

# Eppendorf Certificate

## Certificate of Quality

### epT.I.P.S.<sup>®</sup> - Typical values of trace metal release

The values in the table indicate typical values of trace metal concentrations which are obtained after incubating epT.I.P.S.<sup>®</sup> pipette tips with conc. 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 epT.I.P.S.<sup>®</sup> pipette tips. Rather, the values indicate the extent of trace elements, that can be eluted from epT.I.P.S.<sup>®</sup> pipette tips.

epT.I.P.S.	Trace metal release [ng / $\mu$ L]								
	Al	Cd	Cr	Cu	Hg	Mn	Ni	Pb	Zn
0.1-10 $\mu$ L	0.006 $\pm$ 0.002	< 0.00002	0.0003 $\pm$ 0.001	0.0003 $\pm$ 0.001	< 0.001	< 0.00005	0.0006 $\pm$ 0.0001	< 0.00005	0.001 $\pm$ 0.001
0.1-20 $\mu$ L	0.005	< 0.00002	< 0.0003	< 0.00027	< 0.001	< 0.00005	< 0.0005	< 0.00005	0.001
0.5-20 $\mu$ L	0.005	< 0.00002	< 0.00025	< 0.00025	< 0.001	< 0.00005	< 0.0005	< 0.00005	< 0.001
2-200 $\mu$ L	0.002	< 0.00002	< 0.0001	< 0.0001	< 0.001	< 0.00005	< 0.0002	< 0.00005	< 0.001
20-300 $\mu$ L	0.002	< 0.00002	< 0.0001	< 0.0001	< 0.001	< 0.00005	< 0.00017	< 0.00005	< 0.001
50-1000 $\mu$ L	0.002 $\pm$ 0.001	< 0.00002	< 0.00005	< 0.0001	< 0.001	< 0.00005	< 0.00005	< 0.00005	< 0.001
1250 $\mu$ L	0.002	< 0.00002	< 0.00005	< 0.0001	< 0.001	< 0.00005	< 0.00005	< 0.00005	< 0.001
2.5 mL	0.0015	< 0.00002	< 0.00005	< 0.0001	< 0.001	< 0.00005	< 0.00005	< 0.00005	< 0.001
5 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
10 mL long	0.001	< 0.00002	< 0.00005	< 0.0001	< 0.001	< 0.00005	< 0.00005	< 0.00005	< 0.001

#### Materials and methods:

The epT.I.P.S.<sup>®</sup> 0.1 – 10  $\mu$ L and 50 – 1000  $\mu$ L pipette tips were filled with their nominal volume with conc. nitric acid (65 %) and incubated for 1 hour at room temperature (20 °C). Nitric acid was analyzed by inductively coupled plasma-mass spectrometry (ICP-MS) then. The trace metal concentrations are expressed in ng/ $\mu$ L.

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The values are the average of three individually analyzed samples. The trace metal release of the epT.I.P.S.<sup>®</sup> pipette tips 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 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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Page 2 of 2

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