

# Eppendorf Certificate

## Certificate of Quality

### Eppendorf Tubes® – Typical values of trace metal release

The values in the table indicate typical values of trace metal concentrations obtained by incubating Eppendorf Tubes with concentrated nitric acid for 1 hour (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 Eppendorf Tubes. Rather, they provide an indication of the extent trace elements, that can be eluted from Eppendorf Tubes.

	Trace metal release [ng/μL]								
	Al	Cd	Cr	Cu	Hg	Mn	Ni	Pb	Zn
<b>Eppendorf Safe-Lock Tubes*<sup>1</sup></b>									
0.5 mL*	0.003	< 0.00002	< 0.00005	< 0.0001	< 0.001	< 0.00005	< 0.00005	< 0.00005	< 0.001
1.5 mL	0.002	< 0.00002	< 0.00005	< 0.0001	< 0.001	< 0.00005	< 0.00005	< 0.00005	< 0.001
2.0 mL*	0.002	< 0.00002	< 0.00005	< 0.0001	< 0.001	< 0.00005	< 0.00005	< 0.00005	< 0.001
<b>Eppendorf Tubes® 3810X</b>									
1.5 mL	0.002	< 0.00002	< 0.00005	< 0.0001	< 0.001	< 0.00005	< 0.00005	< 0.00005	< 0.001
<b>Eppendorf Protein LoBind® Tubes</b>									
0.5 mL*	0.006	< 0.00002	< 0.00005	< 0.0001	< 0.001	< 0.00005	< 0.00005	< 0.00005	< 0.001
1.5 mL	0.004	< 0.00002	< 0.00005	< 0.0001	< 0.001	< 0.00005	< 0.00005	< 0.00005	< 0.001
2.0 mL*	0.004	< 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
<b>Eppendorf DNA LoBind® Tubes</b>									
0.5 mL*	0.004	< 0.00002	0.0001	< 0.0001	< 0.001	< 0.00005	< 0.00005	< 0.00005	< 0.001
1.5 mL	0.003	< 0.00002	0.0001	< 0.0001	< 0.001	< 0.00005	< 0.00005	< 0.00005	< 0.001
2.0 mL*	0.003	< 0.00002	0.0001	< 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
<b>Eppendorf Tubes® 5.0 mL*<sup>1</sup></b>									
5.0 mL	< 0.001	< 0.00002	< 0.00005	< 0.0001	< 0.001	< 0.00005	< 0.00005	< 0.00005	< 0.001
5.0 mL with screw cap * <sup>2</sup>	< 0.001	< 0.00002	< 0.00005	0.000183	< 0.001	< 0.00005	< 0.00005	< 0.00005	< 0.001
<b>Eppendorf Conical Tubes</b>									
15 mL* <sup>1, *2</sup>	< 0.001	< 0.00002	< 0.00005	0.00016	< 0.001	< 0.00005	< 0.00005	< 0.00005	< 0.001
45 mL (SnapTec®50)	< 0.001	< 0.00002	< 0.00005	0.000086	< 0.001	< 0.00005	< 0.00005	< 0.00005	< 0.001
50 mL* <sup>1, *2</sup>	< 0.001	< 0.00002	< 0.00005	0.000086	< 0.001	< 0.00005	< 0.00005	< 0.00005	< 0.001
25 mL* <sup>1, *2</sup>	< 0.001	< 0.00002	< 0.00005	0.00016	< 0.001	< 0.00005	< 0.00005	< 0.00005	< 0.001

\*<sup>1</sup> applies also to the SafeCode variants

\*<sup>2</sup> applies also to the BioBased variants

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	Trace metal release [ng/μL]								
	Al	Cd	Cr	Cu	Hg	Mn	Ni	Pb	Zn
<b>PCR Tubes</b>									
0.2 mL	0.0013	<0.00002	0.00016	<0.00010	<0.0010	<0.00005	<0.00005	<0.00005	<0.0010
0.5 mL	0.0011	<0.00002	0.00048	<0.00010	<0.0010	<0.00005	0.00006	<0.00005	0.0029
<b>PCR Tube Strips</b>									
0.1 mL with Cap Strips domed	<0.0010	<0.00002	0.00007	<0.00010	<0.0010	<0.00005	<0.00005	<0.00005	<0.0010
0.2 mL	<0.0010	<0.00002	<0.00005	<0.00010	<0.0010	<0.00005	<0.00005	<0.00005	<0.0010
<b>Fast PCR Tube Strips</b>									
0.1 mL with Cap Strips flat	<0.0010	<0.00002	<0.00005	<0.00010	<0.0010	<0.00005	<0.00005	<0.00005	<0.0010
<b>real-time PCR Tube Strips</b>									
0.1 mL with Masterclear Cap Strips	0.0061	<0.00002	0.00010	0.00037	<0.0010	0.0015	<0.00005	0.00008	<0.0010

## Materials and Methods

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

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

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

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

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