Reticles:

Reticles are a part of collimators, testing telescopes and autocollimators. All reticles have a diameter of 12 mm and a thickness of 1 mm. The free aperture of a reticle used at the illuminated side of an autocollimator is 6 mm and at the eyepiece side 10 mm. The free aperture of reticles used in collimators and telescopes is 10 mm.

General selection criteria:

- For focal lengths more than 300 mm or extensive stopping down (for example when using mirrors with small diameter) reticles with bigger line thickness are recommended.
- When using autocollimators or testing telescopes with 90°-viewing and reticles with lettering (e.g. coordinate division etc.) please specify the direction of use (see figure A, B, C, D).
- Determination of the wedge error of optical components:
  - Collimator reticles: Diaphragms 208 740...208 759
  - Eyepiece reticles: Crossline (208 111...208 115)
  - or Collimator reticles: Crossline (208 111...208 118)
  - Eyepiece reticle: mm-scale (208 304)
- Fast angle measurement:
  - Collimator reticles: Polar coordinate reticle (208 241, 208 860) or mm-scale (208 407)
  - Eyepiece reticles: Crossline (208 111...208 115)
- Adjustment for sharpness of optical systems and testing for resolution:
  - Collimator reticles: Siemens star (208 201, 208 202) or resolution test (208 211...208 217)
  - Eyepiece reticles: Crossline (208 111...208 115)

Examples for reticle combinations

(The reticle combinations are valid for autocollimators as well as for combinations testing telescope/collimator):

- Adjustment of an autocollimator to a mirror or of a collimator to a telescope:
  - Collimator reticles: Crossline (208 111...208 118)
  - Eyepiece reticles: Double crossline (208 123, 208 125, 208 127)
  - The reticle should be chosen so that, in symmetry adjustment, a bright gap appears between the double crossline and single crossline.

- Angle measurement (Determination of angle deviations):
  - Collimator reticles: Crossline (208 111...208 118)
  - Eyepiece reticles: Arc minute graduations (208 411...208 431) or line-division (208 436...208 443)

Examples for reticle combinations

(The reticle combinations are valid for autocollimators as well as for combinations testing telescope/collimator):

- Adjustments for sharpness of optical systems and testing for resolution:
  - Collimator reticles: Siemens star (208 201, 208 202) or resolution test (208 211...208 217)
  - Eyepiece reticles: Crossline (208 111...208 115)

- Adjustment of an autocollimator to a mirror or of a collimator to a telescope:
  - Collimator reticles: Crossline (208 111...208 118)
  - Eyepiece reticles: Double crossline (208 123, 208 125, 208 127)
  - The reticle should be chosen so that, in symmetry adjustment, a bright gap appears between the double crossline and single crossline.

- Angle measurement (Determination of angle deviations):
  - Collimator reticles: Crossline (208 111...208 118)
  - Eyepiece reticles: Arc minute graduations (208 411...208 431) or line-division (208 436...208 443)

Examples for reticle combinations

(The reticle combinations are valid for autocollimators as well as for combinations testing telescope/collimator):
RETICLES

RETICLES WITH ANGLE GRADUATION

For use as eyepiece graduation

For use as collimator reticle

RETICLES WITH LINE GRADUATION

DIAPHRAGMS/PINHOLES

Ord.-No. Total range of graduation Range of fine graduation Smallest interval To be estimated For instrument

<table>
<thead>
<tr>
<th>Ord.-No.</th>
<th>Description</th>
<th>Remark</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>208 810</td>
<td>Diaphragm 0.061</td>
<td>corresponds 30° for AK 140; negative</td>
<td></td>
</tr>
<tr>
<td>208 811</td>
<td>Diaphragm 0.122</td>
<td>corresponds 1° for AK 140; negative</td>
<td></td>
</tr>
<tr>
<td>208 812</td>
<td>Diaphragm 0.244</td>
<td>corresponds 2° for AK 140; negative</td>
<td></td>
</tr>
<tr>
<td>208 814</td>
<td>Diaphragm 0.367</td>
<td>corresponds 3° for AK 140; negative</td>
<td></td>
</tr>
<tr>
<td>208 815</td>
<td>Diaphragm 0.489</td>
<td>corresponds 4° for AK 140; negative</td>
<td></td>
</tr>
<tr>
<td>208 816</td>
<td>Diaphragm 0.611</td>
<td>corresponds 5° for AK 140; negative</td>
<td></td>
</tr>
<tr>
<td>208 817</td>
<td>Diaphragm 0.790</td>
<td>corresponds 10° for AK 300; negative</td>
<td></td>
</tr>
<tr>
<td>208 818</td>
<td>Diaphragm 0.966</td>
<td>corresponds 20° for AK 300; negative</td>
<td></td>
</tr>
<tr>
<td>208 819</td>
<td>Diaphragm 0.670</td>
<td>corresponds 30° for AK 300; negative</td>
<td></td>
</tr>
<tr>
<td>208 820</td>
<td>Diaphragm 0.966</td>
<td>corresponds 1° for AK 300; negative</td>
<td></td>
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<tr>
<td>208 821</td>
<td>Diaphragm 0.526</td>
<td>corresponds 2° for AK 300; negative</td>
<td></td>
</tr>
<tr>
<td>208 822</td>
<td>Diaphragm 0.790</td>
<td>corresponds 3° for AK 300; negative</td>
<td></td>
</tr>
<tr>
<td>208 823</td>
<td>Diaphragm 0.367</td>
<td>corresponds 3° for AK 140</td>
<td></td>
</tr>
</tbody>
</table>
RETICLES

RETICLES WITH CONCENTRIC CIRCLES

Ord.-No. Description Remark
208 232 Concentric circles 0,168-0,38 Ø 0,168 mm; 0,38 mm, crossline 0,01
208 235 Concentric circles 0,5-8 double crossline Ø 0,5; 1; 2; 3; 4; 5; 6; 7; 8 mm; double crossline line space 0,04
208 241 Polar coordinate FK300 2° to 30°, interval 2° for K, F 300
208 860 Concentric circles 0,5-8 double crossline as 208 235 but mirror imaged

ORD.-NO. DESCRIPTION/REMARK
208 232 Resolution test 0,0044...0,252 corresponds USAF-Test group 2 to 7
208 235 Resolution test 0,0044...0,252 negative corresponds USAF-Test group 2 to 7
208 241 Resolution test 0,281...1,0 negative corresponds USAF-Test group 1
208 860 Resolution test 0,035...0,5 negative corresponds USAF-Test group 1 to 4

RETICLES WITH SCALES (MM-GRADUATION)

Ord.-No. Description Remark
208 304 Scale 4-0-4 graduation 0,050 mm from -4 to +4 mm; interval 0,05 mm
208 310 Scale 0-10 graduation 0,157 mm corresponds to 6° for K, F 90°
208 401 Coordinate graduation 0,100 mm from -4,6 to +4,6 mm; interval 0,10 mm
208 850 Scale 4-0-4 graduation 0,050 mm as 208 304, but mirror-imaged
208 801 Coordinate graduation 0,100 mm as 208 401, but mirror-imaged

ORD.-NO. DESCRIPTION/REMARK
208 211 Focault test 0,0315...0,1 negative
208 212 Focault test 0,016...0,0315 negative

RESOLUTION TESTS

ORD.-NO. DESCRIPTION/REMARK
208 211 Resolution test 0,0044...0,252 corresponds USAF-Test group 2 to 7
208 212 Resolution test 0,0044...0,252 negative corresponds USAF-Test group 2 to 7
208 213 Resolution test 0,281...1,0 negative corresponds USAF-Test group 1
208 214 Resolution test 0,035...0,5 negative corresponds USAF-Test group 1 to 4
208 215 Resolution test 0,0086...0,06 with crossline 0,01 corresponds USAF-Test group 4 to 6

FOCAL TESTS

ORD.-NO. DESCRIPTION/REMARK
208 211 Focault test 0,0315...0,1 negative
208 212 Focault test 0,016...0,0315 negative

SIEMENS STARS

ORD.-NO. DESCRIPTION/REMARK
208 201 Siemens star 2x36 sectors
208 202 Siemens star 60-sectors with crossline 0,02