



# Reticles & Micrometers

VanGuard Eyepiece Reticles are an essential addition to microscopes for measuring, counting, or positioning. All reticles come installed in a 10X, 15X, or 20X eyepiece. VanGuard Stage Micrometers (calibration plates) are slide-mounted scales used to calibrate eyepiece reticles for measurement.

## Scale Reticles

### 5mm, 100 Divisions (0.05mm)

Cat. No.	Reticle Description	Reticle Diameter	Eyepiece	Eyepiece F.O.V.	For Series Models
1400-RSM5C10C	5mm, 100 Divisions (0.05mm)	21mm	10X	18mm	1400BR, 1400PH, 1400FL
1400-RSM5C15C	5mm, 100 Divisions (0.05mm)	21mm	15X	13mm	1400BR, 1400PH, 1400FL, 1200CM, 1200MM, 1200CMI, 1200ECM
1400-RSM5C20C	5mm, 100 Divisions (0.05mm)	21mm	20X	9.5mm	1400BR, 1400PH, 1400FL, 1200CM, 1200MM, 1200CMI, 1200ECM
1200-RSM5C10C	5mm, 100 Divisions (0.05mm)	19mm	10X	18mm	1200CM, 1200MM, 1200CMI, 1200ECM
1200-RSM5C10S	5mm, 100 Divisions (0.05mm)	25mm	10X	20mm	1200SH, 1200SF, 1100Z, 1100S
1200-RSM5C10Z	5mm, 100 Divisions (0.05mm)	25mm	10X	20mm	1200Z, 1100Z, 1100S
1200-RSM5C15SZ	5mm, 100 Divisions (0.05mm)	28mm	15X	15mm	1200SH, 1200SF, 1200Z, 1100Z, 1100S

### 10mm, 100 Divisions (0.1mm)

Cat. No.	Reticle Description	Reticle Diameter	Eyepiece	Eyepiece F.O.V.	For Series Models
1400-RSM10C10C	10mm, 100 Divisions (0.1mm)	21mm	10X	18mm	1400BR, 1400PH, 1400FL
1400-RSM10C15C	10mm, 100 Divisions (0.1mm)	21mm	15X	13mm	1400BR, 1400PH, 1400FL, 1200CM, 1200MM, 1200CMI, 1200ECM
1400-RSM10C20C	10mm, 100 Divisions (0.1mm)	21mm	20X	9.5mm	1400BR, 1400PH, 1400FL, 1200CM, 1200MM, 1200CMI, 1200ECM
1200-RSM10C10C	10mm, 100 Divisions (0.1mm)	19mm	10X	18mm	1200CM, 1200MM, 1200CMI, 1200ECM
1200-RSM10C10S	10mm, 100 Divisions (0.1mm)	25mm	10X	20mm	1200SH, 1200SF, 1100Z, 1100S
1200-RSM10C10Z	10mm, 100 Divisions (0.1mm)	25mm	10X	20mm	1200Z, 1100Z, 1100S
1200-RSM10C15SZ	10mm, 100 Divisions (0.1mm)	28mm	15X	15mm	1200SH, 1200SF, 1200Z, 1100Z, 1100S

### 0.500 in., 100 Divisions (0.005 in.)

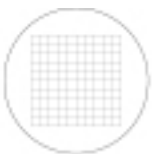
Cat. No.	Reticle Description	Reticle Diameter	Eyepiece	Eyepiece F.O.V.	For Series Models
1400-RSE05C10C	0.500 in., 100 Divisions (0.005 in.)	21mm	10X	18mm	1400BR, 1400PH, 1400FL
1400-RSE05C15C	0.500 in., 100 Divisions (0.005 in.)	21mm	15X	13mm	1400BR, 1400PH, 1400FL, 1200CM, 1200MM, 1200CMI, 1200ECM
1400-RSE05C20C	0.500 in., 100 Divisions (0.005 in.)	21mm	20X	9.5mm	1400BR, 1400PH, 1400FL, 1200CM, 1200MM, 1200CMI, 1200ECM
1200-RSE05C10C	0.500 in., 100 Divisions (0.005 in.)	19mm	10X	18mm	1200CM, 1200MM, 1200CMI, 1200ECM
1200-RSE05C10S	0.500 in., 100 Divisions (0.005 in.)	25mm	10X	20mm	1200SH, 1200SF, 1100Z, 1100S
1200-RSE05C10Z	0.500 in., 100 Divisions (0.005 in.)	25mm	10X	20mm	1200Z, 1100Z, 1100S
1200-RSE05C15SZ	0.500 in., 100 Divisions (0.005 in.)	28mm	15X	15mm	1200SH, 1200SF, 1200Z, 1100Z, 1100S



5mm Scale



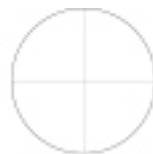
10mm Scale



100 Square Grid



400 Square Grid



Crosshair



Pointer

## Grid Reticles

### 10mm x 10mm, 100 Squares (1mm<sup>2</sup>)

Cat. No.	Reticle Description	Reticle Diameter	Eyepiece	Eyepiece F.O.V.	For Series Models
1400-RGM10110C	10x10mm, 100 Squares (1mm <sup>2</sup> )	21mm	10X	18mm	1400BR, 1400PH, 1400FL
1400-RGM10115C	10x10mm, 100 Squares (1mm <sup>2</sup> )	21mm	15X	13mm	1400BR, 1400PH, 1400FL, 1200CM, 1200MM, 1200CMI, 1200ECM
1400-RGM10120C	10x10mm, 100 Squares (1mm <sup>2</sup> )	21mm	20X	9.5mm	1400BR, 1400PH, 1400FL, 1200CM, 1200MM, 1200CMI, 1200ECM
1200-RGM10110C	10x10mm, 100 Squares (1mm <sup>2</sup> )	19mm	10X	18mm	1200CM, 1200MM, 1200CMI, 1200ECM
1200-RGM10110S	10x10mm, 100 Squares (1mm <sup>2</sup> )	25mm	10X	20mm	1200SH, 1200SF, 1100Z, 1100S
1200-RGM10110Z	10x10mm, 100 Squares (1mm <sup>2</sup> )	25mm	10X	20mm	1200Z, 1100Z, 1100S
1200-RGM10115SZ	10x10mm, 100 Squares (1mm <sup>2</sup> )	28mm	15X	15mm	1200SH, 1200SF, 1200Z, 1100Z, 1100S

### 10mm x 10mm, 400 Squares (0.5mm<sup>2</sup>)

Cat. No.	Reticle Description	Reticle Diameter	Eyepiece	Eyepiece F.O.V.	For Series Models
1400-RGM100510C	10x10mm, 400 Squares (0.5mm <sup>2</sup> )	21mm	10X	18mm	1400BR, 1400PH, 1400FL
1400-RGM100515C	10x10mm, 400 Squares (0.5mm <sup>2</sup> )	21mm	15X	13mm	1400BR, 1400PH, 1400FL, 1200CM, 1200MM, 1200CMI, 1200ECM
1400-RGM100520C	10x10mm, 400 Squares (0.5mm <sup>2</sup> )	21mm	20X	9.5mm	1400BR, 1400PH, 1400FL, 1200CM, 1200MM, 1200CMI, 1200ECM
1200-RGM100510C	10x10mm, 400 Squares (0.5mm <sup>2</sup> )	19mm	10X	18mm	1200CM, 1200MM, 1200CMI, 1200ECM
1200-RGM100510S	10x10mm, 400 Squares (0.5mm <sup>2</sup> )	25mm	10X	20mm	1200SH, 1200SF, 1100Z, 1100S
1200-RGM100510Z	10x10mm, 400 Squares (0.5mm <sup>2</sup> )	25mm	10X	20mm	1200Z, 1100Z, 1100S
1200-RGM100515SZ	10x10mm, 400 Squares (0.5mm <sup>2</sup> )	28mm	15X	15mm	1200SH, 1200SF, 1200Z, 1100Z, 1100S



# General Reticles

## Crosshair

Cat. No.	Reticle Description	Reticle Diameter	Eyepiece	Eyepiece F.O.V.	For Series Models
1400-RCH10C	Crosshair	21mm	10X	18mm	1400BR, 1400PH, 1400FL
1400-RCH15C	Crosshair	21mm	15X	13mm	1400BR, 1400PH, 1400FL, 1200CM, 1200MM, 1200CMI, 1200ECM
1400-RCH20C	Crosshair	21mm	20X	9.5mm	1400BR, 1400PH, 1400FL, 1200CM, 1200MM, 1200CMI, 1200ECM
1200-RCH10C	Crosshair	19mm	10X	18mm	1200CM, 1200MM, 1200CMI, 1200ECM
1200-RCH10S	Crosshair	25mm	10X	20mm	1200SH, 1200SF, 1100Z, 1100S
1200-RCH10Z	Crosshair	25mm	10X	20mm	1200Z, 1100Z, 1100S
1200-RCH15SZ	Crosshair	28mm	15X	15mm	1200SH, 1200SF, 1200Z, 1100Z, 1100S

## Pointer

Cat. No.	Reticle Description	Reticle Diameter	Eyepiece	Eyepiece F.O.V.	For Series Models
1400-RPT10C	Pointer	21mm	10X	18mm	1400BR, 1400PH, 1400FL
1400-RPT15C	Pointer	21mm	15X	13mm	1400BR, 1400PH, 1400FL, 1200CM, 1200MM, 1200CMI, 1200ECM
1400-RPT20C	Pointer	21mm	20X	9.5mm	1400BR, 1400PH, 1400FL, 1200CM, 1200MM, 1200CMI, 1200ECM
1200-RPT10C	Pointer	19mm	10X	18mm	1200CM, 1200MM, 1200CMI, 1200ECM
1200-RPT10S	Pointer	25mm	10X	20mm	1200SH, 1200SF, 1100Z, 1100S
1200-RPT10Z	Pointer	25mm	10X	20mm	1200Z, 1100Z, 1100S
1200-RPT15SZ	Pointer	28mm	15X	15mm	1200SH, 1200SF, 1200Z, 1100Z, 1100S

# Application-Specific Reticles

## Howard Mold Count (HMC)

Cat. No.	Reticle Description	Reticle Diameter	Eyepiece	Eyepiece F.O.V.	For Series Models
1400-RHM10C	Howard Mold Count (HMC)	21mm	10X	18mm	1400BR, 1400PH, 1400FL
1400-RHM15C	Howard Mold Count (HMC)	21mm	15X	13mm	1400BR, 1400PH, 1400FL, 1200CM, 1200MM, 1200CMI, 1200ECM
1400-RHM20C	Howard Mold Count (HMC)	21mm	20X	9.5mm	1400BR, 1400PH, 1400FL, 1200CM, 1200MM, 1200CMI, 1200ECM
1200-RHM10C	Howard Mold Count (HMC)	19mm	10X	18mm	1200CM, 1200MM, 1200CMI, 1200ECM

## Walton & Becket (3:1 Ratio)

Cat. No.	Reticle Description	Reticle Diameter	Eyepiece	Eyepiece F.O.V.	For Series Models
1400-RWB310C	Walton & Becket (3:1 Ratio)	21mm	10X	18mm	1400BR, 1400PH, 1400FL
1400-RWB315C	Walton & Becket (3:1 Ratio)	21mm	15X	13mm	1400BR, 1400PH, 1400FL, 1200CM, 1200MM, 1200CMI, 1200ECM
1400-RWB320C	Walton & Becket (3:1 Ratio)	21mm	20X	9.5mm	1400BR, 1400PH, 1400FL, 1200CM, 1200MM, 1200CMI, 1200ECM
1200-RWB310C	Walton & Becket (3:1 Ratio)	19mm	10X	18mm	1200CM, 1200MM, 1200CMI, 1200ECM

# Stage Micrometers

Cat. No.	Scale	Increments	For Series Models
1200-SMM	1.0mm	0.01mm / 0.05mm / 0.1mm	1400BR, 1400PH, 1400FL, 1200CM, 1200MM, 1200CMI, 1200ECM
1200-SME	0.1 in.	0.001 in. / 0.005 in. / 0.01 in.	1400BR, 1400PH, 1400FL, 1200CM, 1200MM, 1200CMI, 1200ECM
1200-SMME	1.0mm / 0.1 in.	0.01mm / 0.05mm / 0.1mm -- 0.001 in. / 0.005 in. / 0.01 in.	1400BR, 1400PH, 1400FL, 1200CM, 1200MM, 1200CMI, 1200ECM

# Reticle Selection

When selecting the proper reticle, ONLY the objective power should be taken into consideration. The following equation is used:

$$\text{DESIRED VALUE} \times \text{OBJECTIVE POWER} = \text{RETICLE DIVISION}$$

**Example:** 0.01mm x 10X = 0.1mm per division

Therefore: 0.1mm x 100 divisions = 10mm/100 parts (1200-RSM10C Series)

Based on the following equation, listed below are examples of the different values obtained from a single reticle (cat. no. 1200-RSM10C), when used with various objective settings:

$$\frac{\text{RETICLE DIVISION}}{\text{OBJECTIVE POWER}} = \text{VALUE PER DIVISION}$$

- 0.1mm @ 4X Objective Setting = 0.25mm per division
- 0.1mm @ 10X Objective Setting = 0.01mm per division
- 0.1mm @ 25X Objective Setting = 0.04mm per division
- 0.1mm @ 40X Objective Setting = 0.025mm per division
- 0.1mm @ 100X Objective Setting = 0.001mm per division

Reticles must be calibrated to each objective for precise measurements.

# Calibration Procedure

Both the stage micrometer and eyepiece reticle should be graduated in the same system (Metric or English), it is easiest to find the number of times an object is magnified by the objective and the field lens of the given eyepiece when focused in the plane of the eyepiece reticle.

$$\frac{\text{VALUE ON EYEPIECE RETICLE}}{\text{VALUE ON STAGE MICROMETER}} = \text{MAGNIFICATION FACTOR}$$

**Example:** An object measures 3.4mm on the eyepiece reticle and 0.34mm on the stage micrometer. The magnification factor is 3.4 divided by 0.34 which equals 10.0.

Therefore:

$$\frac{\text{SIZE OF OBJECT IN THE EYEPIECE}}{\text{MAGNIFICATION FACTOR}} = \text{ACTUAL SIZE OF OBJECT}$$

**Example:** If an object measures 1.6mm on the eyepiece reticle, its actual size is 1.6 divided by 10.0 or 0.16mm.