

Eppendorf Certificate

Certificate of Quality

Pipette tips - Typical values of trace metal release

The values in the table indicate typical values of trace metal concentrations which are obtained after incubating pipette tips with concentrated nitric acid for 1 hour (see: Materials and methods).

As the indicated values were determined in a one-time measurement, they cannot be guaranteed for every lot of pipette tips. Rather the values indicate the extent of trace elements that can be eluted from pipette tips.

	Trace metal release [ng / μ L]								
	Al	Cd	Cr	Cu	Hg	Mn	Ni	Pb	Zn
epT.I.P.S.®^{*1}									
0.1-10 μL*	0.0038	<0.00002	<0.00005	<0.0001	<0.001	0.00027	<0.00005	<0.00005	<0.001
0.1-20 μL*	0.0034	<0.00002	<0.00005	<0.0001	<0.001	0.00025	<0.00005	<0.00005	<0.001
0.5-20 μL*	0.0032	<0.00002	<0.00005	<0.0001	<0.001	0.00023	<0.00005	<0.00005	<0.001
2-200 μL*	0.0014	<0.00002	<0.00005	<0.0001	<0.001	0.00010	<0.00005	<0.00005	<0.001
20-300 μL	0.0011	<0.00002	<0.00005	<0.0001	<0.001	0.00008	<0.00005	<0.00005	<0.001
50-1000 μL	<0.001	<0.00002	<0.00005	<0.0001	<0.001	<0.00005	<0.00005	<0.00005	<0.001
50-1250 μL*	<0.001	<0.00002	<0.00005	<0.0001	<0.001	<0.00005	<0.00005	<0.00005	<0.001
0.25-2.5 mL*	<0.001	<0.00002	<0.00005	<0.0001	<0.001	<0.00005	<0.00005	<0.00005	<0.001
0.1-5 mL*	<0.001	<0.00002	<0.00005	<0.0001	<0.001	<0.00005	<0.00005	<0.00005	<0.001
0.5-10 mL*	<0.001	<0.00002	<0.00005	<0.0001	<0.001	<0.00005	<0.00005	<0.00005	<0.001
0.5-10 mL L *	<0.001	<0.00002	<0.00005	<0.0001	<0.001	<0.00005	<0.00005	<0.00005	<0.001
Eppendorf Varitips®									
P	<0.0010	<0.00002	<0.00005	<0.00010	<0.0010	<0.00005	<0.00005	<0.00005	<0.0010
S	<0.0010	<0.00002	<0.00005	0.00014	<0.0010	0.00061	<0.00005	0.00005	<0.0010
GEloader®									
0.5 - 20 μL	<0.0010	<0.00002	<0.00005	<0.00010	<0.0010	<0.00005	<0.00005	<0.00005	<0.0010
Microloader									
0.5 - 20 μL	<0.0010	<0.00002	<0.00005	<0.00010	<0.0010	<0.00005	<0.00005	<0.00005	<0.0010

^{*1} applies also to the BioBased variants

Eppendorf Certificate

The Certificate of Quality applies also for epT.I.P.S.® 384, ep Dualfilter T.I.P.S.®, ep Dualfilter T.I.P.S.® 384 and ep Dualfilter T.I.P.S.® SealMax with the following additional volumes.

	Trace metal release [ng /µL]								
	Al	Cd	Cr	Cu	Hg	Mn	Ni	Pb	Zn
epT.I.P.S.® 384, ep Dualfilter T.I.P.S.® 384									
0.1-20 µL	0.0035	<0.00002	<0.00005	<0.0001	<0.001	0.00026	<0.00005	<0.00005	<0.001
5-100 µL*	0.0019	<0.00002	<0.00005	<0.0001	<0.001	0.00014	<0.00005	<0.00005	<0.001
ep Dualfilter T.I.P.S.®*, ep Dualfilter T.I.P.S.® SealMax* ¹									
0.1-10 µL S*	0.0038	<0.00002	<0.00005	<0.0001	<0.001	0.00027	<0.00005	<0.00005	<0.001
0.1-10 µL M*	0.0039	<0.00002	<0.00005	<0.0001	<0.001	0.00029	<0.00005	<0.00005	<0.001
2-20 µl	0.0027	<0.00002	<0.00005	<0.0001	<0.001	0.00020	<0.00005	<0.00005	<0.001
0.5 -20 µl L	0.0032	<0.00002	<0.00005	<0.0001	<0.001	0.00023	<0.00005	<0.00005	<0.001
2-100 µL*	0.0016	<0.00002	<0.00005	<0.0001	<0.001	0.00012	<0.00005	<0.00005	<0.001
2-200 µL	0.0013	<0.00002	<0.00005	<0.0001	<0.001	0.00009	<0.00005	<0.00005	<0.001
50-1250 µL L*	<0.001	<0.00002	<0.00005	<0.0001	<0.001	<0.00005	<0.00005	<0.00005	<0.001
0.2-5 mL L*	<0.001	<0.00002	<0.00005	<0.0001	<0.001	<0.00005	<0.00005	<0.00005	<0.001

* applies also to the BioBased variants

Materials and methods:

The pipette tips were filled with their nominal volume with concentrated nitric acid (65 %) and incubated for 1 hour at room temperature (20 °C). The eluate was then analyzed by inductively coupled plasma-mass spectrometry (ICP-MS). The trace metal concentrations are expressed in ng/µL.

The values are the average of three individually analyzed samples. The trace metal release of all other pipette tips indexed with "*" sizes were calculated from their surface/volume ratio. All values labeled with "<" indicate concentrations below the detection limit of the ICP-MS method.

No metal release was observed after 5-10 rinsings with concentrated nitric acid or after rinsing with 10 % acetic acid or water.

All analyses were performed by GALAB Laboratories accredited to DIN EN ISO/IEC 17025.

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Joana Tziolis
Product Life Cycle Manager
Division Consumables



Monika Schneider
Vice President Global Quality Management &
Regulatory Affairs

Your local distributor: www.eppendorf.com/contact
Eppendorf SE · Barkhausenweg 1 · 22339 Hamburg · Germany
E-mail: eppendorf@eppendorf.com

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