YUXI

COMPANY PROFILE

Save Your Money,Save Your Time

YUXI Cathodic Protection Materials Co., Ltd. is the leading manufacturer and supplier of cathodic protection materials in China. All of our services are focused on providing integrated series of materials such as anodes, backfills, cables, and other accessories.

It's our principal aim to provide the highest quality of materials and integrity of services, so our customer can focus all of their efforts in the more profitable services such as design, engineering, consulting in the world.

Taking advantage of the low cost of raw materials and labor, YUXI is always able to provide the most competitive prices to our customer backed with highest quality products and integrity customer services.

Please select us as your honest and reliable partner to save your money and time.

1 Magnesium Anode

Magnesium anodes are commonly used in cathodic protection, as Mg metal have more negative potential than other galvanic materials.

We adopt super quality magnesium metal exceeding industrial standards for producing anodes. The quality of the anodes is the best in China, and superior on the world.

We supply Mg anodes as follows:

Anode Packaged ready for shipment

Shrink Wrapped anode
On pallet

1.1. Mg HighPotential Anode

Our high potential anodes are made from high purity Mg metal with superior quality tested according to ASTM97-98 standard. Adopted special technology, the anodes have superior electrochemical properties, and in the course of protecting, the anode is consumpted uniformly. Thereof the anodes have a longer life.In practical experience, the actual measured driving potential is between -1.8V to -1.85V, thus provide most powerfu protection to the targeted structure.

We suggest to use our high potential Mg anode in soils with resistivities higher than 2000ohm.cm.

Chemical composition

Alloy	Al (max)	Mn	Si (max)	Cu (max)	Ni (max)	Fe (max)	Other metal impurity (max)	Total of impurities (max)
Mg-Mn	0.01	0.50-1.30	0.05	0.005	0.001	0.01	0.05	0.30

Electrochemical properties

Open voltage (-V)	Closed voltage (-V)	Actual capacity (A.h/kg)	Efficiency (%)
1.70-1.75	1.58-1.62	1,150 min	50 min

1.2. Mg Low Potential Anode

Chemical composition

Alloy	Al	Zn	Mn	Si (max)	Cu (max)	Ni (max)	Fe (max)	Total of impurities (max)
AZ63B	5.30-6.70	2.50-3.50	0.15-0.70	0.10	0.02	0.002	0.003	0.30

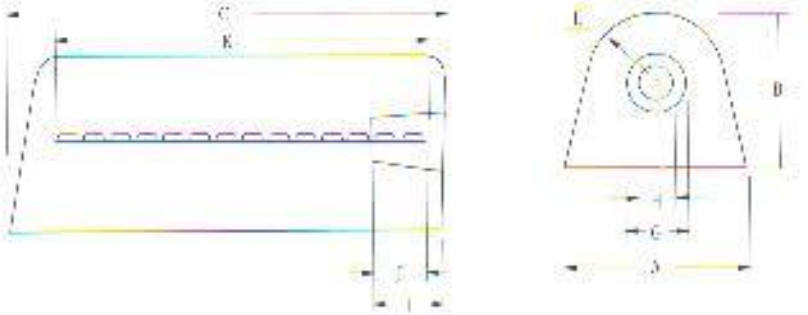
Electrochemical properties

Open voltage (-V)	Closed voltage (-V)	Actual capacity (A.h/kg)	Efficiency (%)
1.50-1.55	1.45-1.50	1,105 min	55 min

We suggestion to use our low potential anodes in soils with resistivity lower than 2,000 ohm.cm to minimize the cost, as this kind of anodes are much cheaper than high potential mg anodes.

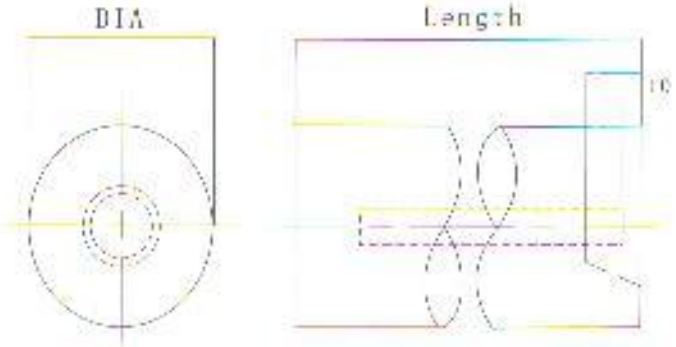
1.3. Specification of cast Mg anodes

"D" shape Type



9D2	4.1	63.5	63.5	669.9	28.6	41.3	15.9	34.9	25.4	517.5	Strip
14D2	6.35	63.5	63.5	1054.1	28.6	41.3	15.9	34.9	25.4	803.3	Strip
20D2	9.5	63.5	63.5	1505	28.6	41.3	15.9	34.9	25.4	1466.9	Wire
9D3	4.1	88.9	95.25	258.8	38.1	47.6	22.2	38.1	31.8	266.7	Strip
17D3	7.7	88.9	95.25	657.2	38.1	47.6	22.2	38.1	31.8	571.5	Strip
32D5	14.5	139.7	146.05	523.9	60.3	47.6	22.2	38.1	31.8	419.1	Strip
48D5	22	139.7	146.05	765.2	60.3	47.6	22.2	38.1	31.8	723.9	Strip

"R" shape



Type	N.W. (kg)	G.W. (kg)	DIA (mm)	Length 1.7V(mm)	Length 1.5V(mm)	Insert Dimension
YM-R36	3.6kg	3.7kg	114	202	193	25x2x190
YM-R41	4.1kg	4.2kg	114	230	220	25x2x190
YM-R50	5.0kg	5.1kg	114	280	268	25x2x195
YM-R77	7.7kg	7.8kg	114	412	431	25x2x332
YM-R100	10kg	10.2kg	114	536	560	25x2x428
YM-R145	14.5kg	14.7kg	146	472	494	25x2x428
YM-R227	22.7kg	22.9kg	178	497	520	25x2x428
YM-R274(I)	27.3kg	27.6kg	178	618	630	25x3x550
YM-R274(II)	27.3kg	28.2kg	114	1462	1528	25x3x1700

- *Above anodes available ex store
- *Above anodes supplied in both bare and packaged forms.
- * Besides above anodes, we are also supplying Hull Anode, Tank Anode,Rectangular Anode.
- * Special size anodes can be manufactured upon receipt your request.

2. Mg Extruded Rod

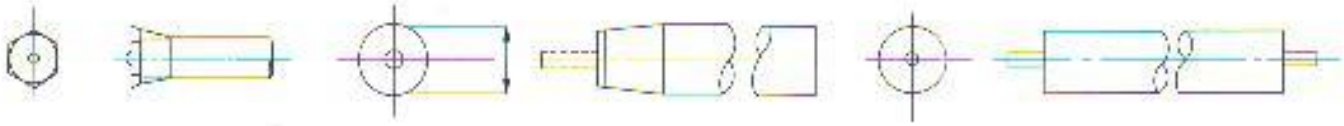
Extruded anodes have high current to weight ratio, are suitable to be used in where a small diameter anode is required to give enough cathodic current.

We supply extruded anodes in both high potential (Mg-Mn alloy) and low potential (AZ31 alloy). Our extruded anodes are typically suitable for all kinds of water heaters and water storage tanks, or in prepolarization of offshore structure etc.

Chemical composition

Alloy	Al	Mn	Zn (max)	Ca (max)	Si (max)	Cu (max)	Ni (max)	Fe (max)	Other Imp. each	Other Imp. total
AZ31B	2.5-3.5	0.2-1.0	0.6-1.4	0.04	0.10	0.01	0.001	0.005	-	0.30
Mg-Mn	0.01 max	0.5-1.3	—	—	—	0.02	0.001	0.03	0.05	0.30

Extruded rod anodes size specification

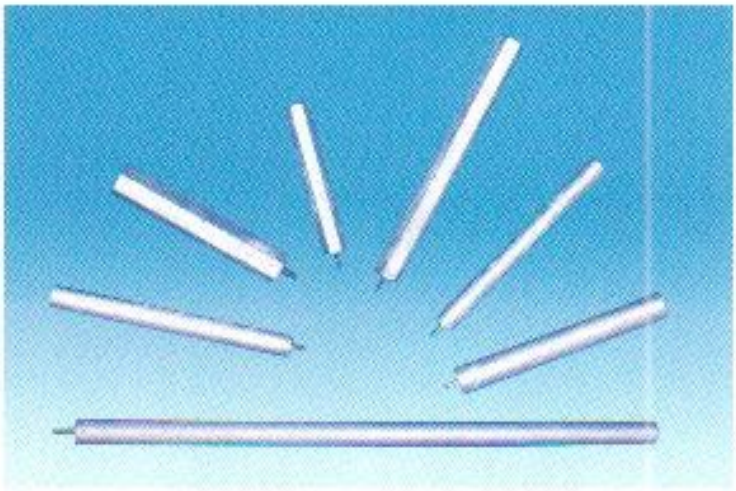


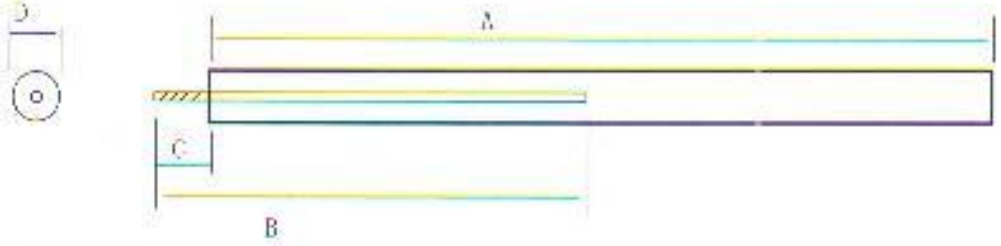
Diameter (inch)	Core eccentric (inch)	Core diameter (inch)	Straightness (inch/ 2 ft length)	Weight (lbs/inch)
0.500-0.020	0.040	0.135	0.060	0.015
0.675-0.020	0.050	0.135	0.060	0.025
0.700-0.020	1/16	0.135	0.060	0.027
0.750-0.020	1/16	0.135	0.040	0.031
0.800-0.020	1/16	0.135	0.040	0.035
0.840-0.020	1/16	0.135	0.040	0.038
0.900-0.020	1/16	0.135	0.040	0.043
1.050-0.020	1/16	0.135	0.040	0.057
1.315-0.020	1/16	0.135	0.040	0.089
1.561±0.016	1/16	0.188	0.050	0.125
2.024±0.024	1/8	0.188	0.050	0.208
2.562±0.024	1/8	0.188	0.050	1/3

3. Mg Cast Rod Anode——AZ63 alloy

Mg cast rod anode are normally use in protecting water heater from corrosion.

Yuxi adopts advanced casting technology, supply supper quality Mg cast rod anode as follows:





Type	length	dia	insert	Type	length	dia	insert
13-115	115	13	M4	18-100	100	18	M4
14-150	150	14	M6	18-140	140	18	M6
14-180	180	14	M6	18-200	200	18	M6
14-215	215	14	M6	18-300	300	18	M6
14-275	275	14	M6	18-400	400	18	M6
16-90	90	16	M4	20-130	130	20	M6
16-100	100	16	M6	20-200	200	20	M6
16-155	155	16	M6	25-150	150	25	M6
16-165	165	16	M6	25-180	180	25	M6
16-210	210	16	M6	25-300	300	25	M8
16-250	250	16	M6	28-110	110	28	M6
16-340	340	16	M6	28-150	150	28	M6
16-400	400	16	M6	28-200	200	28	M8

4. Extruded ribbon anode specification

Extruded magnesium ribbon have much more surface to weight ratios, thus it will creat more greater current than normal cast anode.

Magnesium ribbon anode is normally used for protrecting oil tanks or other steel structures in high resistivity electrolytes.

Chemical composition

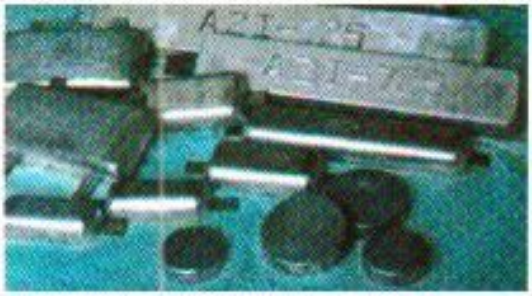
Mg	Mn	Zn	Al (max)	Cu (max)	Ni (max)	Fe (max)	Si (max)	Impurities	
								each	total
Balance	0.50-1.3	——	0.01	0.02	0.001	0.03	—	0.05	0.30
Balance	0.20min	0.7-1.3	2.5-3.5	0.01	0.001	0.002	0.05	0.05	0.30

Section (inch)	3/8X3/4±0.015 (1/8" (corner)
Diameter of core (inch)	0.135
Core eccentric (inch)	<1/16
Weight (lbs/feet)	0.243
Standard coil length (feet)	1000
Coil weight (lbs)	243 (110kg)

5. ZINC ANODE

Zinc anodes are widely adopted for protecting of steel construction from corrosion in seawater and saline mud.

The alloy chemical composition of the anode are covered by US MIL-A-18001H and the ASTM-B418 type I standard.



Chemical composition

AL	Cd	Fe	Pb	Cu	Zn
0.1-0.5	0.02-0.07	0.005 max	0.006 max	0.005max	Balance

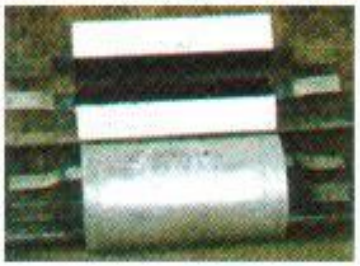
Electrochemical properties

Open Voltage (-V)	Closed Voltage (-V)	Actual capacitance A.h/kg	Efficiency %	Solution Appearance
1.05-1.09	1.00-1.05	780 min	95 min	Solute uniformly

Size Specification

We supply Zn anodes in different shapes according to customer's request. There are hull, condenser, tank anodes and bracelet shapes anodes. The anodes also can be made in strings.

Following are some of the anodes available.



Zn anodes for Vessel

Type	YZ-V01	YZ-V02	YZ-V03	YZ-V04	YZ-V05	YZ-V06	YZ-V07	YZ-V08
Size	390x120x50	500x150x40	300x150x35	400x100x35	300x150x30	320x100x40	250x100x35	200x100x35
Weight	15.6	13.6	11.0	9.0	8.6	8.0	5.6	4.0
Current	610	680	540	540	540	400	410	370

Zn anodes for ballast tank

Type	YZ-B01	YZ-B02	YZ-B03	YZ-B04	YZ-B05	YZ-B06
Size	1500x(65-75)x70	100x(58.5+78.5)x68	800x(56+74)x65	1143x(48+54)x51	300x(58+64)x60	650x(58+64)x70
Weight	52.8	33.0	25.0	22.0	22.0	18.0

Zn anodes for Oil Tank

Type	YZ-T01	YZ-T02>	YZ-T03	YZ-T04	YZ-T05	YZ-T06
Size	500x(105+135)x100	Dia300 x80	390x120x65	Dia250x60	Dia200x50	350x(60+90)x75
Weight	40	40	20	20	10	14

Zn anodes for Pipeline in seawater

Type	YZ-P01	YZ-P02	YZ-03	YZ-04
Size	622x51x420x38	530x46x464x38	503x51x400x51	371x51x562x51
Weight	261	218	191	184

- Above anodes are all in bracelet shape
- The dimension is: diameter x thickness x length x distance between the bracelet.

6. Zinc Ribbon Anode

Zinc ribbon anodes are produced according to ASTM-B-418 type I and type II alloy standard in the shape of diamond with very nice mechenical properties.

Zinc ribbon anode can be used in fresh water, sea water environments, also can be used in underground structures.

Chemical composition

	AL %	Cd %	Fe %	Pb %	Cu %	Zn
ASTM B-418 type I	0.1-0.5	0.02-0.07	0.005 max	0.006 max	0.006 max	Balance
ASTM B-418 type II	0.005 max	0.003 max	0.0014 max	0.003 max	0.002 max	Balance

Electrochemical properties

	Open Voltage (-V)	Closed Voltage (-V)	Capacity A.h/kg	Efficiency
ASTM B-418 type I	1.05 min	1.00 min	372	95%
ASTM B-418 type II	1.10 min	1.05 min	372	90%

Size Specification

Size type	A (inch)	B(inch)	net weight (lbs/feet)
YZR-01	1	1-1/4	2.4
YZR-02	5/8	7/8	1.2
YZR-03	1/2	9/16	0.6
YZR-04	11/32	15/32	0.25

- A and B are the length of the diagonal lines of the diamond section.

7. Aluminum Anode

We supply series of aluminum anode for defend the corrosion of steel structures in seawater. The Performance of the anodes is effected by the chemical composition of the alloy. We have different alloy series to meet customer's request. They are:

a).YA-I series, AL-Zn-In-Si,AL-Zn-In-Cr,Al-Zn-In-Sn alloy
Suitable for seawater environment.

b).YA-II series AL-Zn-In-Mg-Ti Alloy
Suitable for seawater environment, specially suitable for where the fresh water and seawater meet, and have a higher resistivity.

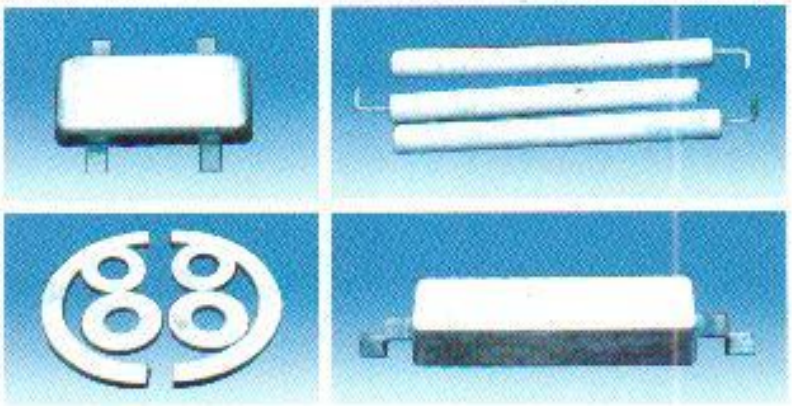
c).YA-III series Al-Zn-In-X-X Alloy
Suitable for mud in the sea

Electrochemical properties:

Type	Open Voltage (-V)	Closed Voltage (-V)	Actual Capacitance A.h/kg	Efficiency %	Solution Appearance
YA-I	1.05-1.18	1.05-1.12	2400min	85min	Solute uniformly
YA-II	1.05-1.18	1.05-1.12	2600min	92min	Solute uniformly
YA-III	1.45-1.50	1.40-1.45	2080min	70min	Solute uniformly

Chemical compositions are available upon request.

Size specification



1. For vessel

Type	YA-V01	YA-V02	YA-V03	YA-V04	YA-V05	YA-V06	YA-V07	YA-V08	YA-V09
Dim.	600x140x57	800x140x50	800x140x40	600x120x50	500x140x35	400x100x35	300x100x35	250x100x35	180x70x35
Weight	16.0kg	15.0kg	12.0kg	10.0kg	5.5kg	3.7kg	2.3kg	1.9kg	1.1kg
Current	1500mA	1500mA	1500mA	960mA	850mA	650mA	550mA	500mA	360mA

2. For Sea port and offshore structure

Type	YA-S01	YA-S02	YA-S03	YA-S04	YA-S05	YA-S06	YA-S07
Dim.	2300x(220+240)x230	1600x220+210)x220	1500x(170-200)x150	800x(200+280)x150	1250(115+135)x130	900x(150+170)x160	1000(115+135)x130
Weight	275kg	165kg	144kg	80kg	56kg	53kg	45kg
Current	4596mA	3515mA	3200mA	2232mA	2515mA	2203mA	2167mA

3.For ballast tank

Type	YA-B01	YA-B02	YA-B03	YA-B04	YA-B05	YA-B06
Dim.	1500x(65-75) x70	500x(115-135)x130	500x(110+130)x120	1000x(58.5+78.5)x68	800x(56+74)x65	1143x(48+54)x51
Weight	21.5kg	23.0kg	20.0kg	13.2kg	10.0kg	9.0kg

4. Pipe line in sea water

Type	YA-P01	YA-P02	YA-P03	YA-P04
Dim.	622x51x420x38	559x76x254x51	503x51x400x51	371x51x562x51
Weight	105kg	80kg	77kg	75kg
Pipe Dia.	20"	16"	14"	10"

The anodes are bracelet shape. the dimension: Out diameter x thickness x length x distance of bracelet.

8. Graphite Anode

Yuxi's Graphite anodes are produced by high quality petroleum coke.The petroleum Coke is mixed with petroleum tar and extruded into rod size.After being repeatedly sintered at very high temperature,the rod becomes high density,high carbon content. thus have a low consumption when it is being used.

According to customer's request, Yuxi's graphite anodes are impregnated by linseed oil or by wax in order to protect the anode from moisture.

Yuxi's graphite anodes can be supplied in following form:

a). Rod, without processing

b). Rod, Hole prepared for connection

c). End connection

d). Center connection

Properties

Bulk Density g/cm³	Apparent Porosity %	Grain Size mm	Ash %	Sulphur %	Specific Resistance Ohms/mm sq
1.65 min	5 max	1.5 max	0.16 max	0.01 max	8.6

Standard size specification

Type	YG-01	YG-02	YG-03	YG-04
Diameter	3 inch	4 inch	3 inch	4 inch
Length	30 inch	40inch	60 inch	80 inch
Weight	13 lbs	35 lbs	27 lbs	70lbs

9. Mixed Metal Oxide Anode

The research of mechanism and application development for electro-active coatings on Titanium was started in early 1980's. Various kinds of multi-elements coatings have been developed. The mixed metal oxide anode has an extremedy low consumption rate, measured in terms of milligrams for ampere-year. Whether operating in soil, fresh water, and or sea water, mixed metal oxide coatings demostrate very high chemical stability --even in environments with very low PH values.

Yuxi's supply high performance MMO anodes suitable for soil, sea mud, seawater, and fresh water environments. Yuxi provide two coating systems for different environment. They are:

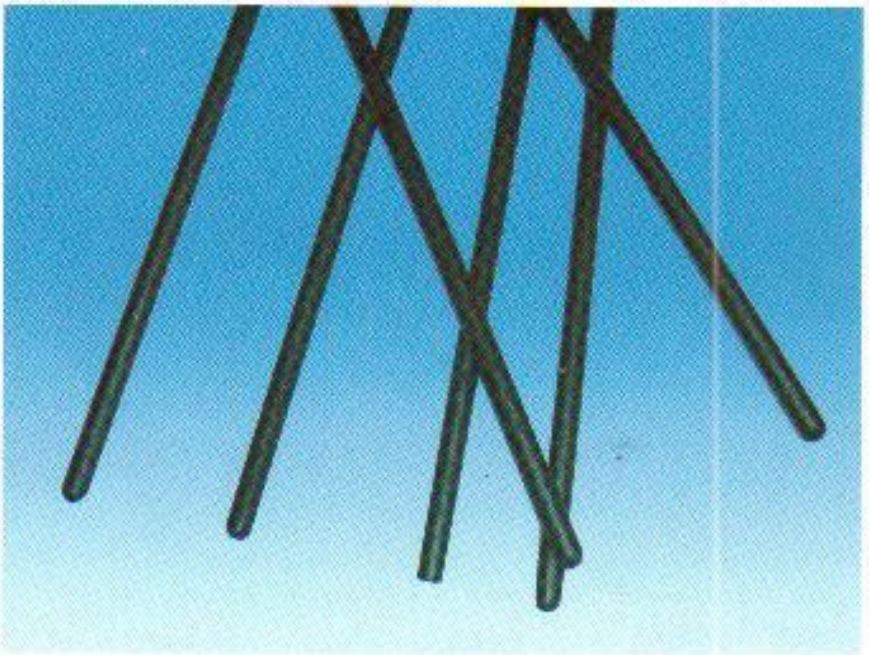
Ir-Ta system and Ir-Ru system.

Products Form of MMO Anode

The MMO anode can be in plate/sheet, rod, tube, wire, mesh etc. The dimension can be made according to customer's request.

Following anodes are usually available ex-stock.

1.MMO solid rod



We supply MMO rod anode in following type:

Type	MMO-1	MMO-2	MMO-3	MMO-4	MMO-5
Diameter	Dia 3.2m	Dia6.4mm	Dia12.7mm	Dia19mm	Dia25mm

The length of above anode can be supplied in any length between 0-1000mm. And the coating type can be changed according to different environments.

2. MMO tube anode

Titanium to ASTM sdandard B338

Standard Dimension:

Dimension	Current output	Life time
Dia 25mm x 1000mm long	8amps (based on 100amps/ m sq)	20years
Dia25mm x 500mm long	4amps (based on 100amps/ msq)	20years
Dia19mm x 1200mm long	7amps (based on 100amps/msq)	20years
Dia32mm x 1200mm long	12amps (based on 100amps/msq)	20years

The tubular anode can be supplied in string.

3. MMO ribbon anode

Titanium to ASTM 265, coated with IrO2/Ta2O5.

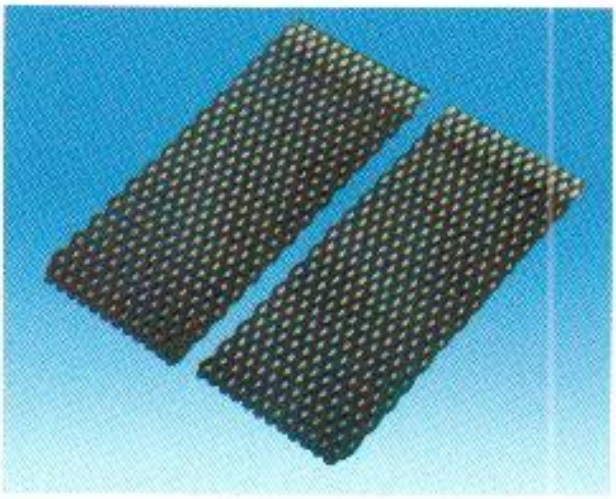
Standard dimension:

12.7mm wide x 0.6mm thickness x 152meters

Current output: 34mA/meter (10mA/lt).

Life time: 50years (at 1.2A/m sq)

4. MMO ribbon mesh anode



Titanium expanded mesh substrate coated with IrO2/Ta2O5.

Standard dimension:

a). 32.5mm wide x 1250mm long

Current Output: In calcined petroleum coke backfill: 5 amps

Life time: 20years.

Dimension of canister: dia 50mm x 1500mm

b). 20mm wide x 1000mm

Current Output: In calcined petroleum coke backfill: 2amps

Life time: 20years.

Dimension of canister: Dia 50mm x 1200mm

***The dimension of the anode can be made according to customer's request.**

Please be noted: When you send us inquiry, please provide us:

a) the type, and size of the anodes

b) Designed ourput current

c) The date of the actuating medium

Our engineers will send you useful suggestion, or select suitable anodes for you, according to the working environment.

10. High Silicon Cast Iron Anode

Si-Fe alloy with 14.5% Silicon content is a wide used corrosion control material. Because of abundant resources and low cost, Si-Fe alloy becomes the major anode material for cathodic protection since 1950s. Si-Fe anodes have good corrosion resisting performance , as the surface of the anode can come into a stable SiO2 film. In sea water or fresh water, we suggest to use Si-Fe alloy containing of chromium or chromium molybdenum to resist the corrosion of chlorions.

Si-Fe anodes are widely used in impressed current cathodic protection of offshore structures,underground pipelines,buried cable and so on.it is a kind of idea anode,as it has the characlery of low resistance,low consumption and low energy consumption.

We produce Si-Fe anodes according to ASTM A518-86 (grade 3) standard. The anodes are made by Chill Cast technology. than have more high quality and performance than normal sand mould casting. We supply the anodes in following specifications:

Rod Anode

Type	Dimension	Surface Area	Weight
YS-R01	25 x 900	0.023	1.5
YS-R02	38 x 900	0.12	7.5
YS- R03	38 x 1200	0.16	10
YS- R04	38 x 1500	0.20	13
YS- R05	50 x 900	0.16	13.5
YS- R06	50 x 1200	0.20	16.5

Type	Dimension	Surface Area	Weight
YS- R07	50x 1500	0.25	20.5
YS- R11	75 x 900	0.28	34
YS- R12	75 x 1200	0.30	40
YS- R13	75 x 1500	0.38	48
YS- R14	100 x 1200	0.38	66
YS-R15	100 x 1500	0.47	83

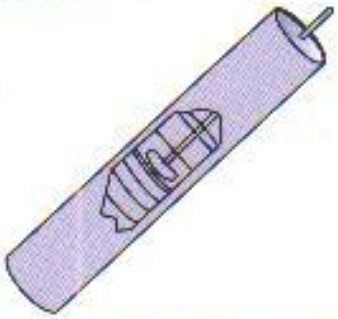
Si-Fe Tube Anode

Compare with the solid rod anode, tube anodes can:

1. Minimize the resistance of anodes to electrolytes.

2. Increase the surface to weight ratio, thus can reduce current density and distribute the produced gases over larger areas. It is very important for deep layer installations.

3. Improve current distribution, relaxes end electric discharge, while the cable joint is located in the center of the tube.



Type	Out Diameter	Wall thickness	Surface area	Surface area	Length
YS-T01	75 mm	10 mm	0.35 m2	0.35 m2	1500mm
YS-T02	100mm	10 mm	0.47 m2	0.47 m2	1500mm

10. CP Wire and Cable

Yuxi supply standard cable for cathodic protection as follows:

Normal type

Type	Stranding	Area (mm^2)	Coating
YC-1	7	2.5	HMWPE
YC-2	7	4.0	HMWPE
YC-3	7	6.0	HMWPE
YC-4	7	8.0	HMWPE
YC-5	7	10	HMWPE
YC-6	7	16	HMWPE
YC-7	7	25	HMWPE
YC-8	7/19	35	HMWPE
YC-9	19	75	HMWPE

Kynar PVDF/HMWPE cable

a).Normal type

Type	Stranding	NOMINAL AREA (MMsq)	MOMINAL WEIGHT (KG)	O.D. (mm)	Coating
YKC-1	7 x1.04	6	89	7.44	PVDF/HMWPE
YKC-2	7x1.35	10	144	8.37	PVDF/HMWPE
YKC-3	7x1.70	16	196	9.42	PVDF/HMWPE
YKC-4	19x1.35	25	312	11.07	PVDF/HMWPE
YKC-5	19x1.53	35	409	12.30	PVDF/HMWPE

CONDUCTOR: Circular stranded conductor of copper wires.
INSULATION: Irradiated PVDF with radial thickness 0.51mm.
SHEATH: HMWPE.

1.1. Anode Backfill

Yuxi supply standard backfill as follows:

Petroleum Coke Backfill

Specification

Fixed carbon	99%
Ash	0.2%
Moisture	0.5%
Volatiles	0.4%
Sulphur	0.9%
Bulk Density:	900-1000kg/CBM
Resistivity:	0.15ohm.cm

Metallurgical coke

Specification

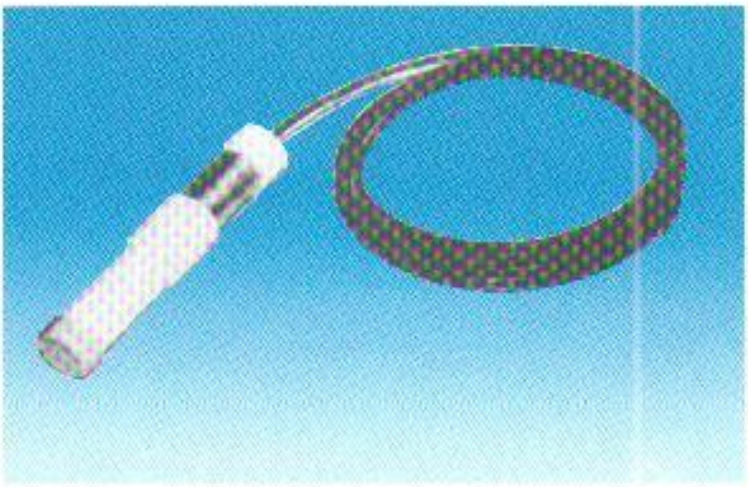
Fixed carbon	90%
Ash	8%
Moisture	10%
Volatiles	1%
Sulphur	1.2%
Bulk Density:	500-600kg/CBM
Resistivity:	35-55ohm.cm

Special backfill can be supplied upon receipt request.

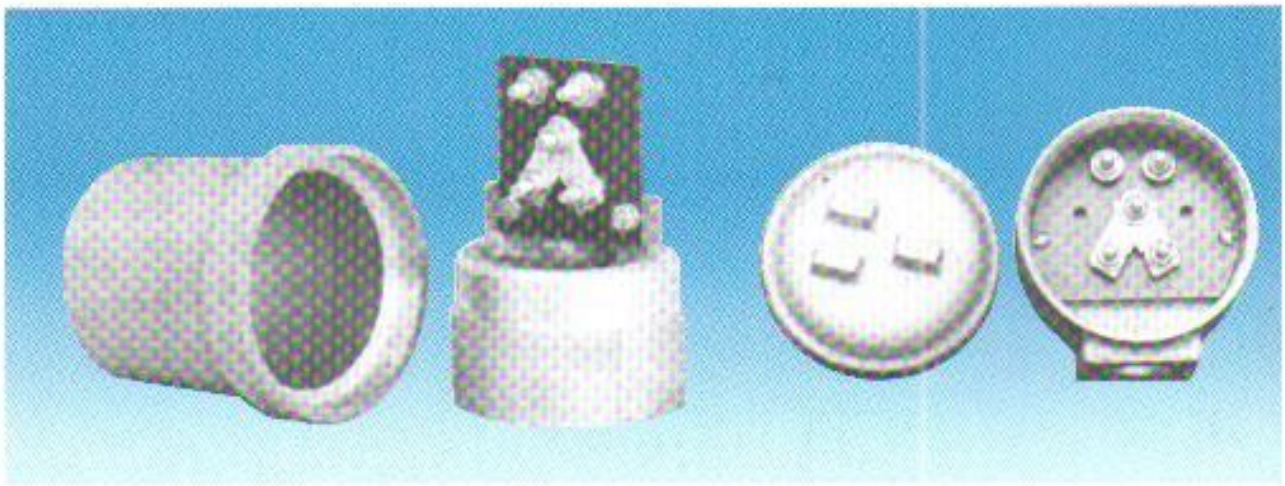
Other accessories

1.Reference Electrode

Copper-Cooper Sulfate ($Cu-CuSO_4$)	Silver-Silver Chloride (Ag-AgC1)	Zinc-Zinc Sulfate ($Zn/ZnSo_4$)
• Stability: 10 mV with 3.0 mA load. • Temperature Range: 0℃ to + 57.2℃	• Stability: 10 mV with 3.0 mA load. • Temperature Range: 0℃ to + 57.2℃	• Stability: 10 mV with 3.0 mA load. • Temperature Range: 0℃ to + 57.2℃



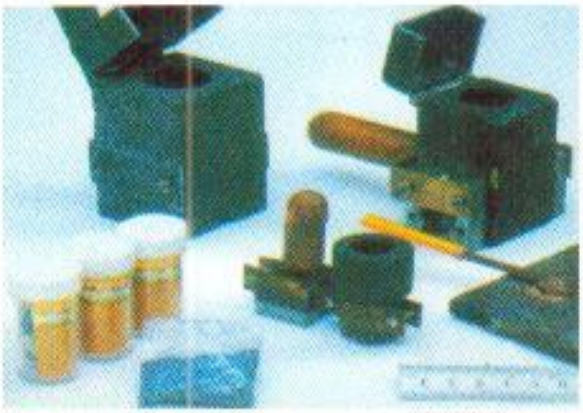
2. Test Station/Junction boxes



3. Rectifiers

4. Insulation Flanges

5. Thermit Cadweld Cartridge



Heat Shrink Pipe Models & Sizes

No.	Type	DIA. Before Shrink	MIN.DIA After Shrink	Lenth	Thickness	Suitable Pipe
1	RSY-100/45-500	100	45	500+30	≥ 1.5	ф 57 ф 60
2	RSY-130/60-500	130	60			ф 76 ф 89
3	RSY-155/75-500	155	75			ф 108 ф 114
4	RSY-210/100-500	210	100			ф 159
5	RSY-220/100-550	220	100	500+30		ф 168
6	RSY-270/130-550	270	130			ф 219
7	RSY-290/140-550	290	140			ф 245
8	RSY-320/150-550	320	150			ф 273
9	RSY-350/170-550	350	170			ф 299
10	RSY-375/180-550	375	180			ф 325
11	RSY-410/200-550	410	200			ф 351
12	RSY-440/210-550	440	210			ф 377
13	RSY-490/240-600	490	240	600+30-5		ф 426
14	RSY-595/280-600	595	280			ф 529
15	RSY-700/330-600	700	330			ф 630
16	RSY-800/380-600	800	380			ф 720

Note: produce special models or sizes at customers'request.