How to Properly Use the Dial Gauge to Determine Sample z-Position

Philips X’Pert System

MINT Center
A few facts

• The x-ray line at the sample stage is 20 mm high and 1.2 mm wide.

• Therefore, for samples smaller than 20 mm the intensity method (50% of $I_0$) DOES NOT WORK.

• In this case you NEED to use the dial gauge!

• You HAVE to know how to use it properly!
The Dial Gauge

There are 50 tick marks per half-turn (100 µm). Distance between tick marks = 2 µm.

Distance between each tick mark = 200 µm (= one full turn of the big hand).

This is the true ‘0’ mark

Half a turn corresponds to 100 µm.

When it show 1 mm the sample is at the correct z-position!
1. Count the tick marks the little hand has passed. In this example 4 tick marks have been passed → 4 x 0.2 mm = 0.8 mm.
2. Read the tick marks the big hand is showing (72) → 0.072 mm
3. Add both numbers: 0.8 mm + 0.072 mm = 0.872 mm
How to Read the Gauge (2)

1. Count the tick marks the little hand has passed. In this example 1 tick mark has been passed $\rightarrow 1 \times 0.2 \text{ mm} = 0.2 \text{ mm}$.
2. The big hand went past the other ‘0’ mark $\rightarrow$ add 0.1 mm.
3. Read the tick marks the big hand is showing (48) $\rightarrow 0.048 \text{ mm}$
4. Add the 3 numbers: $0.2 \text{ mm} + 0.1 \text{ mm} + 0.048 \text{ mm} = 0.348 \text{ mm}$
Find the Correct z-Position

1. Carefully increase z until dial gauge hands move.

2. Take the dial gauge reading.

3. Calculate: 1 mm – dial reading = $\Delta Z$

4. Add $\Delta Z$ to the current z shown in the software and type it in as the new position.