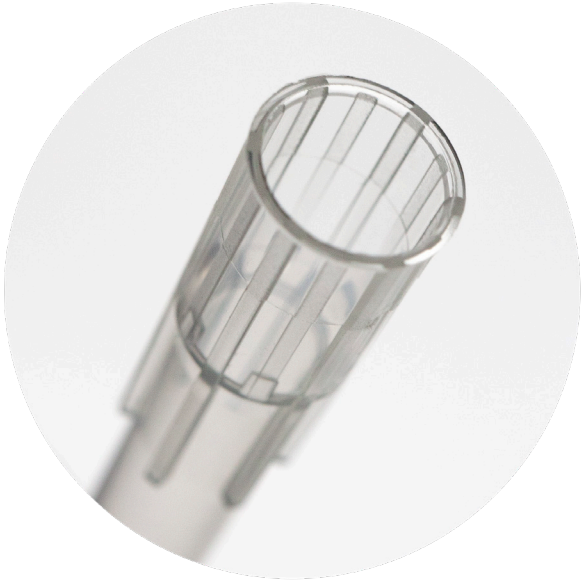
Technical Bulletin

Superior Ergonomics with StarStop



The Risk of Repetitive Stress Injury

Repetitive Stress Injury (RSI) is caused by repetitive tasks, forceful exertions, or awkward positioning. The repetitive movement and overuse of muscles can cause mild to severe pain as well as lasting damage. The cost associated with the diagnosis as well as the treatment for RSI amounts to billions.

Laboratory technicians are highly vulnerable to RSI due to the repetitive nature of modern standard lab practices which include pipetting. The required force for insertion and ejection of pipette tips of chosen pipettes have resulted to many RSI cases.

The Solution: StarStop™

To improve the health of laboratory scientists, our engineers at Biotix® have put in the time and research into developing ergonomic pipette tips. The breakthrough was Biotix creating patented StarStop® technologies that incorporated a positive stop feature made of internal ribs. These ribs interact with the barrel of the pipette which inhibit the jamming of tips that lead to high ejection forces as seen in *Figure 1*. In addition to capping the ejection force, the positive stop feature allows Biotix to identify the specific seal point on the tip to engineer a perfect fit on every tip.

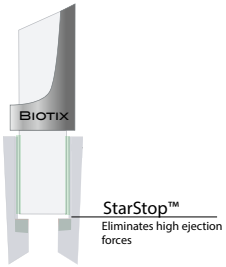


Figure 1

Biotix has incorporated StarStop into its own branded line of LTS compatible pipette tips with resulting better ergonomics and provide the following:

More reproducible results with a consistent seal from tip to tip
Creates an identical tip alignment on multichannel pipettes
Lowest ejection forces on LTS pipettes

Ergonomic Testing

Within our own facility at Biotix, we compared 20 Biotix xTIP4 tips against tips from Rainin and MBP with the followign sizes: 20 µL, 200 µL, 1000 µL. The respective Rainin pipette was mounted on a fixture with an insertion force of 8 lbf using a vertical track and eject at the same track using a force gauge. The pipette tip rack was placed on a calibrated OHAUSE RC3000 scale to verify the tested insertion force. Ejection force was tested using an Imada DS2-44 force gauge. Seals were tested using a draw test with visual verification to a graduation mark and held for 15 seconds to ensure no leaking.

The data in *Figure 2* below shows that the ejection force at the positive stop is equal in the 20uL tip sizes across 20 tip samples. Biotix showed lower ejection on the 200uL and 1000uL volume size by .06 lbf.

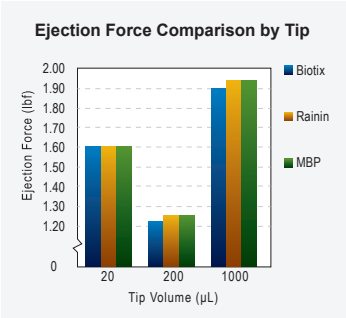


Figure 2

Study Results

Overall Biotix tips demonstrated in having the lightest ejection force compared to Rainin and MBP, resulting in the giving the highest ergonomic benefit for the end-user. Between the three tip sizes when the positive stop was reached, Biotix had the slight advantage on the 200uL and 1000uL tip size.

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