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E7R9 ThinGap Series

Rotating Ring-Disk Working Electrode Product Guide

Part # Style: AFEE7R9GCYY

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

Warnings

Caution:

Maximum Rotation Rate 3000 RPM.

Caution:

Use care when rotating over 2000 RPM.

Thermal Stability:

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

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Description

The single-piece E7R9 ThinGap Series rotating ring-disk electrode (RRDE) is designed for use in fuel cell electrocatalytic studies. Since the E7R9 ThinGap RRDE tips are manufactured with fragile glassy carbon disks or rings, larger dimensions are used in comparison to ThinGap RRDEs manufactured with metal disks and rings (the E7R8 series). The E7R9 RRDE tips have a 320 μm gap between the disk and ring. Additionally, they have a high collection efficiency, aiding in the detection of peroxide from oxygen reduction reaction catalysts.

The E7R9 RRDE tip is designed for use with both ASR and MSR rotators with shaft part numbers are AFE6A and AFE6MB, respectively. The lower portion of the tip is protected by a shroud of polytetrafluoroethylene (PTFE). This fluoropolymer is compatible with a wide range of organic solvents, acids, and bases.

Mounting the RRDE Tip

Before mounting the RRDE tip on to the rotator shaft, make certain that the shaft is securely mounted in the rotator. When threading the RRDE 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. A properly mounted tip will have a small gap (~1.3 mm) between the shaft and tip.

The electrode is narrow enough to fit through a 24/25 center port on an electrochemical cell. Care should be taken to prevent the rotating electrode from rubbing against surfaces (such as the inner wall of the cell). When the RRDE tip is placed in solution, the electrode surface should be approximately 5 to 12 mm below the solution level. The gap between the shaft and the tip should never be immersed in the solution because the solution may enter the gap and cause corrosion of the metal threads and inner parts of the tip.

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).

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). Leak testing is performed at ambient (room) temperature. Exposing the electrode to temperatures less than 10°C or above 25°C may create a leak between the electrode material and the shroud.

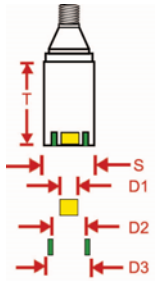
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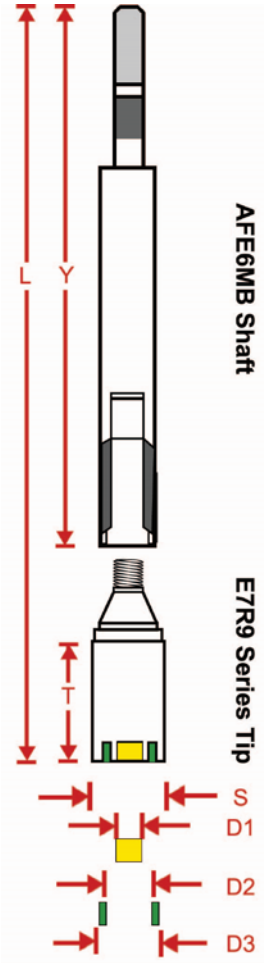
Diagram



Tip Shroud Length (T):	25.4 mm
Shroud Diameter (S):	15.0 mm
Disk Diameter (D1):	5.61 mm
Ring ID (D2):	6.25 mm
Ring OD (D3):	7.92 mm
Collection Efficiency:	37%
Disk Area:	0.2475 cm^2
Ring Area:	0.1866 cm^2
Ring-Disk Gap:	320 μm

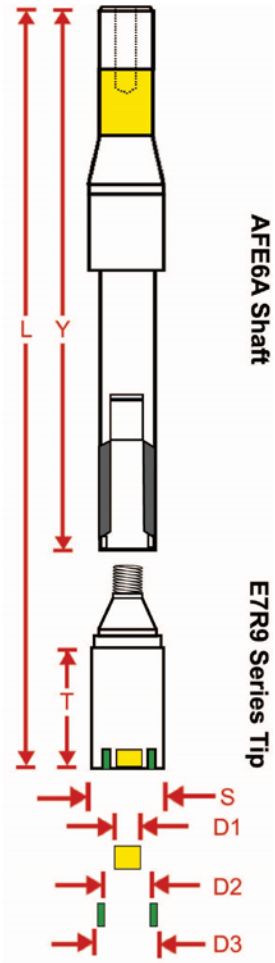
Additional shaft and tip dimensions are provided on the next page.

MSR Rotator Shaft with Tip



Disk Diameter (D1):	5.61 *mm*
Ring ID (D2):	6.25 *mm*
Ring OD (D3):	7.92 *mm*
Shroud Diameter (S):	15.0 *mm*
Tip Shroud Length (T):	25.4 *mm*
Overall Length (L):	196.9 *mm*
Shaft Length (Y):	170.7 *mm*
Collection Efficiency:	37%

ASR Rotator Shaft with Tip



Disk Diameter (D1):	5.61 *mm*
Ring ID (D2):	6.25 *mm*
Ring OD (D3):	7.92 *mm*
Shroud Diameter (S):	15.0 *mm*
Tip Shroud Length (T):	25.4 *mm*
Overall Length (L):	184.2 *mm*
Shaft Length (Y):	158.0 *mm*
Collection Efficiency:	37%

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