Selecting the right Eyepiece Reticle

What is an Eyepiece Reticle?

An eyepiece reticle is a glass disc with a pattern on it that fits at the optical focal plane inside a microscope eyepiece. It is used to provide alignment, measurement, size or shape comparison, or area counting of specimens by having the reticle pattern superimposed over the specimen image.

Selecting your Reticle

There are two things that need to be defined when selecting your reticle:
1. The pattern that is suitable for your application
2. The diameter required to fit your eyepiece

The application or method that you are working to will normally determine the reticle pattern that will be required. For instance, if you are doing straightforward length measurements you may require a simple horizontal scale, if you are performing asbestos analysis you are most likely to need a Walton & Beckett reticle.

One very common mistake that is made when selecting the reticle is with the size of the pattern. If you have a 10mm length scale (such as our NE1) in the eyepiece this does not mean that it will measure 10mm at the specimen stage. You have to take into account the objective magnification.

Actual Size on Reticle / Objective Magnification = Size at the Stage

Example
If using 10X objective lens, 10mm scale on the reticle will represent 1mm at the specimen stage. (10mm/10X = 1mm)

In practical use, if you have a specimen of typically 50 micron (0.050mm) length and you are using a 40x objective then you will need to select a reticle pattern that is able to measure a size of 2mm (0.050mm x 40x = 2mm).

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How to Size and Fit a Microscope Eyepiece Reticle?

Here is a guide to define the right reticle diameter to fit your eyepiece.

- First step would be to contact the microscope manufacturer directly as they might have this information on hand. However some manufacturers may not be able to advise you on the reticle diameter needed that will fit the eyepiece, so you will need to measure it yourself.

- Remove the eyepiece from the microscope and look at the bottom (open) end, There should be a threaded ring or plastic insert that is used to secure the reticle in place.

    - If your eyepiece has a threaded ring then you just need to measure the internal diameter of the eyepiece where that threaded ring is fitted (across the internal thread of the eyepiece).

    - If the eyepiece has a plastic insert then there should be a small recess (where the reticle sits) in the top of it and you should measure the width of that.

    - If neither of these two options is fitted then you will have to get a reticle holder from the microscope manufacturer.

- The reticle is fitted inside the eyepiece at the optical focal plane. The focal plane being the position where both the formed image of the specimen and the reticle are in focus.

> Tips: A good way to find your focal plane can be done by putting a small object such as a pencil up into the tube while looking through the eyepiece. As the pencil is moved up the tube you will see the tip of the pencil come into sharp focus at a certain point. If you now hold the pencil in the same position and turn the eyepiece around the tip of the pencil will be indicating the image (or focal) plane. Hopefully at that position in the eyepiece tube you will be able to see the correct mounting shelf.

- The reticle diameter needs to be a fraction smaller than the inside diameter of the eyepiece at the point of the optical plane. Note that our reticles are manufactured with a diameter tolerance of +0/-0.1mm.

Cleaning Procedure for Reticles

To remove all possible contamination, reticles should be cleaned with a small jet of clean dry air or should be gently brushed with a clean optical brush. If marks remain on the surface (fingerprints for instance), and further cleaning is necessary, a soft cotton swab dampened with acetone should be employed.

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