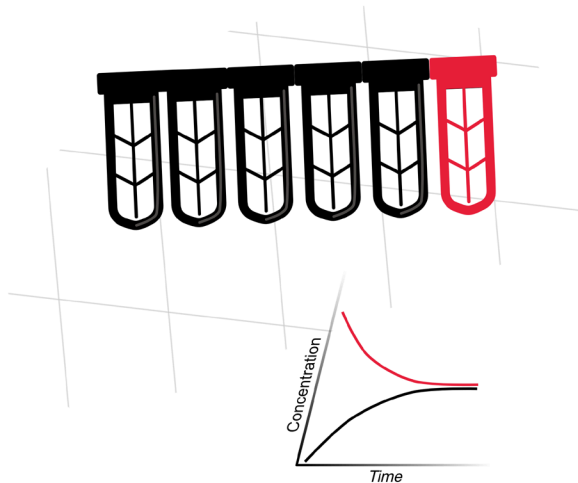


Xpress Mini Dialyzer

MD1000

Manual & Data Sheet



General Information

The Xpress Mini Dialyzer MD1000 is a unique system designed for processing large quantities of clinical samples for a variety of applications. The MD1000 is delivered ready-to-use in a 48 deep well plate with 8 sample cartridges where each cartridge has 6 single sample segments. The segments can also be easily separated to test single samples. The exclusive design of the MD1000 allows 48 samples and dialysis buffers to be loaded and removed from the top of the device without removing the cartridges. The MD1000 may be used with common single and multi-channel pipettes as well as automated liquid handling systems. It is compatible with the SBS microplate standard.



MD1000 cartridge in 48-deep well plate

Product Features and Benefits

Feature	Benefit
Pipette in sample and buffer or remove test dialysate from the top of the device without removing sample cartridges.	Simple to process large quantities of samples where the free hormone is in the buffer. Also easy to automate with liquid handling systems.
Regenerated cellulose membrane.	Low protein and hormone binding for high recovery of test samples.
High membrane surface area per sample.	Short incubation time to reach equilibrium - as quickly as 120 minutes.

◀ **Table 1**
Product overview

Applications

- Separation of free hormones from bound to plasma proteins
- Protein and peptide sample purification (eg. desalting before mass spectrometry)
- Optimization of protein renaturation with different renaturation buffers and steps
- Removal of dyes after protein labeling
- Protein sample rebuffering
- Protein in vitro translation
- Enzyme activity assays

Specifications

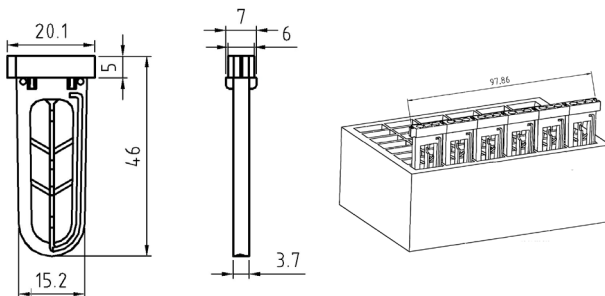
Application conditions

Sample volume	50–1,000 µl
Buffer volume	700–2,950 µl*
Temperature	1–60 °C
pH	4–8
Sample	Aqueous solutions only
Membrane	Low binding regenerated cellulose Contains glycerol to prevent embrittlement and traces of elements like sulphides and heavy metals
Cutoffs (MWCO)	2 3.5 6–8 12–14 20 140** kDa
Weight	230 g (6 cartridges MD1000 in 48-deep well plate)
Dimensions	12.6×8.4×4.6 cm (L×W×H)

* max. filled well with Mini Dialyzer

** Membrane: scienova Bio-Xell®

The Bio-Xell® membrane is a natural product, which can cause higher variation ranges within and between the dialyzer lots. This results in different dialysis speeds. We recommend to extend the dialysis time. Recommended dialysis duration, e.g. dyes: 4 hrs.



◀ **Table 2**
Specifications MD1000

▼ **Figure 1**
Single Segments for single samples

Single samples

- Separate cartridge into single segments:
- Connection between segments (slot and key)
- Move segments with key upwards

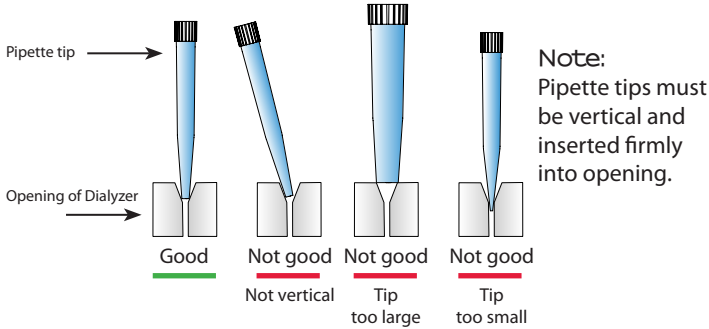
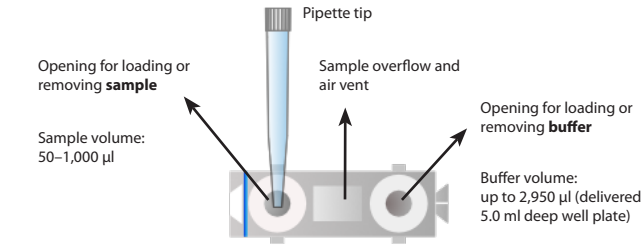


Mini Dialyzer MD1000 cartridge
- view from front -

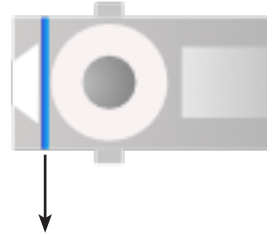
◀ **Figure 2**
Engineering drawing of MD1000

Segment (left and middle), cartridge in deep well plate (right)
unit: mm

Handling



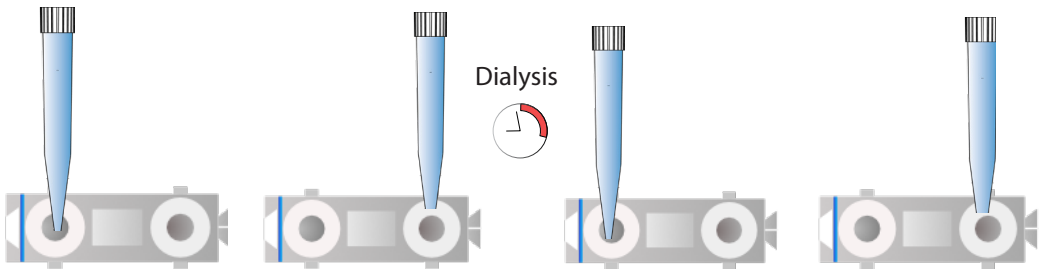
◀ **Figure 3**
Mini Dialyzer MD1000 Segment
- view from above -



The sample opening (inside the Dialyzer) is marked with a blue line.

◀ **Figure 4**
Correct use of pipette tips

▼ **Figure 5**
Usage of Mini Dialyzer MD1000



1. Load the sample (50–1,000 μl) in the left opening by using 1,000 μl tips.

2. Fill the outer buffer (600–2,950 μl) in the right opening by using 1,000 μl or 5 ml pipette tips.

3. Remove the sample (50–1,000 μl) from the left opening by using 1,000 μl pipette tips.

4. Remove the outer buffer (600–2,950 μl) from the right opening by using 1,000 μl or 5 ml pipette tips.

Instructions

Preparing before usage

- The MD1000 is delivered ready-to-use and no special preparation is necessary.

Loading sample (cartridge)

- It is recommended to start with loading the sample and then filling the outer buffer.
- The openings are designed for the usage of 1,000 µl and 5 ml pipette tips.
- Designed for the use of common single channel or 8-channel pipettes and automated liquid handling systems.
- The sample can be filled in the MD1000 if the cartridges are located in the 48 deep well plate or if removed from the deep well plate.
- Fill pipette with 150 to 1,000 µl of sample and put the tips into the marked opening (see figure 6).
- Carefully load the sample into the channel.

Loading buffer (cartridge)

- Recommended buffer volumes are listed in table 2.
- If the MD1000 cartridges were pulled out from the deep well plate, fill the empty wells with the required buffer volume.
- If the MD1000 cartridges were located in the deep well plate, fill the buffer into the wells by using the non-marked openings (buffer loading channel), figure 7.

Starting dialysis

- If the MD1000 cartridges were located in the deep well plate the dialysis starts subsequently after buffer is filled into each well.
- If the MD1000 cartridges were filled outside the deep well plate, the dialysis starts simultaneously in each segment when the MD1000 cartridge is placed into the buffer filled deep well plate.

Removing dialysed sample and buffer

- Remove sample and buffer by using the respective openings.
- It is recommended to remove the buffer before removing the sample.

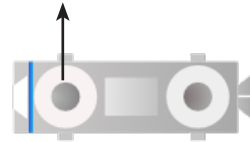
Video demonstration

For a demonstration of the Dialyzer Family visit our website:

<https://www.scienova.com>

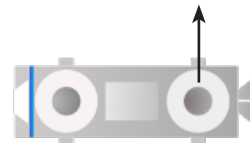
▼ **Figure 6**

Opening for sample loading/removing



Head of a MD1000 dialyzer
(one segment)

Opening for buffer loading/removing
(for usage in deep well plates)

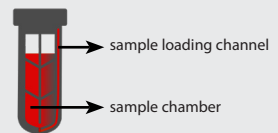


Head of a MD1000 dialyzer
(one segment)

▲ **Figure 7**

- ▶ The sample loading channel is covered by the dialysis membrane. Therefore the sample in the channel is also dialysed and will be removed with the remaining sample (see schematic illustration below).

That means less sample loss and higher recovery (**minimized dead volume**).



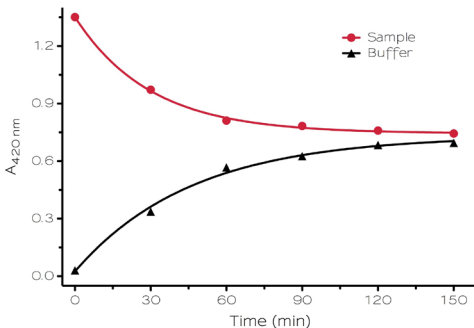
Recommendations

- When pipetting into and from sample and buffer openings, be sure pipette tip is firmly seated into opening. Also reduce pipetting speed slightly especially during sample introduction.
- Remove sample from MD1000 by aspiration with blow-out (min. 30 μ l) e.g. 1000 μ l sample - adjust pipette to 1030 μ l.
- If using sample volumes smaller than 1,000 μ l with corresponding buffer volumes remove sample with blow-out to empty the loading channel.
- Samples less than 250 μ l may have reduced volume recovery (less than 90 %).
- For effective dialysis, it is important to have the buffer level above the level of the sample (see table 3).
- At higher temperatures, dialysis takes place at a faster rate.

Sample volumes and corresponding buffer volumes

sample (μ l)	buffer (μ l)*	ratio
150	700	1:5.67
200	800	1:5
500	1,400	1:3.8
800	2,100	1:3.625
900	2,450	1:3.72
1,000	2,650	1:3.65

* in 96-deep well plate, liquid in sample chamber and sample channel on same level



◀ **Table 3**

Sample volumes and corresponding buffer volumes

◀ **Figure 8**

Example: Dialysis of the dye p-nitrophenol in Mini Dialyzer MD1000

Conditions: MD1000 in 48-deep-well-plate, MWCO 12–14 kDa, **dialysis buffer:** 2.7 ml Phosphate buffered saline pH=7.4 (PBS), **sample:** 1,000 μ l para-Nitrophenol (1 mM in PBS), **method:** preincubated in deep well plates, 200 μ l samples were taken at different points (dialysis buffer was adjusted to the same level), **determination method:** TECAN Sunrise Photometer, measure wavelength: 420 nm, reference wavelength: 620 nm, performed at room temperature, non-shaking.

Chemical Resistance

G	Acetonitrile	G	Acetic acid 25 %
G	Acetone	G	Acetic acid 96 %
G	Chloroform	G	Formic acid 25 %
G	Sodium hydroxide 32 %	N	Formic acid 100 %
G	Ethanol 70 %	L	Hydrochloric acid 10 %
G	Ethanol 98 %	N	Hydrochloric acid 25 %
G	Ethylacetate	N	Hydrochloric acid 37 %
G	Ethylene glycole	N	Hydrofluoric acid 50 %
G	Glycerol	N	Nitric acid 25 %
G	n-Hexane	N	Nitric acid 65 %
G	iso-Propanol	L	Phosphoric acid 25 %
G	Methanol 98 %	N	Phosphoric acid 85 %
G	Methylene chloride	N	Sulfuric acid 98%
G	1-Propanol	L	Ammonium hydroxide 1 N
G	Tetrahydrofuran	L	Ammonium hydroxide 25 %
G	Toluene	L	Potassium hydroxide 1 N
G	Hydrogen peroxide 30 %	N	Potassium hydroxide 32 %
		L	Sodium hydroxide 1 N
		N	Sodium hydroxide 32 %

G	Good chemical resistance
L	Limited chemical resistance, e.g. pore size cannot be guaranteed
N	No chemical resistance, use not recommended

Note

Tested MWCO:

3.5 | 6–8 | 12–14 kDa

Incubation: 18 h

Determination Method: Optical integrity and leak-tightness to air pressure

◀ **Table 4**

Chemical resistance

