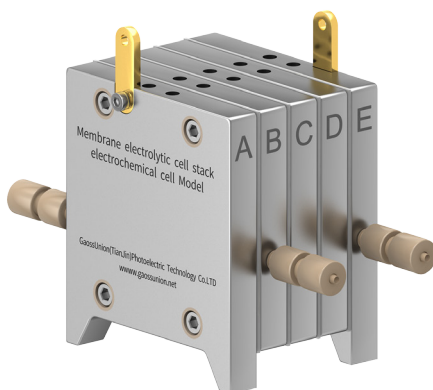
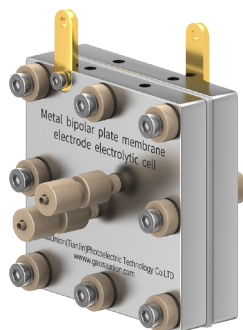
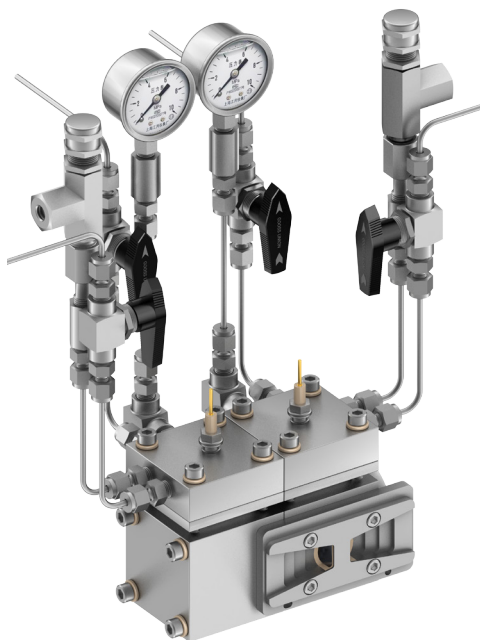


Electrochemical Product Catalogue

Electrolytic Cells Electrode



COMPANY

Company Profile Gaoss Union was established in 2008 in East Lake High-Tech Development Zone of Wuhan, known as "Optics Valley of China".

Ever since its establishment, Gaoss Union has devoted to research, development, production, sales and service of electrochemical products. It is a scientific and technological company with research of electrochemical reactions as well as design and manufacture of electrochemical devices as its major businesses.

Gaoss Union manufacture and sell three-electrode, electrolytic cells, flow cells, characterization cells, electrochemical materials, etc. required for electrochemical experiments, as well as provide customized electrode and electrochemical device services.

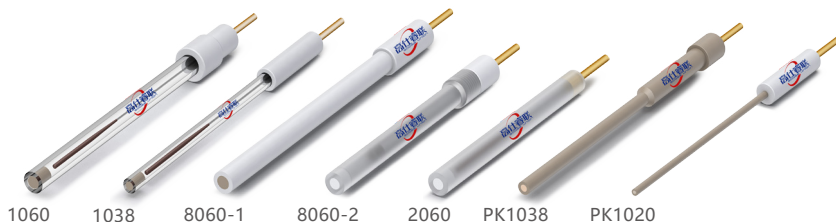
Welcome to inquire.



Introduction of Various Reference Electrodes

Ag/AgCl Electrode

- Ag/AgCl electrode is often used in neutral systems (filled with saturated KCl solution)
- In case of acid-base system, please increase the use of salt bridge

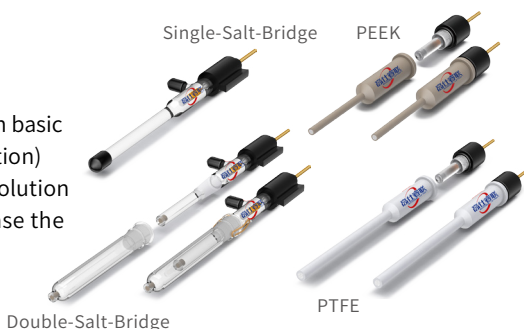


Saturated Calomel Electrode

- Saturated calomel electrode is often used in neutral systems (filled with saturated KCl solution)
- In case of acid-base system, please increase the number of salt bridge used

Hg/HgO Electrode

- Hg/HgO electrode is often used in basic systems (filled with 1 M KOH solution)
- If the concentration of alkaline solution is greater than 1 M, please increase the use of salt bridge



Hg₂SO₄ Electrode

- Hg₂SO₄ Electrode is often used in acidic systems (filled with saturated K₂SO₄ solution)



Ag/Ag⁺ Electrode

• Ag/Ag⁺ Electrode is used in organic solution system



Salt Bridge

• Effectively reduce resistance
• Cross mix application can effectively protect electrodes
• Salt bridge filling solution: the salt bridge filling solution is related to the reference electrode, which is basically the same as the reference electrode filling solution, but when used to avoid chloride ions, the salt bridge filling solution is saturated KNO₃ solution



Reference Electrodes

Name	Model
Ag/AgCl Electrode	R1038
	R1060-regular
	R1060-lengthen
	R2060
	R8060 (double-salt-bridge)
	PK-1020 (leakless)
	PK-1038 (leakless)
Saturated Calomel Electrode	232
	217 (double-salt-bridge)
	1545
Hg ₂ SO ₄ Electrode	standard
Hg/HgO Electrode	single-salt-bridge
	double-salt-bridge
	PK-Hg/HgO
Ag/Ag ⁺ Electrode	4038
	4060

Standard Hydrogen Reference Electrode

Standard Hydrogen Reference Electrode

- Easy to replace and provides hydrogen to the electrode.
- The hydrogen electrode has no internal electrolyte, so there is no ion exit and no diffusion potential.
- No electrolyte replenishment required.
- The hydrogen electrode does not contain toxic/heavy metals. Can be used in high concentration fluorinated media as it is made of PTFE
- Very effective in highly concentrated alkaline and acidic media (pH2 to pH16)



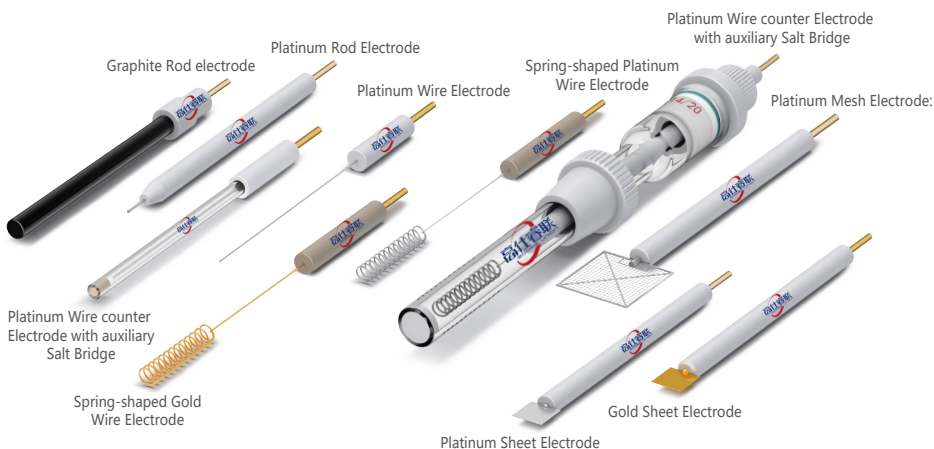
Name	Product ID
Standard Hydrogen Electrode	10101
Standard hydrogen electrode sand core	10101-1
Standard hydrogen electrode salt bridge	10101-2
<u>All sizes are common sizes.</u>	
<u>Customization is available upon request</u>	

Introduction of Various Counter Electrodes

Counter Electrode instructions

- Platinum sheet electrode: thickness 0.1-0.5mm, specification 5*10,10*10,10*15,10*20,15*15,15*20,20*20,20*25,25*25,30*30
- Platinum mesh electrode: mesh 52,specification 10*10, 20*20,30*30
- Platinum wire electrode: specification 0.5*37,1*37,1*5,1*10, 0.5*230, front spring diameter 4mm
- Gold wire electrode: specification 0.5*230, front spring diameter 4mm
- Graphite electrode: specification 6*75

Platinum Wire/Rod Electrode



Platinum Wire/Rod Electrode

Name	Product ID	Specifications (mm)
Platinum Wire Electrode	PT0537	φ0.5*37mm
Platinum Wire Electrode	PT1037	φ1.0*37mm
Platinum Wire Electrode	PT0523	φ0.5*230mm
Salt Bridge Platinum Wire Electrode	PT052300	φ0.5*230mm
Platinum Rod Electrode	PT1005	φ1.0*5mm
Platinum Rod Electrode	PT1010	φ1.0*10mm
<u>All sizes are common sizes and can be customized upon request</u>		

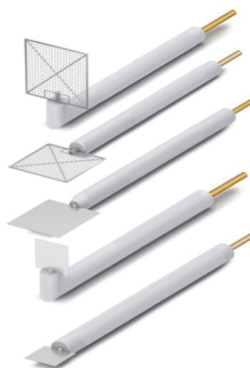
Introduction of Various Counter Electrodes

Platinum Mesh Electrode

Product ID	Specifications (mm)
Pt 0510	5*10
Pt 1010	10*10
Pt 1015	10*15
Pt 1020	10*20
Pt 1030	10*30
Pt 1515	15*15
Pt 2020	20*20
Pt 3030	30*30
Pt-R20	Φ20

All sizes are common sizes and can be customized upon request.

Mesh number of platinum mesh: #52



Platinum Sheet Electrode

Product ID	Specifications (mm)
Pt 0505-1	5*5*0.1
Pt 0505-2	5*5*0.2
Pt 0505-3	5*5*0.3
Pt 0510-1	5*10*0.1
Pt 0510-2	5*10*0.2
Pt 0510-3	5*10*0.3
Pt 1010-1	10*10*0.1
Pt 1010-2	10*10*0.2
Pt 1010-3	10*10*0.3
Pt 1010-5	10*10*0.5
Pt 1015-1	10*15*0.1
Pt 1015-2	10*15*0.2
Pt 1015-3	10*15*0.3
Pt 1015-5	10*15*0.5
Pt 1020-1	10*20*0.1
Pt 1020-2	10*20*0.2
Pt213	5*2*0.2

Product ID	Specifications (mm)
Pt 1020-3	10*20*0.3
Pt 1020-5	10*20*0.5
Pt 1030-1	10*30*0.1
Pt 1030-2	10*30*0.2
Pt 1030-3	10*30*0.3
Pt 1030-5	10*30*0.5
Pt 1515-1	15*15*0.1
Pt 1515-2	15*15*0.2
Pt 1515-3	15*15*0.3
Pt 1515-5	15*15*0.5
Pt 2020-1	20*20*0.1
Pt 2020-2	20*20*0.2
Pt 2020-3	20*20*0.3
Pt 2020-5	20*20*0.5
Pt 3030-1	30*30*0.1
Pt 3030-2	30*30*0.2
Pt 3030-2	30*30*0.3

Introduction of Various Counter Electrodes

Graphite Rod Counter Electrode



Name	Specifications (mm)	Purity
Graphite Rod Electrode (Japan)	$\phi 3 \sim 6 \times 75 \text{mm}$	99.99%
Graphite Rod Electrode (China)	$\phi 3 \sim 6 \times 75 \text{mm}$	98%
Bare Graphite Rod (Japan)	$\phi 3 \sim 6 \times 75 \text{mm}$	99.99%
Bare Graphite Rod (China)	$\phi 3 \sim 6 \times 75 \text{mm}$	98%
<u>The length of the graphite rod can be customized according to the requirements</u>		

Introduction of Various Working Electrodes



Standard Electrode



L-shaped Electrode



T-shaped Electrode



Electron Microscope Electrode



Magnetic Electrode



Multifunctional Combination Electrode

1	Standard Electrode
2	L-shaped Electrode
3	T-shaped Electrode
4	Electron Microscope Electrode
5	Magnetic Electrode
6	Multifunctional Combination Electrode

Working Electrodes

Name	Specifications (mm)	Name	Specifications (mm)
Glassy Carbon Electrode (USA)	1mm	Glassy Carbon Electrode (Japan)	1mm
	2mm		2mm
	3mm		3mm
	4mm		4mm
	5mm		5mm
	6mm		6mm
			7mm
			8mm
			9mm
			10mm
			15mm
			20mm
Platinum Disk Electrode <99.99%>	0.5mm	Gold Disk Electrode <99.999%>	0.5mm
	1mm		1mm
	2mm		2mm
	3mm		3mm
	4mm		4mm
	5mm		5mm
	6mm		6mm
Silver Disk Electrode	2mm	Mercury Film Silver based Electrode Hg(Ag)FE	2*10mm
	3mm	Cadmium Electrode	2mm
	4mm	Titanium Electrode	2~4mm
	5mm	Palladium Electrode	3mm
	6mm		
Pyrolytic Graphite Electrode	2~6mm	Graphite Electrode	2~6mm
Isotropic Carbon Graphite Electrode	2~4mm	Zinc Electrode	2~4mm
Nickel Electrode	2~4mm	Copper Electrode	2~4mm
Carbon Paste Electrode (Not Adjustable)	2~4mm	Carbon Paste Electrode (Adjustable)	2~4mm
Tungsten Electrode	2~4mm	Iron Electrode	2~4mm
Carbon Steel Electrode	2~5mm	Stainless Steel Electrode	2~5mm

Electrode Clamp Series

Electrode Clamp

- The metal electrode clamp is manufactured in one piece, such as stainless steel, copper, and titanium.
- The insulating materials used are high purity PTFE and PEEK.
- The electrode clamp employs materials such as platinum, gold, and glassy carbon.
- Sample holders are replaceable, connected using pure platinum wire, exhibiting corrosion resistance with excellent electrical conductivity.



Name	Specifications
Stainless Steel Electrode Clamp	sus-1 (316F)
	sus-2 (PTFE shell)
	sus-X
Platinum Sheet Electrode Clamp	PT-1
	PT-2
	PT-3
	PT-X
Glassy Carbon Electrode Clamp	GC-2
	Special Electrode Clamp for Glassy Carbon Sheet (PEEK)
	GC-1010 (PTFE)
Titanium Electrode Clamp	TI-3
	TI-X

Rotating Disk (Ring Disk) Electrode

Rotating Disk/Ring Disk Electrode

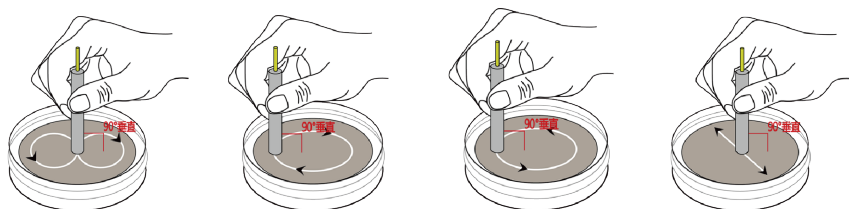
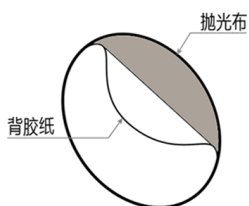
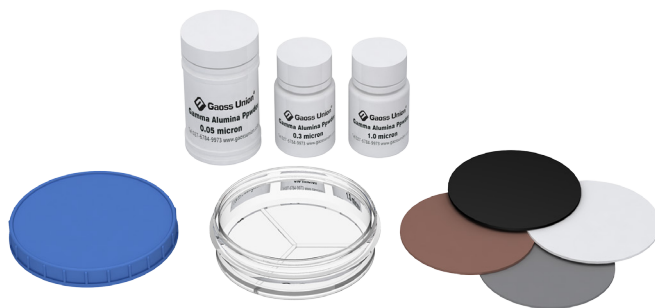
- Glassy carbon electrode: glassy carbon is manufactured in the USA or Japan
- Gold electrode: 99.999% purity
- Platinum electrode: 99.999% purity
- Other electrodes available: silver, palladium, zinc, aluminum, iron, nickel, titanium, tungsten molybdenum, tantalum, stainless steel, carbon steel and other.
- Pyrolytic Graphite Electrode: Highly Oriented Pyrolytic Graphite (HOPG).



Product ID	Specifications
Rotating Disk Electrode (Compatible with the US made glassy carbon) (External thread & internal thread)	GC (glassy carbon) 5mm
	AU (gold) 5mm
	PT (platinum) 5mm
Rotating Disk Electrode (Compatible with the Japan made glassy carbon)	GC (glassy carbon) 3, 4, 5mm
	AU (gold) 3, 4, 5mm
	PT (platinum) 3, 4, 5mm
Rotating Ring Disk Electrode (Compatible with the US made glassy carbon) (External thread)	GC (glassy carbon) 5.6mm
	AU (gold) 5.6mm
	PT (platinum) 5.6mm
Rotating Ring Disk Electrode (Compatible with the Japan made glassy carbon)	GC (glassy carbon) 4mm
	AU (gold) 4mm
	PT (platinum) 4mm
Rotating Electrode Clamp	
Electric Rotary Dispenser	

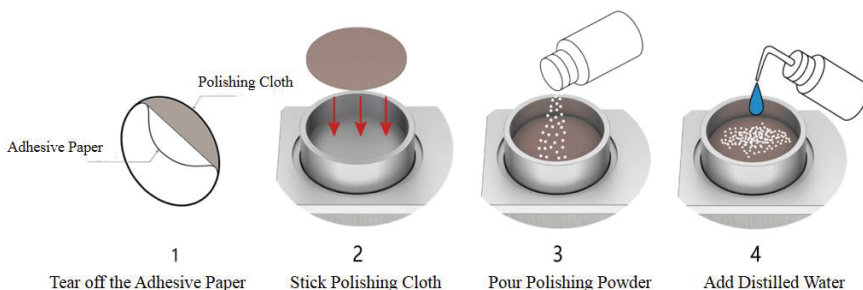
All RDEs can be customized for high temperature (up to 300°) electrodes or electron microscope electrodes...

Electrode Polishing Series



Electrode polishing

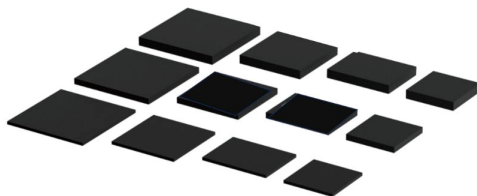
- Set up the electrode polisher, attach the polishing cloth, add 0.05um polishing powder, dampen with distilled water to form a paste.
- Turn on the polishing machine and run at maximum speed.
- Hold the electrode vertically over the pad with proper pressure. After 20 seconds, polish is done. Rinse electrode with distilled water.
- On the electrochemical workstation, choose cyclic voltammetry and test the electrode in standard potassium ferricyanide solution. A peak difference of around 70 confirms electrode qualification.
- Use two clean beakers, place A with absolute ethanol and B with Type II deionized water. Submerge the electrodes in A and then B, conducting ultrasonic cleaning for up to 60 seconds. Remove and air dry the electrode for future use.
- In case of electrode modification, invert the electrode onto an electrode drying rack for drop-coating.



Product ID
P400 Series Kit
P800 Series Kit
Electric polishing machine GU100

Glassy Carbon Sheet

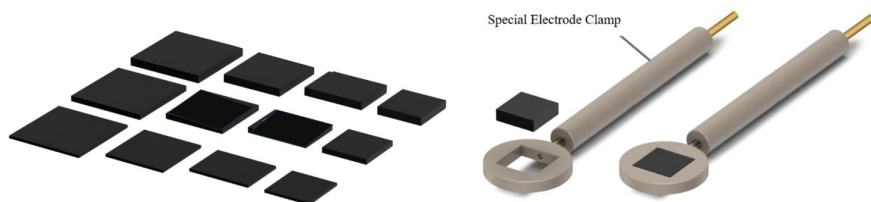
- Glassy carbon sheet size:10*10mm,15*10mm,20*10mm, 25*10mm,15*15mm, 20*15mm,20*20mm,25*25mm
- Country of Origin: US, Japan
- The effect is better when used with special electrode clamps



Product ID	Specifications (mm)		Product ID	Specifications (mm)	
GC1010-1	10*10*1		GC1515-1	15*15*1	
GC1010-2	10*10*2		GC1515-2	15*15*2	
GC1010-3	10*10*3		GC1515-3	15*15*3	
GC1015-1	10*15*1		GC1520-1	15*20*1	
GC1015-2	10*15*2		GC1520-2	15*20*2	
GC1015-3	10*15*3		GC1520-3	15*20*3	
GC1020-1	10*20*1		GC2020-1	20*20*1	
GC1020-2	10*20*2		GC2020-2	20*20*2	
GC1020-3	10*20*3		GC2020-3	20*20*3	
GC1025-1	10*25*1		GC2525-1	25*25*1	
GC1025-2	10*25*2		GC2525-2	25*25*2	
GC1025-3	10*25*3		GC2525-3	25*25*3	
All sizes are common sizes and can be customized upon request					

Graphite Sheet

- Graphite sheet size: 10*10mm,15*10mm,20*10mm,25*10mm,15*15mm, 20*15mm, 20*20mm,25*25mm
- Graphite sheet thickness:3mm,2mm,1mm
- Origin: US, JP
- The effect is better when used with specially designed electrode clamps



Product ID	Specifications (mm)		Product ID	Specifications (mm)
1010-1	10*10*1		1515-1	15*15*1
1010-2	10*10*2		1515-2	15*15*2
1010-3	10*10*3		1515-3	15*15*3
1015-1	10*15*1		1520-1	15*20*1
1015-2	10*15*2		1520-2	15*20*2
1015-3	10*15*3		1520-3	15*15*3
1020-1	10*20*1		2020-1	20*20*1
1020-2	10*20*2		2020-2	20*20*2
1020-3	10*20*3		2020-3	20*20*3
1025-1	10*25*1		2525-1	25*25*1
1025-2	10*25*2		2525-2	25*25*2
1025-3	10*25*3		2525-3	25*25*3

Ion Exchange Membrane

Name	Product ID	Size	Country of Origin
Cation Exchange Membrane	Nafion 115	100*100mm	US, Dupont
	Nafion 117	100*100mm	US, Dupont
	Nafion 211	100*100mm	US, Dupont
Anion Exchange Membrane	Fuma-FAA-3-PK-130	100*100mm	Germany



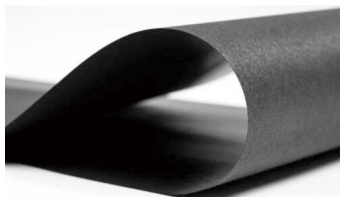
Fumatech



Nafion

Carbon Paper & Carbon Cloth

Name	Product ID	Size
Hydrophobic Carbon Paper (DE)	SGL22BB	100*100mm
Hydrophilic Carbon Paper (Taiwan)	CDS180S	100*100mm
Hydrophobic Carbon Cloth (Taiwan)	W1S1010	400*400mm
Hydrophilic Carbon Cloth (Taiwan)	W0S1009	400*400mm
PTFE Membrane		100*100mm



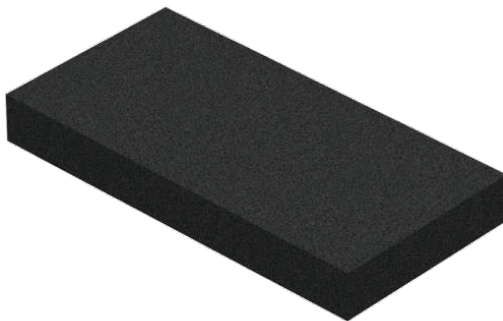
SGL22BB



W1S1011

Mesh Glass Carbon (RVC)

Name	Size	Remark
Mesh Glass Carbon (RVC)	100*50*10mm	100PPI
	100*100*10mm	100PPI



Metal Foam

Name	Size	Thickness
Copper Foam	210*295mm	0.5mm
Nickel Foam	210*295mm	0.5mm



Electrode Frame Series

Simple Electrode Frame Model: E1000

Equipped with a small electrolytic cell (choose one of 7ml, 15ml, 25ml, 50ml)

The compatible electrodes of the electrolytic cell need to be purchased separately.



Model	Specifications
E1006	3 of $\Phi 6.5$, 2 of $\Phi 2$
E1008	1 of $\Phi 8.5$, 2 of $\Phi 6.5$, 2 of $\Phi 2$
E1010	1 of $\Phi 10.5$, 2 of $\Phi 6.5$, 2 of $\Phi 2$
E1012	1 of $\Phi 12.5$, 2 of $\Phi 6.5$, 2 of $\Phi 2$
E1016	1 of $\Phi 16.5$, 2 of $\Phi 6.5$, 2 of $\Phi 2$