

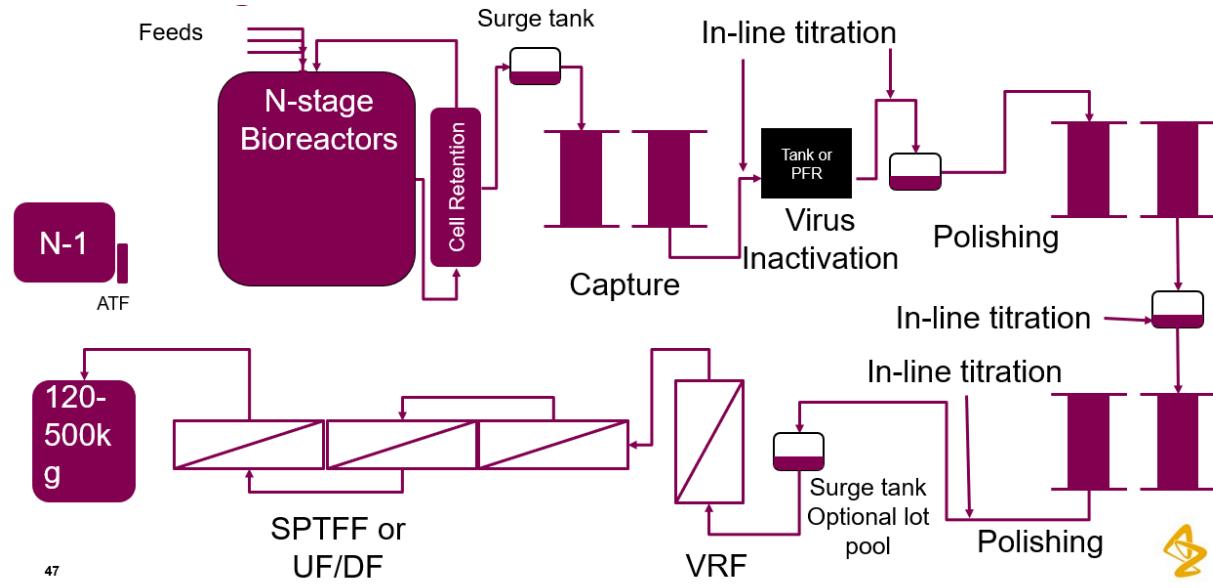


The National Institute for Innovation in Manufacturing Biopharmaceuticals





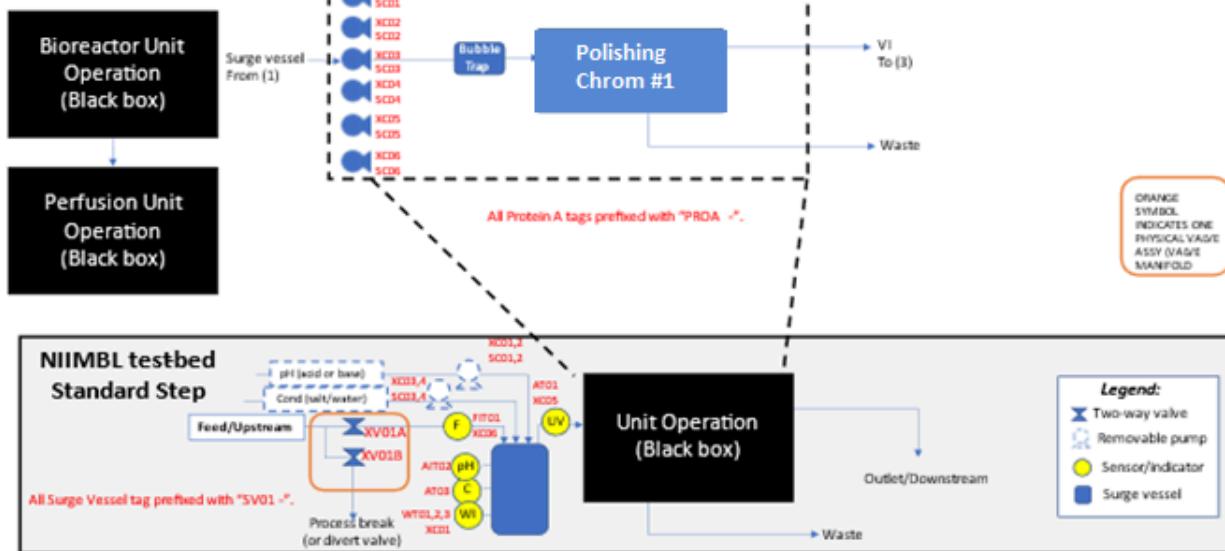








**Polishing
(2) Chrom #1**

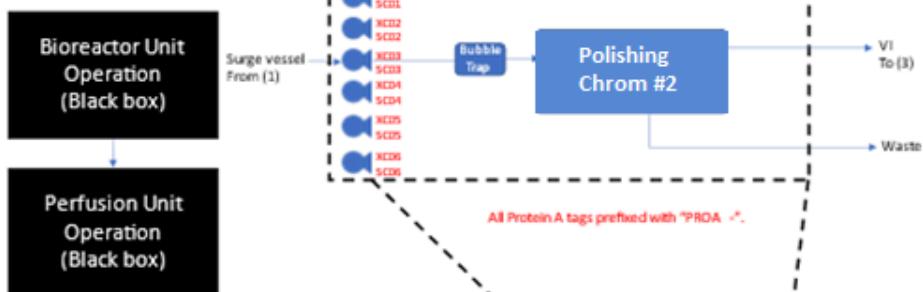








(2) Polishing Chrom #2



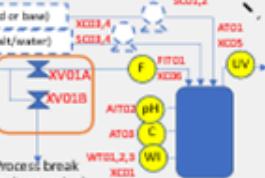
ORANGE SYMBOL INDICATES ONE PHYSICAL VALVE ASSY (VALVE MANIFOLD)

NIIMBL testbed Standard Step

Feed/Upstream

All Surge Vessel tag prefixed with "SV01 -".

Process break (or divert valve)



Unit Operation (Black box)

Outlet/Downstream

Waste

Legend:

- Two-way valve
- Removable pump
- Sensor/Indicator
- Surge vessel

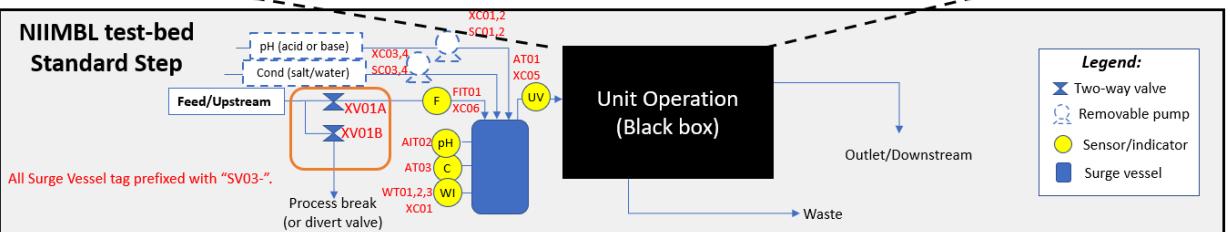








(4) Post-VI Depth Filtration

















(3)

Viral inactivation black box:

















(8) Ultrafiltration

