

**OEG**Optik
Elektronik
Gerätetechnik

Precision-Diamond-Scriber MR 200

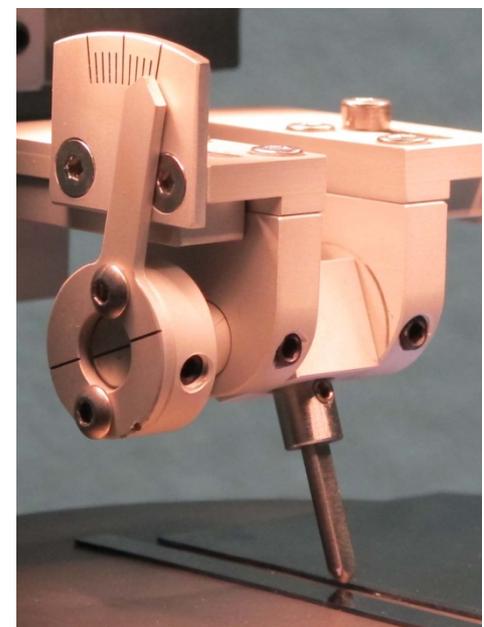
manual scribing for precise cutting of structured silicon wafers

MR 200 - das ideal tool for REM-preparations in semiconductor technology

The setup and the equipment of MR 200 enables high precision scribing for defined cutting of structured silicon wafers. The MR 200 is an indispensable tool, in particular for REM preparations in semiconductor technology. The MR 200 is also suited for singling of chips in low numbers, for example in laboratory use.

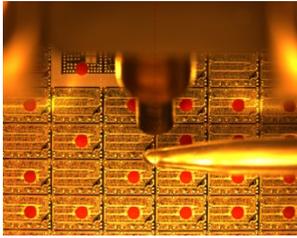
Technical Parameters

- Basic frame of extruded profile
- Size (B x T x H): appr. (400 x 800 x 600) mm
- weight appr. 20kg
- electromagnetic scribing power generation
(on inquiry: pneumatic scribing power generation for higher scribing force)
- control of scribing diamond by footswitch
(lowering, lift off)
- adjustable scribing power (35g...120g, others on inquiry)
- Width of scribing groove ca. 5 μ m...10 μ m
(dependent on scribing power and material)
- adjustable lowering speed
- adjustable height of scribing diamond
- adjustable work angle of scribing diamond
- high quality Zoom-microscope with stepless adjustment of magnification in the range 8x...40x
- hair cross eyepiece for exact adjustment of scribing line according edges, structures and reference marks etc.
- resolution of optics better 10 μ m at magnification 10x
- teflon coated vacuum-waferchuck, mounted of x/y-stage, diameter 200mm (on inquiry 100mm)
- angle fine adjustment of waferchucks by micrometer screw (10 μ m resolution = 0,006°)
- exact 90°-rotation of the chuck without switch off of vacuum
- adjustable stops for 90°-rotation of the chuck
- manual x/y-stage, stroke (205 x 205)mm for scribing movement and rough positioning
- 25mm Micrometer screw for fine positioning crosswise to scribing direction
- 10mm micrometer screw for fine positioning in scribing direction
- LED ring light with brightness control and power supply
- minimum specimen size appr.: (10 x 10)mm
- wafer thickness: all standard thicknesses of si-wafers
- materials: silicon, saphire (other materials on inquiry)
- video system (also with image processing software) as attachment available
- optics with higher magnification/resolution alternatively available

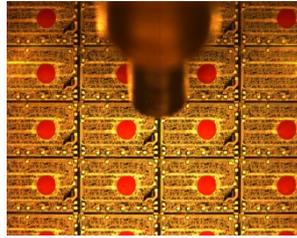


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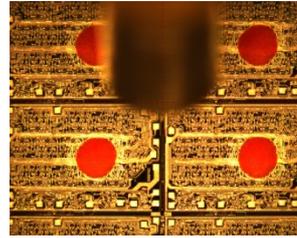
The high quality zoom optics allows stepless adjustment of magnification from 8x to 40x. Many attachments for additional features are available for the microscope.



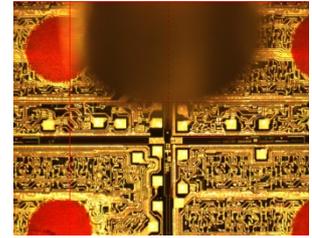
8x



16x



32x



40x

Optional attachments

1. Digital gauge 100mm/200mm for table movement crosswise to scribing direction

The 25mm micrometer can be replaced by a digital gauge.

Optional the digital gauge can have 100mm (above picture) or 200mm measuring range (picture below).

The readout of the digital gauges is 10µm.

This option supports the scribing of lines with exact defined distance.

In connection with the exact 90°-rotation of the chuck it is also possible, to scribe a grid very accurate.

Using the digital gauge, the option of rough and fine positioning remains.

Only the fine positioning is extended to 100mm instead of 25mm and takes place by an high accurate spindle.

There are some differences in construction between the 100mm and the 200mm digital gauges.

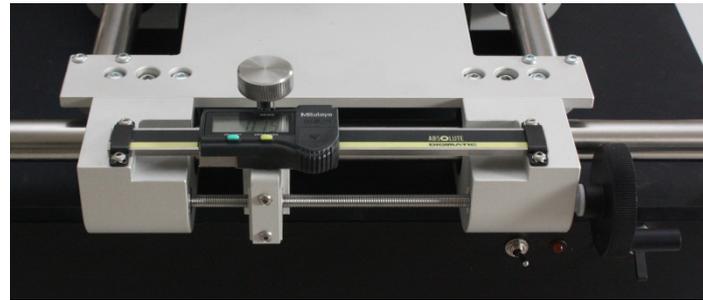
While the 100mm digital gauge does not measure the way during rough positioning, the 200mm measures the way. Because the mechanical effort is higher for the 200mm gauge, the MR 200 extends his mechanical width to around 500mm. If you need advice, which gauge to choose, please do not hesitate to contact OEG.

2. Upgrade kit for camera adaption

The upgrade kit for adaption of a CCD-camera consists of the according microscope building groups.

Additionally necessary is the camera itself and a monitor or PC with image processing.

Customer can choose own solutions for that or use the OEG offer for camera and PC with software.





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3. Color-video system

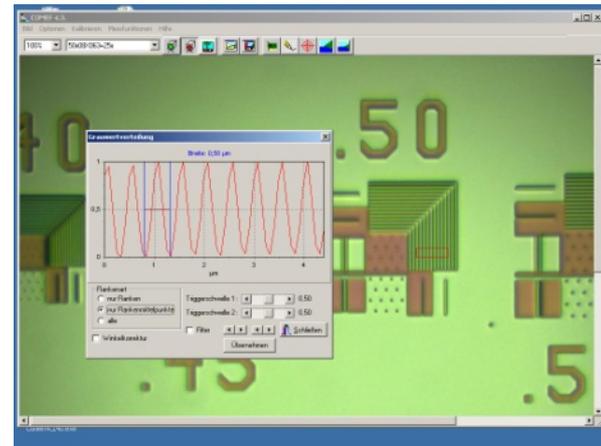
Consisting of:

- USB 2.0 CCD-camera
- All-in-one computer
- Image processing software

In connection with the upgrade kit for camera adaption (point 2 of this description), this equipment supports the inspection of the microscope image by eyepiece and on the computer monitor at the same time.

The image processing system offers many helpful functions like:

- Live video representation of the camera image on the computer scree
- saving, loading, lettering of images as jpg or bmp
- insertion of haircross, grid, ruler
- measuring functions: distance, angle, radius, area, length.



4. Line width measurement

Another extension of the image processing software is the tool for line width measurement. This module is proven in semiconductor technology for high accurate measurement of structures (width, distance). The measurement takes place using grey value distributions in the image. No more manual marks must be set.

5. MR 200 Basic device

On request OEG supplies the MR 200 without microscope and light source. The customer can use own equipment.

The microscope must have a working distance of around 70mm.

The illumination should be a ring light.

6. Pneumatic scribing power generation

The scribing power is generated by an electromagnet. If the scribing power, generated with this principle is not sufficient, a pneumatic scribing power generation for more scribing force is available. If there are any doubts about the necessary scribing power, please contact OEG.



Exact scribing, easy operation

After positioning the substrate on the chuck, the microscope is focused on the wafer surface. By manual driving of the table into x- and y-direction, the scribing line can be adjusted to reference marks or structures on the specimen. The high quality zoom microscope allows a fast change between overview and detailed inspection of the specimen. Using the fine adjustment of the x/y-table the wafer can be positioned very accurate. The touchdown point of the scribing diamond can be adjusted. The hair cross of the eye piece or the hair cross on the monitor defines the touchdown point of the scribing diamond. The scribing diamond is controlled by a foot switch (raise / lower), so that the scribing movement can be controlled with both hands. If the scribing line is defined, the diamond is lowered by help of the foot switch. For scribing the wafer, the complete chuck is moved manually.