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Certificate of Quality

Combitips advanced®/ViscoTip®: Typical values for trace metals

The values in the table indicate typical values of trace metal concentrations which are obtained after incubating Combitips advanced/ViscoTip with conc. nitric acid for 60 minutes (see: Materials and Methods, page 2).

As the indicated values were determined in a one-time measurement, they cannot be guaranteed for every lot of Combitips advanced/ViscoTip. Rather, they provide an indication of the extent trace elements can be eluted from Combitips advanced/ViscoTip.

Trace Metal Release [ng/μL]									
Combitips advanced	Al	Cd	Cr	Cu	Hg	Mn	Ni	Pb	Zn
0.1 mL	0.005366	< 0.00002	< 0.00005	< 0.0001	< 0.001	< 0.00005	< 0.00005	< 0.00005	< 0.001
0.2 mL	0.003799	< 0.00002	< 0.00005	< 0.0001	< 0.001	< 0.00005	< 0.00005	< 0.00005	< 0.001
0.5 mL	0.002405	< 0.00002	< 0.00005	< 0.0001	< 0.001	< 0.00005	< 0.00005	< 0.00005	< 0.001
1.0 mL	0.001700	< 0.00002	< 0.00005	< 0.0001	< 0.001	< 0.00005	< 0.00005	< 0.00005	< 0.001
2.5 mL	0.001076	< 0.00002	< 0.00005	< 0.0001	< 0.001	< 0.00005	< 0.00005	< 0.00005	< 0.001
5.0 mL	< 0.001	< 0.00002	< 0.00005	< 0.0001	< 0.001	< 0.00005	< 0.00005	< 0.00005	< 0.001
10 mL	< 0.001	< 0.00002	< 0.00005	< 0.0001	< 0.001	< 0.00005	< 0.00005	< 0.00005	< 0.001
25 mL	< 0.001	< 0.00002	< 0.00005	< 0.0001	< 0.001	< 0.00005	< 0.00005	< 0.00005	< 0.001
50 mL	< 0.001	< 0.00002	< 0.00005	< 0.0001	< 0.001	< 0.00005	< 0.00005	< 0.00005	< 0.001
ViscoTip	Al	Cd	Cr	Cu	Hg	Mn	Ni	Pb	Zn
10 mL	< 0.001	< 0.00002	< 0.00005	< 0.0001	< 0.001	< 0.00005	< 0.00005	< 0.00005	< 0.001
Detection Limit [ng/μL]									
	Al	Cd	Cr	Cu	Hg	Mn	Ni	Pb	Zn
	0.001	0.00002	0.00005	0.0001	0.001	0.00005	0.00005	0.00005	0.001

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Materials and Methods

The Combitips advanced/ViscoTip (0.1 mL – 50 mL) were filled to their nominal volume with conc. nitric acid (65 %) and incubated for 60 minutes at room temperature (20 °C). The nitric acid was then analyzed by inductively coupled plasma mass spectrometry (ICP-MS). The trace metal concentrations are stated in ng/µL.

The values are the average of three samples individually analyzed. The trace metal release of the Combitips advanced/ViscoTip were calculated from their surface/volume ratio. All values labelled with "<" indicate concentrations below the detection limit of the ICP-MS method.

No trace metal release was observed after 5-10 times rinsing with conc. nitric acid or after rinsing with 10 % acetic acid or water. (All analyses were performed by GALAB Laboratories, Geesthacht, Germany accredited to DIN EN ISO/IEC 17025).

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Dr. Benjamin Otto
Global Product Line Manager Consumables



Dr. Birgit Schreiber
Vice President Quality Management & Regulatory Affairs

Your local distributor: www.eppendorf.com/contact
Eppendorf AG · 22331 Hamburg · Germany
E-mail: eppendorf@eppendorf.com

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