

# Q Polishing Reimagined



Remove  
Virus, HCP, DNA,  
& Endotoxins

## Introducing NatriFlo™ HD-Q flow-through chromatography

The NatriFlo HD-Q anion exchanger, based on proven and universally-used quaternary amine chemistry, combines the capacity of the highest performance resins with the exceptional flow properties of membrane adsorbers. The compact NatriFlo Process 600 can polish up to 5 kg of monoclonal antibody in a single pass, typically in less than 2 hours. The NatriFlo family is fully scalable from 0.2 mL devices to production-scale.

**True Q Resin Polishing Performance:** Efficient and reproducible Q polish performance combining resin binding capacity with adsorber speed to achieve a new level of flexibility.

**Polishing Workhorse:** Purify 10 kg of monoclonal antibody per liter membrane volume with sustained best-in-class clearance of virus, HCP, DNA and endotoxin.

### Learn More

For more information, technical details, and method development guidelines, please visit:

[www.natrixseparations.com/hdq](http://www.natrixseparations.com/hdq)

**Unrivaled Salt Tolerance:** Purify without dilution in more buffer types at high conductivity, even in phosphate buffers.

### Other important features:

- Single-use pre-packed column: equilibrate, run, and discard. No cleaning, handling equipment or storage space required
- Plug-and-play: No packing, no validation, no QC
- High flow rates: Process more in less time
- Easily scaled up as capacity needs grow



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MATERIALS INNOVATION

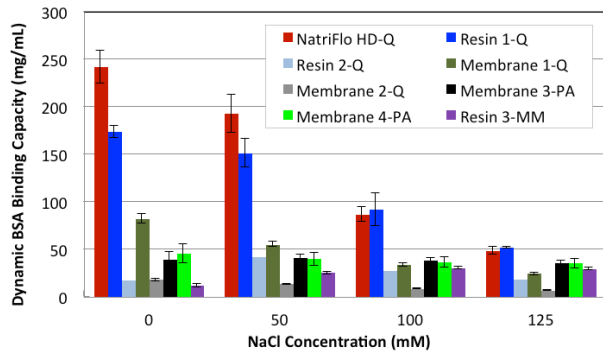
[www.JSRLifeSciences.com](http://www.JSRLifeSciences.com)

# Natrix HD-Q Hydrogel Membrane: Performance Data

The NatriFlo HD-Q hydrogel membrane is available in a range of sizes for flow-through polishing applications. It binds impurities such as host cell proteins (HCP), DNA, virus and endotoxins even in high conductivity solutions and in phosphate buffer—in the presence of high concentrations of monoclonal antibodies. *Note that the studies shown in figures 3 & 5 were conducted in the presence of high concentrations of antibody.*

**FIGURE 1: High dynamic binding capacity and salt tolerance**

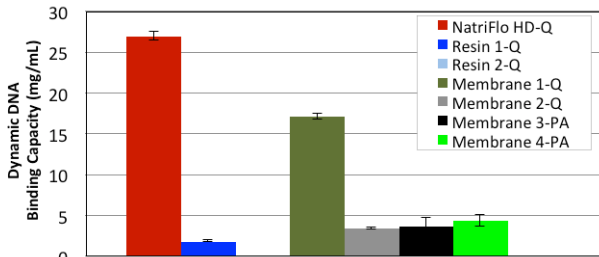
High dynamic protein binding capacity at different salt concentrations provides a robust platform enabling flexibility for process development and reduced sensitivity to changes in the manufacturing environment.



NatriFlo HD-Q has a very high salt tolerance and exhibits exceptional binding capacity, even at high conductivity. All membranes tested at 10 membrane volumes/min (6 seconds residence time). Resins were tested at 1 column volume/minute (60 seconds residence time).

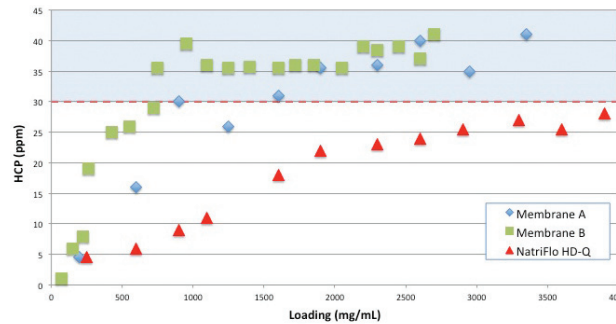
**FIGURE 2: Dynamic DNA Binding Capacity**

High Dynamic Binding Capacity. The same materials tested in Figure 1 were also tested for DNA binding. The HD-Q material is the only material that has high binding capacity for both DNA and proteins.



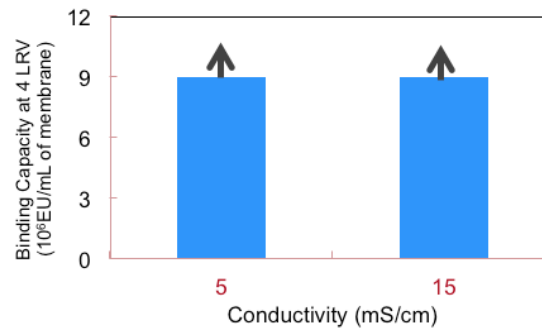
**FIGURE 3: Clearance of Host Cell Proteins (HCP) from mAb**

HD-Q Hydrogel membrane compared to two leading membrane adsorbers. At a load of 4 kg of antibody per liter of membrane HCP is still below the target threshold of 30 ppm (Feed HCP 104 ppm, pH 7.5, 5 mS/cm, 10 membrane volumes/min). Collaborator Data.



**FIGURE 4: Endotoxin Clearance**

Endotoxin clearance >4 LRV for loads as high as 9 million EU/mL across a wide conductivity range.



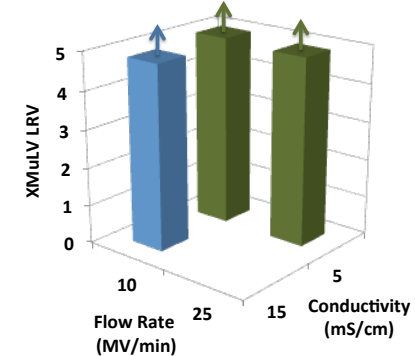
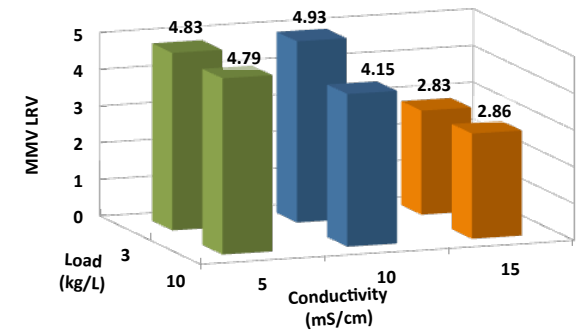
Device: NatriFlo HD-Q Recon; flow rate: 25 MV/min  
 Equilibration buffer: 25 mM Tris + NaCl, pH 8 & 5 mS/cm  
 Sample: Equilibration buffer spiked with endotoxin at concentration >1000 EU/mL  
 Binding capacity: >9 million EU/mL at 4 LRV irrespective of conductivity from 5 to 15 mS/cm ("Up Arrow" reflects limit of detection)

**FIGURE 5: Viral Clearance**

MMV: > 4 LRV from feed sample having 10 mS/cm conductivity at 10 kg/L membrane load.

xMuLV: ≥ 4.8 LRV from sample having 15 mS/cm conductivity at 10 kg/L membrane load. (Note: "Up Arrows" reflect limit of detection.)

DNA: > 2.96 LRV from feed sample having 10 mS/cm conductivity at 10 kg/L membrane load (Feed had 612 ppb reduced to <0.7 ppb measured by qPCR assay. *Not shown in graph.*)



Virus clearance study conducted using client material at Eurofins Lancaster Laboratories (Lancaster, PA)



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