80 x 200 x 270
ISEM-8 /Sp28	90 x 200 x 270
ISEM-8 /Sp29	100 x 200 x 270
ISEM-8 /Sp30	200 x 200 x 270

Finished graphite blocks **TTK-55** ready for immediate collection from our warehouse.
 More cost-effective than when cutting to a specific size.

Item No.	Dimensions [mm]
TTK-55 /Sp1	50 x 50 x 120
TTK-55 /Sp3	70 x 150 x 150
TTK-55 /Sp2	100 x 100 x 200
TTK-55 /Sp11	20 x 200 x 550
TTK-55 /Sp31	25 x 200 x 550
TTK-55 /Sp12	30 x 200 x 550
TTK-55 /Sp13	40 x 200 x 550
TTK-55 /Sp14	50 x 200 x 550
TTK-55 /Sp15	60 x 200 x 550
TTK-55 /Sp16	70 x 200 x 550
TTK-55 /Sp17	80 x 200 x 550
TTK-55 /Sp18	90 x 200 x 550
TTK-55 /Sp19	100 x 200 x 550

Item No.	Dimensions [mm]
TTK-55 /Sp20	200 x 200 x 550
TTK-55 /Sp21	20 x 200 x 270
TTK-55 /Sp32	25 x 200 x 270
TTK-55 /Sp22	30 x 200 x 270
TTK-55 /Sp23	40 x 200 x 270
TTK-55 /Sp24	50 x 200 x 270
TTK-55 /Sp25	60 x 200 x 270
TTK-55 /Sp26	70 x 200 x 270
TTK-55 /Sp27	80 x 200 x 270
TTK-55 /Sp28	90 x 200 x 270
TTK-55 /Sp29	100 x 200 x 270
TTK-55 /Sp30	200 x 200 x 270

Electrode production material

Tungsten rods - the cheapest and the most used diameters and lengths

Diameter \varnothing (mm)	1.0	1.6	2.0	2.4	3.2	4.0	4.8	6.4
Lenght (mm)	175	175	175	175	175	175	175	175

Copper-thungsten

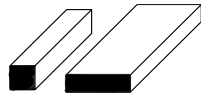
Round bars



Please indicate the required dimensions and composition in your inquiry
(composition example 75:25 or 70:30 or 80:20 or 90:10 or...)

Copper-thungsten

Square bars



Please indicate the required dimensions and composition in your inquiry
(composition example 75:25 or 70:30 or 80:20 or 90:10 or...)

Silver-thungsten

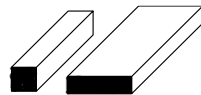
Round bars



Please indicate the required dimensions in your inquiry.



Silver-thungsten

Square bars




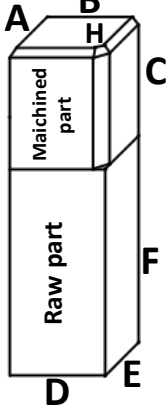
Please indicate the required dimensions in your inquiry.

Electrode production material

	Description	Item No.	Hexagon Size	Offset total	Clamping diameter	Hexagon Length	Total Length
	Hexagon copper rods with round shank	Cu6ER3-01	3 mm	- 0,1 mm	Ø6 mm	50mm	80mm
		Cu6ER4-01	4 mm	- 0,1 mm	Ø6 mm		
		Cu6ER5-01	5 mm	- 0,2 mm	Ø6 mm		
		Cu6ER5-02	5 mm	- 0,2 mm	Ø6 mm		
		Cu6ER6-01	6 mm	- 0,1 mm	Ø6 mm	100mm	130mm
		Cu6ER6-02	6 mm	- 0,2 mm	Ø6 mm		
		Cu6ER8-01	8 mm	- 0,1 mm	Ø6 mm		
		Cu6ER8-02	8 mm	- 0,2 mm	Ø6 mm		
		Cu6ER10-01	10 mm	- 0,1 mm	Ø6 mm		
		Cu6ER10-02	10 mm	- 0,2 mm	Ø6 mm		
		Cu6ER12-01	12 mm	- 0,1 mm	Ø6 mm		
		Cu6ER12-02	12 mm	- 0,2 mm	Ø6 mm		


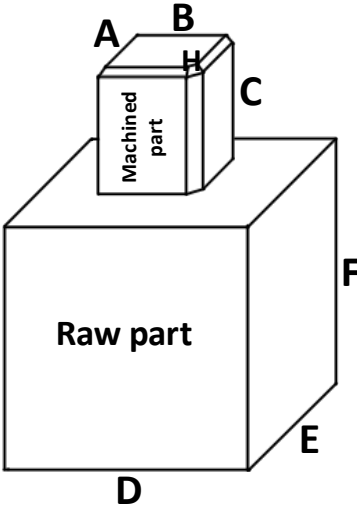
Offset total -0,1mm for hexagon copper rods 5mm and bigger is suitable for EDM die sinkers without all axis CNC (without planetary function).

Offset total -0,2mm for hexagon copper rods 5mm and bigger is suitable for CNC EDM die sinkers and EDM RBT1 EDM device for removing broken taps and tools.


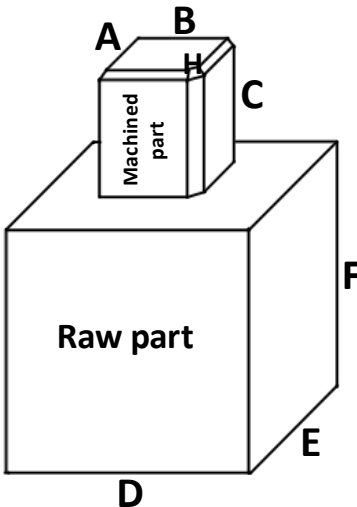
COPPER and GRAPHITE electrode production material - 12pcs packing quantity										
		A	B	C	D	E	F	H	Item No.	
		14,7	14,7	30	15	15	50	2,5	EL-Cu15-01	
										EL-Gr15-01
		24,7	24,7	30	25	25	50	2,5	EL-Cu25-01	
								EL-Gr25-01		
We can supply any other dimensions upon request.										

- * EL-Cu = copper production material
- * EL-Gr = graphite production material

Electrode production material

COPPER and GRAPHITE electrode production material - 12pcs in package										
		A	B	C	D	E	F	H	Item No.	
		15	15	30	25	25	50	2,5	EL-Cu15-02	
										EL-Gr15-02
		15	15	30	30	30	50	2,5	EL-Cu15-03	
										EL-Gr15-03
		15	15	30	35	35	50	2,5	EL-Cu15-04	
										EL-Gr15-04
15	15	30	40	40	50	2,5	EL-Cu15-05			
								EL-Gr15-05		
15	15	30	50	50	50	2,5	EL-Cu15-06			
								EL-Gr15-06		
We can supply any other dimensions upon request.										

- * EL-Cu = copper production material
- * EL-Gr = graphite production material

COPPER and GRAPHITE electrode production material - 12pcs in package										
		A	B	C	D	E	F	H	Item No.	
		25	25	30	25	25	50	2,5	EL-Cu25-02	
										EL-Gr25-02
		25	25	30	30	30	50	2,5	EL-Cu25-03	
										EL-Gr25-03
		25	25	30	35	35	50	2,5	EL-Cu25-04	
										EL-Gr25-04
25	25	30	40	40	50	2,5	EL-Cu25-05			
								EL-Gr25-05		
25	25	30	50	50	50	2,5	EL-Cu25-06			
								EL-Gr25-06		
We can supply any other dimensions upon request.										

- * EL-Cu = copper production material
- * EL-Gr = graphite production material

Single component adhesive



- is recommended for joining small adjacent surfaces
- suitable for electrode production materials, such as graphit, copper, copper-tungsten...
- suitable for quick joining electrode production materials together with clamping pallets – palletisation for EDM

If necessary, we also provide the multi-component adhesives, suitable for larger surfaces to be glued.

Adhesive application:

The adhesive should be applied to the contact surface of the electrode, however max. on 40% of the surface of the electrode. Best on the circumference of the electrode contact surface. After application of adhesive must be bonded parts pressed together. The adhesive has quenched into microspores of bonded parts, microfilm has formed, but still remains conductive contact for the electric current flowing. Therefore, it must remain at least 60% of the bonding surface without adhesive.

Note:

It is recommended for better conduction of electricity overbridge the glued joint with conductor.