

Specifications and Mechanical Properties of Simplus brand Capillaries - Tech Information

Date: 2-MAY-2013 Last Updated: 26-OCTOBER-2025

Overview

This article summarizes the construction, dimensions, and mechanical properties of Simplus™ capillaries. These capillaries are manufactured from high-purity fused silica and coated with polyimide to enhance durability and handling strength.

Key specifications such as outer diameter (OD), bending stress characteristics, and metals assay information are provided to support users who require precise physical and material data for method development or regulatory documentation.

Capillary Construction

Simplus™ CE capillaries are manufactured from bare fused silica, selected for its superior optical clarity and smooth internal surface. To protect the fragile silica, the capillaries are coated externally with a polyimide layer, which provides:

- Mechanical strength
- Improved flexibility
- Resistance to handling stress
- Protection during instrument installation

Without this coating, fused silica is brittle and prone to breakage, making polyimide essential for routine laboratory use.

Outer Diameter Specifications

The standard outer diameter (OD) for Simplus™ capillaries is:

→ 365 μm \pm 10 μm

This size is widely used in CE instruments and provides a balance of strength, compatibility, and ease of installation into common cartridge-based and open-architecture systems.

Mechanical Performance and Bending Stress

The bending stress values for Simplus™ capillaries—measured at various bending radii—are provided in the accompanying technical table. These values help users understand:

- Minimum recommended bending radius
- Expected stress tolerance

- Handling limitations
- Breakage risk during tight instrument routing

In general, a larger bending radius reduces the stress placed on the fused silica core and minimizes the risk of fractures during operation.

		Bend Radius (mm)													
Applied Bending Stress (kpsi)		4	6	8	10	15	20	25	30	40	50	60	80	100	130
Bend Radius		476	318	238	191	127	95	76	64	48	38	32	24	19	15

Metals Assay

A detailed **metals assay** of the fused silica material is provided in the corresponding documentation . This information is important for:

- Regulatory submissions
- Contamination-sensitive applications
- High-purity requirements in analytical workflows

The assay identifies trace metal content to confirm that the silica meets performance and purity standards suitable for CE applications.

Trace Elements in Simplus™ Brand Bare Fused Silica Capillaries

Element	Symbol	By Weight
Aluminum	Al	0.1 (0.05)
Antimony	Sb	0.002
Arsenic	As	0.03
Boron	B	0 to 0.01
Cadmium	Cd	0.0002
Calcium	Ca	0.1 (0.05)
Chromium	Cr	n.d.
Copper	Cu	0.0004
Gallium	Ga	n.d.
Gold	Au	n.d.
Iron	Fe	0.2 (0.02)
Lithium	Li	0 to 0.05
Magnesium	Mg	0 to 0.1 (0.0005)
Manganese	Mn	0 to 0.01
Phosphorous	P	0.01 to 0.1
Potassium	K	0 to 0.001 (0.01)
Silver	Ag	n.d.
Sodium	Na	0.04 (0.05)
Titanium	Ti	0 to 0.1 (0.05)
Uranium	U	n.d.
Zirconium	Zr	0 to 0.001

Product Information

For full details, specifications, and ordering options: [Simplus Capillary Product Page](#)

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