

# Reference Electrodes

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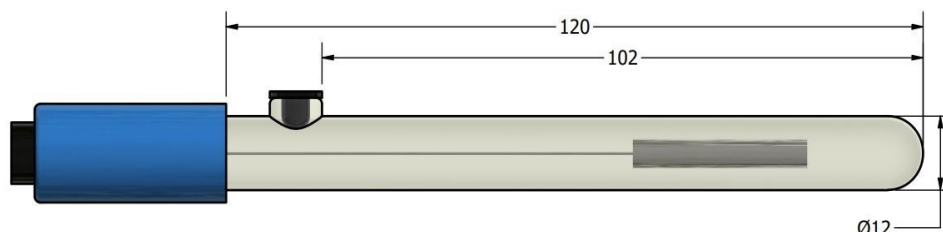
## 1 Standard Products

The products listed below available in our warehouse, but we are glad to deliver any ad hoc solution for you needs. Please refer to section 2 for customization capabilities and feel free to submit your request to our team. Dimensions in mm.

### 1.1 Calomel

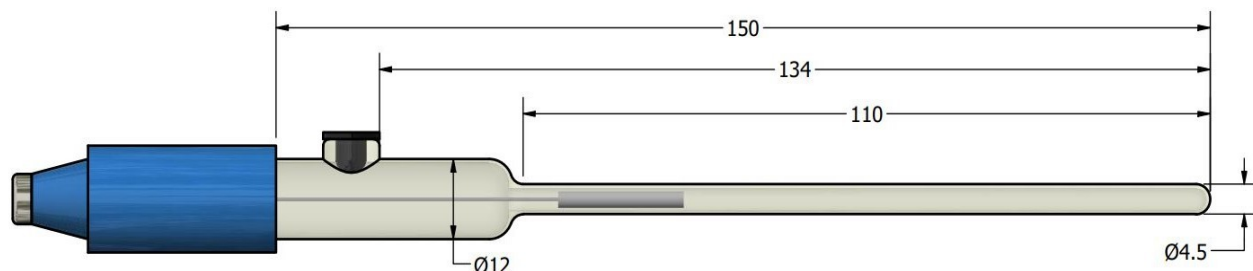
#### 1.1.1 303/SCG/12

Hg/Hg<sub>2</sub>Cl<sub>2</sub> laboratory reference electrode with saturated KCl electrolyte. 12mm diameter and 120mm length. Glass body and ceramic porous frit. Working temperature in the range 0 to 50°C. Maximum immersion depth up to 1cm below internal electrolyte level.



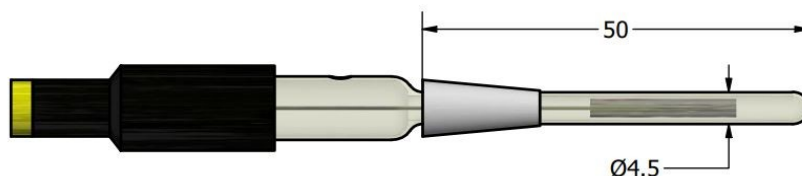
### 1.1.2 303/SCG/6

Hg/Hg<sub>2</sub>Cl<sub>2</sub> laboratory reference electrode with saturated KCl electrolyte. 4.5mm diameter and 120mm useful length. Glass body and ceramic porous frit. Working temperature in the range 0 to 50°C. Maximum immersion depth up to 1cm below internal electrolyte level.



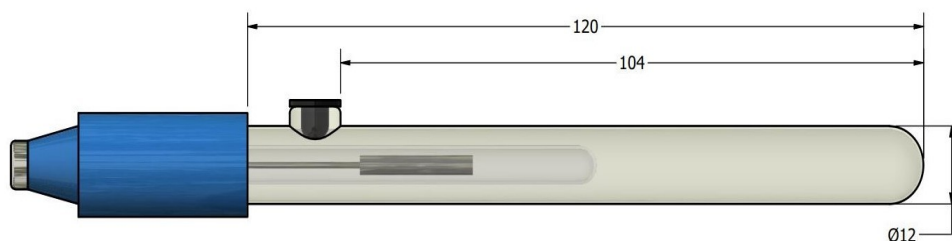
### 1.1.3 303/SCG/6JZ

Hg/Hg<sub>2</sub>Cl<sub>2</sub> laboratory reference electrode with saturated KCl electrolyte. 4.5mm diameter and 50mm useful length (below conical tapered joint adapter). Glass body and ceramic porous frit. Working temperature in the range 0 to 50°C. Maximum immersion depth up to 1cm below internal electrolyte level. Usually comes with NS6 PTFE conical tapered joint. Electrode developed for voltammetric analyzer Model 4330.



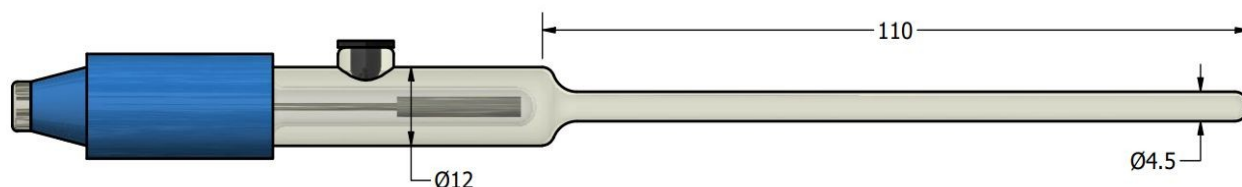
### 1.1.4 390/TCG/12

Hg/Hg<sub>2</sub>Cl<sub>2</sub> double salt bridge laboratory reference electrode. Gel KCl internal electrolyte and saturated KNO<sub>3</sub> external electrolyte. 12mm diameter and 120mm length. Glass body and ceramic porous frit. Working temperature in the range 0 to 50°C. Maximum immersion depth up to 1cm below internal electrolyte level.



### 1.1.5 390/TCG/6

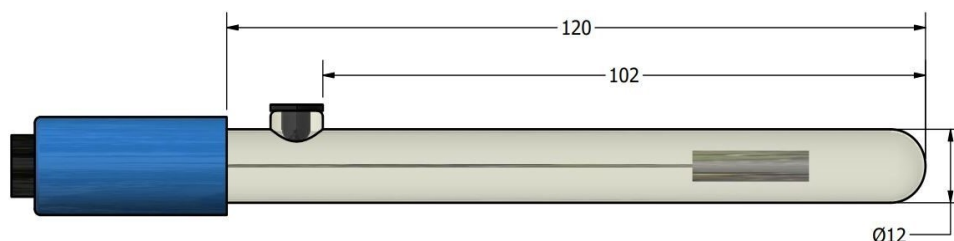
Hg/Hg<sub>2</sub>Cl<sub>2</sub> double salt bridge laboratory reference electrode. Gel KCl internal electrolyte and saturated KNO<sub>3</sub> external electrolyte. 12mm diameter and 120mm length. Glass body and ceramic porous frit. Working temperature in the range 0 to 50°C. Maximum immersion depth up to 1cm below internal electrolyte level.



## 1.2 Silver Chloride & Silver Nitrate

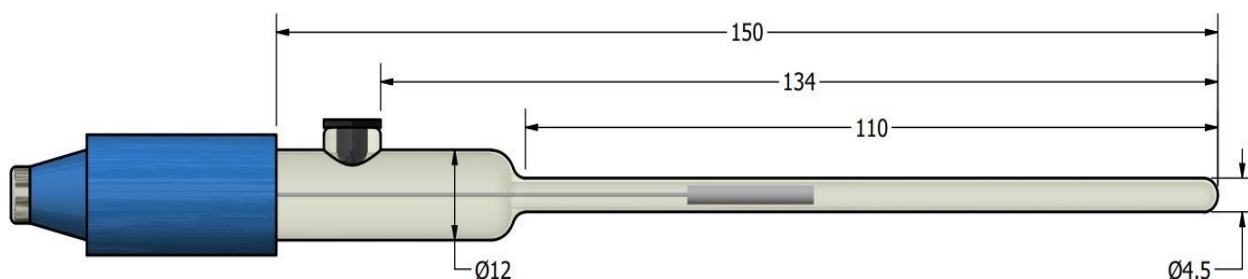
### 1.2.1 373/SSG/12

Ag/AgCl laboratory reference electrode with 3.3M KCl electrolyte. 12mm diameter and 120mm length. Glass body and ceramic porous frit. Working temperature in the range 0 to 90°C. Maximum immersion depth up to 1cm below internal electrolyte level.



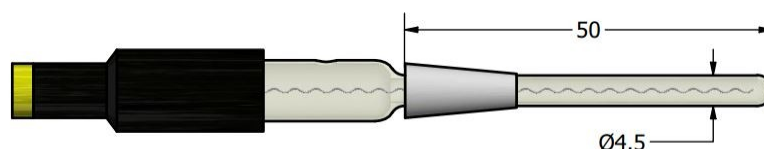
### 1.2.2 373/SSG/6

Ag/AgCl laboratory reference electrode with 3.3M KCl electrolyte. 4.5mm diameter and 120mm useful length. Glass body and ceramic porous frit. Working temperature in the range 0 to 90°C. Maximum immersion depth up to 1cm below internal electrolyte level.



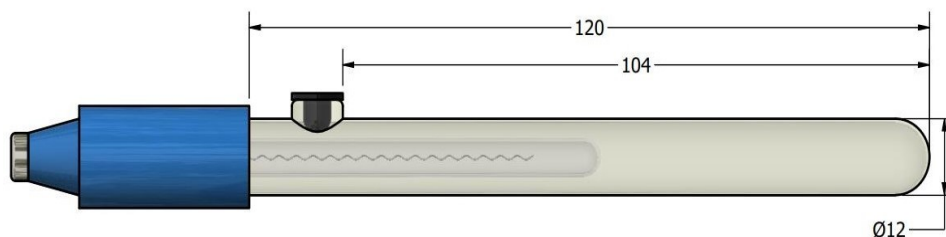
### 1.2.3 373/SSG/6JZ

Ag/AgCl laboratory reference electrode with 3.3M KCl electrolyte. 4.5mm diameter and 50mm useful length. Glass body and ceramic porous frit. Working temperature in the range 0 to 90°C. Maximum immersion depth up to 1cm below internal electrolyte level. Usually comes with NS6 PTFE conical tapered joint. Electrode developed for voltammetric analyzer Model 4330.



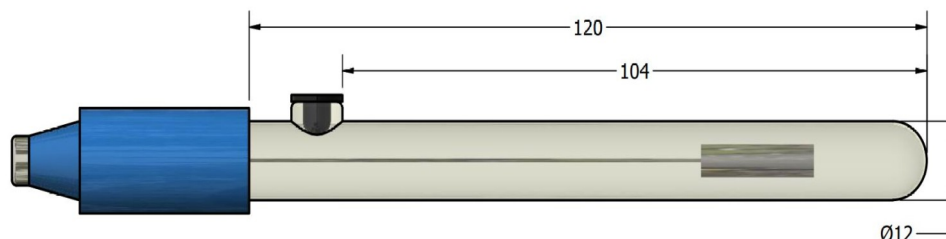
### 1.2.4 390/TSG/12

Ag/AgCl double salt bridge laboratory reference electrode. Gel KCl internal electrolyte and saturated KNO<sub>3</sub> external electrolyte. 12mm diameter and 120mm length. Glass body and ceramic porous frit. Working temperature in the range 0 to 50°C. Maximum immersion depth up to 1cm below internal electrolyte level.



### 1.2.5 373/SNG/12

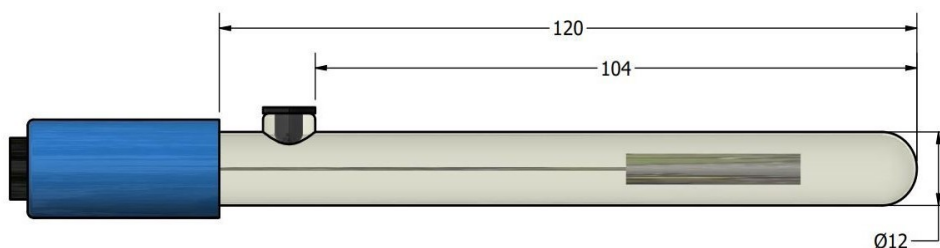
Ag/AgNO<sub>3</sub> laboratory reference electrode with 0.1M acetonitrile electrolyte. 12mm diameter and 120mm length. Glass body and ceramic porous frit. Working temperature in the range 0 to 80°C. Maximum immersion depth up to 1cm below internal electrolyte level. Developed for applications in non-aqueous media.



## 1.3 Mercury Oxide

### 1.3.1 383/OHG/12

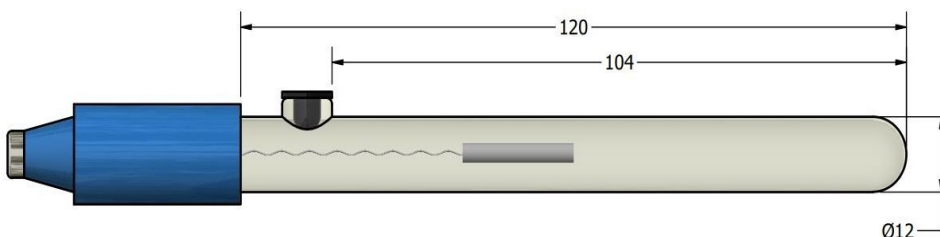
Hg/HgO laboratory reference electrode with 0.1M KOH or 0.1M NaOH electrolyte. 12mm diameter and 120mm length. Glass body and ceramic porous frit. Working temperature in the range 0 to 50°C. Maximum immersion depth up to 1cm below internal electrolyte level.



## 1.4 Mercury Sulfate

### 1.4.1 383/SHG/12

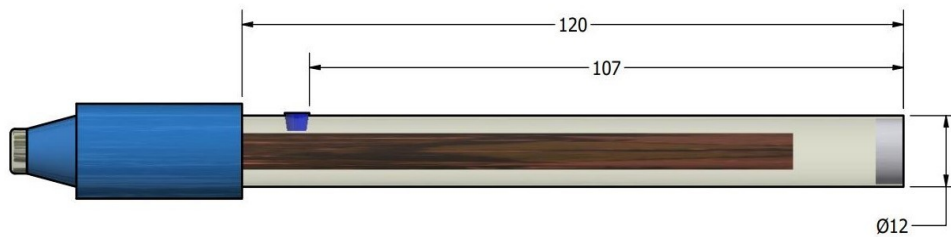
Hg/Hg<sub>2</sub>SO<sub>4</sub> laboratory reference electrode with saturated K<sub>2</sub>SO<sub>4</sub> electrolyte. 12mm diameter and 120mm length. Glass and ceramic porous frit. Working temperature in the range 0 to 50°C. Maximum immersion depth up to 1cm below internal electrolyte level.



## 1.5 Copper Sulfate

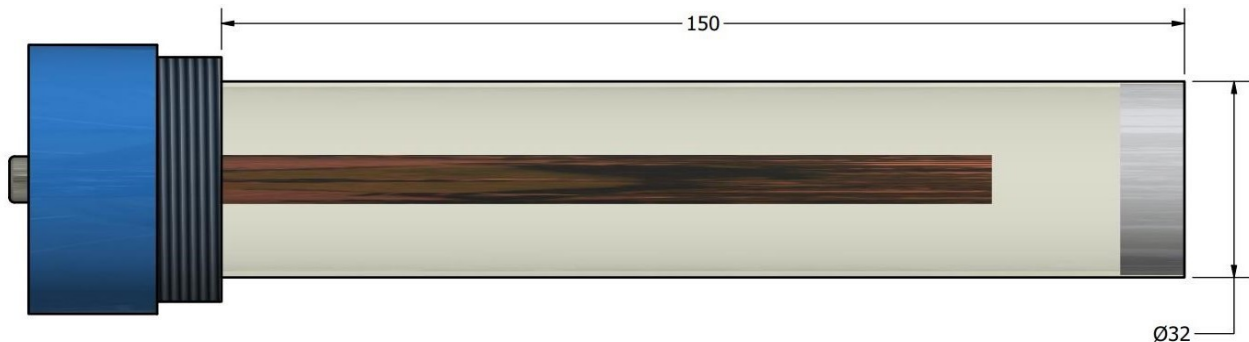
### 1.5.1 383/SCU/12

Cu/CuSO<sub>4</sub> laboratory reference electrode with 0.1M CuSO<sub>4</sub> electrolyte. 12mm diameter and 120mm length. Plastic body and ceramic porous frit. Working temperature in the range 0 to 90°C. Maximum working pressure 2bar. Maximum immersion depth up to 1cm below internal electrolyte level.



### 1.5.2 383/SCU/023

Cu/CuSO<sub>4</sub> reference electrode for in field applications with 0.1M CuSO<sub>4</sub> electrolyte. 32mm diameter and 150mm length. Plastic body and large, 32mm, ceramic porous frit allowing for proper measurements on concrete. Working temperature in the range 0 to 90°C.

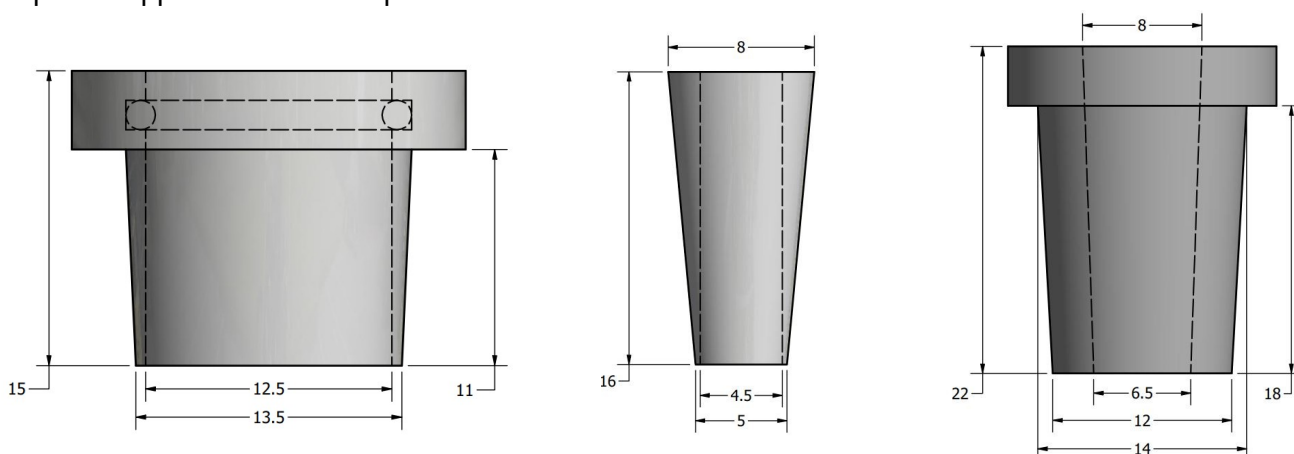


## 2 Custom Products

The available customizations are here listed. Submit our team a request if you need anything different and we will be pleased to help. Further ad hoc solutions have been developed for severe working pressures or non-conventional tube length, material and shape.

### 2.1 Conical Tapered Joint

Any electrode, either 4.5mm or 12mm body, can be equipped with plastic conical tapered joint adapter that allows for extended applications. Model 391/CR (left) has been developed for 12mm electrodes with O-Ring sealing for airtight installations, this NS12 plastic adapter can be easily removed by hand allowing for multiple uses of the same electrode. Model 391/CR6JZ (centre) is a PTFE NS6 adapter pressure fitted on 4.5mm electrodes upon request. Model 435/CR allows for the use of NS6 conical tapered electrodes on NS12 fitting cells. Dimensions in mm. Adapters for specific applications can be produced.



### 2.2 Connection Plug

Standard laboratory electrodes come with banana plug (2mm for 6JZ models and 4mm for others), but other connection methods are available like through wire, shielded S7 plug, threaded bolt and others. Non-detachable wire is particularly indicated for industrial applications.

### 2.3 Electrolyte & Refilling

The filling electrolyte of both single or double salt bridge electrodes can be completely customized upon customer's needs, both in composition and concentration. For industrial applications a top refilling system is available.

### 2.4 Porous Frit – Number & Dimension

In applications with possible heavy dirtying that might occlude frits we suggest working with multiple frits on the same electrode or with larger area frit sections, typical for concrete applications.