Bed guideway inspection plan for a roll grinder

roll-grinder-bed

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

Scope

For straightness and twist of the extra-long guideways of a roll grinder bed (12000 mm, example/teaching data). Multi-segment spliced measurement is used; the first station of each segment is re-read to monitor drift, with the temperature field and instrument relocation error tightly controlled.

Equipment and configuration guidance

• Dual-axis long-focus photoelectric autocollimator (0.1″ class)

• 200 mm reflector base and a bridge spanning both guideways (example)

• Multi-point bed thermometers

• Segment markers and drift re-read log

Principle and calculation

Δh=L·tanθ; with L=200 mm, 1″≈0.970 μm (example/teaching data). Splicing minimises squared height differences in the overlaps; twist = roll angle × bridge span B; thermal drift is corrected linearly from each segment's re-read difference.

On-site checklist

• Temperature field log complete

• Drift re-read passed for every segment

• Overlap at least 3 intervals

Suggested records

• Full straightness and twist curves

• Raw segment data and splice parameters

• Temperature and drift correction records

Limitations

Does not cover hot-state grinding deformation or bed deformation under roll weight; the measurement cycle is long, so the report must state the environment window and the temperature correction method.

Detailed teaching example

Roll Grinder Bed Guide Inspection · Tutorial Case

Scenario and task

Teaching demonstration, not a real customer project: first three segments of a long-travel straightness survey on a roll grinder bed guide; data are instructional settings.

Workflow overview

Oil temperature → Head station → Guide segments → Log readings → Straightness

Preparation and measurement steps

01. Clean the bed guide and confirm hydrostatic oil temperature is stable

02. Fix the autocollimator on a stand at the head of the bed

03. Survey with a 200 mm bridge along the V-guide step by step

04. Record the pitch reading per segment

05. Cumulate three segments for straightness results

Teaching example readings

• Bridge span L=200 mm; segment 1 autocollimator reading θ□=+1″

• Segment 2 autocollimator reading θ□=+0.5″

• Segment 3 autocollimator reading θ□=-1.5″

Calculation procedure

Height conversion: Δh = L·tan(θ·π/648000)×1000 (μm). Segment 1: 200×tan(+1″)=+0.97 μm; Segment 2: 200×tan(+0.5″)=+0.48 μm; Segment 3: 200×tan(-1.5″)=-1.45 μm. Cumulative heights: 0→+0.97→+1.45→+0.00 μm; peak-to-valley PV=+1.45−(+0.00)=+1.45 μm.

Example result and interpretation

Tutorial result PV≈1.45 μm, demonstrating long-travel guide inspection on the grinder bed.

Example verification checklist

• Measure only after hydrostatic oil temperature stabilises

• Bridge contacts the guide without gaps

• Check instrument zero before surveying

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