

APPLICATION NOTE

RTI Mover Speed Calibration

This Application Note describes how the speed of the RTI Mover can be calibrated for use with Ocean 2014. The intention is to give an understanding of how an individual calibration can be performed and how to use the calibration data in Ocean 2014.



Introduction

With the release 2015.06 of Ocean 2014 it is possible to make correction for deviations in speed for the RTI Mover. This allows higher precision in the estimation of beam width when using the RTI Mover. At delivery of the RTI Mover the speed is checked and the mechanical construction is adjusted so that the speeds at 83,3 mm/s and 55,6 mm/s are within 2% from nominal value. For the lower available speed settings the variation may be higher.

This Application note describes a method for how the user can measure and use the Speed Correction Factor in Ocean 2014. For detailed information about how the Correction Factor is used, see User's Manuals (or Help File) for Ocean 2014.

Calibration

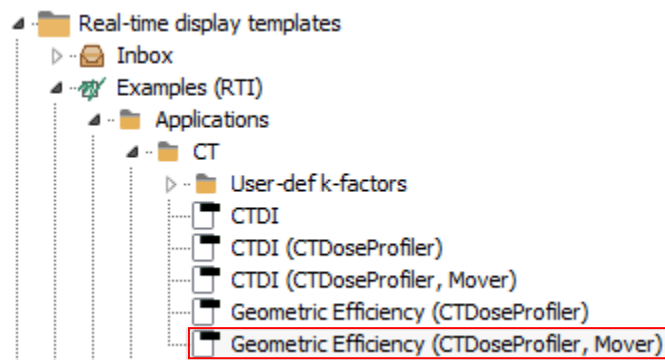
When doing the calibration it is recommended to use a standard fluoroscopy x-ray source with ability to a radiation field size wider than 100 mm. The procedure below assumes that the user is familiar with the use of the CT Dose Profiler, Mover and Ocean 2014.

Material

- Fluoroscopy x-ray source
- RTI Mover
- RTI Piranha and CT Dose Profiler
- Ocean 2014
- Ca 80 mm copper bit (or other attenuating material)

Set-up

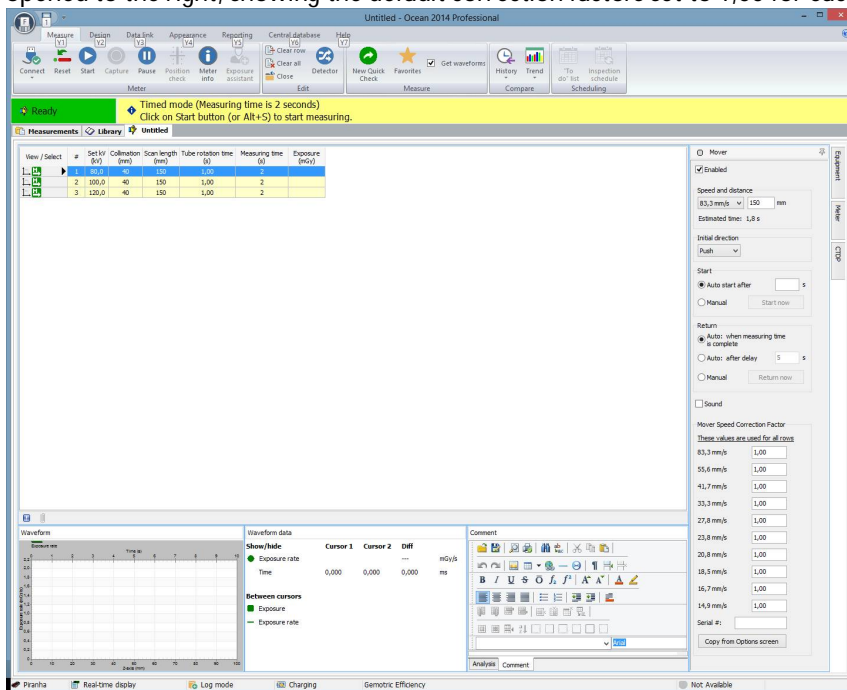
Set up the Mover, CT Dose Profiler, and Ocean 2014 using a template that uses the Mover. For example the RTI example *Geometric Efficiency (CTDoseProfiler, Mover)*. See image below.



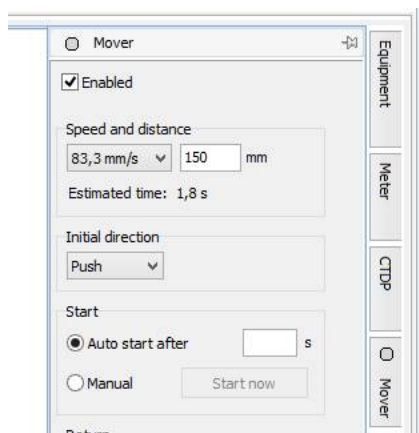
Position the Mover so that the CT Dose Profiler can move inside the plastic rod within the x-ray field during the entire movement. Place an attenuating filter on the plastic tube over the CT Dose Profiler. In this example an 83.0 mm wide, 0.25 mm thick copper filter that is bended to easily fit to the plastic tube. See photo below.



The image below shows the opened template without any changes of settings. The Mover settings screen is opened to the right, showing the default correction factors set to 1,00 for each speed selection.

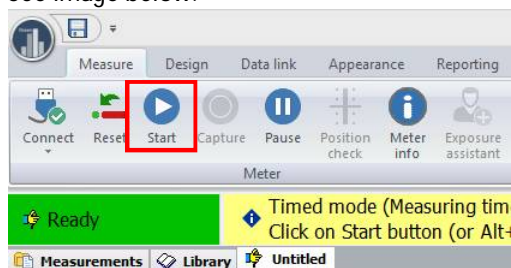


Default setting is 83.3 mm/s and moving distance is 150 mm. See image below. These settings can be kept without change for the calibration of the 83,3 mm/s speed.

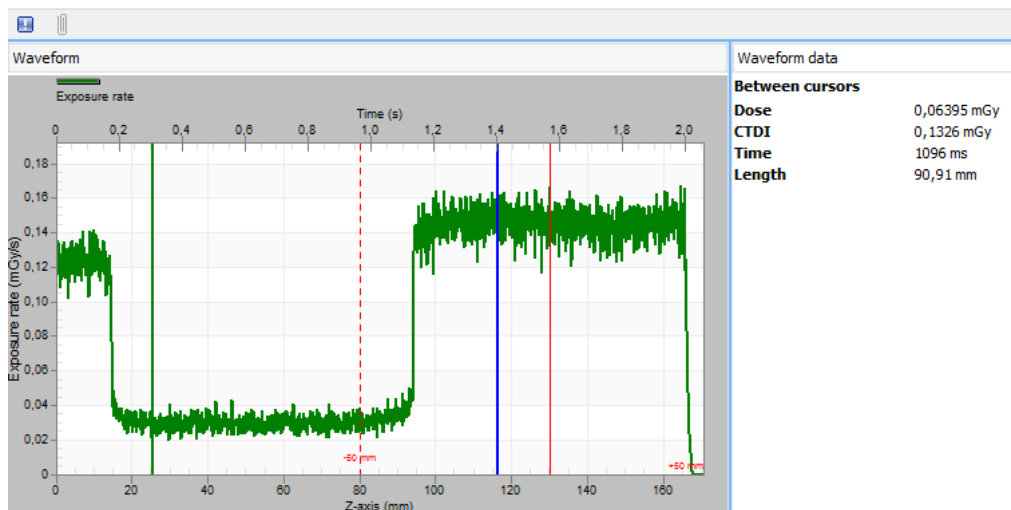


For the calibration measurements the waveform and the waveform data will be used.

Start the fluoroscopic exposure, followed by starting the measurement in Ocean 2014 by pressing the *Start* button. See image below.

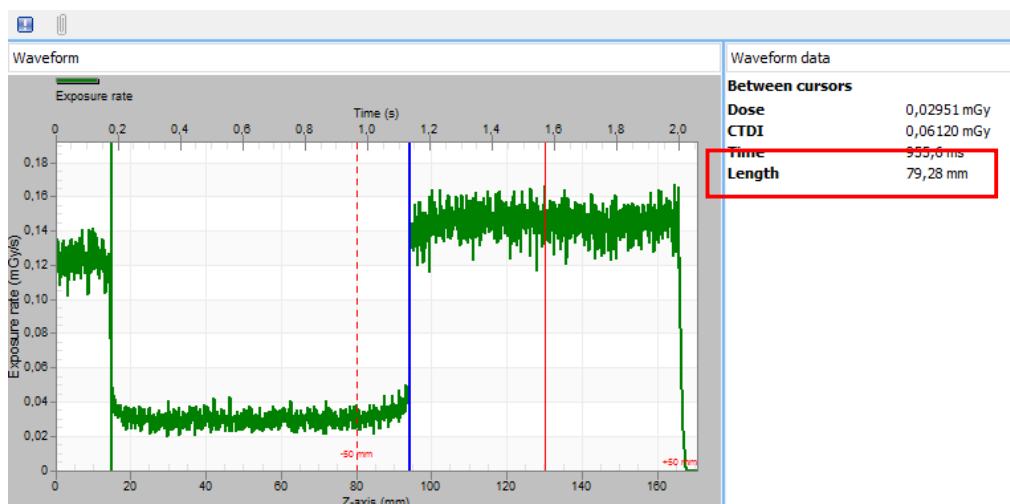


After the timed window of 2 sec has expired – end the exposure. Now the waveform and waveform data shall show something similar to the image below.



The lower part in the waveform comes from the attenuation in the copper filter. For an accurate calibration it is important that the edges between high and low radiation output are sharp.

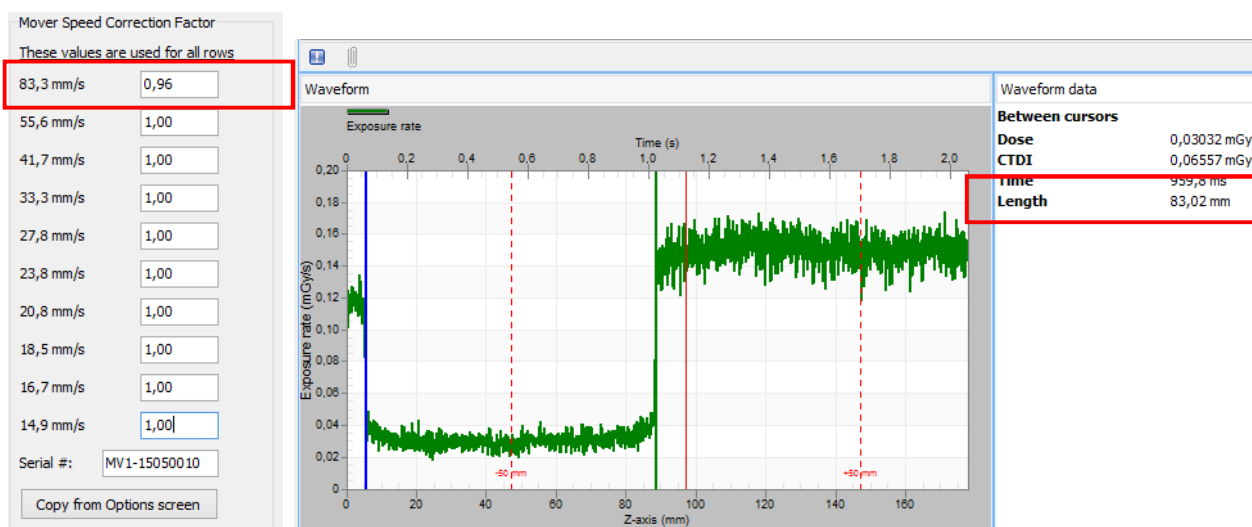
Now move the green and blue cursors to the left and right edge respectively, as in the image below. In this example the distance between the cursors is given as 79,28 mm. The copper bit used for the calibration is 83,0 mm.



The Speed Correction Factor to use in Ocean can then be calculated as.

$$Cf = \frac{Wf-length}{Ref-length} = \frac{79.28}{83.0} = 0.96$$

Applying the Speed Correction Factor in Ocean 2014 and repeating the measurement gives now a measured length of 83.02 mm, see images below.



Now same procedure can be applied for each speed intended for use.
 The image below shows calibration data entered for all speeds available in Ocean 2014.

Mover Speed Correction Factor

These values are used for all rows

83,3 mm/s	<input type="text" value="0,96"/>
55,6 mm/s	<input type="text" value="0,96"/>
41,7 mm/s	<input type="text" value="1,03"/>
33,3 mm/s	<input type="text" value="0,99"/>
27,8 mm/s	<input type="text" value="0,99"/>
23,8 mm/s	<input type="text" value="0,99"/>
20,8 mm/s	<input type="text" value="1,00"/>
18,5 mm/s	<input type="text" value="1,00"/>
16,7 mm/s	<input type="text" value="1,01"/>
14,9 mm/s	<input type="text" value="1,02"/>

Serial #:

When saving the measurements this set of correction data will be saved in this measurement only. Saving as a Real-time display template, or a Test template the set of data will be saved and used by these templates. There is also an option to store the correction data in Ocean 2014 Options. To do that, see instructions in the Mover User's Manual.

*** END ***