

# Laboratory Product Focus

## IN CASE OF EMERGENCY – BREAK GLASS!

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*Does your thumb ache? Does your wrist ache?  
Do you have sharp shooting pains up your arm?  
Does your back ache? Does your neck ache?*

*Perhaps you are developing an Upper Limb Disorder (ULD) caused by repetitive work, more commonly referred to as RSI (Repetitive Strain Injury).*

*Since 1995 (over 10 years ago) Biohit has been preaching the benefits of their products' design; superb accuracy and precision, lightweight pleasing design for ease of use and to reduce the force needed to pipette and eject a tip.*

*Now nearly every pipette manufacturer and distributor uses this argument to promote their products! With mass promotion however comes dilution of the message and false acceptance that all products are equal in this department. All products are not equal and the design or engineering of the various products have taken many different approaches to reducing these stresses. As an example, Biohit have used an extension spring, as opposed to a compression spring on their new mLINE. It is easier to pull a spring apart than to continually compress it, therefore thumb pressure is significantly lower. On the Biohit eLINE, the patented electronic tip ejection avoids any risk of RSI (Figure 1).*

*How many other pipettes can claim this?*

**IN 1948 CRAMP OF THE HAND OR FOREARM DUE TO REPETITIVE MOVEMENTS SUCH AS TYPING WAS CLASSIFIED AS A PRESCRIBED DISEASE**

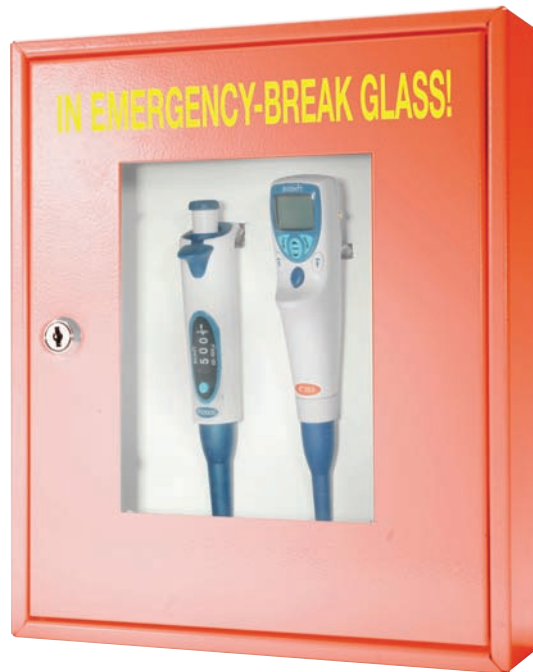


Figure 1. "In Emergency Break Glass"

Recognition of the problem has come from other areas, with the legal system showing expected enthusiasm and moving opinions slowly from one of ignorance of the ailment to acceptance and provenance. As an example in 1948 cramp of the hand or forearm due to repetitive movements such as typing was classified as a prescribed disease for the purpose of industrial benefit. It was described as PDA4 but the injured employee seldom saw any compensation.

Despite Judge Prosser's maverick statement in the late 80's that "RSI does not exist", there are numerous cases where successful actions have been brought against employers.

The critical cases occurred in the early 90's with favourable judgements for the employee and leaving the responsibility for monitoring problem areas to the employers. Pipetting is not as prevalent as the use of

keyboards and VDU's and other industrial areas, hence most cases have been brought in non-laboratory situations. We have had personal

correspondence with several lawyers over the years, whose clients were proposing litigation against their public and private employers. All cases were conveniently settled out of court! Now several thousand cases are brought per year for cases of RSI often supported by the Trade Union Council.

### **Has all this made any difference to scientist's use of pipettes?**

Despite Biohit's success in the field of pipettes, being a leader in electronic pipettes and a major player in the mechanical variety, the question still remains.

A quick search on the Internet for "RSI pipettes" and "Health and Safety" produces many hundreds of recommendations from varying organisations websites that would not have been considered 10 years ago. For example, this is an extract from a well-known University website.

*"There have been reports that excessive use of automatic type pipettes may be leading to symptoms of RSI- pain in hands, arms and wrists with eventual loss of ability to perform simple manipulations. Staff are advised not to perform excessive numbers of such actions and to take rest periods if discomfort is experienced."*

The very nature of health and safety, the concern for the well being of fellow man and need to avoid the clutches of lawyers dictates that a lot of information is available.

As we know information overload means that this advice is seldom read or even seen! Unfortunately ignorance is no excuse in the eyes of the law! The fact that the issue has been recognised and the potential problems evaluated is a measure of security for the administration. Are there, however, any of the scientists at the sharp end concerned or even aware?

Certainly in the United Kingdom the Health and Safety Executive has produced publications on this very subject, something that all Health & Safety officers should be aware of. It is these people's responsibility to provide a risk assessment report. How many risk assessments have been carried out on repetitive pipetting in laboratories?

With the plethora of pipette companies that have creatively adopted the message and the few that have subsequently advanced their pipetting technology, it would seem reasonable that most of the advanced world (at least) would be using pipettes with limited exertion pressures!

This isn't the case however! We can only assume that a percentage are aware and have adopted a more careful approach to their selection of pipettes.

The real question is why the remaining majority have not adopted these principles and why they still use models of pipette that were designed 30 years ago, which have significantly higher plunger and tip ejector pressures than modern units and must therefore prove less accurate in repetitive pipetting regimes (Figure 2).

Like cars, (Figures 3 and 4), different types of pipettes are purchased for a variety of reasons, but clearly not the same ones. With pipettes the buying issues are generally (in no particular order):

- Familiarity
- One particular brand is used and this makes for consistent service and support
- Illusions over the superiority of a particular pipette
- Purchasing commitments and organisation
- Design, comfort, performance and functionality
- Standard Operating Procedures

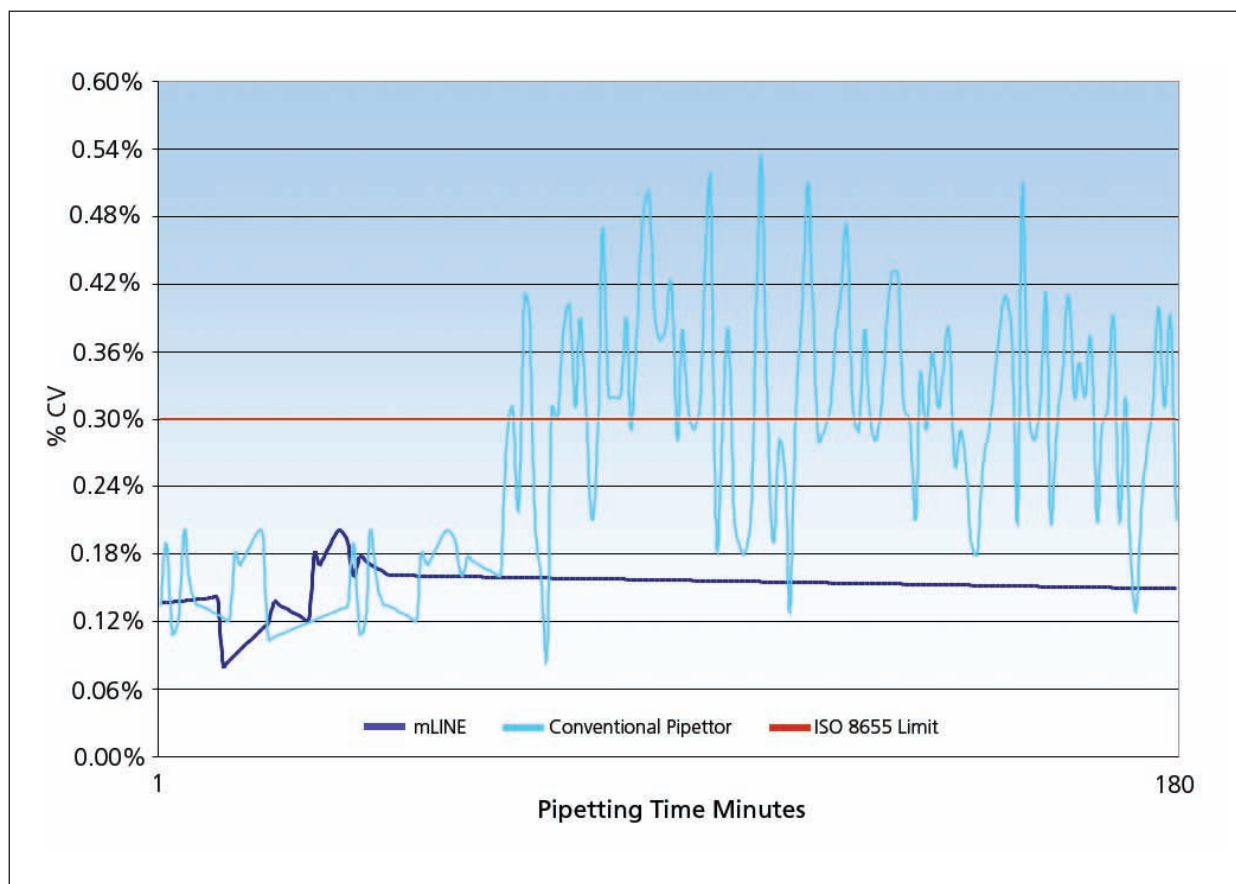


Figure 2. Biohit mLINE and conventional 1000  $\mu$ l pipettor performance comparison. Each pipettor was tested over a 5-hour period. Sets of 5 repeat weighings of 500  $\mu$ l were done 180 times into a calibrated Mettler SAG105 balance. The same trained operator was used to perform the tests. The limit line for CV% is the maximum permissible error as defined in ISO8655-2. The light pipetting action of mLINE delivers improved reproducibility over time.

#### Ask yourself the question; if you were buying a new car which criteria would you use?

You would look at the practical aspects; service intervals and costs for spares, use on types of terrain and in different weather conditions, child compatibility, fuel consumption, features etc. If it was a company car you may well be tied to a fleet model. A pipette is not so different; the following are features you would expect on a pipette these days, certainly from Biohit.

- Designed for continual use (which means it should be light and only require low forces to operate to avoid RSI)
- Be extremely accurate and precise in repetitive conditions.
- Fully autoclavable
- Easy to set the volume, both in adjustment and visibility
- Easy to service and calibrate
- Fit most good quality tips
- Life time costing should be good (spares, service, calibration)
- Additional features such as tip cone filters to avoid tip cone contamination and additional stickers, shelf rests, calibration tools etc.

It is not difficult to determine which is the best tool for the job. We do understand that other more onerous or complex forces may be at work that prohibit the free purchase of your Gti, but it may well make sense even in this case to canvass for your own emergency products when the repetitive tasks become too much. It may also be wise to educate the system and illustrate the dangers of poor pipetting (and RSI) to administrative personnel.



Figure 3. 1970 Ford Anglia 105E



Figure 4. The latest VW Golf GTI

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“Break Glass in an Emergency” is a common enough sight for all of us; you see it in offices, on trains, in many public places. How many of us have broken that glass?

Only a few will have had need of course. The reason is that emergencies are actually quite rare, in much the same way that the percentage of sufferers of RSI are low in comparison to the number of scientists using pipettes. There is a much more engaging argument for lower force pipettes and this is the tiredness aspect. Although continual use may increase risk of RSI, with its subsequent employment issues, the use of these pipettes also seriously reduces the chances of inaccurate results from pipetting!

Reducing health risks and test errors is very responsible; it may also avoid serious internal and external litigation.