

The Eppendorf Xplorer® Electronic Pipette Family – Better Reproducibility

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Abstract

Electronic pipettes are designed for versatile and flexible use in laboratory applications. Moreover, they can significantly reduce the stress on the user's thumbs and arms. The Eppendorf Xplorer electronic pipettes feature innovative technical solutions including a constant piston speed as well as spring-loaded tip cones developed specifically

to enable precise liquid dispensing operations in the laboratory. The effect of these technical solutions on overall reproducibility was examined on the basis of measurement results and calculations, with subsequent demonstration of the advantages concerning dispensing precision and accuracy.

Introduction

For lab scientists, the most important criterion regarding electronic pipettes, besides ergonomics and ease of use, is high reproducibility of results in daily routines. Precise results reduce costs and optimize the amount of time required because they eliminate the need to repeat analyses and experiments. The electronic Eppendorf Xplorer pipette supports users in achieving maximum result reproducibility by featuring eight aspiration and dispensing speeds as well as an innovative spring-loaded tip cone [1].

The effect that these technical features have on the precision of pipetting results has been examined and will be discussed on the following pages.

Constant piston speed

The speed of aspiration and dispensing strongly influences accurate pipetting due to individual liquid properties. Depending on the application, Xplorer electronic pipettes can be used with different speed settings for aspirating and dispensing liquid volumes.

This enables users to determine the optimal dispensing speed for the respective application. Since each dispensing step in a series dispenses the samples with a constant speed, a much higher, user-independent reproducibility can be achieved in comparison with a mechanical pipette (fig. 1). Xplorer pipettes provides eight aspiration and dispensing speeds, so they can be individually adjusted for each liquid or application.

A constant and low speed is also relevant when it comes to the effect of shear forces on functional units such as DNA, proteins or cultured cells. An uncontrolled, fast liquid transfer can seriously affect cells and disrupt experiments.

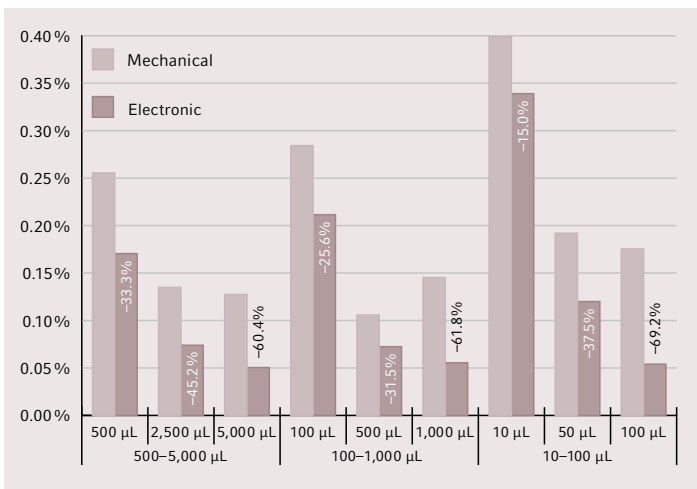


Fig 1: Comparison of random errors, mechanical vs. electronic pipette

The low speed levels available with Xplorer pipettes enable a low flow velocity, reducing shear stress for these functional units.

To take reproducibility to the next level, Eppendorf offers the VisioNize® pipette manager (sold separately), which can be used to connect the Xplorer family pipettes and remotely define their settings. It is a standalone touch server that interacts in real-time with Xplorer pipettes via WiFi technology, allowing remote feature setting and ensuring precise and reproducible pipetting results, regardless of user, liquid or experiment setup.

Overall, the above-mentioned features make the electronic Eppendorf Xplorer pipettes suitable for a wide variety of applications in molecular biology, microbiology, cell culture assays and analytical chemistry.

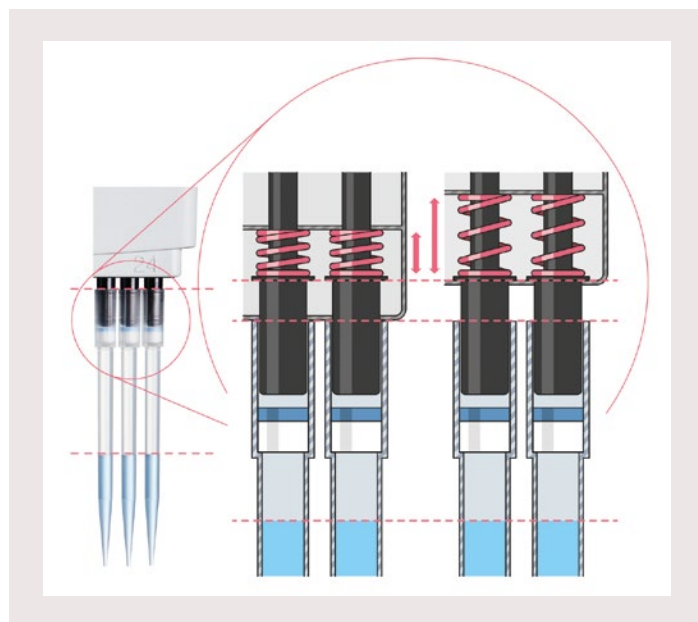


Fig. 2: Spring-loaded tip cones

Spring-loaded tip cones ensure effortless attachment and a secure fit of the tip cones.

Uniform tip attachment

The accuracy of dispensing operations is, among other things, dependent on the air cushion in the pipette. If the pipette tip is pushed further up the pipette cone by applying a greater attachment force, this changes the air cushion and thus the volume of the aspirated liquid. Differences in the level at which the pipette tips are attached therefore result in different pipetting volumes. This, in turn, reduces the reproducibility of dispensing results.

Eppendorf Xplorer electronic pipettes offer a high level of result reproducibility, since their spring-loaded tip cones ensure the tip is always uniformly fitted at the same position on the cone.

The spring-loaded tip cone furthermore automatically compensates for the additional force used to attach the pipette tip. This means that only minimal effort is required to achieve the optimal tip fit – and subsequent tip ejection is also easier.

Summary

The consistent implementation of technical features (e.g., electronic speed control of the piston and spring-loaded tip cones) not only minimizes physical strain, but also significantly improves the reproducibility of pipetting results. In this way, electronic pipettes increase productivity and enhance everyday laboratory routines.

Eppendorf Xplorer electronic pipettes combine optimum ease of use with maximum precision. This enables users to carry out sample processing with maximum reproducibility.

For more information, technical specifications and ordering information for Eppendorf Xplorer electronic pipettes, visit www.eppendorf.com/xplorer.

Software updates for Eppendorf Xplorer electronic pipettes are available at www.eppendorf.com/software-downloads.

Your local distributor: www.eppendorf.com/contact

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