



E8R4 High Efficiency Series

Rotating Ring-Disk Working Electrode Product Guide

Part # Style: AFE8R4XXYY

(XX = disk electrode material, e.g. GC = glassy carbon or PT = platinum; YY = ring electrode material, e.g. AU = gold or PT = platinum)

Warnings



Caution:

Maximum Rotation Rate 3000 RPM.



Caution:

Use care when rotating over 2000 RPM.



Thermal Stability:

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

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Description

The Fixed-Disk E8R4 High Efficiency series rotating ring-disk electrode (RRDE) is designed for maximum collection efficiency.

The E8R4 RRDE tip is designed for use with the WaveVortex 10 rotator. It is compatible with the MSR Rotator (requires the AFE6MB shaft) and the ASR Rotator (requires the AFE6A shaft).

The lower portion of the tip is protected by a shroud of polyether ether ketone (PEEK). This fluoropolymer is compatible with a wide range of solvents and is tolerant of elevated temperatures. The gap between the ring and disk electrodes (also called a U-cup) is made from polytetrafluoroethylene (PTFE), which prevents water droplet spreading and makes this electrode ideal for thin films.

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.

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 80°C may create a leak between the electrode material and the shroud.

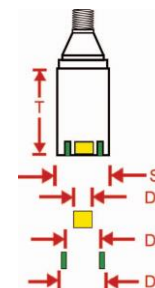
Maintenance

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).

Photographs



Diagram



Tip Shroud Length (T): 25.4 mm

Shroud Diameter (S): 15.0 mm

Disk Diameter (D1): 5.0 mm

Ring ID (D2): 6.0 mm

Ring OD (D3): 8.5 mm

Collection Efficiency: 43.9%

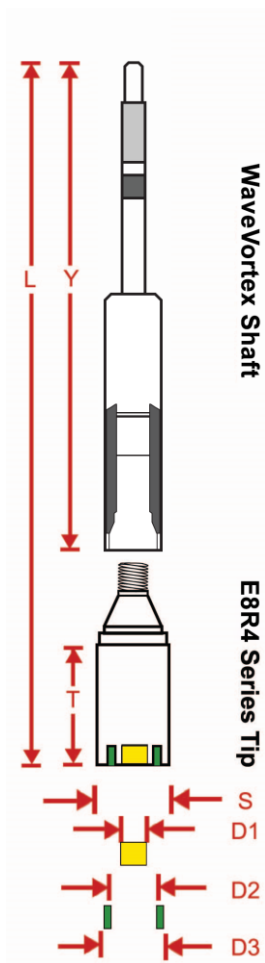
Disk Area: 0.1963 cm²

Ring Area: 0.2847 cm²

Ring-Disk Gap: 500 μm

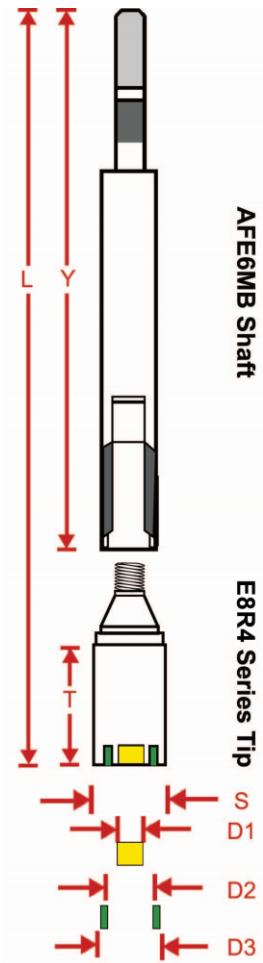
Additional shaft and tip dimensions are provided on the next page.

WaveVortex 10 Shaft with Tip



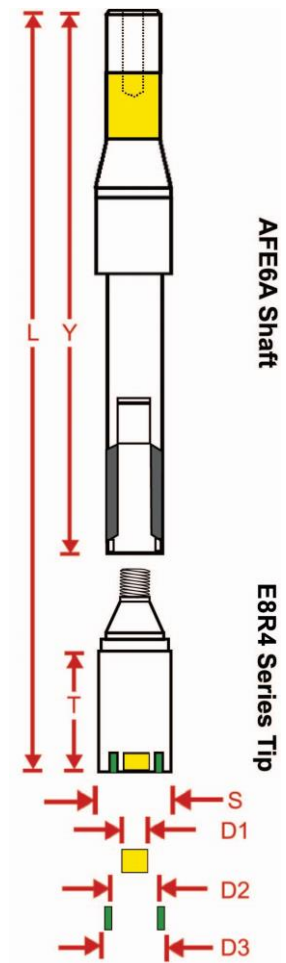
Disk Diameter (D1):	5.0 mm
Ring ID (D2):	6.0 mm
Ring OD (D3):	8.5 mm
Shroud Diameter (S):	15.0 mm
Tip Shroud Length (T):	25.4 mm
Overall Length (L):	151.9 mm
Shaft Length (Y):	125.7 mm
Collection Efficiency:	43.9%

MSR Rotator Shaft with Tip



Disk Diameter (D1):	5.0 mm
Ring ID (D2):	6.0 mm
Ring OD (D3):	8.5 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:	43.9%

ASR Rotator Shaft with Tip



Disk Diameter (D1):	5.0 mm
Ring ID (D2):	6.0 mm
Ring OD (D3):	8.5 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:	43.9%