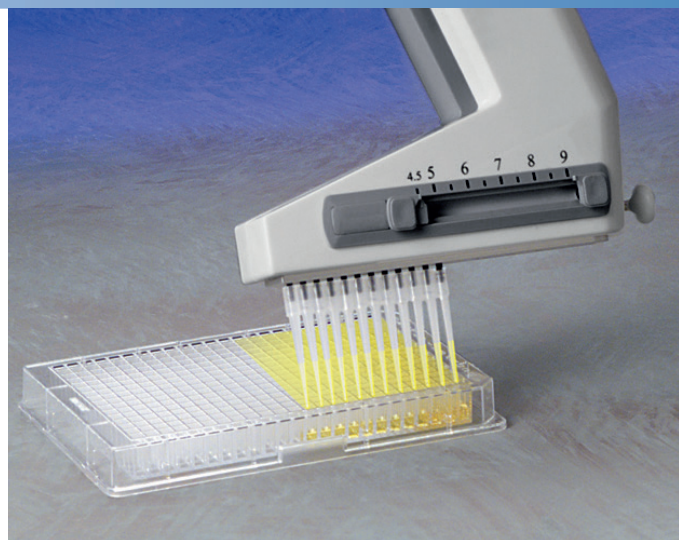


384-well pipetting

Paula Heimler, Field Product Manager, Thermo Fisher Scientific, USA

Key Words

- **Microwell plate (Microplate)** is a standard tool in research laboratories that typically has 6, 24, 96, or 384 sample wells. Each well holds nanoliters to milliliters of liquid.
- **384-well microplates** quadruple well density with a well-to-well spacing of 4.5 mm and a volume of 120 μl .
- **Pipetting system** is a pipette and pipette tip that are designed in tandem to ensure that a perfect balance exists between security of the seal and ease of application/ejection.
- **Finnpipette 16-channel adjustable-volume pipette** is a manual multichannel pipette with a maximum volume of 50 μl . It works as a pipetting system with Thermo Scientific Finntip micro 384 pipette tips.
- **Matrix Equalizer electronic pipette** gives an instant boost in productivity because of equal tip spacing that expands or contracts with the simple adjustment of a slide rod, allowing the pipette to perform sample transfers between virtually any tube rack, microplate or horizontal gel box. The pipette enables plate-to-plate transfers between 96- and 384-well microplates, as well as loading gels 8 or 12 channels at a time directly from a microplate or tube rack.
- **ELISA** is *Enzyme-linked Immunosorbent Assay*. In ELISA, a pipette is used to move a liquid sample onto a solid phase with special binding properties. Multiple liquid reagents are sequentially added, incubated and washed, producing a color change.
- **Efficiency** in general describes the extent to which time or effort is optimally used for an intended task or purpose.
- **Ergonomics** is the science of fitting the job to the worker.



Microwell plates

Microwell plates are flat plates that have multiple “wells” that are used as small test tubes. First developed in 1951 as a fast, economic and reliable test method for the identification of the influenza virus, the microplate format replaced test methods involving high volume test tubes. The microplate has become a standard tool in analytical research and clinical diagnostic testing laboratories. A microplate typically has 6, 24, 96, 384 or even 1536 sample wells arranged in a 2:3 rectangular matrix.

High-throughput screening for miniaturized assays started in 1994 with the launch of 384-well microplates. Compared to 96-well plates, the 384-well microplate quadruples the well density with a well-to-well spacing of 4.5 mm and a total well volume of 120 μl . 384-well plates are in a 16 x 24 format. The convergence of microplates and pipettes really took effect with the development of ELISA technology. A very common partnering with microplates and pipettes is in the Enzyme-linked Immunosorbent Assay, ELISA, which is the basis of most modern medical diagnostic testing in humans and animals.

Multichannel pipettes – Manual and electronic

For manual high-throughput applications, such as filling up a 384-well microwell plate, most researchers prefer a multichannel pipette. Instead of dispensing well by well, a row of 16 wells can be processed in parallel. What could once only be accomplished through repetitive motions with a single-channel pipette can be performed quickly and easily, standardizing laboratory results.

Thermo Scientific Finnpiquette – First 16-channel pipette

Finnpiquette® manual 16-channel pipettes were the first to be introduced to researchers. High-precision Finnpiquette F1 and F2 16-channel pipettes are designed to dispense volumes of 1 µl to 50 µl. Finnpiquette manual 16-channel pipettes are designed as a pipetting system with Finntip® micro tips in a 384-rack format.



Operator fatigue is often overlooked in the search for maximum accuracy and repeatability. Repetitive motions cause stress in hand joints and muscles. Even a well-trained and experienced operator will experience a decrease in accuracy and repeatability as pipetting time increases. Multichannel pipettes allow users to complete their research quickly and as efficiently as possible.

Long-term pipette operation can lead to repetitive strain injuries (RSI), such as carpal tunnel syndrome. These disorders may cause significant reductions in accuracy and repeatability by impairing the proper pipetting techniques that are crucial to achieving optimal accuracy. Preventive measures include choosing the most ergonomic pipette available for the job at hand.

To improve the ergonomics of pipettes by reducing the necessary force, electronic pipettes were developed. The manual movement of the piston is replaced by a small electric motor powered by a battery. Whereas manual pipettes need a movement of the thumb, electronic pipettes have a trigger and are programmable. Electronic pipettes can decrease the risk of RSI-type injuries.

Thermo Scientific Matrix electronic pipette

- Ergonomic design reduces risk of repetitive stress injuries (RSI).
- Step-based programming makes it logical, intuitive and easy to create programs.
- On-board memory saves programs (up to 40 steps each) allowing you to spend more time pipetting and less time programming.
- Large volume capacity – 1250 µl per tip capacity allows you to fill an entire microplate with up to 100 µl per well from a single aspiration.
- Matrix® fixed 16-channel pipettes for linking simple or complex protocols for 5 µl to 125 µl.
- Matrix adjustable tip spacing allows you to transfer multiple samples between any tube rack, microplate and/or horizontal gel box increasing efficiency.
- Matrix Equalizer 384 with minimum spacing 4.5 mm for transfer to/from 384-well microplates and 384-well PCR plates.
- Sold as a pipetting system with Matrix pipette tips.
- Five volume ranges and two spacing ranges available allows for the flexibility to pipette between many types of labware.



Leading the way in liquid handling pipetting

For 40 years, Thermo Scientific has led the way in liquid handling pipetting products. Reliable accuracy and precision, increased efficiency, uncompromised safety, advanced ergonomics – all are the hallmarks of innovative product design.

thermoscientific.com/liquidhandling

© 2012 Thermo Fisher Scientific Inc. All rights reserved. All trademarks are the property of Thermo Fisher Scientific Inc. and its subsidiaries. Specifications, terms and pricing are subject to change. Not all products are available in all countries. Please consult your local sales representative for details.

North America: +1 800 522 7763

Europe:

Austria +43 1 801 40 0

Belgium +32 2 482 30 30

Finland/Nordic +358 9 329 100

France +33 2 28 03 20 00

Germany National Toll Free 08001-536 376

Germany International +49 6184 90 6940

Italy +39 02 95059 1

Netherlands +31 76 571 4440

Russia/CIS +7 (812) 703 42 15

Spain/Portugal +34 93 223 3154

Switzerland +41 44 454 12 12

UK/Ireland +44 870 609 9203

Asia:

India +91 22 5542 9494

Japan +81 45 453 9220

China +86 21 6865 4588 or +86 10 5850 3588

Other Asian countries +852 2885 4613

Countries not listed:

+49 6184 90 6940 or +33 2 28 03 20 00

Thermo
SCIENTIFIC

Part of Thermo Fisher Scientific