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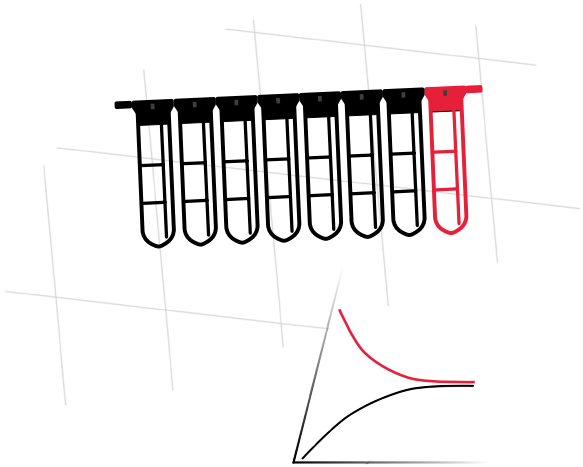
Xpress Equilibrium Dialyzer

ED300

Manual & Data Sheet



General Information

The Xpress Equilibrium Dialyzer ED300 is a unique system designed for processing large quantities of clinical samples for testing of free hormones such as testosterone, estradiol, cortisol, FT3 and FT4. The ED300 is delivered ready-to-use in a 96 deep well plate with 12 sample cartridges where each cartridge has 8 single sample segments. The segments can also be easily separated to test single samples. The exclusive design of the ED300 allows 96 samples and dialysate buffers to be loaded and removed from the top of the device without removing the cartridges. The ED300 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.

ED300 cartridge in 96-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.
An ED300 deep well plate can hold 96 samples.	Reduced cost per test and increased test throughput.
High membrane surface area per sample.	Short incubation time to reach equilibrium - as quickly as 120 minutes.

Applications

- Separation of free hormones from those 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	50–300 µl
Buffer volume	300–1,400 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	155 g (12 cartridges ED300 in 96-deep well plate)
Dimensions	12.6×8.4×4.6 cm (L×W×H)

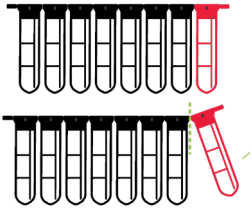
** maximum filled well with Micro Dialyzer*

** 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 value: Dialysis of dyes: 4 h

◀ ***Table 1***
Specifications ED300

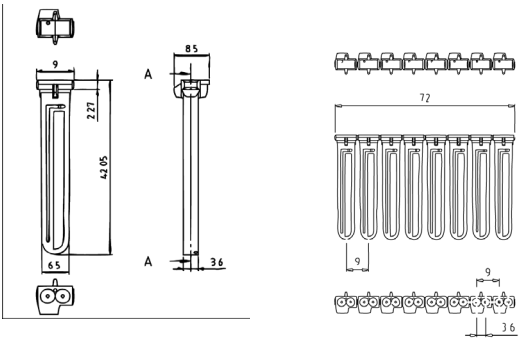
Single samples

- Separate cartridge into separate single segments:
- Connection between segments (predetermined breaking point)
- Rotate upwards to separate one or more segments (optional)



Equilibrium Dialyzer ED300 cartridge
- view from front -

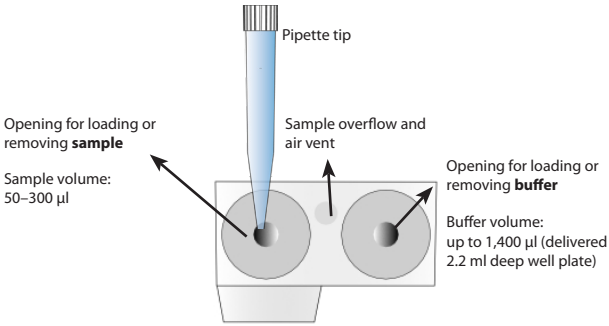
Engineering drawing of ED300



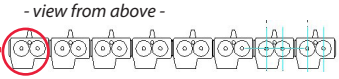
Segment (left and middle), cartridge (right)
unit: mm

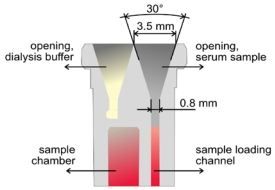
◀ ***Figure 1***
Engineering drawing of ED300

Handling

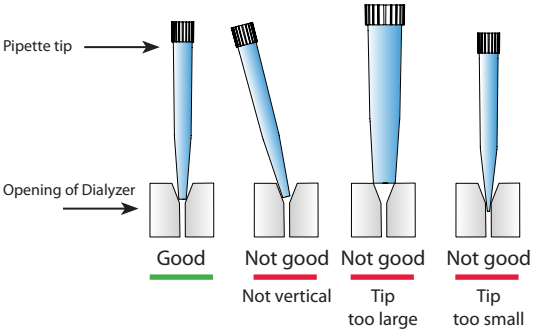


▼ ***Figure 2***
Equilibrium Dialyzer ED300 Segment - view from above -

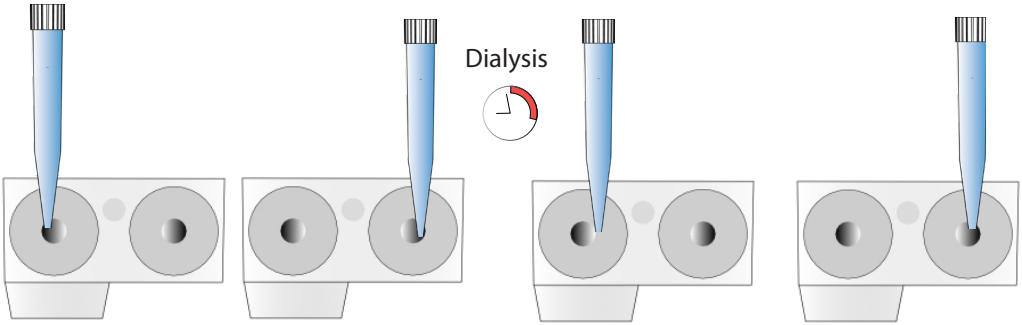




▲ ***Figure 3***
Diameter sizes for pipette tip holes.



Note:
Pipette tips must be vertical and inserted firmly into opening.



1. Load the sample (50–300 µl) in the left opening by using 200–1000 µl tips.

2. Fill the outer buffer (300–1,400 µl) in the right opening by using 1,000 µl pipette tips.

3. Remove the sample (50–300 µl) from the left opening by using 200–1,000 µl pipette tips.

4. Remove the outer buffer (300–1,400 µl) from the right opening by using 1,000 µl pipette tips.

Instructions

Preparing before usage

- The ED300 is delivered ready-to-use and no special preparation is necessary

Starting dialysis - 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 200 µl pipette tips
- Designed for the use of commercial single channel or 8-channel pipettes and automated liquid handling systems
- The sample can be filled in the ED300 if the cartridges are located in the 96 deep well plate or if removed from the deep well plate
- Fill pipette with 50 to 300 µl of sample and put the tips into the marked opening (see figure 4)
- Carefully load the sample into the channel

Starting dialysis - Loading buffer (cartridge)

- Recommended buffer volumes are listed in table 2
- If the ED300 cartridges were pulled out from the deep well plate, fill the empty wells with the required buffer volume
- If the ED300 cartridges were located in the deep well plate, fill the buffer into the wells by using the non-marked openings (buffer loading channel), figure 5

Starting dialysis

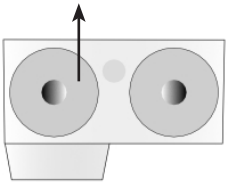
- If the ED300 cartridges were located in the deep wells the dialysis starts subsequently after buffer is filled into each well
- If the ED300 cartridges were filled outside the deep well plate, the dialysis starts simultaneously in each segment when the ED300 is placed into the buffer filled deep well 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

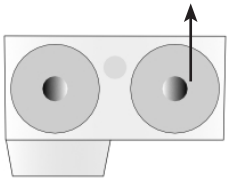
▼ ***Figure 4***

Opening for sample loading/removing



Head of a ED300 dialyzer (one segment)

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



Head of a ED300 dialyzer (one segment)

▲ ***Figure 5***

▶ The sample loading channel is covered by the dialysis membrane. Therefore the sample in the channel is dialysed also and will be removed with the remaining sample (see schematic illustration below).
That means less sample loss and higher recovery (**minimized dead volume**).

Video demonstration

For a demonstration of the ED300 in use with an automated liquid handling system go to: *www.vivaproducts.com/downloads/videos/ED300/ED300_3.mp4*

Recommendations

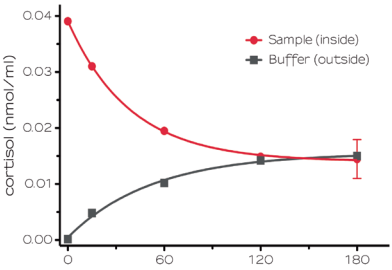
- When pipetting into and from sample and buffer openings, be sure pipette tip is firmly seated into opening. Also reduce pipetting speed slightly especially during sample introduction.
- Remove sample from ED300 by aspiration with blow-out (min. 30 µl) e.g. 300 µl sample - adjust pipette to 330 µl
- If using sample volumes smaller than 300 µl with corresponding buffer volumes remove sample with blow-out to empty the loading channel
- Samples less than 100 µl 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 2)
- At higher temperatures, dialysis takes place at a faster rate

Sample volumes and corresponding buffer volumes

sample (µl)	buffer (µl)*	ratio
50	300	1:7
100	500	1:6
150	650	1:5.33
200	900	1:5.5
250	1,100	1:5.4
300	1,300	1:5.33

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

◄ ***Table 2***
Sample volumes and corresponding buffers



◄ ***Figure 6***
Example: Equilibrium dialysis of cortisol in human serum with ED300

Conditions: ED300 in 96-deep-well-plate, MWCO 3.5 kDa, **dialysis buffer:** 650 µl Phosphate buffered saline (PBS), **sample:** 150 µl extracted human serum, **method:** dialysis 3 hrs., 22 °C, non-shaking, **determination method:** According to Neogen Cortisol® ELISA Extraction Kit

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

Notes

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