



## QC012 Series

12 mm Rotating Cylinder  
Electrode Product Guide

Part # Style: ACQC01205

(accepts 12 mm OD, 6.35 mm ID cylinder inserts)

### Warnings



**Caution:**

Maximum Rotation Rate: **2000 RPM.**



**Thermal Stability:**

Use electrode from **10°C to 25°C.** Extreme temperatures damage electrode seals.



**Chemical Compatibility:**

The electrode shroud material is made of polychlorotrifluoroethylene (PCTFE); it is incompatible with some chlorinated solvents and tetrahydrofuran.

### Contact Us / Support

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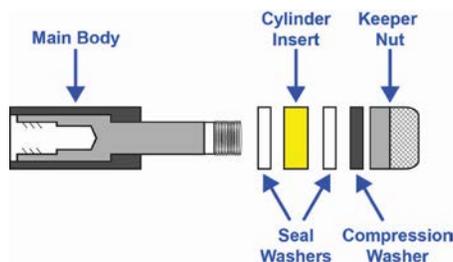
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### Description

The QC012 Series 12 mm rotating cylinder electrode (RCE) tip is commonly used to evaluate mass transport limited corrosion. The tip is composed of six items: **main body**, **two PTFE seal washers**, **cylinder insert (sold separately)**, **compression washer**, and **PCTFE Keeper Nut** (see figure below).



The special tip of the QC012 Series is designed to hold a cylindrically shaped metal sample (**coupon**) that is mounted at the lower end of the shaft and held into place by the **seal** and **compression washers**, as well as the **keeper nut**. The tip is fashioned primarily from chemically inert materials like polytetrafluoroethylene (PTFE) and polychlorotrifluoroethylene (PCTFE); of note, however, PCTFE can exhibit incompatibility with tetrahydrofuran and select chlorinated solvents like chloroform and carbon tetrachloride. Buried within the tip's **main body** is a metal shank that provides mechanical stability and also electrical contact with the metal **coupon** sample. The tip can be mounted directly onto the permanent shaft of the CPR rotator and can also fit the ASR and MSR rotators when used with the appropriate shafts (part numbers AFE3A and AFE3M, respectively)

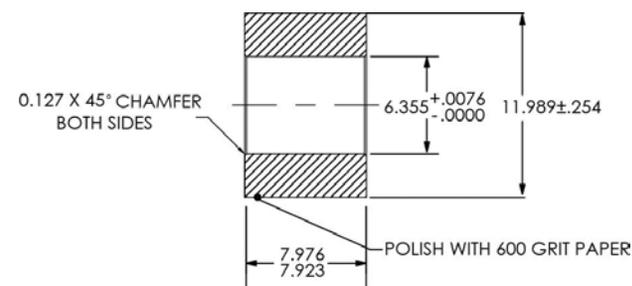
### Photographs



### 12 mm RCE Cylinder Inserts (Coupons)

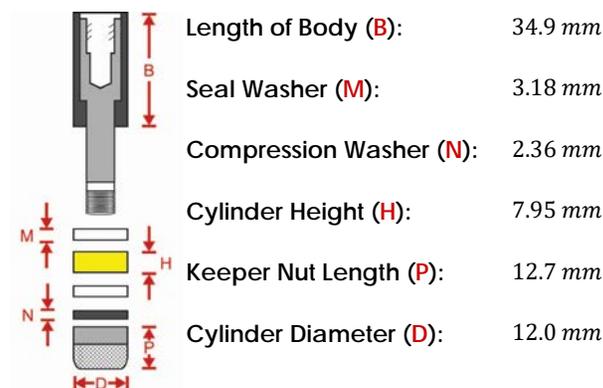
When a cylinder insert is installed onto the 12 mm RCE shaft, the total metal surface area exposed to solution is  $3 \text{ cm}^2$ . Generally, the material from which the cylinder is made represents the same material whose field corrosion is the subject of RCE research.

Pine Research provides a mechanical drawing for 12 mm RCE cylinder inserts (see figure below, units are in mm) for users who choose to machine their own cylinder inserts. It is critical that cylinders be of exact dimensions. Pine Research can custom make cylinder inserts from any non-toxic materials, including starting material sent by the customer. Inquire with sales to purchase custom cylinder inserts.



Cylinder inserts are sold in packages of ten (10). Each package includes a certification sheet for the material used to manufacture the cylinder inserts. The cylinder inserts made by Pine Research are fabricated from a variety of popular steel alloys.

### Schematic



Additional shaft and tip dimensions are provided on the next page.

DRP10102 / REV001 (MAY 2016)

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## Assembling the 12 mm RCE Tip

To assemble the 12 mm RCE tip, follow the instructions below:

1. Slide a seal washer past the threading on the main body so that it fits snugly against the PTFE shrouding of the RCE main body.
2. Take the cylinder insert and place it snugly next to the washer from step 1.
3. Place the second seal washer flush against the cylinder insert.
4. Place the compression washer flush against the seal washer.
5. Thread the PTCFE keeper nut into place to hold the tip assembly together.

## Mounting the 12 mm RCE Tip

Before mounting the RCE tip on to the rotator shaft, make certain that the shaft is securely mounted in the rotator. For the CPR rotator, the shaft is permanently mounted in the rotator. The appropriate shafts for the MSR rotator and the ASR rotator should be selected and securely mounted into the MSR motor coupling and ASR draw bar, respectively.

When threading the RCE tip on to the shaft, do not apply excessive force to the shroud as this may cause the shroud to slip along the shaft of the electrode. The electrode is narrow enough to fit through a 24/25 center port on an electrochemical cell. Take care to prevent the RCE from rubbing against surfaces (such as the inner wall of the cell).

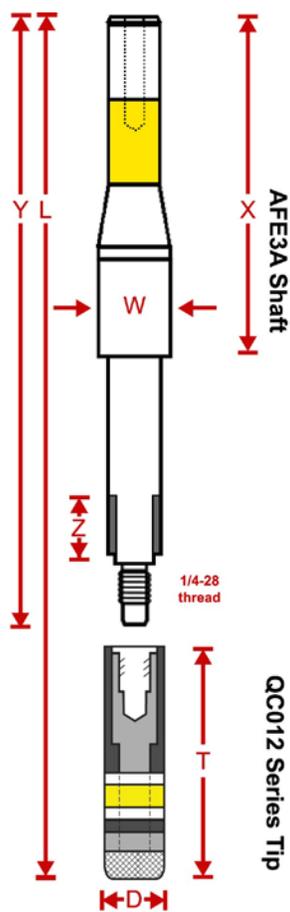
## Maintenance

Due to the nature of the corrosive environment in which the RCE system components are exposed, replace coupons after every use. To replace a coupon, thread the mounting fixture (part number ACQC01243, sold separately) into the body of the tip to assist in holding the tip steady. The seal washers should be replaced every 2-3 uses.

## Storage

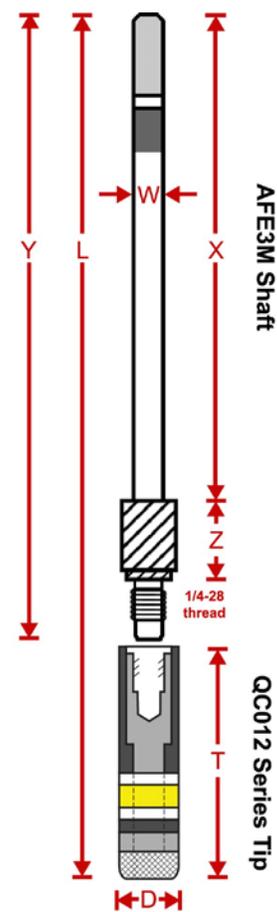
The 12 mm RCE tip should be disassembled and corroded washers and coupons should be removed and other components rinsed with water prior to storage.

## ASR Rotator Shaft with Tip



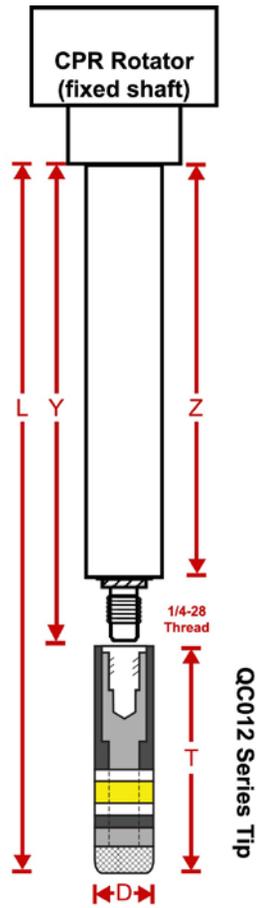
Cylinder Diameter (D):	12.0 mm
Length of tip (T):	64.3 mm
Overall Length (L):	230.2 mm
Shaft length (Y):	182.6 mm
Upper Shaft Length (X):	82.6 mm
Upper Shaft OD (W):	18.3 mm
Sheath Length (Z):	16.6 mm

## MSR Rotator Shaft with Tip



Cylinder Diameter (D):	12.0 mm
Length of tip (T):	64.3 mm
Overall Length (L):	199.5 mm
Shaft length (Y):	151.9 mm
Upper Shaft Length (X):	118.6 mm
Upper Shaft OD (W):	6.35 mm
Sheath Length (Z):	16.6 mm

# CPR Rotator Shaft with Tip



Cylinder Diameter (D):	12.0 mm
Length of tip (T):	64.3 mm
Overall Length (L):	127.0 mm
Shaft length (Y):	79.4 mm
Sheath Length (Z):	63.5 mm