

The HydroFlex™ platform

Microplate washing & vacuum filtration in a compact,
modular platform

Excellent performance, flexibility and reliability

Ideal for a range of 96-well format applications

The new HydroFlex system is a truly flexible platform that provides excellent automated micro-plate washing performance as well as vacuum filtration, reflecting over 25 years of expertise in advanced liquid handling at Tecan. This modular and upgradeable platform is ideal for a range of applications, whether you are working with cells, enzymes or DNA, in research labs in academia, biotech and pharma, or in clinical diagnostics labs using the appropriately validated instrument.

The HydroFlex platform is capable of processing a variety of plate types in 96-well format, reflecting its application flexibility, including strip-plates, full plates with flat bottom- and round bottom-well geometries, and half-area plates with smaller well diameter for less reagent consumption.

The platform's advanced technology and outstanding safety features provide added reliability during your processes, and its robust design and quality components ensure reliable performance with low service costs. The HydroFlex functions either as a stand-alone instrument or it can be easily integrated with the Tecan Freedom EVOlyzer® or other automated ELISA platforms to meet higher throughput requirements.

Regulatory compliance

The HydroFlex platform has been designed for general purpose use and its project documentation has been prepared to meet the IVD 98/79 EC directive. It is suitable for research applications as well as clinical applications, after mandatory validation of the HydroFlex system together with the corresponding kits has been performed by a kit company or lab authority.

The HydroFlex platform offers far more than a standard plate washer and is suitable for:

- washing of enzyme-linked immunosorbent assays (ELISAs)
- gentle washing of cell-based assays with adherent or weakly adherent cells
- washing protein arrays spotted into the wells of a microplate
- vacuum filtration-to-waste, e.g. for PCR cleanup after DNA amplification
- washing of assays using magnetic beads.



Modular and upgradeable to suit your application needs

HydroFlex options

The flexibility of the HydroFlex platform means you can configure your set-up according to your current application needs and that you can upgrade your system when your application needs change. The available options for the HydroFlex platform include:

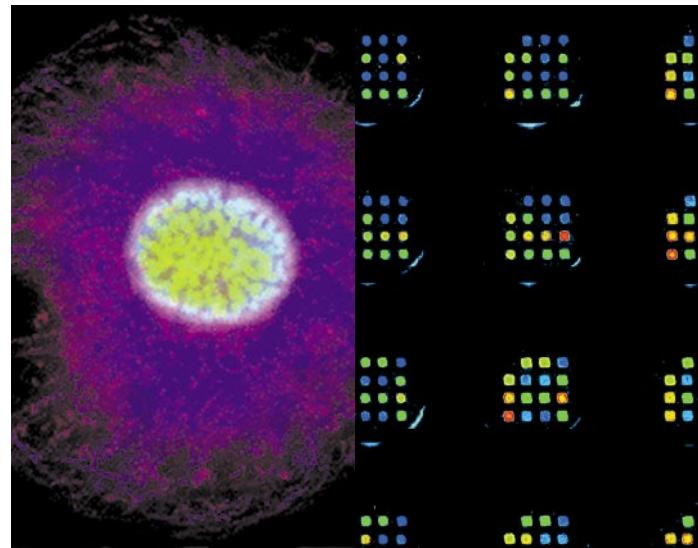
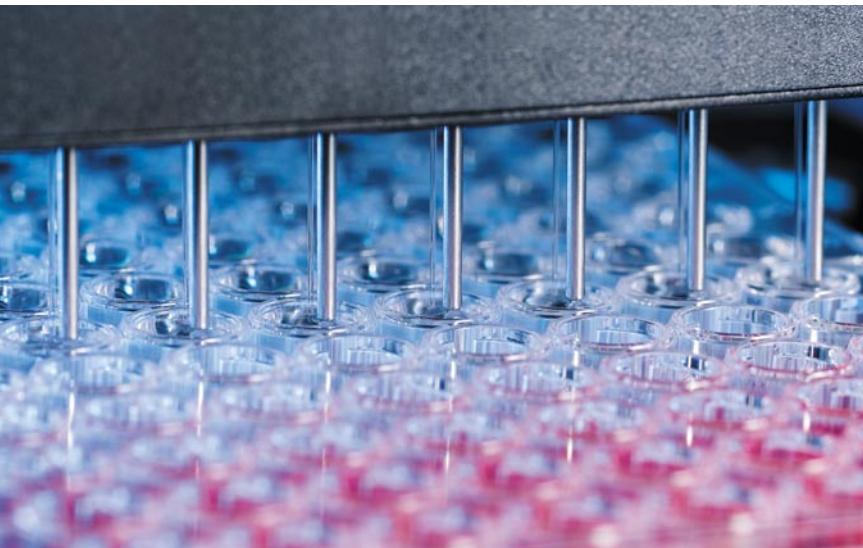
	<ul style="list-style-type: none">• 8- or 16-way manifold for ELISA and cell assays for simultaneous washing of 8 or 16 wells
	<ul style="list-style-type: none">• 8- or 16-way process control manifold for online monitoring of washing in overflow mode
	<ul style="list-style-type: none">• liquid level detection (LLD) system to monitor bottle filling levels
	 
	<ul style="list-style-type: none">• automated vacuum filtration system, with external vacuum pump, waste bottle, bleeding valve and specialized plate carrier for vacuum filtration plates• plate carrier for magnetic bead separation (MBS) for washing bead-based assays

Main platform features at a glance:

- compact and modular system, suitable for a range of applications and laboratories
- ready for automated washing of ELISAs, cells and protein arrays
- automated system for vacuum filtration to waste
- magnetic plate carrier for washing of beads with a magnetic core
- advanced online process control system for high reliability and safety
- bubble sensor unit that ensures reliable buffer dispensing
- multipoint aspiration for flat bottom plates to achieve minimal residual volumes in each well
- user-interchangeable plate carriers for easy switching between washing and filtration applications
- easy programming with built-in keypad or with HydroControl software
- individual software control of speed settings and wash head positions
- suitable for integration with Freedom EVO and Freedom EVOlyzer workstations
- excellent reliability and low service costs.

Application benefits

Advanced technology for research, biotech and clinical laboratories



ELISA washing

The HydroFlex platform's outstanding online control features set new standards of reliability and safety for microplate washers, with options including a process control (PC) manifold that monitors all wash steps in overflow mode and detects clogged needles by conductivity sensing. The liquid level detection system (LLD) monitors filling levels in wash buffers and waste bottles, and the bubble sensor unit checks the feeding line to the wash head for proper filling with wash buffer. An online function check of the dispense pump, as well as sieves in all wash bottles to prevent particles from entering the wash head, also ensure reliable wash performance.

The washer's very low residual volumes (under 2 µl per well) and multiple aspiration points for flat bottom-well geometries ensure consistent, high quality washing. The overflow procedure obtains excellent wash efficiency in a single step, avoiding the tedious repositioning of the wash head associated with procedures requiring sequential aspiration and dispense steps. To fine-tune the HydroFlex washer for different throughput needs, different wash heads are available for simultaneous processing of eight wells (one strip) or 16 wells (two strips).

Cell and protein array washing

The HydroFlex platform is ideal for applications using cell- or DNA-based assays in research labs. Its 2-in-1 design for both cell and ELISA washing eliminates the need for tedious changing between dedicated wash heads. Individual software control of critical wash parameters, such as speed settings for aspiration and dispense steps, as well as wash head positions, allows fine-tuning of the washer according to the cell type used. A very gentle drop-wise dispense mode combined with a move function optimizes the wash head position relative to the rising liquid level in the wells, minimizing cell detachment and ensuring good wash results, even with weakly-adherent cell types.

For washing of protein arrays spotted into wells, the ability to fine-tune wash parameter settings and wash head positions on the HydroFlex system is especially important for achieving good wash results.

Modular design allows vacuum filtration and plate washing

Vacuum filtration

The vacuum filtration option benefits many research applications, such as PCR clean-up after DNA amplification, by easily removing unwanted residues or reaction by-products with the filtrate. The purified DNA is collected on filtration membrane plates then re-suspended, and its concentration and purity can be determined using a microplate reader such as the Tecan Infinite™ M200.

Vacuum filtration is simple to automate with the HydroFlex, including programming of the sequence of filtration steps and wash buffer dispenses, along with automated control of the vacuum level, filtration time and bleeding step for quick release of the plate after the filtration step.

Washing assays using magnetic beads

The optional magnetic bead separation (MBS) plate carrier for washing assays with magnetic beads consists of an array of 96 magnets. These magnets are positioned underneath the wells of a corresponding 96-well plate, allowing fixing of beads with a magnetic core at the bottom of the well during the wash step, minimizing loss of beads.



Robust and easy to use

Low maintenance and RoHS compliant

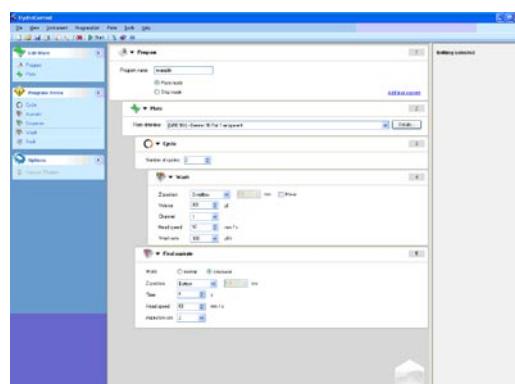
Reliable equipment is critical to good quality laboratory investigations and the HydroFlex pump system has been carefully designed and tested for excellent long-term performance. The advanced pump system includes a dispense pump with revolutions per minute (RPM) control that helps to ensure a smooth and consistent performance and allows slow and precise dispensing, such as for washing cells. The aspiration pump has a double head, ensuring optimum performance to achieve minimum residual volume, even with foaming wash buffers. Its superior design separates moving parts and bearings from the dispensed liquid, minimizing wear to the pump and keeping service costs low. Based on extensive testing, the HydroFlex washer including the pump system offers a mean time to first failure (MTFF) of more than 40,000 plates with a confidence level of 95%.

The HydroFlex has been designed to meet the European directive for the Reduction of Hazardous Substances (RoHS) by actively eliminating such hazardous materials from the product, rather than relying on the current RoHS-exempt status for medical devices.

With this approach, Tecan minimizes future necessary product changes and consequent revalidation efforts for customers, in case the RoHS directive should include medical devices in the future.



Intuitive operation via HydroControl software or built-in keypad



Software

For an easy start, the intuitive HydroControl™ software is included with every HydroFlex system, providing a pre-defined plate library as well as examples of wash programs. The software can additionally be used to pre-program the HydroFlex for kit companies who are the legal manufacturers of their customized version of the instrument, with kit-specific wash programs and plate parameters.

This information can be quickly transferred onto the HydroFlex washer via a USB interface using the download function. As the HydroControl software provides a simulation mode for off-line operation, the connection from the software to the HydroFlex system is only needed for data transfer. The software fulfills user administration

requirements, including electronic records and signatures and has been designed to meet the FDA CFR 21 part 11 regulation. The HydroControl software provides a standardized interface for robotic integration of the HydroFlex with Tecan's Freedom EVO® liquid handling workstations or Freedom EVOLyzer ELISA analyzer.

Alternatively, the HydroFlex washer can be fully programmed and operated as a stand-alone instrument using its built-in keypad. All critical wash parameters, such as dispense and aspiration speed as well as wash head positions, can be controlled onboard the HydroFlex system. For vacuum filtration applications the vacuum level and the filtration time can also be defined via the keypad.

Instrument Specifications for HydroFlex washer

Parameters	Characteristics
General	
Display unit	Liquid Crystal Display with two rows of sixteen digits
Keyboard	Four key membrane keyboard
Number of dispensing channels	1-, 2- or 4-channels
Manifold types	8- or 16-way for parallel processing of 8- or 16-wells, 8- or 16-way Process control manifold for online monitoring of overflow-wash step
Variable	
Volume of solution dispensed	50 – 3000 µl in 50 µl steps for washing 50 – 400 µl in 50 µl steps for dispensing
Dispensing accuracy	<= 2 % (300µl dispense volume, dispense rate: 3, 8-way manifold).
Dispensing uniformity	CV: <= 4% over the plate (300µl dispense volume, dispense rate: 3, 8-way manifold).
Residual volume	Crosswise aspiration: <= 2 µl per well for 96-well flat-bottom Greiner plate (asp. rate 3, asp. time 4 sec., head speed 10mm/sec, 8-way manifold)
Vacuum range	150 – 850 mbar absolute pressure for vacuum filtration
Interface	USB
Shaking	Linear shaking; high-, medium- and low-setting
Power	
Supply	Auto sensing for the settings 100 – 120 V or 220 – 240 V, 50/60 Hz
Consumption	65 VA
Physical	
Outside dimensions for plate washing	Width: 27.5 cm, Depth: 36.6 cm, Height: 18.1 cm
Weight	6.6 kg
The instruments adhere to applicable safety standards to date.	

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