# Large slewing bearing and flange flatness

large-bearing-flatness

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Application template; not a claim of a completed customer project.

## Scope

Flatness and parallelism of mounting faces on wind, construction and large rotary equipment.

## Equipment and configuration guidance

• Autocollimator or laser tracker

• Bridge and equal-height blocks

• Multi-point temperature log

## Principle and calculation

Flatness is the extreme deviation from the fitted plane; parallelism is the extreme difference between corresponding points.

## On-site checklist

• Stations cover bolt spans

• Free and preloaded measured

• Gradient logged

• Local highs marked

## Limitations

Thin flanges deform elastically under preload; free-state results are not the installed condition.

## Detailed teaching example

Worked flatness example on a Ø3000 mm slewing-ring flange

## Scenario and task

Teaching example: twelve equally spaced points on a Ø3000 mm flange; flatness and parallelism are derived from heights, with preload change recorded separately.

## Preparation and measurement steps

01. Confirm diameter, bolt preload state and measurement condition (free or preloaded).

02. Place stations around and across the face, covering bolt spans.

03. Measure heights or angles on one datum.

04. Evaluate flatness and flange parallelism; mark local highs.

## Teaching example readings

• Point deviations in µm: +0, +2, +3, +1, -1, -2, -1, +0, +1, +2, +1, +0 at 30° steps.

• After removing the mean the range is 5 µm.

• Re-measure after preload; the change is recorded separately, not folded into flatness.

## Calculation procedure

Flatness is the maximum deviation from the fitted plane; the residual range here is 5 µm. A three-point datum gives a larger value and must be named.

## Example result and interpretation

The deviation sits in two opposite quadrants, indicating warp rather than tilt. Shims remove tilt, not warp.

## Example verification checklist

• Point count and distribution must match the drawing or agreement; at least twelve for rings.

• Preload force and sequence change the result; log torque and sequence.

• Flatness and parallelism are separate criteria.

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