

The ergonomic design of the Fisherbrand Elite Pipetters provide accurate and precise liquid delivery.

Introduction

The Fisherbrand™ Elite™ pipetter family was designed to take into account the demands of today's diversified laboratory needs. It offers superior comfort, performance, reliability and repeatability in one of the lightest pipettes available.

Ergonomics is one key contributor in delivering accurate and precise data. The Elite pipetter offers ergonomic advantages that enable you to easily follow good laboratory pipetting practices to deliver consistent results. The Elite pipetter offers a soft touch tip ejector, which reduces tip ejection force by 50% when compared to traditional ejection mechanisms. The contoured lightweight handle design offers a comfortable grip and provides molded resting supports for the hand and index finger that help reduce muscle strain. Lastly, the Elite pipetter's superior finger rest allows the pipetter to rest in your hand securely while conducting additional two-handed operations, such as threading a cap onto a microcentrifuge tube. These combined features greatly reduce the potential for RSI (repetitive strain injury), thus allowing the user to follow good laboratory pipetting practices to produce accurate and precise results.

In addition to the superior ergonomics, the Elite pipetters are best utilized with Fisherbrand™ SureOne™ pipet tips, which were designed and developed to be a complete system solution for optimal liquid sample delivery. The SureOne pipet tip portfolio offers a wide variety of packaging options ranging from bulk to rack, and rack sterile to reloads in filtered and non-filtered selections. The extensive tip variety will match up with the demanding and diversified needs of any laboratory. From standard pipette tips to specialty tips like the extended length series, the SureOne offering enables laboratories to find all of their liquid handling needs in this single product family.



Inaccuracy and Imprecision Testing

Inaccuracy is the difference between the dispensed volume and the selected volume of a pipetter. The significance of this in terms of liquid delivery is knowing the specified sample volume was accurately dispensed.

Imprecision refers to the repeatability of the pipettings. The significance of this in terms of liquid delivery is knowing that the specified sample volume is delivered accurately each time the sample is dispensed.

Low retention pipette tips enhance the ability to recover additional sample volume from within the tip by improving the hydrophobic properties—reducing surface tension of the tip plastic—improving precision. The increased precision is most beneficial with small-volume pipetting where precision values can be improved.

Materials and Methods

- Test pipette: Fisherbrand Elite Pipetter 1–10 µl
- Test tips: SureOne 10 µl Pipet Tip
- Test liquid: water

1. Do 10 pipettings with the minimum volume.
2. Do 10 pipettings with the maximum volume.
3. Calculate the inaccuracy (A) and imprecision (cv) of both series.

Forward pipetting technique was used in accordance with the Thermo Scientific internal SOP. The test conditions corresponded to the demands of the EN ISO 8655 standard.

Results and Discussion

The pipetting results of the Fisherbrand Elite pipetter 1–10 µl with the SureOne 10 µl pipet tips are displayed in Table 1. The data points for both the 1 µl and 10 µl dispensed volumes stayed within a narrow range and were within the specification limits of the pipetter. These results indicate that the Fisherbrand Elite pipetter in combination with SureOne pipet tips forms an optimized pipetting system that can deliver accurate and precise liquid dispensation. Additional data is supplied for the full line of Elite pipettors in Table 2.

Maximum permissible errors according to ISO 8655					
Range	Volume µl	Inaccuracy µl	Inaccuracy %	Imprecision s.d.µl	Imprecision cv %
1–10 µl	10	±0.120	±1.2	0.080	0.8
	1	±0.120	±12	0.080	8.0

Table 1.



Fisherbrand Elite pipetter and SureOne pipet tips provide optimal pipetting performance.

Conclusions

In this application note the excellent pipetting performance was discussed along with the ergonomic benefits that help reduce the potential for RSI. When using SureOne pipet tips with the Fisherbrand Elite pipettors an optimal pipetting performance is ensured with this system approach to liquid handling.

Maximum permissible errors according to ISO 8655						
Single Channels Pipettors						
Range	Volume µl	Inaccuracy µl	Inaccuracy %	Imprecision s.d.µl	Imprecision cv %	
0.2–2 µl	2	±0.080	±4	0.040	2.0	
	0.2	±0.080	±40	0.040	20.0	
0.5–5 µl	5	±0.125	±2.5	0.075	1.5	
	0.5	±0.125	±25	0.075	15.0	
1–10 µl	10	±0.120	±1.2	0.080	0.8	
	1	±0.120	±12	0.080	8.0	
2–20 µl	20	±0.20	±1.0	0.10	0.5	
	2	±0.20	±10.0	0.10	5.0	
5–50 µl	50	±0.50	±1.0	0.20	0.4	
	5	±0.50	±10.0	0.20	4.0	
10–100 µl	100	±0.80	±0.8	0.30	0.3	
	10	±0.80	±8.0	0.30	3.0	
20–200 µl	200	±1.60	±0.8	0.60	0.3	
	20	±1.60	±8.0	0.60	3.0	
100–1000 µl	1000	±8.0	±0.8	3.0	0.3	
	100	±8.0	±8.0	3.0	3.0	
0.5–5 ml	5000	±40.0	±0.8	15.0	0.3	
	500	±40.0	±8.0	15.0	3.0	
1–10 ml	10000	±60.0	±0.6	30.0	0.3	
	1000	±60.0	±6.0	30.0	3.0	
Multichannel Pipettors						
Range	Channel	Volume µl	Inaccuracy µl	Inaccuracy %	Imprecision s.d.µl	Imprecision cv %
1–10 µl	8,12	10	±0.24	±2.4	0.16	1.6
		1	±0.24	±24	0.16	16
5–50 µl	8,12	50	±1.0	±2.0	0.4	0.8
		5	±1.0	±20	0.4	8.0
10–100 µl	8,12	100	±0.80	±0.8	0.3	0.3
		10	±0.80	±8.0	0.3	3.0
30–300 µl	8,12	300	±8.0	±2.7	3.0	1.0
		30	±8.0	±26.7	3.0	10.0

Table 2.

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