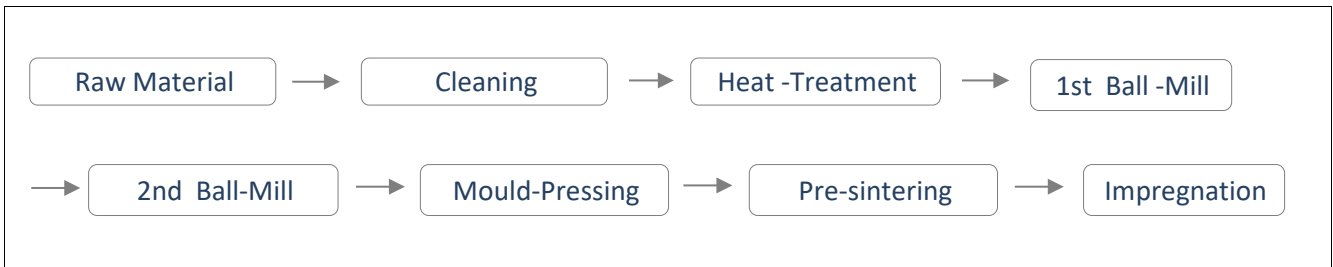


Copper Tungsten

Product process



Characteristics

The products are metallurgy of tungsten and copper or silver made through the above metallurgy. The standard composition is 75/25% (tungsten/copper or -/silver) although the other compositions are available. The shape of product are available to be provided in rod, plate & the other cut pieces

1. Resistance welding electrode

It integrates such features of tungsten and copper as high temperature resistance, electrical arc ablation resistance, high proportion, good electrical and heat conductivity, being easy to cut and transpiration cooling.

It also owns such advantages of tungsten as high hardness, melting and adherence resistance. It is used for projection welding and butt-welding electrode with high temperature resistance.

2. Electric spark electrode

It is used for the electrode of mould made from tungsten copper alloy and mega-hard alloy. The common electrode has high consumption and low rate.

The high electrical ablation rate, low consumption ratio, precise electrode size and high quality processing performance of copper tungsten can ensure that the precision of the work piece is greatly enhanced.

3. High-voltage discharge tube electrode

When the high-voltage vacuum discharge tube is working, the temperature of contact material will rise to thousands degree centigrade within several tenths seconds.

High ablation resistance, high toughness, good electrical and conductivity of copper tungsten provide necessary condition to stable operation of the discharge tube.

4. Electric contact

- a) Telecommunication
- b) Control signal
- c) Automotive & Power relay
- d) Semi-conductor
- e) Weight balance
- f) Electric connector - conductive device joining & electric circuit breaker

Electrode contact can be produced from a variety of precious metal material including fine silver, silver tungsten, copper tungsten and copper graphite alloy.

Mainly, the application have been widely used in mechanical switches and circuit breaker.

Many kind of them required high quality and safety for electric,thermal shock for each process

Copper Tungsten

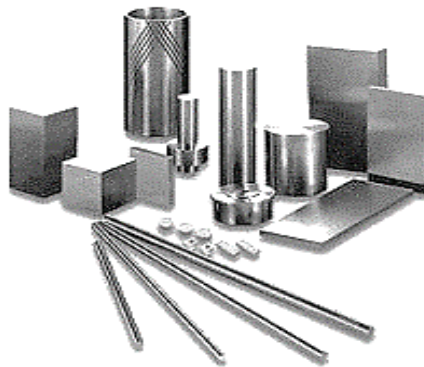


Specification

Type	Class (B702)	Density (g/cm ³)	Conductivity (%IACS)	HRB	HB (Mpa)
CuW60	9 (B)	12.7 - 13.4	≥ 54	78-85	≥ 1545
CuW70	10 (C)	14.1 - 14.3	≥ 47	90-92	≥ 1720
CuW75	11 (D)	14.8 - 15.0	≥ 42	94-96	≥ 2035
CuW80	12 (E)	15.4 - 15.6	≥ 38	99-101	≥ 2160
CuW85	13 (-)	16.1 - 16.3	≥ 32	107-109	≥ 2355

※ Other compositions are available upon request

Silver Tungsten



Specification

Type	Class	Density (g/cm ³)	Conductivity (%IACS)	HRB	HB (Mpa)
AgW60	9	14.6 - 14.9	≥ 54	80-83	≥ 1515
AgW70	10	15.2 - 15.5	≥ 50	89-92	≥ 1695
AgW75	11	15.8 - 16.1	≥ 45	92-95	≥ 2005
AgW80	12	16.3 - 16.6	≥ 40	94-99	≥ 2130
AgW85	13	16.9 - 17.2	≥ 35	102-105	≥ 2325

※ Other compositions are available upon request

Copper Tungsten

Rod (Round)			
Dia. (mm)	Available		
	L=100mm	L=150mm	L=200mm
0.7	○		
0.8	○		
0.9	○		
1.0	○	○	○
2.0	○	○	○
3.0	○	○	○
4.0	○	○	○
5.0	○	○	○
6.0	○	○	○
7.0	○	○	○
8.0	○	○	○
9.0	○	○	○
10.0	○	○	○
11.0	○	○	○
12.0	○	○	○
13.0	○	○	○
14.0	○	○	○
15.0	○	○	○
16.0	○	○	○
17.0	○	○	○
18.0	○	○	○
19.0	○	○	○
20.0	○	○	○
21.0	○	○	○
22.0	○	○	○
23.0	○	○	○
24.0	○	○	○
25.0	○	○	○
26.0	○	○	○
27.0	○	○	○
28.0	○	○	○
29.0	○	○	○
30.0	○	○	○
~	~	~	~
50.0	○	x	x

Plate (Block, Disk ...)							
							Unit : mm
Thickness x Width x Length	Available	Thickness x Width x Length	Available	Thickness x Width x Length	Available	Thickness x Width x Length	Available
1x75x200	X	1x100x100	X	1x100x150	X	1x100x200	X
2x75x200	X	2x100x100	X	2x100x150	X	2x100x200	X
3x75x200	○	3x100x100	○	3x100x150	○	3x100x200	○
4x75x200	○	4x100x100	○	4x100x150	○	4x100x200	○
5x75x200	○	5x100x100	○	5x100x150	○	5x100x200	○
6x75x200	○	6x100x100	○	6x100x150	○	6x100x200	○
7x75x200	○	7x100x100	○	7x100x150	○	7x100x200	○
8x75x200	○	8x100x100	○	8x100x150	○	8x100x200	○
9x75x200	○	9x100x100	○	9x100x150	○	9x100x200	○
10x75x200	○	10x100x100	○	10x100x150	○	10x100x200	○
11x75x200	○	11x100x100	○	11x100x150	○	11x100x200	○
12x75x200	○	12x100x100	○	12x100x150	○	12x100x200	○
13x75x200	○	13x100x100	○	13x100x150	○	13x100x200	○
14x75x200	○	14x100x100	○	14x100x150	○	14x100x200	○
15x75x200	○	15x100x100	○	15x100x150	○	15x100x200	○
16x75x200	○	16x100x100	○	16x100x150	○	16x100x200	○
17x75x200	○	17x100x100	○	17x100x150	○	17x100x200	○
18x75x200	○	18x100x100	○	18x100x150	○	18x100x200	○
19x75x200	○	19x100x100	○	19x100x150	○	19x100x200	○
20x75x200	○	20x100x100	○	20x100x150	○	20x100x200	○
21x75x200	○	21x100x100	○	21x100x150	○	21x100x200	○
22x75x200	○	22x100x100	○	22x100x150	○	22x100x200	○
23x75x200	○	23x100x100	○	23x100x150	○	23x100x200	○
24x75x200	○	24x100x100	○	24x100x150	○	24x100x200	○
25x75x200	○	25x100x100	○	25x100x150	○	25x100x200	○
26x75x200	○	26x100x100	○	26x100x150	○	26x100x200	○
27x75x200	○	27x100x100	○	27x100x150	○	27x100x200	○
28x75x200	○	28x100x100	○	28x100x150	○	28x100x200	○
29x75x200	○	29x100x100	○	29x100x150	○	29x100x200	○
30x75x200	○	30x100x100	○	30x100x150	○	30x100x200	○
~	~	~	~			~	~
50x75x200	○	50x100x100	○			50x100x200	○

※ The above quotations can be adjusted to depending on raw material status of LME market.

Silver Tungsten

Rod (Round)			
Dia. (mm)	Available		
	L=100mm	L=150mm	L=200mm
0.7	○		
0.8	○		
0.9	○		
1.0	○	○	○
2.0	○	○	○
3.0	○	○	○
4.0	○	○	○
5.0	○	○	○
6.0	○	○	○
7.0	○	○	○
8.0	○	○	○
9.0	○	○	○
10.0	○	○	○
11.0	○	○	○
12.0	○	○	○
13.0	○	○	○
14.0	○	○	○
15.0	○	○	○
16.0	○	○	○
17.0	○	○	○
18.0	○	○	○
19.0	○	○	○
20.0	○	○	○
21.0	○	○	○
22.0	○	○	○
23.0	○	○	○
24.0	○	○	○
25.0	○	○	○
26.0	○	○	○
27.0	○	○	○
28.0	○	○	○
29.0	○	○	○
30.0	○	○	○
~	~	~	~
50.0	○	x	x

Plate (Block, Disk ...)							
							Unit : mm
Thickness x Width x Length	Available	Thickness x Width x Length	Available	Thickness x Width x Length	Available	Thickness x Width x Length	Available
1x75x200	X	1x100x100	X	1x100x150	X	1x100x200	X
2x75x200	X	2x100x100	X	2x100x150	X	2x100x200	X
3x75x200	○	3x100x100	○	3x100x150	○	3x100x200	○
4x75x200	○	4x100x100	○	4x100x150	○	4x100x200	○
5x75x200	○	5x100x100	○	5x100x150	○	5x100x200	○
6x75x200	○	6x100x100	○	6x100x150	○	6x100x200	○
7x75x200	○	7x100x100	○	7x100x150	○	7x100x200	○
8x75x200	○	8x100x100	○	8x100x150	○	8x100x200	○
9x75x200	○	9x100x100	○	9x100x150	○	9x100x200	○
10x75x200	○	10x100x100	○	10x100x150	○	10x100x200	○
11x75x200	○	11x100x100	○	11x100x150	○	11x100x200	○
12x75x200	○	12x100x100	○	12x100x150	○	12x100x200	○
13x75x200	○	13x100x100	○	13x100x150	○	13x100x200	○
14x75x200	○	14x100x100	○	14x100x150	○	14x100x200	○
15x75x200	○	15x100x100	○	15x100x150	○	15x100x200	○
16x75x200	○	16x100x100	○	16x100x150	○	16x100x200	○
17x75x200	○	17x100x100	○	17x100x150	○	17x100x200	○
18x75x200	○	18x100x100	○	18x100x150	○	18x100x200	○
19x75x200	○	19x100x100	○	19x100x150	○	19x100x200	○
20x75x200	○	20x100x100	○	20x100x150	○	20x100x200	○
21x75x200	○	21x100x100	○	21x100x150	○	21x100x200	○
22x75x200	○	22x100x100	○	22x100x150	○	22x100x200	○
23x75x200	○	23x100x100	○	23x100x150	○	23x100x200	○
24x75x200	○	24x100x100	○	24x100x150	○	24x100x200	○
25x75x200	○	25x100x100	○	25x100x150	○	25x100x200	○
26x75x200	○	26x100x100	○	26x100x150	○	26x100x200	○
27x75x200	○	27x100x100	○	27x100x150	○	27x100x200	○
28x75x200	○	28x100x100	○	28x100x150	○	28x100x200	○
29x75x200	○	29x100x100	○	29x100x150	○	29x100x200	○
30x75x200	○	30x100x100	○	30x100x150	○	30x100x200	○
~	~	~	~			~	~
50x75x200	○	50x100x100	○	50x100x150		50x100x200	○

※ The above quotations can be adjusted to depending on raw material status of LME market.

Copper Tungsten / Standard Tube

Metric unit (mm)				Imperial unit (")			
O.D	I.D.	Tolerance of O.D.	Length	O.D	I.D.	Tolerance of O.D.	Length
1.00	0.25	0 - +0.03	200	0.039	0.010	0 - +0.001	8.0
1.10	0.25	0 - +0.03	200	0.043	0.010	0 - +0.001	8.0
1.20	0.25	0 - +0.03	200	0.047	0.010	0 - +0.001	8.0
1.30	0.25	0 - +0.03	200	0.051	0.010	0 - +0.001	8.0
1.40	0.25	0 - +0.03	200	0.055	0.010	0 - +0.001	8.0
1.50	0.40	0 - +0.03	200	0.059	0.016	0 - +0.001	8.0
1.60	0.40	0 - +0.05	200	0.063	0.016	0 - +0.002	8.0
1.70	0.40	0 - +0.05	200	0.067	0.016	0 - +0.002	8.0
1.80	0.40	0 - +0.05	200	0.071	0.016	0 - +0.002	8.0
1.90	0.40	0 - +0.05	200	0.075	0.016	0 - +0.002	8.0
2.00	0.50	0 - +0.05	200	0.079	0.020	0 - +0.002	8.0
2.10	0.50	0 - +0.05	200	0.083	0.020	0 - +0.002	8.0
2.20	0.50	0 - +0.05	200	0.087	0.020	0 - +0.002	8.0
2.30	0.50	0 - +0.05	200	0.091	0.020	0 - +0.002	8.0
2.40	0.50	0 - +0.05	200	0.094	0.020	0 - +0.002	8.0
2.50	0.50	0 - +0.05	200	0.098	0.020	0 - +0.002	8.0
2.60	0.50	0 - +0.10	200	0.102	0.020	0 - +0.004	8.0
2.70	0.50	0 - +0.10	200	0.106	0.020	0 - +0.004	8.0
2.80	0.50	0 - +0.10	200	0.110	0.020	0 - +0.004	8.0
2.90	0.50	0 - +0.10	200	0.114	0.020	0 - +0.004	8.0
3.00	0.50	0 - +0.10	200	0.118	0.020	0 - +0.004	8.0
3.50	0.80	0 - +0.10	200	0.138	0.031	0 - +0.004	8.0
4.00	0.80	0 - +0.10	200	0.157	0.031	0 - +0.004	8.0
4.50	0.80	0 - +0.10	200	0.177	0.031	0 - +0.004	8.0
5.00	0.80	0 - +0.10	200	0.197	0.031	0 - +0.004	8.0
5.50	0.80	0 - +0.10	200	0.217	0.031	0 - +0.004	8.0
6.00	0.80	0 - +0.15	200	0.236	0.031	0 - +0.006	8.0
6.50	0.80	0 - +0.15	200	0.256	0.031	0 - +0.006	8.0
7.00	1.00	0 - +0.15	200	0.276	0.039	0 - +0.006	8.0
7.50	1.00	0 - +0.15	200	0.295	0.039	0 - +0.006	8.0
8.00	1.00	0 - +0.15	200	0.315	0.039	0 - +0.006	8.0
8.50	1.00	0 - +0.15	200	0.335	0.039	0 - +0.006	8.0
9.00	1.00	0 - +0.15	200	0.354	0.039	0 - +0.006	8.0
9.50	1.00	0 - +0.15	200	0.374	0.039	0 - +0.006	8.0
10.00	1.00	0 - +0.15	200	0.394	0.039	0 - +0.006	8.0

Copper Tungsten / Roto Tube

Metric unit (mm)				Imperial unit (")			
O.D	I.D.	Tolerance of O.D.	Length	O.D	I.D.	Tolerance of O.D.	Length
1.00	0.20	0 - +0.03	200	0.039	0.008	0 - +0.001	8.0
1.10	0.20	0 - +0.03	200	0.043	0.008	0 - +0.001	8.0
1.20	0.20	0 - +0.03	200	0.047	0.008	0 - +0.001	8.0
1.30	0.20	0 - +0.03	200	0.051	0.008	0 - +0.001	8.0
1.40	0.20	0 - +0.03	200	0.055	0.008	0 - +0.001	8.0
1.50	0.20	0 - +0.03	200	0.059	0.008	0 - +0.001	8.0
1.60	0.40	0 - +0.05	200	0.063	0.016	0 - +0.002	8.0
1.70	0.40	0 - +0.05	200	0.067	0.016	0 - +0.002	8.0
1.80	0.40	0 - +0.05	200	0.071	0.016	0 - +0.002	8.0
1.90	0.40	0 - +0.05	200	0.075	0.016	0 - +0.002	8.0
2.00	0.40	0 - +0.05	200	0.079	0.016	0 - +0.002	8.0
2.10	0.50	0 - +0.05	200	0.083	0.020	0 - +0.002	8.0
2.20	0.50	0 - +0.05	200	0.087	0.020	0 - +0.002	8.0
2.30	0.50	0 - +0.05	200	0.091	0.020	0 - +0.002	8.0
2.40	0.50	0 - +0.05	200	0.094	0.020	0 - +0.002	8.0
2.50	0.50	0 - +0.05	200	0.098	0.020	0 - +0.002	8.0
2.60	0.50	0 - +0.10	200	0.102	0.020	0 - +0.004	8.0
2.70	0.50	0 - +0.10	200	0.106	0.020	0 - +0.004	8.0
2.80	0.50	0 - +0.10	200	0.110	0.020	0 - +0.004	8.0
2.90	0.50	0 - +0.10	200	0.114	0.020	0 - +0.004	8.0
3.00	0.50	0 - +0.10	200	0.118	0.020	0 - +0.004	8.0
3.50	0.80	0 - +0.10	200	0.138	0.093	0 - +0.004	8.0
4.00	0.80	0 - +0.10	200	0.157	0.031	0 - +0.004	8.0
4.50	0.80	0 - +0.10	200	0.177	0.031	0 - +0.004	8.0
5.00	0.80	0 - +0.10	200	0.197	0.031	0 - +0.004	8.0
5.50	0.80	0 - +0.10	200	0.217	0.031	0 - +0.004	8.0
6.00	0.80	0 - +0.15	200	0.236	0.031	0 - +0.006	8.0
6.50	0.80	0 - +0.15	200	0.256	0.031	0 - +0.006	8.0
7.00	1.00	0 - +0.15	200	0.276	0.040	0 - +0.006	8.0
7.50	1.00	0 - +0.15	200	0.295	0.040	0 - +0.006	8.0
8.00	1.00	0 - +0.15	200	0.315	0.040	0 - +0.006	8.0
8.50	1.00	0 - +0.15	200	0.335	0.040	0 - +0.006	8.0
9.00	1.00	0 - +0.15	200	0.354	0.040	0 - +0.006	8.0
9.50	1.00	0 - +0.15	200	0.374	0.040	0 - +0.006	8.0
10.00	1.00	0 - +0.15	200	0.394	0.040	0 - +0.006	8.0

Copper Tungsten / Tapping electrode



Metric unit (mm)							
Code No	Pitch	OD	Depth	Thread Length	Shank Length	Flush hole	Available
M2	0.40	1.50	0.22	55	25		△
M2.5	0.45	1.80	0.24	55	25		△
M3	0.50	2.00	0.27	55	25		○
M4	0.70	2.80	0.38	55	25		○
M5	0.80	3.70	0.43	55	25		○
M6	1.00	4.50	0.54	55	25		○
M8	1.25	6.30	0.68	55	25		○
M10	1.50	8.00	0.81	55	25		△
M12	1.75	9.70	0.95	55 / 75	25		△
M14	2.00	11.50	1.08	55 / 75	25		△
M16	2.00	13.50	1.08	55 / 75	25		△
M18	2.50	15.00	1.35	55 / 75	25		△
M20	2.50	17.00	1.35	55 / 75	25		△

Imperial unit (")							
Code No	Pitch	OD	Depth	Thread Length	Shank Length	Flush hole	Available
1	64	0.0540		2-1/4	1.00		
2	56	0.0670		2-1/4	1.00		
3	48	0.0800		2-1/4	1.00		Developing
4	40	0.0930		2-1/4	1.00		"
4	48	0.0930		2-1/4	1.00		"
5	40	0.1060		2-1/4	1.00		"
6	32	0.1190		2-1/4	1.00		"
8	32	0.1450		2-1/4	1.00		"
10	24	0.1710		2-1/4	1.00		"
10	32	0.1710		2-1/4	1.00		"
12	24	0.1970		3-1/4	1.00		"
12	28	0.1970		3-1/4	1.00		"
1/4	20	0.2310		3-1/4	1.00		"
5/16	18	0.2935		3-1/4	1.00		"
5/16	24	0.2935		3-1/4	1.00		"
3/8	16	0.2793		3-1/4	1.00		"
3/8	24	0.3049		3-1/4	1.00		"
7/16	14	0.3309		3-1/4	1.00		"
7/16	20	0.3572		3-1/4	1.00		"
1/2	13	0.3866		3-1/4	1.00		"
1/2	20	0.4197		3-1/4	1.00		"

Characteristic

Tapping electrode is very important element to drill and tap for very hard metals, tight tolerance and high productivity demands.

Our tapping electrode is produced through special cutting-process for thread by CNC machine.

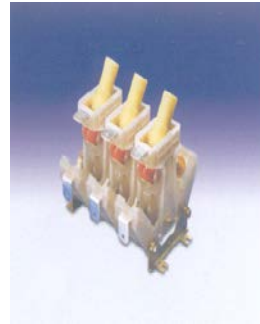
The quality will be compared with a rolling system in straightness and tolerance of outer diameter.

Our product always will be preserved the superior straightness, pitch and outer diameter exactly.

Remarks

- Straightness : 97%
- Tolerance of pitch, outer diameter and length : 0 ~ + 0.02mm
- Material : Copper Tungsten, Copper graphite - EDM C3
- Shape : With Flushing Hole, Without Flushing Hole
- Process : Cutting thread system with single point tool by CNC M/C, not Rolling system

Electric contact



Characterics

Electrical contacts can be produced from a variety of precious metals including fine silver, silver tungsten, and copper tungsten alloy by sintering or impregnation method of powder metallurgy.

The design of contacts could be provided to your specific application according to the proposal drawing.

Application

Telecommunication

Circuit breaker

Semi-conductor

Automotive & Power relay

ARC-Proof

etc ...

Shape

Contact assemblies by welding

Contact tapes

Contact button

etc ...

Product process

Copper tungsten metallurgy by sintering or Impregnation upon request

Silver tungsten metallurgy by sintering or Impregnation upon request

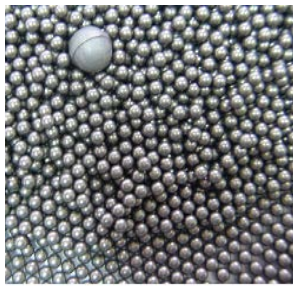
Specification

Material	Composition	Density (g/cm ³)	Hardness (HV)	IACS (%)
Fine Silver	99% Ag	10.5	45	108
Silver Tungsten	50% W	13.4	110	58
	65% W	14.8	150	50
	70% W	15.4	195	47
	75% W	16.0	220	45
Copper Tungsten	60% W	12.9	182	47
	70%W	14.2	197	42
	75% W	14.8	220	38
	80% W	15.4	233	35

※ Other compositions are available upon request

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Heavy metal



Characterics

Tungsten based high density metallurgy are material with a high amount of tungsten content and a low amount of Ni-Cu, Ni-Fe, Ni-Cu-Fe and the other content upon request.

The products have the advantages such as good machinability, mechanical properties, high modules of elasticity and high absorption capacity against X-ray and λ -ray.

Application

- Balanceable weight
- Electrode for resistance welding
- Electrodeheat upsetting anvil block
- High voltage electrical contact
- Protection shield for nuclear radiation
- Substitutional material for uranium
- Vibrating pulleys

Product proces

Powder metallurgy by sintering

Specification

Code	WHA-1	WHA-2	WHA-3	WHA-4
Physical properties				
Tungsten weight (%)	85	90	95	97
Density (g/cm ³)	16	17	18	18.5
Hardness (HRC)	25 ~ 30	26 ~ 32	27 ~ 33	30 ~ 35
Tensile strength (kg/mm ²)	80 ~ 90	75 ~ 85	70 ~ 80	65 ~ 75
Elongation (%)	20 ~ 25	15 ~ 20	5 ~ 10	3 ~ 5
Impact strength (kg/F-m)	25 <	20 <	8 <	5 <
Electric conductivity (IACS%)	15~ 16	14~ 15	14~ 15	12~ 14

Dimension

Size	Thickness (mm)	width (mm)	Length (mm)	Material - composition
Form class				
Billet	Φ5 ~ 10	"	30 ~ 60	W-Ni-Fe
Plate	20 ~ 55	"	50 ~ 200	W-Ni-Cu-Fe
Rod	Φ10 ~ 100	"	50 ~ 350	The others ...

※ Other compositions are available upon request

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