



# OPERATION INSTRUCTION

## Magnalium Straight Edges

1. This product is mainly used for measuring the straightness and flatness of workpieces, and can also serve as a flat reference standard for calibrating other instruments.



2. Before use, it is necessary to clean the surface of the straight edge and the workpiece to be measured with a clean soft cloth to avoid affecting the accuracy of the measured values.

### 3. Usage :

#### (1) Straightness measurement by dial indicator

- Take the measurement of machine tool guideway straightness as an example: Use the magnalium straight edge as the measurement reference, place it in parallel along the length direction of the guideway, and ensure the entire length of the straight edge covers the area to be measured of the guideway. Then place support blocks at positions about  $2L/9$  away from both ends of the straight edge ( $L$  = length of straight edge).
- Fix the indicator stand stably on the measuring surface of the guideway, ensuring there is no looseness or wobble of the stand.
- Before measurement, it is necessary to level the straight edge. First, move the indicator stand to one end of the inspected guideway, adjust the dial indicator slowly to make its point contact the measuring surface of the straight edge vertically, and record the reading at this time. Then, move the indicator stand smoothly to the other end of the guideway, maintain consistent contact between the point and the measuring surface of the straight edge, and compare the two readings, if the values are equal, this indicates the straight edge has been leveled.
- During measurement, move the indicator stand slowly from one end of the guideway to the other, observe the dial indicator readings. The difference between the maximum and minimum readings is the straightness error of the inspected guideway.

#### (2) Straightness measurement by gauge blocks

- Use two equal-height blocks to support the working surface of the straight edge on the inspected surface. Then insert gauge blocks at equal intervals between the two surfaces, and determine the straightness error of the inspected surface based on the dimensional differences of the inserted gauge blocks.

blocks at a distance of  $2L/9$  from each end ( $L$  = length of straight edge). Adjust the straight edge until the dial indicator readings at both ends are identical. Mark measurement points along the working surface, typically no fewer than 8-10 points.

- Select an autocollimator with a division value of  $0.005\text{mm/m}$  ( $1''$ ), then fix and calibrate the autocollimator. Move the reflector along the straight edge; allow it to stabilize at each point before recording the reading. The straightness error is the difference between the maximum and minimum readings.

- Alternatively, use a dial indicator with an indicator stand and gauge blocks. Press the gauge block firmly against the bottom surface of the straight edge. Adjust the dial indicator's point to contact the gauge block surface. Move the gauge block and indicator stand along the marked points, ensuring continuous contact between the gauge block and the surface.

Record the dial indicator reading at each point, the straightness error is the difference between the maximum and minimum readings.

#### (2) Parallelism measurement

- Place the magnalium straight edge on a granite surface plate. Support it with equal-height blocks at a distance of  $2L/9$  from each end. Adjust the straight edge until the dial indicator readings at both ends are identical. Place a gauge block on the top surface of the straight edge. The gauge block must be large enough to cover the scraped area, providing a stable measurement reference.

- Gently press the dial indicator point against the upper surface of the gauge block. Move the gauge block along the straight edge, maintaining contact between its bottom face and the top surface of the straight edge. Take measurements at marked points and record all dial indicator readings. Flip the straight edge and repeat the above steps. The parallelism error is the difference between the maximum and minimum readings obtained throughout the entire process.

#### Attention:

Magnalium straight edges are not suitable for inspection with electronic levels. Since this type of straight edge has a relatively light weight, it will affect the inspection results when equipped with an electronic level for inspection.

#### 5. Precautions and maintenance:

- Never damage the work surface of the straight edge. After use, store it horizontally or hang it up. Avoid heavy pressure to prevent deformation.
- For long-term storage, apply a thin layer of industrial oil to prevent rust. Do not use acidic cleaners.
- The straight edge must undergo regular calibration, typically at annual intervals, to ensure measurement accuracy