

Userguide

epMotion 5070/5075 | AU005

Minimization of remaining volumes in plates and tubes

Renate Fröndt, Eppendorf AG, Hamburg

Introduction

With the epMotion 5070/5075, the volume of a liquid to be used is calculated for all dispensings of an application on the basis of the required samples and of the remaining volume of the programmed tubes.

The term remaining volume is understood as the "remaining volume that cannot be removed from a tube".

The geometry of the forms and the immersion depth of the pipette tips differentiate the remaining volume of the individual tubes.

The user can independently change this remaining volume for each tube and each plate.

In order to change the remaining volume of a tube on the epMotion, the bottom tolerance of the tube must be changed.

Bottom tolerance is understood as the distance between the calculated tube bottom and the calculated, lowest end of the pipette tip.

Calculating the remaining volume

As a rule, the pipette tip is submerged 3 mm into the liquid prior to aspiration of the liquid. However, the immersion depth changes when the filling height is reduced.

Aspiration of the liquid is possible to the following limiting data under standard conditions: 1.0 mm distance between tube bottom and pipette tip and simultaneous 0.7 mm immersion depth of the pipette tip in the liquid. The immersion depths of the pipette tips are reduced under standard conditions after a filling height of < 4 mm from 3 mm to 0.7 mm.

Tolerances of the pipette tips and the bottom tolerances are already incorporated at this distance. The remaining volume is thus calculated under standard conditions with the filling height of 1.7 mm and the geometry of the tube.

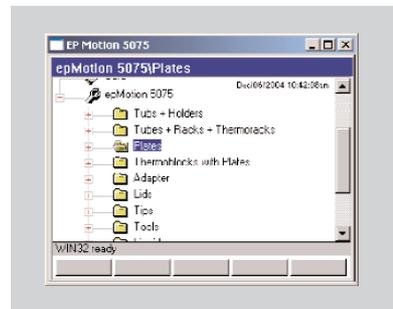
This lowest required volume is calculated at the start with the help of the "Number of samples". For safety reasons (meniscus formation varies in the tubes) the "required volume" should always be exceeded.

In the case of especially expensive reagents, a remaining volume greater than the entered standard bottom tolerance may be too high. For this reason, any administrator has the possibility to reduce (max. 0.2 mm) or, in special cases (sediment), to increase it. These measures reduce or increase the remaining volume. This modification is described in the following section.

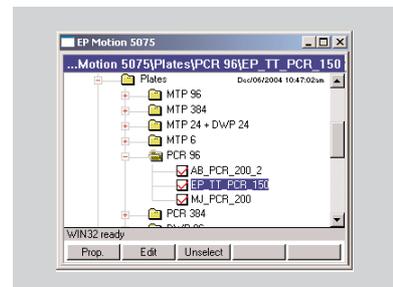
Changing the remaining volume

The changing of the bottom tolerance, and thus of the remaining volume, is carried out in the epMotion 5070/5075 node.

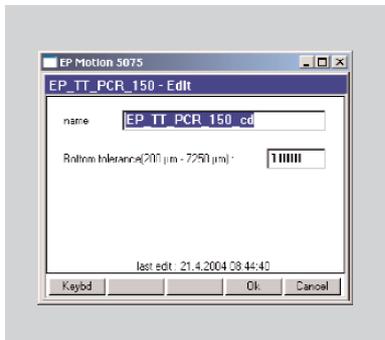
1) To do this, open the epMotion node and mark the folder of the appropriate tube form.



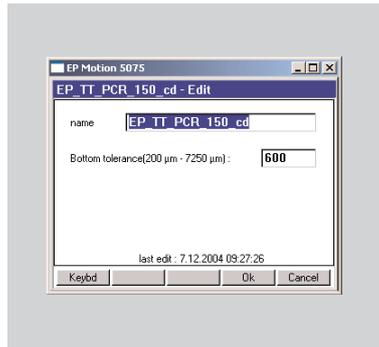
2) Now mark the tube or plate.



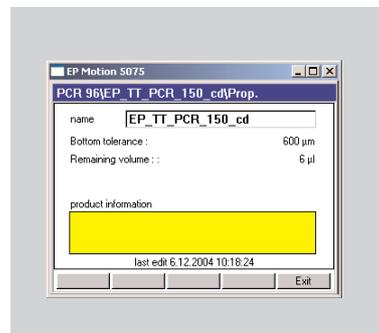
3) To reduce the bottom tolerance, the logged in administrator should press the Edit function key in the first display. The following display appears:



4) The bottom tolerance can be entered between 200 µm (0.2 mm) and 50% of the tube height. The suggested name with the extension "cd" can be changed if required. When, as in the adjacent example, 600 µm are entered, a new labware file with the extension "cd" will appear after "OK" is pressed. This file may also need to be set to Select by the administrator, in order to be able to use it for editing of methods and for the necessary practical test.



5) The properties of the new EP_TT_150_cd file appear as follows: The Remaining volume has been adjusted to the new bottom tolerance. The field for "product information" is empty and has a coloured background.



Checking the remaining volume

Plates and tubes for which a modification of the bottom tolerance has been carried out may only be released for use following appropriate test runs.

To check the remaining volume of a tube, a method should be edited in which a small volume is removed from this tube step-by-step. It should thereby be observed after which removal step too little volume is aspirated into the pipette tip. The volume remaining in the tube and the last falsely removed volume together roughly equal the remaining volume.

If the remaining volume is assessed as being too great, the bottom tolerance can be reduced again in an additional step.

When changing batches of pipette tips, plates or tubes, or when there is reason to doubt the accuracy of dispensing, the reduced bottom tolerance must be checked again. The bottom tolerance can also be increased. This is recommended for tasks such as removal above a solid sediment (crucor, etc.) or with phase mixes.

General

The reduction of the factory settings for the standard bottom tolerance is the responsibility of the user. The user is exclusively responsible for dispensing accuracy and problem-free removal in the case of tubes with changed bottom tolerances.

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