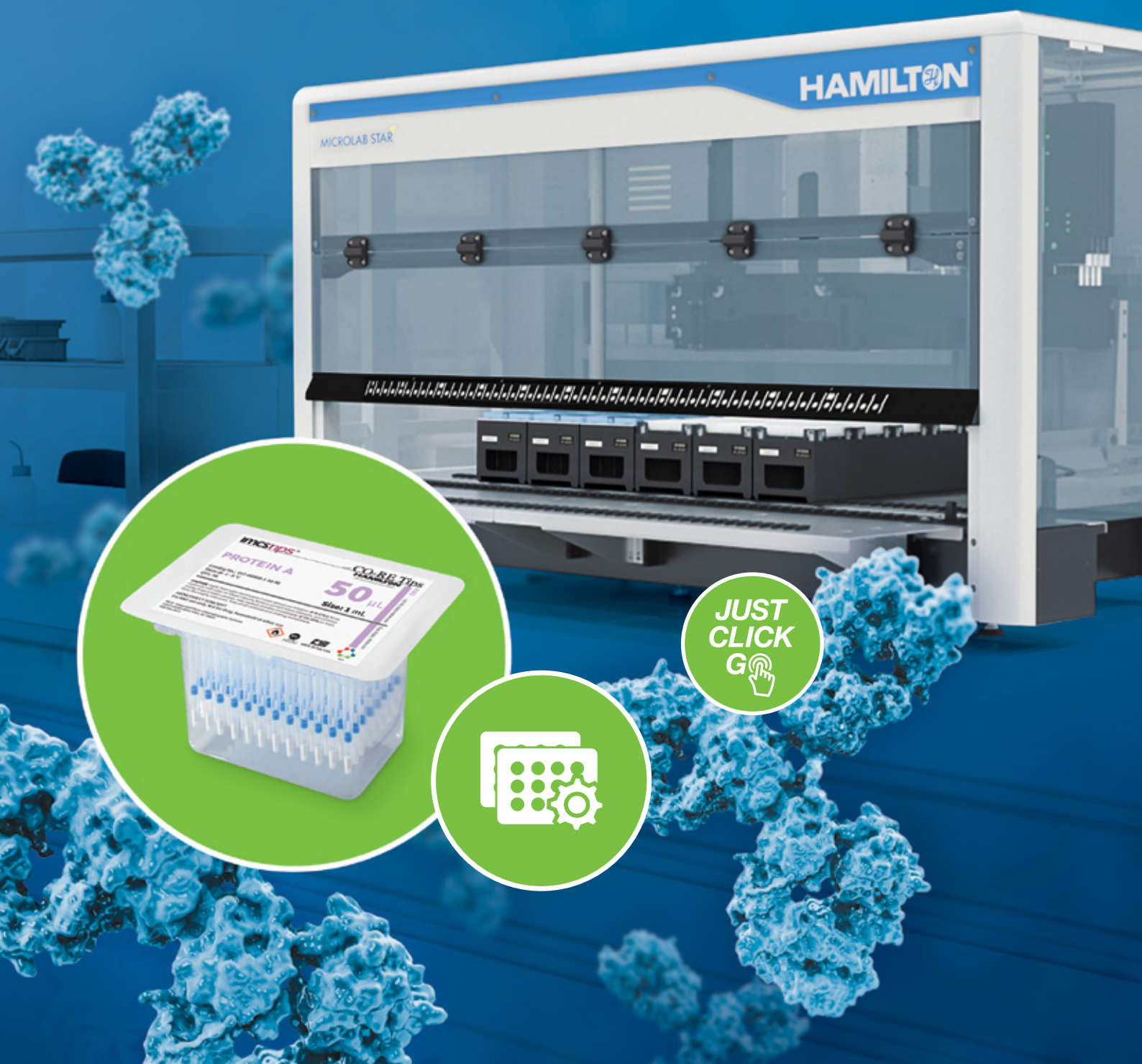


affinityPure STAR™ for IMCStips®



High Recovery. Simplified. Efficient. Reproducible.

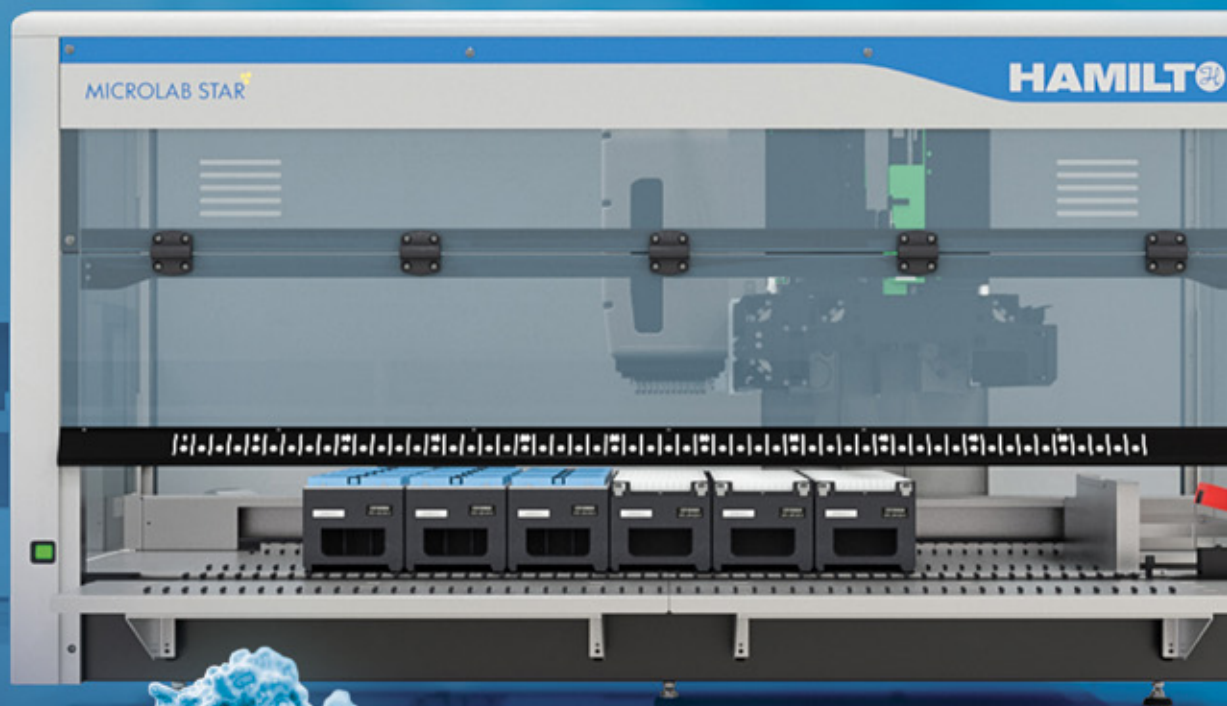
IMCS Affinity Purification Tip

Affinity purification, from the research phase through manufacturing, is used broadly in the biotechnology and biopharmaceutical industries to enrich antibodies and recombinant proteins for downstream analysis. Small-scale purification is often needed in fields which demand high-throughput screening of expressed antibodies or proteins to enable biophysical and functional characterization. For any process that requires analyzing a large number of samples with highly reproducible results, the implementation of an automated liquid handling solution to perform hands-free affinity purification is essential to maximize productivity and reduce human error.

Hamilton Robotics and Integrated Micro-Chromatography Systems (IMCS) have developed an automated workstation to streamline affinity purification of proteins in all phases of research and manufacturing. IMCStips® contain loose affinity resin within Hamilton's CO-RE® pipette tips and leverage patented dispersive mixing technology to efficiently bind the target analyte. The combination of integrated purification with Hamilton's robust liquid handling technology provides a fully automated and reproducible method for a historically time-intensive manual procedure. Method parameters for affinity IMCStips have been optimized to minimize reagent volumes, reduce consumables, and speed up the purification process.

The affinityPure STAR™ workstation includes a pre-defined hardware configuration and graphical user interface to deliver a plug-and-purify experience. IMCStips are available with a variety of different affinity resins and volumes in Hamilton's 300 µL and 1 mL tips while also allowing for the use of custom resins as required for your application.





LESS THAN
10%
VARIANCE
ACROSS 96 SAMPLES

96
SAMPLES
IN 10 TO 30 MINUTES



Benefits



Pre-Configured Automation Platform for Affinity Purification

- IMCStips utilize turbulent mixing to maximize contact between the resin and protein of interest to achieve up to 30 percent higher recoveries in less time
- Automation delivers robust and reproducible purification of target analytes with consistent recovery percentages
- Consumables and automation platforms form a combination of technologies to streamline time-consuming workflows



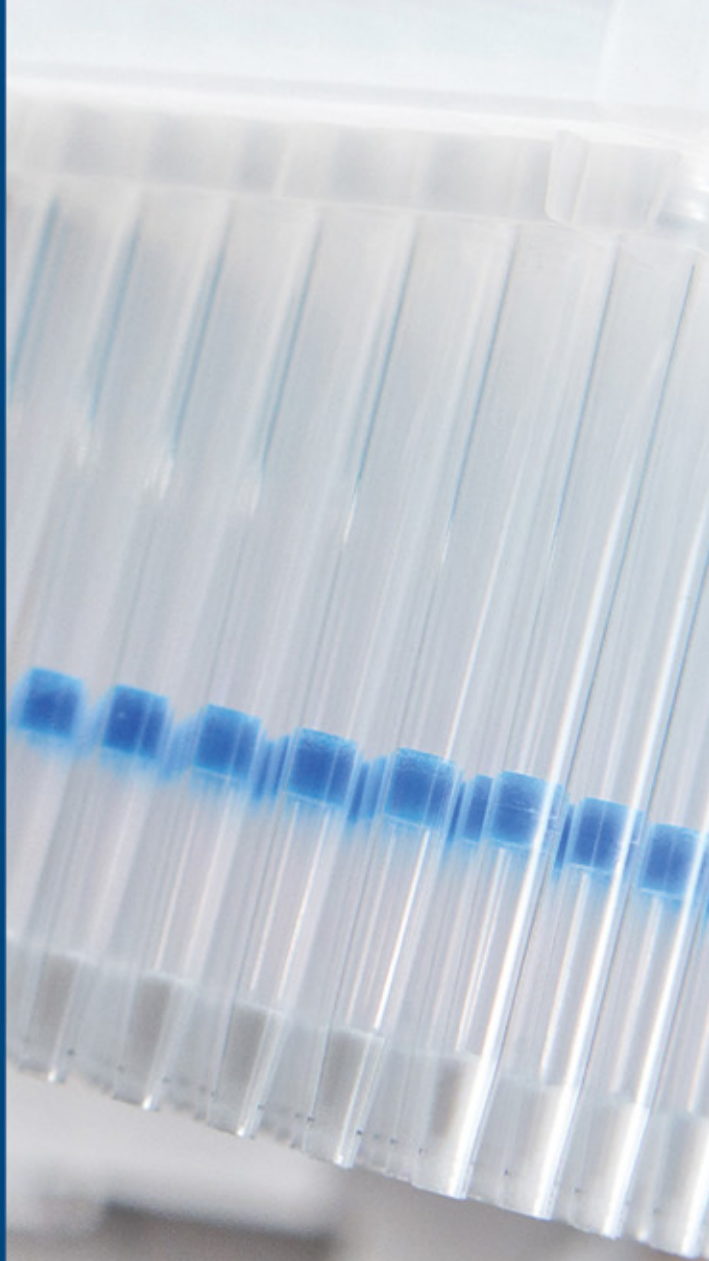
Hamilton Verified Graphical Methods to Enable Plug-and-Purify Automation on the affinityPure STAR Platform

- Pre-defined hardware configuration tested and verified with IMCStips affinity purification chemistry
- Includes Hamilton methods with user-friendly graphic interface for simple automation deployment with the option for user customization
- Fully-automated method eliminates user preparation of reagent plates and performs the entire affinity purification process



Flexible Sample Processing to Alleviate Workflow Challenges

- Process up to 96 samples in 10 to 30 minutes
- Selectable parameters for mixing cycles, volume, and other optional steps easily configurable by the user
- Testing mode enables rapid optimization of method parameters using a single deepwell plate and up to 8 samples



HAMILTON **imcstips®**

Sample Input	Wash 1	Elution 1
Sample Number: 96	Mixing Cycles: 2	Mixing Cycles: 3
Well ID of first Sample in all 96-Well Plates?: 1	Mixing Volume: 500	Mixing Volume: 400

Condition	Wash 2	Elution 2 (Optional) <input type="checkbox"/> Check to Run
Mixing Cycles: 3	Mixing Cycles: 4	Mixing Cycles: 3
Mixing Volume: 600	Mixing Volume: 500	Mixing Volume: 400

Sample	Wash 3 (Optional) <input type="checkbox"/> Check to Run	Elution 3 (Optional) <input type="checkbox"/> Check to Run
Mixing Cycles: 45	Mixing Cycles: 3	Mixing Cycles: 3
Mixing Volume: 600	Mixing Volume: 500	Mixing Volume: 400

Assay Settings	Resin Bed Volume
Turn on Testing Mode: <input checked="" type="checkbox"/>	Resin Bed Volume: 25 µL
Save Current Settings as Default: <input checked="" type="checkbox"/>	Resin Bed Volume: 50 µL

Cancel Continue

Workflow



Equilibrate



Bind



Wash



Elute



Neutralize

IMCStips affinity purification shows greater consistency and higher recovery than traditional spin columns using the same resin.

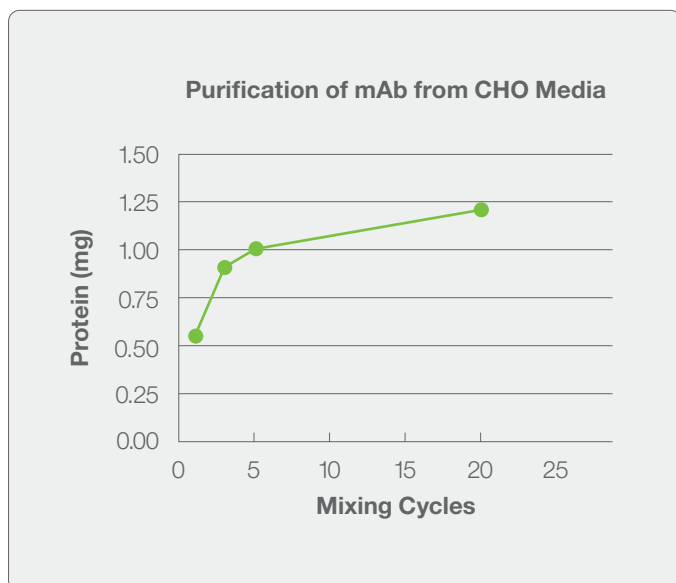


Figure 1. Monoclonal antibody (mAb) was purified from CHO cell media to demonstrate the yield at an increasing number of mixing cycles. The yield of purified mAb (abs @ 280 nm) increased as the number of mixing cycles increased.

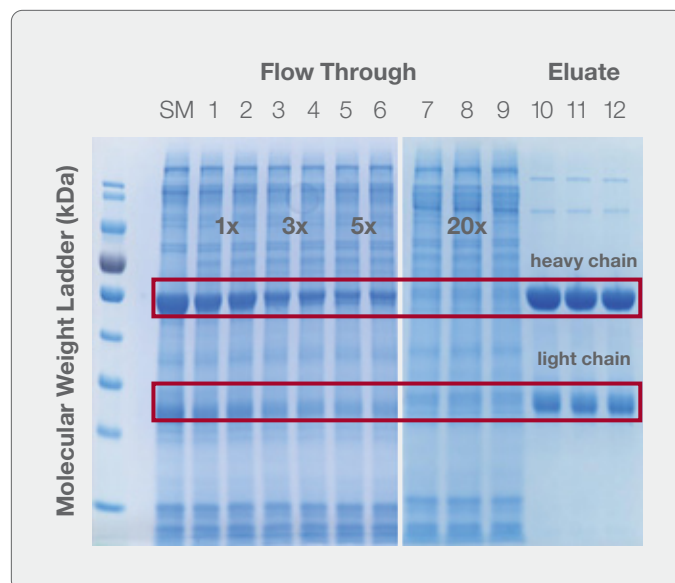


Figure 2. IMCStips (1 mL) with 50 μ L of protein A resin was used at increasing mixing cycles to demonstrate improved yield of captured IgG (abs @ 280 nm), also indicated by the depletion of heavy and light chains in the flow through media. After 20 mixing cycles, the eluate was recovered in 400 μ L of sodium acetate buffer pH 3.5. SM: Starting material, 1, 3, 5, and 20x refers to the number of mixing cycles during the sample binding step.

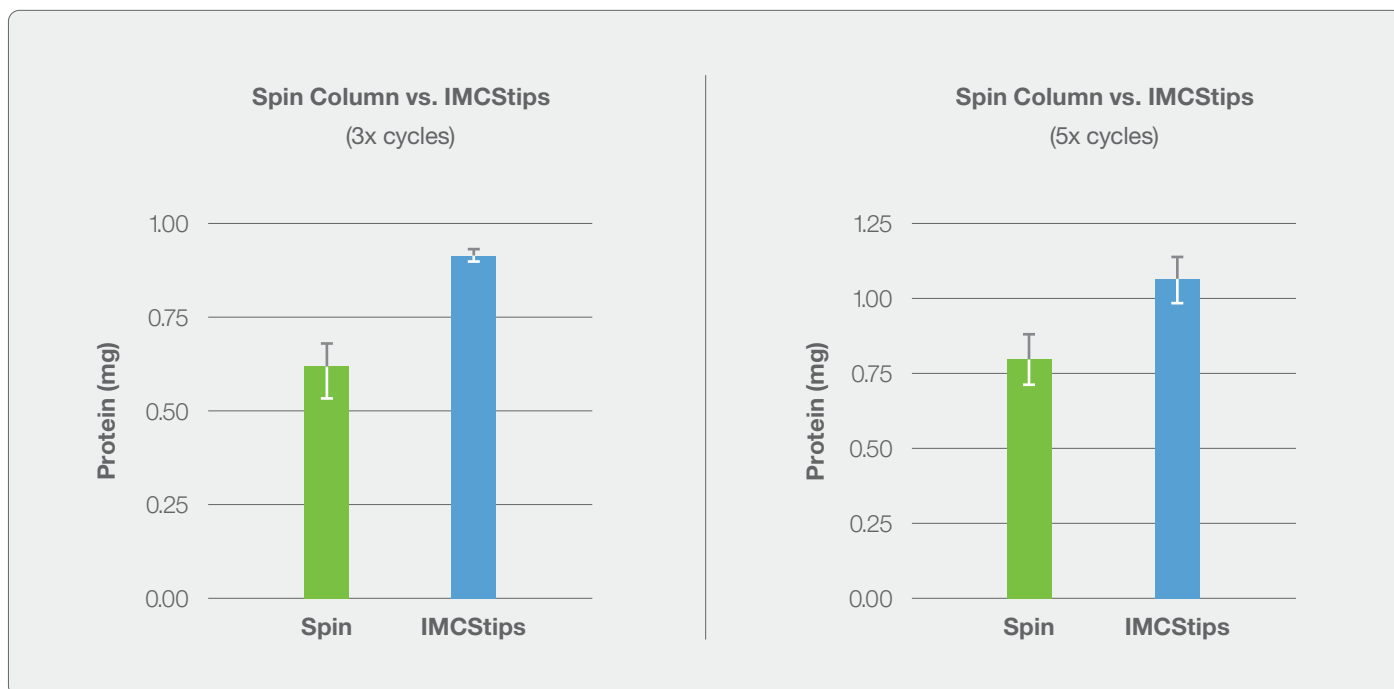
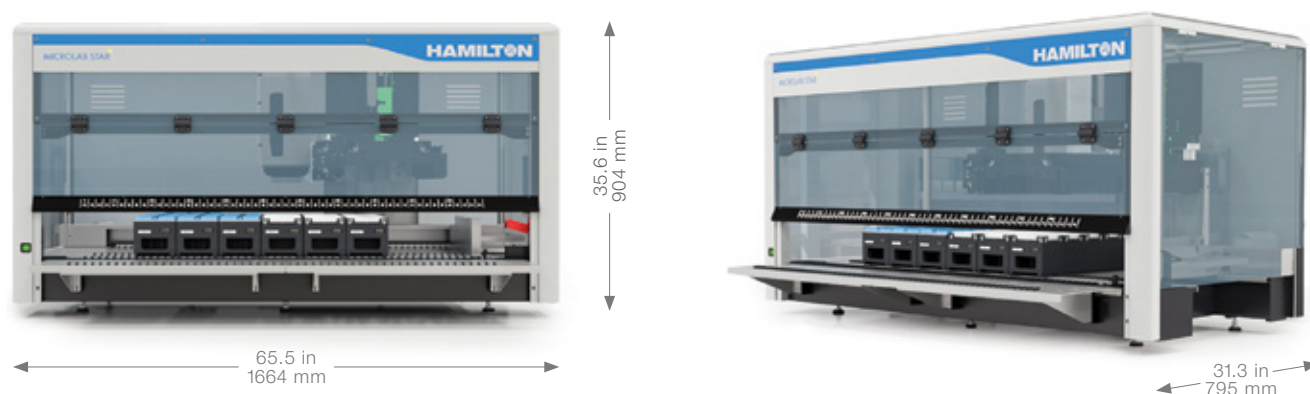


Figure 3. For comparison, IMCStips and spin columns were processed in parallel to assess recovery. The spin columns were centrifuged at 100 x g for 5 minutes and flowthrough samples were re-applied to the column either 3 or 5 times. The IMCStips method used 3 or 5 mixing cycles to replicate the spin column method. The spin column format yielded less mAb than tip-based format (abs @ 280 nm) at both 3 and 5 cycles.

Specifications



Technical Specifications

	STAR
Instrument W x H x D	65.5 in (1664 mm) x 35.6 in (904 mm) x 31.3 in (795 mm); Autoload: 39.6 in (1006 mm)
Positional Accuracy	X-Y-Z positional accuracy of 0.1 mm
Deck Capacity	54 Tracks (T) / 45 ANSI/SLAS positions or Tip Racks Maximum of 9 carriers (6 T) holding 5 tip racks or 5 plate positions per carrier Maximum of 54 tube carriers (1 T) holding 24 or 32 tubes per carrier
Available Products	Hamilton STAR for IMCStips affinity purification Pre-programmed Venus Software Script for IMCStips affinity purification

Pipetting Specifications for Disposable Tips*

Individual Channels			
Tip Size	Volume	Precision	Trueness
50 µL	1 µL	4.0%	5.0%
50 µL	50 µL	0.80%	2.0%
300 µL	200 µL	0.80%	1.0%
1000 µL	1000 µL	0.80%	1.0%

*Test criteria available upon request

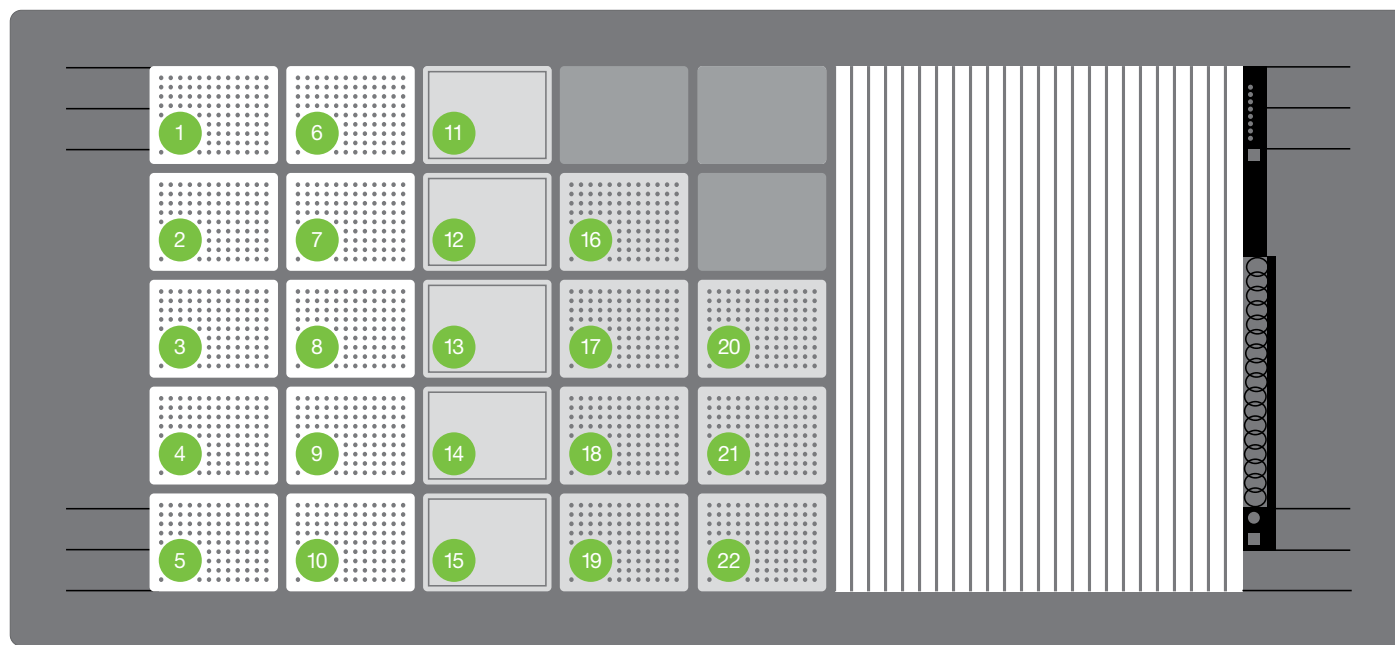
Liquid Level Detection

Individual Channels	Capacitive liquid level detection (cLLD) and pressure (pLLD) on aspiration, cLLD on dispense, minimum volume 10 µL, depending on container type
96- and 384-Probe Head	Capacitive liquid level detection (cLLD)

Operating Data

Maximum Power Consumption	600 or 1000 VA (depending on configurations)
Voltage	100 (-15%) to 240 VAC (+10%)
Frequency	50 / 60 Hz ± 5%
Delayed Action Fuse	115 V~: 6.3 A, 230 V~: 3.15 A
Operating Temperature Range	15–35°C (relative humidity 30–85% with no condensation)
Recommended PC	Intel Core 2 Duo, ≥ 4 GB RAM, 500 GB Hard Drive, 16x DVD +/-RW, DirectX 250 MB graphic card, MS Windows 10
Communication	USB, RS232

System Deck



- | | | | | |
|-------------------|---------------------------|-----------------------------|----------------------------|-------------------------------|
| 1 IMCStips 1 mL | 6 IMCStips 300 μ L | 11 Waste Reservoir | 16 Sample Plate | 20 Elution Plate 1 |
| 2 CO-RE Tips 1 mL | 7 CO-RE Tips 300 μ L | 12 Equilibrium Reservoir | 17 Wash Plate 1 | 21 Elution Plate 2 |
| 3 CO-RE Tips 1 mL | 8 CO-RE Tips 300 μ L | 13 Wash Reservoir | 18 Wash Plate 2 | 22 Elution Plate 3 (optional) |
| 4 CO-RE Tips 1 mL | 9 CO-RE Tips 300 μ L | 14 Elution Reservoir | 19 Wash Plate 3 (optional) | |
| 5 96 Tip Adapter | 10 CO-RE Tips 300 μ L | 15 Neutralization Reservoir | | |

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