Eppendorf LoBind® Tubes and Plates

Instructions for use

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1 Product description

1.1 Eppendorf LoBind Tubes and Plates

Eppendorf LoBind Tubes and Plates are made from a special polymer mixture.The LoBind material improves the recovery rate of the samples. The tubes are certified free of human DNA, DNase, RNase and PCR inhibitors (PCR clean).

Eppendorf LoBind Tubes and Plates are available in the following product versions:

- Eppendorf Protein LoBind for preparation and storage of protein, peptide, antibody, or virus samples.
- DNA LoBind for DNA or RNA applications in forensic analysis, for microarrays and Next Generation Sequencing.

Eppendorf LoBind Tubes are available in four sizes (0.5/1.5/2.0/5.0 mL).

Eppendorf LoBind Tubes are equipped with a graduation as an indicator for the filling quantity and a labeling area for identification.

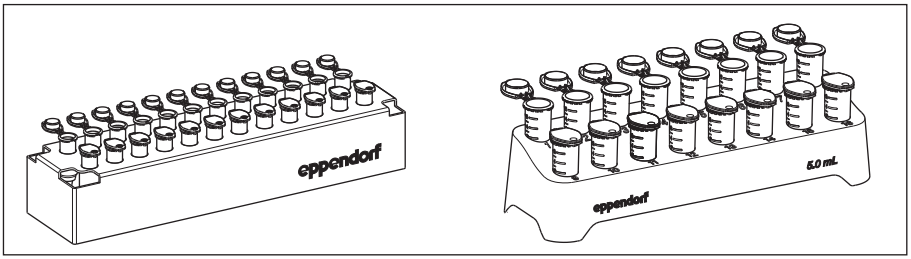


Fig. 1-1: Tubes in a 1.5/2.0 mL and a 5.0 mL tube rack

The Eppendorf LoBind Plates are available as Eppendorf Deepwell Plates and Eppendorf Microplates (*see ordering information*).

2 Safety

2.1 Intended use

Eppendorf LoBind Tubes and Plates are single-use tubes made from polypropylene for preparing, mixing, centrifuging, transporting and storing solid and liquid samples and reagents. The field of application is training, routine and research laboratories in the areas of life sciences, industry, clinics and chemistry.

DNA LoBind Tubes are not suitable for performing polymerase chain reactions (PCR) or similar amplification reactions.

Using Protein LoBind Tubes may increase evaporation time. If you flush the vessels with, for example, water of a buffer prior to use this will improve the evaporation properties.

Eppendorf Microplates can be used in all conventional plate readers.

Operation requires skilled personnel who have been trained for the above mentioned areas.

Eppendorf LoBind Tubes and Plates may only be used for research purposes.

2.2 Hazards arising from the intended use



WARNING! Damage to health from toxic, radioactive or aggressive chemicals as well as infectious liquids and pathogenic germs.

- Observe the national regulations for handling these substances, the biological security level of your laboratory, the material safety data sheets and the manufacturer's application notes.
- Wear personal protective equipment.
- For comprehensive regulations about handling germs or biological materials of the risk group II or higher, please refer to the "Laboratory Biosafety Manual" (source: World Health Organisation, Laboratory Biosafety Manual, in its current version).



WARNING! Risk from hazardous substances.
If the tubes are handled improperly the contents of the tube can splash out or escape.

- Only use undamaged tubes and plates.
- Do not fill the tubes and plates above the permitted total volume.
- Make the necessary safety arrangements for transport or storage to prevent materials escaping from the tube. Use stands that are suitable for the tubes.
- Do not freeze the tubes and plates with liquid nitrogen.
- Seal the tubes and plates carefully.
- Use a clip for Eppendorf Tubes 5.0 mL if the tube is heated above 80 °C.
- Do not centrifuge any tubes which are sealed with a clip.



WARNING! For mixers or centrifuges: Risk of contamination if the tube mounts are too large (wells, rotor bores, buckets).
Tubes may be destroyed and the substances they contain released.

- Please note height and diameter of the tube. Only use suitable centrifuge inserts or mixer thermoblocks
- If required, use the adapter intended for this purpose.



WARNING! Risk of contamination from damaged tubes or plates.
Tube and plates may be destroyed if used incorrectly. The substances they contain will be released.

- Seal the tubes and plates carefully.
- Centrifuge tubes and plates at the maximum permitted centrifugation forces only.
- Centrifuge stacked plates at lower speed only.
- Please note that organic solvents can reduce the mechanical resistance of the tubes. If in doubt, please contact the Eppendorf Application Support (support@eppendorf.com).



WARNING! Risk of contamination from multiple use.
Consumables are intended for single-use only.

- After use, dispose of consumables in accordance with the substances with which they have come into contact.



CAUTION! Contamination risk when disposing of used consumables.

- Dispose of used consumables in accordance with the substances with which they have come into contact.
- Observe the rules applicable to your lab.



NOTICE! Material change of consumables due to extreme temperatures.
Extreme temperatures (e.g., during refrigeration or autoclaving) affect consumables material. The mechanical strength, dimensions and shape of the consumable will change.

- Use consumables that are suitable for the selected temperature range or selected procedure.



NOTICE! Material damage from incorrect use.

- Only use the product for its intended purpose as described in the operating manual.
- Ensure adequate material resistance when using chemical substances.
- If in doubt, contact the manufacturer of the product.

3 Applications

3.1 Eppendorf DNA LoBind Tubes and Plates

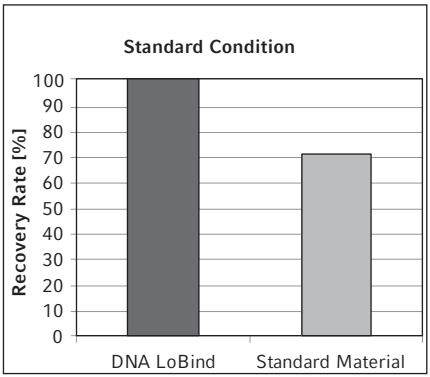
3.1.1 DNA Incubation

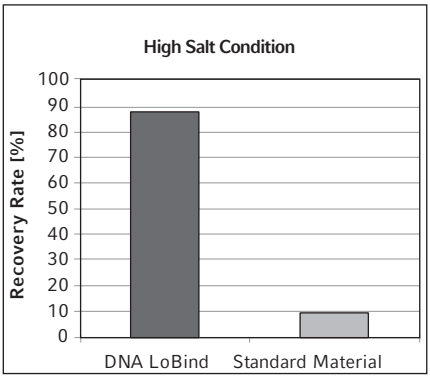
DNA (830 bp) was dissolved in two buffer solutions.

- 0.1 M NaCl/TE buffer (standard condition)
- 2.5 M NaCl/TE buffer (high salt condition)

The solution (0.1 ng/µL) was incubated at 37 °C for 24 hours in two different plates (384-well Deepwell Plates made of standard material and Deepwell Plates made of Eppendorf DNA LoBind material).

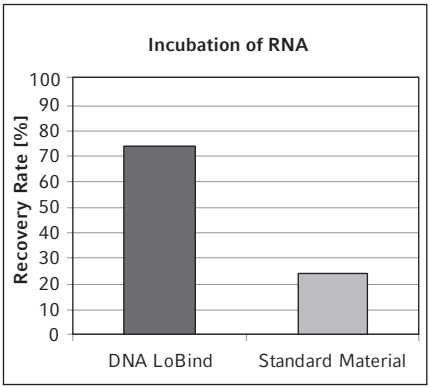
After removing the solution the DNA concentration was determined by means of real-time PCR and the recovery rate (in percent) was determined from that result.





3.1.2 rRNA incubation

A 100 ng/mL rRNA solution in the TE buffer was incubated at room temperature in standard material tubes and DNA LoBind Tubes. After 24 hours, the RNA solutions were brought from the tubes onto a measuring plate and colored with the reagent RiboGreen.The recovery was determined from the measuring results.



3.1.3 Manufacturing and storage of standard preparations in real-time PCR

Aliquots serial dilutions of a standard series for real-time PCR were manufactured and stored in different vessels. When using Eppendorf DNA LoBind Tubes , there was a higher amplification efficiency compared to similar tubes by another manufacturer.

Source: M Lecerf, J. Le Goff, Université Paris, Paris, France (Eppendorf Application Note No. 226)

3.1.4 Extraction of RNA

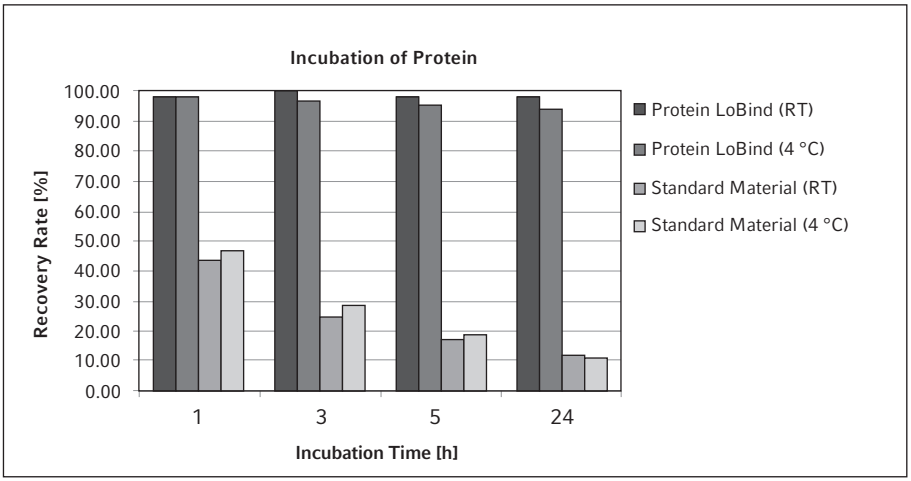
In Eppendorf DNA LoBind Tubes, RNA was isolated from microdissected skin tissue. Combined with the extraction kit used, this resulted in a high RNA yield

Source: Dr. C. Kruse, Institut für Medizinische Molekularbiologie, Universität Lübeck, D-Lübeck

3.2 Eppendorf Protein LoBind Tubes and Plates

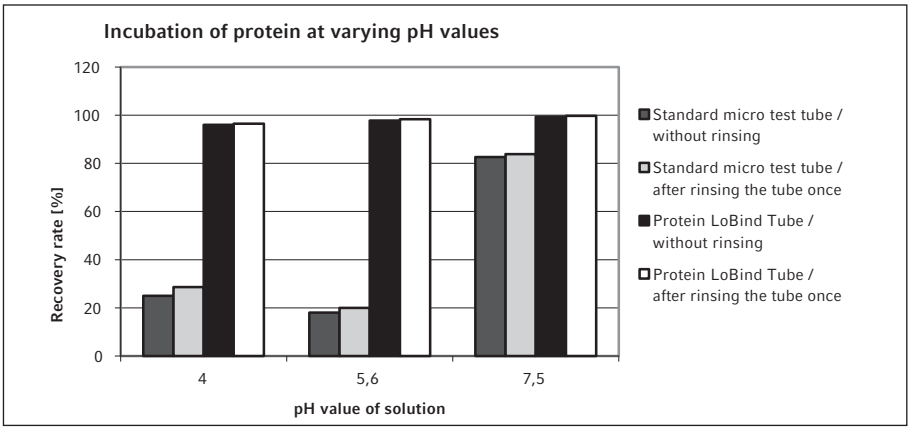
3.2.1 Incubation of proteins at different temperatures

The recovery rate of proteins was determined by measuring the fluorescence after incubating fluorescein-marked BSA at room temperature and 4°C. For this purpose, fluorescein-marked BSA (1 µg/mL) was incubated in 384-well standard material microplates and Protein LoBind material for 24 hours. Samples were taken at different times and the fluorescence intensity was determined.



3.2.2 Incubation of proteins at different pH values

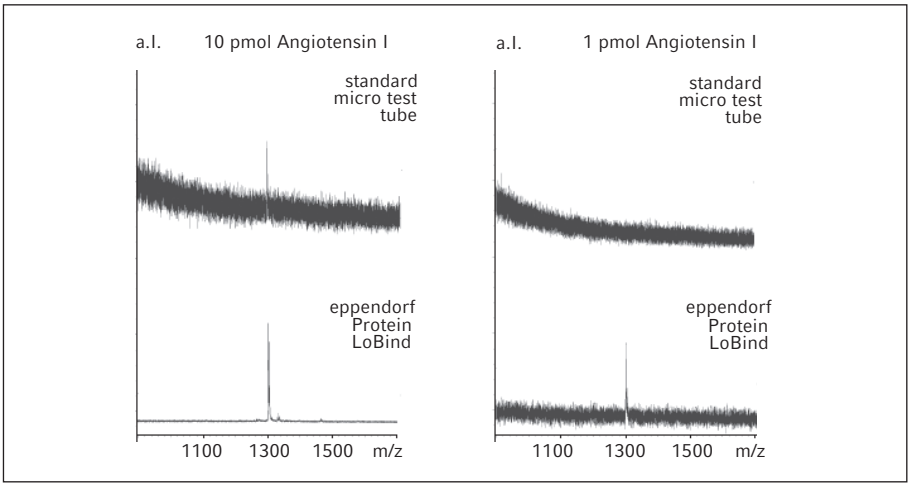
BSA labeled with ^{131}I (1 µg/ml) was dissolved in 0.1 M acetate, pH 4 and pH 5.6 and in 0.1 M Tris, pH 7.5 and incubated in Eppendorf Protein LoBind Tubes and standard micro test tubes at a temperature of 20°C for 24 hours. Afterwards, the solutions were removed and the tubes were filled with solutions without BSA as described above. The radioactivity of the tubes and solutions was measured directly and then again after rinsing the tube once.



Source: Dr. M. Badertscher, Omnimedica AG, CH-Schlieren

3.2.3 MALDI-TOF mass spectrum after storage of peptides at 4°C

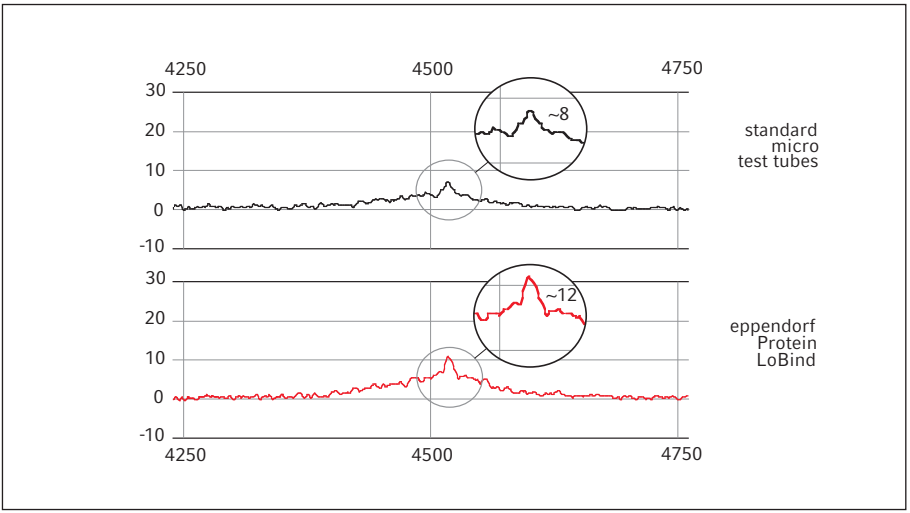
1.3 µg/ml (10 pmol) and 130 ng/ml (1 pmol) angiotensin I (peptide), dissolved in water, was incubated in Eppendorf Protein LoBind Tubes and standard micro test tubes in the refrigerator.Then a MALDI-TOF mass spectrum was recorded of 1 µl of the samples each.



Source: Dr. S. Seeber and Dr. A. Humeny, Institut für Biochemie, Universität Erlangen-Nürnberg, D-Erlangen

3.2.4 SELDI-TOF mass spectrum after elution of peptides from gel

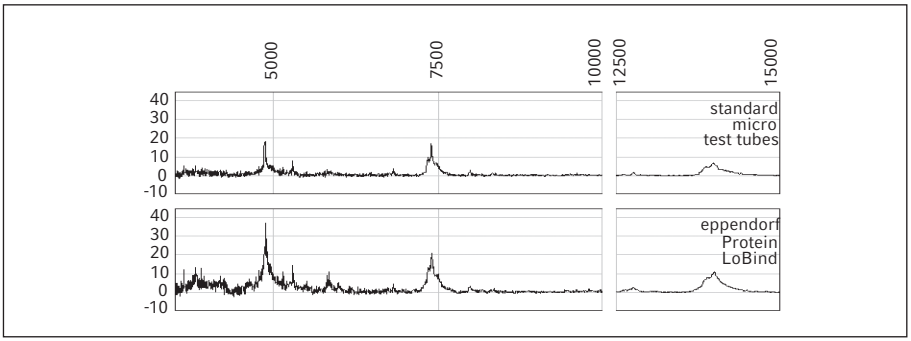
After the electrophoretic separation of amyloid-beta peptide 1-42 (produced synthetically) in an SDS-urea gel and staining with Sypro Ruby the corresponding peptide bands were cut out of the gel and eluted from the gel in Eppendorf Protein LoBind Tubes and standard micro test tubes. Then a SELDI-TOF mass spectrum was recorded.



Source: Dr. S. Seeber and Dr. A. Humeny, Institut für Biochemie, Universität Erlangen-Nürnberg, D-Erlangen

3.2.5 SELDI-TOF mass spectrum after protein extraction from serum

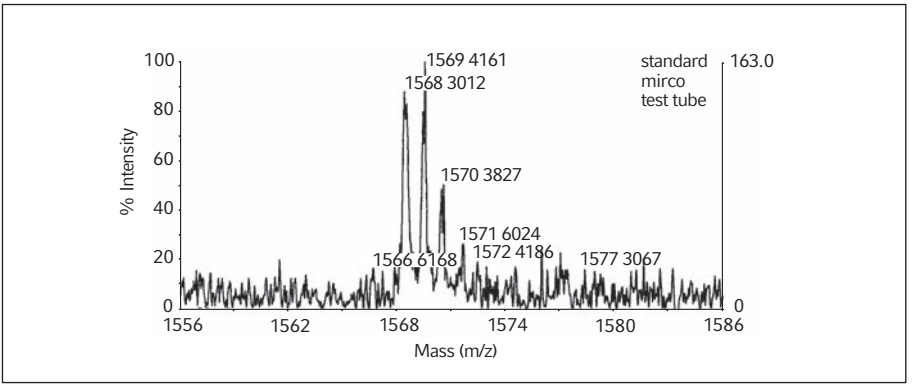
In Eppendorf Protein LoBind Tubes and standard micro test tubes proteins from whole blood were extracted according to a standard protocol using 8 M urea.The proteins were then analyzed by SELDI-TOF mass spectrometry.

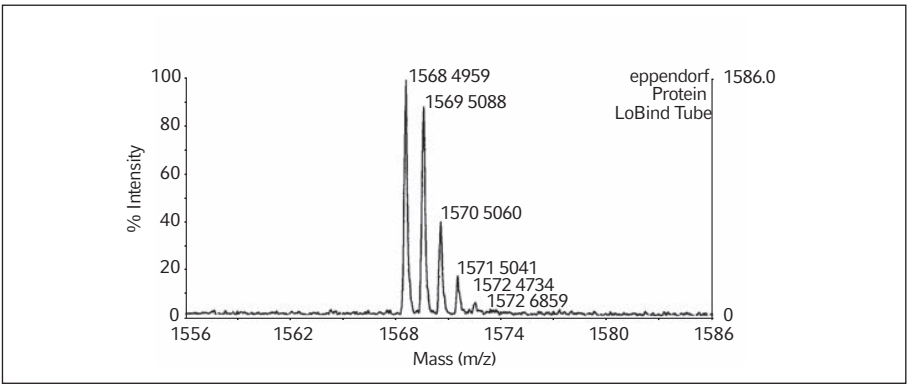


Source: Dr. S. Seeber and Dr. A. Humeny, Institut für Biochemie, Universität Erlangen-Nürnberg, D-Erlangen

3.2.6 MALDI-TOF mass spectrum after trypsin in gel digestion of protein

After electrophoretic separation of a protein extract from NIH 3T3 cells the proteins were eluted from the gel in Eppendorf Protein LoBind Tubes and standard micro test tubes with up to 100 % acetonitrile. Then a trypsin digestion is performed according to the standard protocol and the peptide mixture is analyzed by ESI mass spectrometry.





Source: Unpublished results from Japan

4 Technical data

Material:	Polypropylene
Storage before use:	Protect from sunlight and UV light. Store dry and at room temperature.
Chemical resistance:	The reaction tubes and plates show a high resistance to UV light and chemicals. Refer to application no. 56: “The best material for original Eppendorf Tubes® and Plates: properties and chemical resistance of polypropylene"
Operating temperature:	-86 °C - 100 °C
• Eppendorf Tubes 5.0 mL (without clip)	≤ 80 °C
• Eppendorf Tubes 5.0 mL (closed with clip)	≤ 100 °C
Autoclavable:	When opened, 121 °C, 20 min

4.1 Maximum values for centrifuging



NOTICE! Consumables heat up.
In uncooled centrifuges, the temperature in the rotor chamber, rotor and sample can increase to above 40 °C, based on the run time, g-force (rcf)/speed and ambient temperature.

- Please note that the resistance to centrifugation of the tubes and plates will reduce.
- Please note the temperature resistance of the samples.

Can be centrifuged at 4 °C – 40 °C

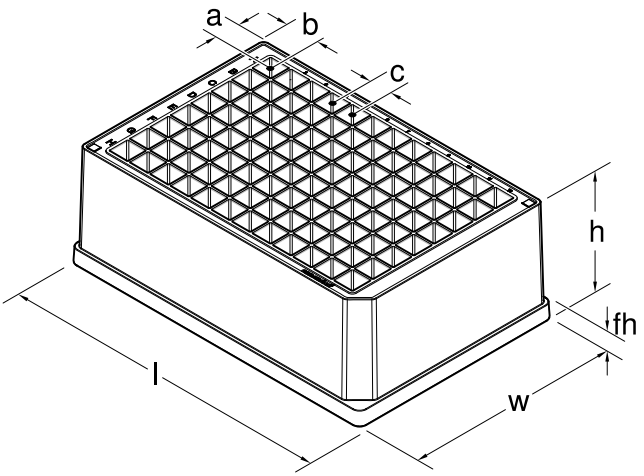
The tubes can be centrifuged with the maximum g-forces (rcf) listed in the table below under the following conditions:

- in a 45° fixed-angle rotor
- Sample temperature with aqueous saline solution 40 °C
- Duration of centrifugation 90 min

Vessel		**Protein**	**DNA**
Eppendorf LoBind Tubes	0.5 mL	18 000 × *g*	30 000 × *g*
	1.5 mL	18 000 × *g*	30 000 × *g*
	2.0 mL	18 000 × *g*	25 000 × *g*
	5.0 mL	25 000 × *g*	25 000 × *g*
Eppendorf Deepwell Plates		6 000 × *g*	6 000 × *g*
Eppendorf Microplates		6 000 × *g*	6 000 × *g*

The mechanical strength of the tubes and plates is reduced by the use of organic solvents. In case of doubt, contact Eppendorf Application Support.

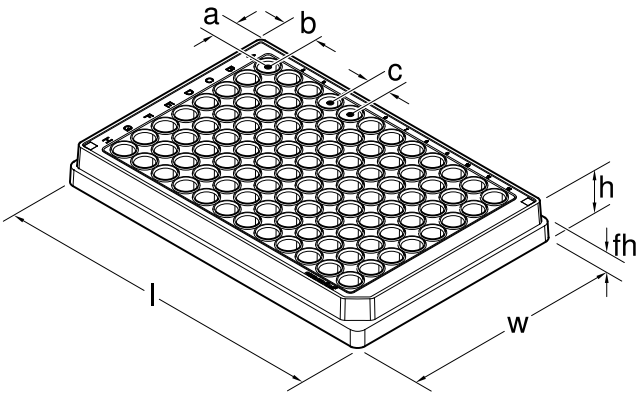
4.2 Eppendorf Deepwell Plate



	Eppendorf Deepwell Plate			96/2000 µL	96/1000 µL	96/500 µL	384/200 µL
Well/cavity	Theoretical total volume	[µL]		2400	1200	700	240
	Working volume	[µL]		50 - 2000	30 - 1000	30 - 550	20 - 225
	Position Well center A1	[mm]	**a/b**	11.2/14.4			9.0/12.1
	Distance of well center	[mm]	**C**	9.0			4.5
	Depth	[mm]		41	41	24	22
Plate	Length	[mm]	**l**	127.8			
	Width	[mm]	**W**	85.5			
	Height	[mm]	**h**	44.1	44.1	27.1	25.1
	Base height	[mm]	**bh**	6.1			
	Stacking height SH*	[mm]		42.7	42.7	25.7	23.7

* The height of a plate stack is made up of a base plate of height h and other stacked plates each of stacking height SH.

4.3 Eppendorf Microplate



	Eppendorf Microplate			96/F-PP	96/U-PP	96/V-PP	384/F-PP	384/V-PP
Well/cavity	Bottom shape			flat	round	V-shape	flat	V-shape
	Theoretical total volume	[µL]		400	360	350	150	140
	Working volume	[µL]		50 - 350	20 - 320	20 - 300	10 - 120	5 - 120
	Position Well center A1	[mm]	**a/b**	11.2/14.4			9.0/12.1	
	Distance of well center	[mm]	**C**	9.0			4.5	
	Depth	[mm]		11.2	11.1	11.2	11.6	11.6
Plate	Length	[mm]	**l**	127.8				
	Width	[mm]	**W**	85.5				
	Height	[mm]	**h**	14.4				
	Base height	[mm]	**bh**	6.1				
	Stacking height SH*	[mm]		13.0				

* The height of a plate stack is made up of a base plate of height h and other stacked plates each of stacking height SH.

4.4 Eppendorf purity grades

	PCR clean
	
Batch testing (certified) for the following purity criteria	
Free of human DNA	■
DNA-free (free of human and bacterial DNA)	
DNase-free	■
RNase-free	■
Free of PCR inhibitors	■
ATP-free	
Pyrogen-free (endotoxin-free)	
Sterile (Ph.Eur./UPS)	

Eppendorf Protein LoBind and DNA LoBind: consumables with the highest recovery rates for proteins and DNA and RNA molecules. They are PCR clean, i.e. free from RNase, DNase, human DNA and PCR inhibitors.

5 Ordering Information

Order no. (International)	Order no. (North America)	Description
0030 108.094	022431064	**Eppendorf Protein LoBind Tubes 0.5 mL** PCR clean, 100 pieces
0030 108.116	022431081	**Eppendorf Protein LoBind Tubes 1.5 mL** PCR clean, 100 pieces
0030 108.132	022431102	**Eppendorf Protein LoBind Tubes 2.0 mL** PCR clean, 100 pieces
0030 108.302	0030108302	**Eppendorf Protein LoBind Tubes 5.0 mL** PCR clean, 100 pieces
0030 108.035	022431005	**Eppendorf DNA LoBind Tubes 0.5 mL** PCR clean, 250 pieces
0030 108.051	022431021	**Eppendorf DNA LoBind Tubes 1.5 mL** PCR clean, 250 pieces
0030 108.078	022431048	**Eppendorf DNA LoBind Tubes 2.0 mL** PCR clean, 250 pieces
0030 108.310	0030108310	**Eppendorf DNA LoBind Tubes 5.0 mL** PCR clean, 200 pieces
0030 123.107 0030 123.115	0030123107 0030123115	**Tube-rack** for 0.5 mL test tubes for 1.5 – 2.0 mL test tubes
0030 119.495	0030119495	**Tube rack** for Eppendorf Tubes 5.0 mL 2 pieces
0030 504.305	0030504305	**Eppendorf Deepwell Plate 96/2000 µL** 20 plates, wells clear, white border color Protein LoBind
0030 504.208 0030 503.201	951032905 951032808	**Eppendorf Deepwell Plate 96/1000 µL** 20 plates, wells clear, white border color Protein LoBind DNA LoBind (also for RNA and other nucleic acids)
0030 504.100 0030 503.104	951032107 951032000	**Eppendorf Deepwell Plate 96/500 µL** 40 plates, wells clear, white border color Protein LoBind DNA LoBind (also for RNA and other nucleic acids)

Order no. (International)	Order no. (North America)	Description
		Eppendorf Deepwell Plate 384/200 µL 40 plates, wells clear, white border color
0030 524.101	951031305	Protein LoBind
0030 523.105	951031208	DNA LoBind (also for RNA and other nucleic acids)
		Microplate 384/V-PP 80 plates, wells clear, white border color
0030 624.300	951040589	Protein LoBind
0030 623.304	951040546	DNA LoBind

6 List of references

6.1 Eppendorf Application Notes

No. 180: Eppendorf LoBind®: Evaluation of protein recovery in Eppendorf Protein LoBind Tubes and Plates

No. 226: Use of Eppendorf LoBind® Tubes to consistently prepare and store standard panels for real-time PCR absolute quantifications

6.2 References

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Sorption processes in ion-exchange chromatography of viruses

Journal of Chromatography A; 2007, 1142:2-12

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Tube Shows Minimal Affinity For Peptides And Proteins

Bioscience Technology September 2004

Bark SJ, Hook V

Differential Recovery of Peptides from Sample Tubes and the Reproducibility of Quantitative Proteomic Data

J. Proteome Res.; 2007; Volume 6, 11:4511–4516

Please refer to our webpage www.eppendorf.com for more articles on the topic "Eppendorf LoBind Tubes and Plates".

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