



E3TPK Series

Rotating Disk Working Electrode Product Guide

Part # Style: **AFE3T050XXPK**

(XX = disk electrode material, e.g. AU = gold, PT = platinum, GC = glassy carbon, etc.)

Warnings



Caution:

Maximum Rotation Rate **2500 RPM**.



Caution:

Use care when electrode is rotating over **2000 RPM**.



Thermal Stability:

Use electrode from **10°C to 80°C**. Extreme temperatures damage electrode seals.



Chemical Compatibility:

The polyether ether ketone (PEEK) shroud will dissolve in concentrated acids.

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Description

The E3TPK Series rotating disk electrode (RDE) tip is designed for use with ASR, CPR and MSR model rotators. The top of the RDE tip mates with the 1/4-28 outer thread found on the CPR rotator shaft. Shafts are also available for the ASR and MSR rotators which have the appropriate 1/4-28 outer thread. The tip has a protective shroud made from polyether ether ketone (PEEK), a polymer with excellent high temperature properties. The shroud is resistant to most solvents; however, it will dissolve in concentrated sulfuric and nitric acid solutions, and it may discolor in more dilute acid solutions.

Mounting the Electrode

Before mounting the RDE 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 (part number AFE3M) and the ASR rotator (part number AFE3A) should be selected and securely mounted into the MSR motor coupling and ASR draw bar, respectively. When threading the RDE tip on to the shaft, do not apply excessive force to the shroud as this may damage the seal between the shroud and the electrode surface.

The electrode is narrow enough to fit through a 24/25 center port on an electrochemical cell. Take care to prevent the rotating electrode from rubbing against surfaces (such as the inner wall of the cell). When the rotating electrode is placed in a solution, the electrode surface should be at least 5 mm below the solution level. Take care to prevent the threads on the shaft (and the inner threads within the tip) from coming into contact with the solution. Thus, the RDE tip should be positioned so that no more than half the length of the shroud is below the solution level.

Stationary Use

The RDE tip can be used as a non-rotating electrode. The tip can be mounted on a special stationary shaft (part number AFE3F) for such applications.

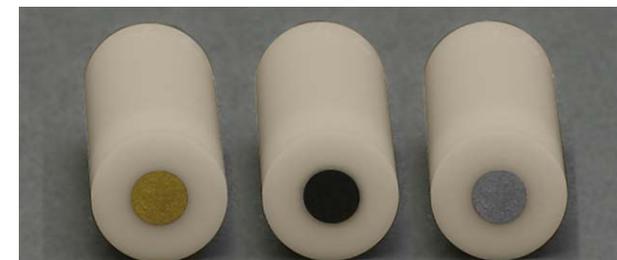
Leak Testing

The shroud is tightly sealed around the circumference of the working electrode material. The electrode is guaranteed to be leak-free at the time of shipment (each electrode is shipped with a copy of the factory leak test results). Such leak testing is typically performed at ~25°C and ~80°C. Exposing the electrode to temperatures less than 10°C or greater than 80°C may cause a leak between the electrode and the shroud.

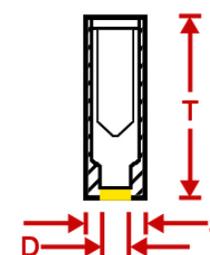
Maintenance

After using the electrode, clean it with distilled water and replace the protective cover to prevent the electrode surface from being scratched. Periodically, the electrode surface will need to be polished. An electrode polishing kit with various alumina slurries and polishing pads is available (sold separately). Note that the PEEK shroud is resilient and can be difficult to polish by hand. In some cases, it may be necessary to use a mechanical polisher to assure the shroud is coplanar with the electrode surface.

Photograph



Diagram



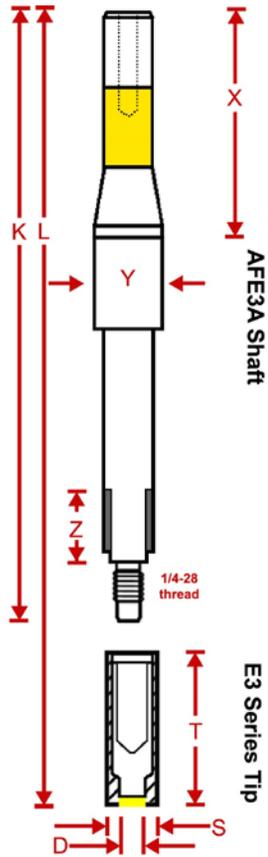
Disk Diameter (D): 5.0 mm

Shroud Diameter (S): 12.0 mm

Length of Tip (T): 35 mm

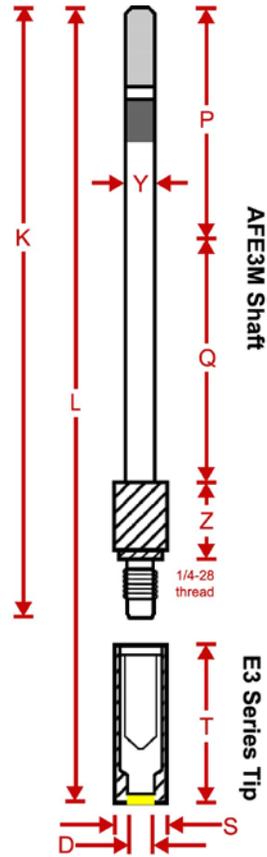
Additional shaft and tip dimensions are provided on the next page.

ASR Rotator Shaft with Tip



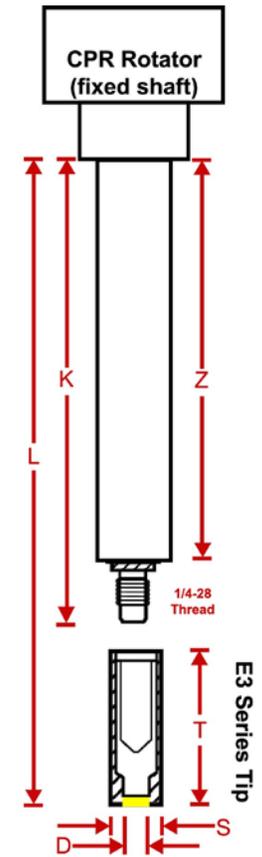
Disk Diameter (D):	5.0 mm
Shroud Diameter (S):	12.0 mm
Tip Shroud Length (T):	35 mm
Overall Length (L):	200.9 mm
Upper Shaft length (X):	82.6 mm
Shaft Length (K):	182.6 mm
Upper Shaft OD (Y):	18.3 mm
Shaft Length (Z):	16.6 mm

MSR Rotator Shaft with Tip



Disk Diameter (D):	5.0 mm
Shroud Diameter (S):	12.0 mm
Tip Shroud Length (T):	35 mm
Overall Length (L):	170.2 mm
Upper Shaft OD (W):	6.35 mm
Hidden Length (P):	68 mm
Exposed Metal (Q):	50.6 mm
Polymer Sheath (Z):	16.6 mm

CPR Rotator Shaft with Tip



Disk Diameter (D):	5.0 mm
Shroud Diameter (S):	12.0 mm
Tip Shroud Length (T):	35 mm
Overall Length (L):	98.5 mm
Shaft Length (K):	79.4 mm
Sheath Length (Z):	63.5 mm