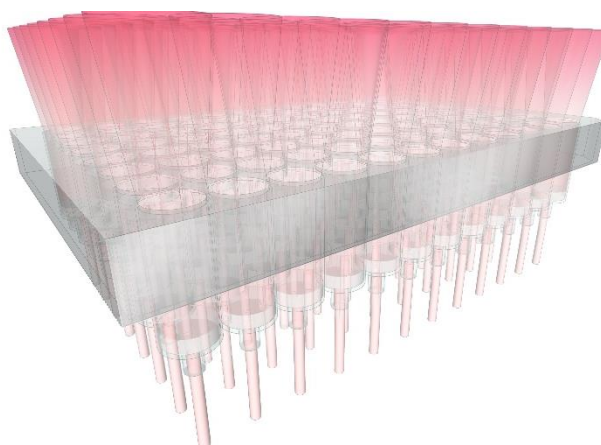


## Optima PRO and Optima PRO-D Screens General Instructions for Use

### Key Benefits:

- **Instant swelling of resin in a 96 well plate format:** Pre-packed with 50 µl Protein Ark's swell gel resin.
- **Filtration and purification in one step:** Purify secreted protein from unclarified mammalian or insect cell culture loaded directly into the wells of the screen.
- **Clog-free:** No need for sample pre-filtration.
- **Drip-free:** The Proprietary SelfSeal Membrane ensures < 2.7% SD for well-well yield reproducibility across the entire plate.



Reproducible contact time: Unique flow control across the entire 96 well plate

The Protein Ark Optima PRO Screens are designed for high throughput protein purification in batch mode. For the first time, you can batch control up to 96 different clarified or unclarified samples with any purification resin, in parallel and with no mess, hands-free and no x-talk between wells.

The Optima PRO Screens are supplied in the following formats:

- Pre-packed with 50 µl super or fastback swell gel resin and a Diatomaceous Earth filter support (DE) – **Optima PRO-D**
- Pre-packed with 50 µl super or fastback swell gel resin only - **Optima PRO**
- Empty

Optima PRO-D screens are pre-packed with 50 µl super or fastback swell gel resin and a Diatomaceous Earth filter support (DE).

DE is a benign, highly pure filter aid which acts as a permeable filter cake preventing the Optima PRO-D Screen from clogging when unclarified mammalian (HEK/CHO) or insect cells (Sf9/Hi5) are loaded directly into the pre-packed resin wells.

The DE filter support does not affect the purity of the final protein product.

## Optima PRO Screen Specifications

Product Name	Optima Pro Empty Screen	Optima PRO Ni Advance Screen	Optima PRO Protein A Screen	Optima PRO Q IEX Screen	Optima PRO S IEX Screen	Optima PRO HEP Screen
Product Code (without DE)	PAL-HT-EMP-1/2/10	PAL-HT-NIADV-1/2/10	PAL-HT-PA-1/2/10	PAL-HT-Q-1/2/10	PAL-HT-S-1/2/10	PAL-HT-HEP-1/2/10
Product code (with DE)	n/a	PAL-HT-NIADV-1D/2D/10D	PAL-HT-PA-1D/2D/10D	PAL-HT-Q-1D/2D/10D	PAL-HT-S-1D/2D/10D	PAL-HT-HEP-1D/2D/10D
Resin:	n/a	Fastback Ni Advance	Protein A50	Fastback Q-IEX	Fastback S-IEX	Super Heparin
Specificity:	Resin dependent	His-tag	IgG, Fc region	Negatively charged proteins	Positively charged proteins	Heparin Binding Proteins
Matrix:	Resin dependent	6% cross-linked Agarose	Highly cross-linked agarose	6% cross-linked agarose	6% cross-linked agarose	6% cross-linked agarose
Coupled ligand:	Resin dependent	Ni chelating ligand	Recombinant Multimeric Protein A	Quaternary ammonium	Sulphonic acid propyl	Porcine Heparin
Binding capacity per well:	Resin dependent	1 mg	0.6 mg	2.5 mg	2.5 mg	0.25 mg
Bead size:	Resin dependent	90 µm	35 – 90 µm	90 – 100 µm	90 – 100 µm	20 – 50 µm
DTT stability (24 hours)	Resin dependent	20 mM	-	-	-	20 mM
EDTA stability (24 hours)	Resin dependent	20 mM	-	-	-	1 mM
Buffer compatibility:	Resin dependent	Common aqueous buffers from pH 4-9	Common aqueous buffers from pH 2.5-10	Common aqueous buffers from pH 2-12	Common aqueous buffers from pH 2-12	Common aqueous buffers from pH 3-12
Resin volume per well	50 µl – 100 µl					
Max recommended sample volume			1 ml			
Plastic material			Polypropylene			
Membrane material			PTFE			
Recommended vacuum pressure			-0.6 bar (max. vacuum -0.8 bar)			
Recommended centrifuge speed			1,000 – 2,000 x g			
Recommended shaker speed (2 mm orbit)			800 rpm			
Maximum shaker speed (2 mm orbit)			1,200 rpm			
Shipping/delivery:			Ambient			
Storage temperature:	Ambient					2 – 8°C

## Sample Preparation

Sample Type	Optima PRO (pre-packed with resin only)	Optima PRO-D (pre-packed with resin and Diatomaceous Earth)
Intact Mammalian cells (HEK/CHO)	Unclearified sample (Up to $5 \times 10^6$ cells/ml)	Unclearified sample (Up to $50 \times 10^6$ cells/ml)
Intact Insect cells (Sf9/Hi5)	Unclearified sample (Up to $5 \times 10^6$ cells/ml)	Unclearified sample (Up to $50 \times 10^6$ cells/ml)
Bacterial cell lysate ( <i>E.coli</i> )	Pre-clarification of sample (5,000 x g for 15 mins in 2ml deep well block)	
Mammalian cell lysate (HEK/CHO)	Pre-clarification of sample (5,000 x g for 15 mins in 2ml deep well block)	
Insect cell lysate (Sf9/Hi5)	Pre-clarification of sample (5,000 x g for 15 mins in 2ml deep well block)	

### **1 Packing the Optima PRO empty plate (PAL-HT-EMP-1)**

- a. Re-suspend the resin (e.g. Super Ni-NTA Resin) by mixing thoroughly to achieve a homogeneous suspension.
- b. Add 12 ml 50% suspension into an appropriate container.
- c. Add 48 ml of appropriate buffer to obtain a final volume of 60 ml (10% suspension). Gently agitate to achieve a 10% v/v homogeneous suspension.

*Note: Proper agitation is necessary to make sure the agarose beads are evenly mixed. If the suspension is not mixed well, agarose beads settle to the bottom of the tube and lead to inconsistent filling and poor well-to-well reproducibility! It is also possible to use 50% suspension, but extra care is required to ensure even distribution of resin in each well.*

- Keep mixing the agarose suspension until all wells of the plate are filled

The suspension is considered homogeneous if it appears uniform to the eye. No agarose clumps should be visible

- d. Dispense 500  $\mu$ l suspension into each well of the plate (500  $\mu$ l 10 % suspension corresponds to 50  $\mu$ l bed volume).

*Note: If you do not use all wells of the plate for purification, seal the top of the empty wells.*

- e. Centrifuge the Optima PRO plate for 2 mins. at 2,000 x g to remove storage buffer

### **2 Equilibration**

- a. Equilibrate resin by adding 500  $\mu$ l lysis/equilibration buffer to each well.
- b. Centrifuge the Optima PRO plate for 2 mins. at 2,000 x g to remove storage buffer

The Optima PRO empty plate is ready for sample loading (step 2 in centrifugation and vacuum protocol)

## **Optima PRO Screen Protocol - Purification using 5-step 25 min Centrifugation Protocol** **This protocol is for the Optima PRO and Optima PRO-D Screens**

1. **Setting Up**
  - a. Tap the Optima PRO screen plate to ensure all resin/DE pellets are at the bottom of each well.
  - b. Gently remove the sealing mat from the top of the Optima PRO screen plate.
  - c. Pre-equilibrate the resin by adding up-to 1ml of Binding buffer to each well. Incubate with shaking at 800rpm for 1-2 minutes.
  - d. Centrifuge for 1-2 mins. at 1,000 - 2,000 x g.
  
2. **Sample Loading**
  - a. Load up to 1 ml of clarified or unclarified sample in each well and incubate for 15 mins, shaking at 800 rpm (2mm orbit shaker). Slowly increase the shaking speed until reaching 800 rpm.
  - b. Do not use the sealing mat during the incubation step
  
3. **Sample Flow through**
  - a. Transfer the Optima PRO screen plate on to a 2 ml wash plate and centrifuge for 1-2 mins. at 1,000 - 2,000 x g.
  
4. **Washing**
  - a. Add up to 1 ml of binding/wash buffer to each well and centrifuge at 1,000 - 2,000 x g for 1-2 mins. Repeat the wash step twice.
  
5. **Elution:**
  - a. Transfer the Optima PRO screen plate on to a 0.35 ml collection plate. Add up to 300  $\mu$ l elution buffer to each well and centrifuge at 1,000 - 2,000 x g for 1-2 mins. Repeat the elution step if necessary.
  - b. Store the eluted protein at 2-8 °C until further analyses.

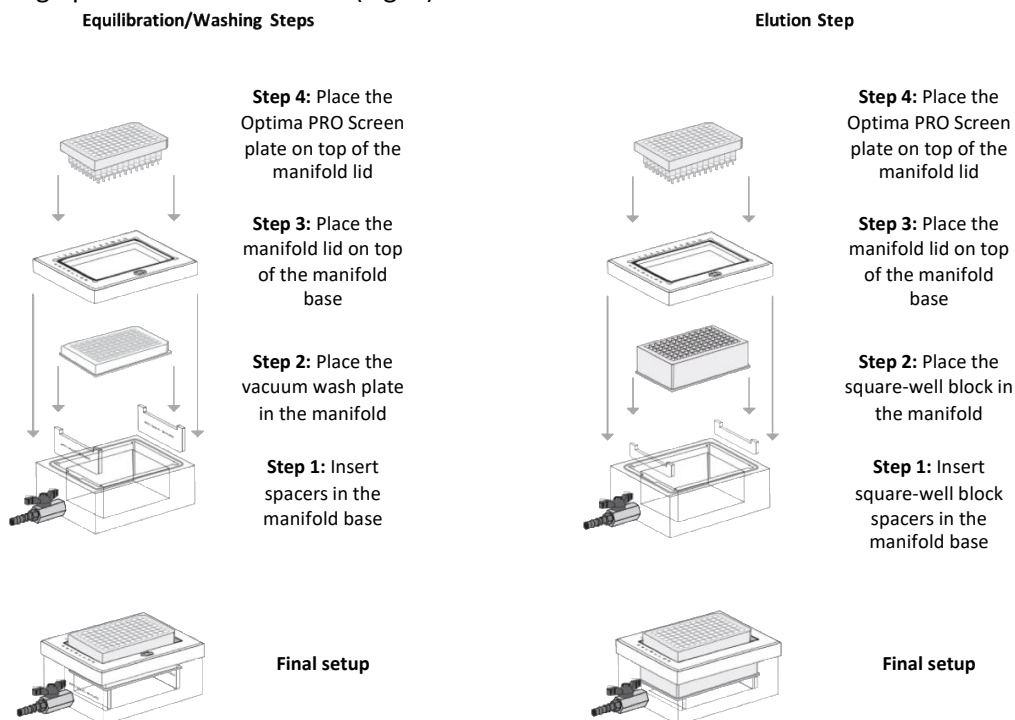
### **Notes**

- Ensure full mixing of the sample, resin and DE (for Optima PRO-D) is achieved during the incubation step. Shaking speed can be increased up to 1200 rpm (shaker orbit 2 mm).
- Increase incubation time to increase resident time between sample and resin for improved binding and purification.
- Number of wash and elution steps should be optimized for each protein purification.
- The recommended minimum elution volume is 50  $\mu$ l.

## Purification Protocol using Vacuum Manifold

### This protocol is for the Optima PRO and Optima PRO-D Screens

#### Setting up the vacuum manifold (Fig. 1)



#### 1. Setting up the vacuum manifold for the preparation of the Optima PRO screen plate

- Insert spacers into the grooves located on the short ends of the manifold.
- Insert the waste container into manifold base.
- Place the pressure sealing plate/shaker base on to the spacers inside the manifold base. Close the manifold base with the manifold lid.

#### 2. Setting up Optima PRO plate

- Tap the Optima PRO screen plate to ensure all resin/DE pellets are at the bottom of each well.
- Gently remove the sealing mat from the top of the Optima PRO screen plate.
- Pre-equilibrate the resin by adding up-to 1ml of Binding buffer to each well. Incubate with shaking at 800rpm for 1-2 minutes.
- Apply approx. -0.6 bar vacuum until all wells have drained. If necessary, press down the plate slightly until flow through starts. Note: The vacuum may have to be adjusted for optimal results.
- Apply approx. -0.8 bar vacuum for a few seconds to remove any residual drips from nozzles. When all the sample has flow through the plate, release the vacuum.

#### 3. Sample loading

- a. Place the Optima PRO screen plate into the shaker frame.
- b. Load up to 1 ml clarified or unclarified sample in each well and incubate for 15 mins., shaking at 800 rpm (2mm orbit shaker).
- c. Do not use the sealing mat during the incubation step

#### **4. Sample Flow-Through**

- a. Place the Optima PRO screen plate on top of the manifold base as illustrated in Fig. 1.
- b. Apply approx. -0.6 bar vacuum until all wells have drained. If necessary, press down the plate slightly until flow through starts. *Note: The vacuum may have to be adjusted for optimal results.*
- c. Apply approx. -0.8 bar vacuum for a few seconds to remove any residual drips from nozzles. When all the sample has flow through the plate, release the vacuum.

#### **5. Washing**

- a. Wash the resin by adding up to 1 ml wash buffer to each well.
- b. Apply approx. -0.6 bar vacuum for 1 min.
- c. Allow the buffer to pass through the wells.
- d. Apply approx. -0.8 bar vacuum of for a few seconds to remove any residual drips from the long drip nozzles. Release the vacuum. Repeat the washing step twice. Remove the Optima PRO screen plate from the vacuum manifold.

#### **6. Set up the Vacuum Manifold for Elution**

- a. Remove manifold lid, wash plate and waste container from the vacuum manifold.
- b. Insert new spacers for square-well blocks into the grooves located at the narrow ends of the manifold.
- c. Insert a square-well block into the base of the manifold.
- d. Add the lid to the manifold base.

#### **7. Elution**

- a. Add up to 300 µl elution buffer to each well.
- b. Place the plate on to the top of the manifold base.
- c. Elute the target proteins by applying approx. -0.6 bar vacuum for 1 min.
- d. Apply approx. -0.8 bar vacuum for a few seconds to remove any drops from the long drip nozzles.
- e. Release the vacuum. Repeat the elution step, if necessary. Store the eluted protein at 2-8 °C until further analyses.

#### **Notes**

- Ensure full mixing of the sample, resin and DE (for Optima PRO-D) is achieved during the incubation step. Shaking speed can be increased up to 1200 rpm (shaker orbit 2 mm).
- Increase incubation time to increase resident time between sample and resin for improved binding and purification.
- Number of wash and elution steps should be optimized for each protein purification.
- The recommended minimum elution volume is 50 µl.

### Ordering Information

Product Description	Product Codes		
	1 kit	2 kits	10 kits
Optima PRO Empty 96 well Screen	PAL-HT-EMP-1	PAL-HT-EMP-2	PAL-HT-EMP-10
Optima PRO-D Ni Advance 96 well Screen	PAL-HT-NiADV-1D	PAL-HT-NiADV-2D	PAL-HT-NiADV-10D
Optima PRO-D Heparin 96 well Screen	PAL-HT-HEP-1D	PAL-HT-HEP-2D	PAL-HT-HEP-10D
Optima PRO-D Protein A 96 well Screen	PAL-HT-PA-1D	PAL-HT-PA-2D	PAL-HT-PA-10D
Optima PRO-D Q-IEX 96 well Screen	PAL-HT-Q-1D	PAL-HT-Q-2D	PAL-HT-Q-10D
Optima PRO-D S-IEX 96 well Screen	PAL-HT-S-1D	PAL-HT-S-2D	PAL-HT-S-10D
Optima PRO Ni Advance 96 well Screen	PAL-HT-NiADV-1	PAL-HT-NiADV-2	PAL-HT-NiADV-10
Optima PRO Heparin 96 well Screen	PAL-HT-HEP-1	PAL-HT-HEP-2	PAL-HT-HEP-10
Optima PRO Protein A 96 well Screen	PAL-HT-PA-1	PAL-HT-PA-2	PAL-HT-PA-10
Optima PRO Q-IEX 96 well Screen	PAL-HT-Q-1	PAL-HT-Q-2	PAL-HT-Q-10
Optima PRO S-IEX 96 well Screen	PAL-HT-S-1	PAL-HT-S-2	PAL-HT-S-10

### Kit components/compositions

Component	Pack Sizes		
Optima PRO Screen plate	1 pc	2 pc	10 pc
Pressure sealing/vacuum plate	1 pc	2 pc	2 pc
2 ml wash collection plate	2 pc	4 pc	-
0.35 ml eluate collection plate	1 pc	2 pc	-
Hanging drop blotting membrane	2 pc	4 pc	20 pc
Sealing mats	1 pc	2 pc	10 pc