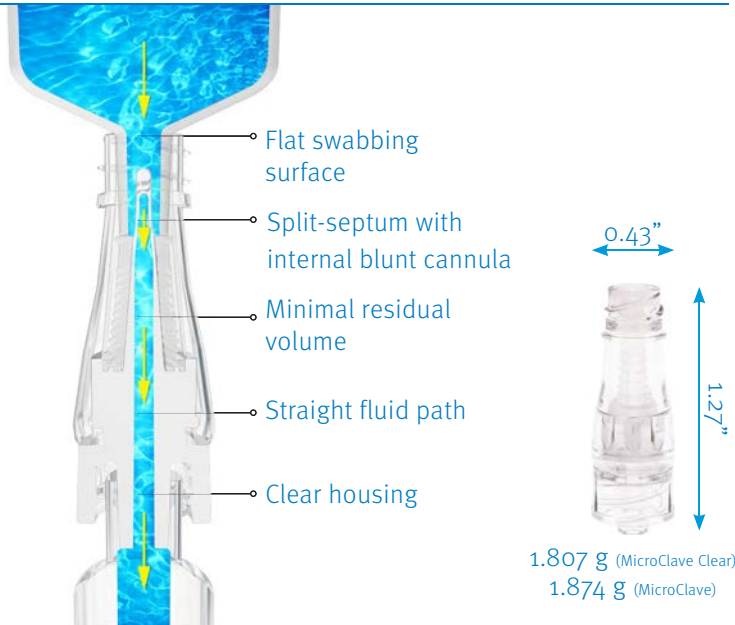
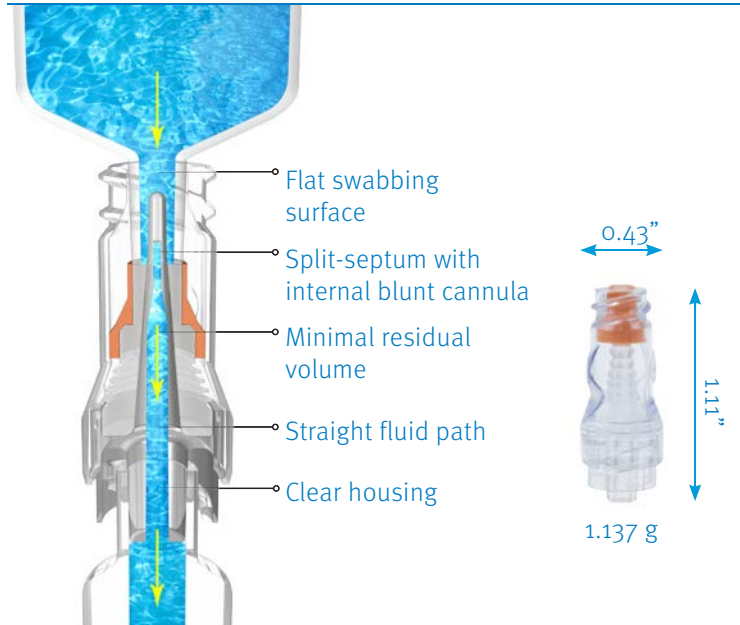


# MicroClave® and NeutraClear®/Cair~Drive Comparative Matrix

## MicroClave by ICU Medical Inc.



## NeutraClear/Cair~Drive by Cair LGL



PRODUCT PERFORMANCE	MICROCLAVE TECHNOLOGY	CAIR~DRIVE TECHNOLOGY
Base Technology	Internal cannula and silicone compression seal split-septum. Internal cannula windows are exposed by the insertion of a male luer, and cannula enters the male luer's internal space to achieve flow.	Internal cannula and silicone compression seal split-septum. Internal cannula windows are exposed by the insertion of a male luer, and cannula enters the male luer's internal space to achieve flow.
Displacement	Neutral: 0 to -0.01 mL -0.0049 mL and -2.2 cm published <sup>1</sup>	Neutral: 0 to -0.01 mL
Residual Volume	0.04 mL	0.05 mL
Fluid Path	Straight through polycarbonate cannula.	Straight through polycarbonate cannula.
Moving Parts in Fluid Path	No	No
Number of Assembly Parts	3, of which 1 moves on luer access.	4, of which 2 move on luer access.
Number of Activations	700	400
Fluid Residual External on Disconnect	Minimal	Minimal
Clamping Sequence	None required	None required
Flow Rate	165 mL/min	180 mL/min claimed, 133 mL/min tested. <sup>1</sup>
Back Pressure	60 psig	60 psig claimed, 9.5 psig tested. <sup>1</sup>
Clear Available	Yes	Yes (partially obstructed view of fluid path)
Antimicrobial Available	Yes	No
Compatibility	Lipid-resistant and can be used in chemotherapy. Chemical inertia is guaranteed.	Not chemotherapy-compatible for alcohol-based drugs and Busulfan.
High Pressure Compatibility	400 psi maximum pressure or 10 mL/second.	> 7 bars (101 psi).
Peer Reviewed Published Studies and Poster Presentations	No. of Published Studies = 6 <sup>2</sup> No. of Poster Presentations = 3 <sup>3</sup>	None identified.

Performance data on file at ICU Medical Inc. San Clemente, CA 92673. Reference ENG-433

NeutraClear, Cair~Drive and Cair LGL are trademarks of Cair LGL.

- ICU Medical Engineering Test Lab. Procedure P520-00017. Cair~Drive Needle Free Connector.
- Peer Reviewed Published Studies: Yebenes J, Delgado M, Sauca G, Serra-Prat M, et al. Efficacy of three different valve systems of needle-free closed connectors in avoiding access of microorganisms to endovascular catheters after incorrect handling. *Crit Care Med* 2008;36: 2558-2561. Stoker R Facing the challenge of CRBSIs *Managing Infection Control*, November 2009. Moore C, Landreth R, Maschmeier C, et al. Significantly decreased rate of catheter-related bloodstream infections after discontinuation of luer access device at an academic medical center. *Managing Infection Control*, November 2009. Maragakis L, Bradley K, Song X, et al. Increased catheter-related bloodstream infection rates after the introduction of a new mechanical valve intravenous access port. *Infect Control Hosp Epidemiol*, 2006; 27:67-70. Bouza E, Munoz P, Lopez-Rodriguez J, et al. A needleless closed system device (Clave®) protects from intravascular catheter tip and hub colonization: a prospective randomized study. *J Hosp Infect.* 2003; 54:279-287. Brown JD, Moss HA, Elliott TSJ. The potential for catheter microbial contamination from a needleless connector. *J Hosp Infect.* 1997; 36:181-189.
- Peer Reviewed Poster Presentations: Landreth R, Moore C, Maschmeier C. The connector or not the connector: Reduction of blood culture contamination. *APIC* 2010. Moore C, Landreth R, Maschmeier C. Maintained low rate of catheter-related bloodstream infections (CRBSIs) after discontinuation of a luer access device (LAD) at an academic medical center. *Apic* 2010. Ryder M, Fisher S, Hamilton G, et al. Bacterial transfer through needlefree connectors: Comparison of nine different devices. *SHEA* 2007.

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