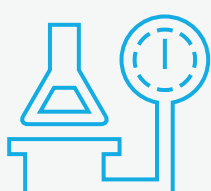


3M™ Polisher ST— The Next Frontier in Downstream Processing

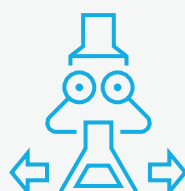
- 1.** Monoclonal antibodies (mAbs) and recombinant therapeutic proteins are the two largest biologics segments, comprising nearly 86.0% of the total biologics market in 2019. Producing these molecules consistently at a commercial scale is both complex and costly (\$300-\$400 Million)



- 2.** 3M™ Polisher ST technology offers a sand box approach that provides several advantages including the ability to anticipate process yield, product purity and quality.



>100 X mAb loading of typical Q resin (10+ kg/m² target loading)



Scalability from lab to manufacturing scale*



High salt and low pH tolerance

- 3.** Virus clearance studies are a core component of the multipronged approach needed to ensure the safety of biologic products. 3M™ Polisher ST technology has been tested for viral clearance in a wide range of operating conditions with mAb solutions. Robust viral clearance of 4 logs or more was shown for all tested conditions, including low pH, high conductivity or presence of turbidity



- 4.** 3M™ Polisher ST offers not only economic benefits and versatility, but it also has specific functional advantages over equivalent packed-bed columns. These are:



Convenience

There is no cleaning or validation, no packing, re-packing and recycling.



Small footprint

A 16" inch diameter production scale capsule of 1.6m² surface area of Q functional and guanidinium media can replace a packed column of 80 liters. Capsules can be stacked for even higher loadings.*



Economics

Use of one fifth (20%) of the buffer volume compared to a column of equal capacity, saving time and money. Lower buffer volumes in the purification process drive down wastewater that needs to be handled for disposal.*

- 5.** 3M™ Polisher ST can replace the anion exchange polishing column and, since it does not require a depth filter or a membrane for protection, can combine multiple purification steps into one.



About 3M

At 3M, we apply science in collaborative ways to improve lives daily. With \$32 billion in sales, our 96,000 employees connect with customers all around the world. Learn more about 3M's creative solutions to the world's problems at www.3M.com or on Twitter @3M or @3MNews.

For more information on 3M, visit www.3M.com and for 3M Purification, visit www.3Mpurification.com.

*3M™ Polisher ST production scale capsules will be available at a later date.