



# Gear Accuracy

## Testing and Inspecting



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Is machining alone enough to guarantee gear accuracy?

- No, Gear accuracy depends on tooth geometry and assembly-related deviations, so it must be measured and verified.

Core inspection targets (what accuracy means in practice):

- Tooth profile (involute form accuracy)
- Tooth trace / lead (helix/line direction accuracy)
- Pitch (tooth spacing accuracy)
- Runout (radial/circumferential deviation)
- Composite deviation (overall meshing deviation)

# Gear Accuracy-Testing and Inspecting

Main instruments used to test and inspect gear accuracy:

## 1. Gear Measuring Machine

- Measures tooth profile, lead/trace, pitch, and runout

## 2. 3D Coordinate Measuring Machine (CMM)

- Measures pitch accuracy of racks and general dimensional features (datums, bores, faces)

## 3. Composite Gear Tester

- Tests composite deviation under rolling/meshing conditions



# Gear Accuracy-Testing and Inspecting

Common shop-floor tools used during gear production:

## 1. Vernier calipers / Micrometer calipers / Cylinder gauge

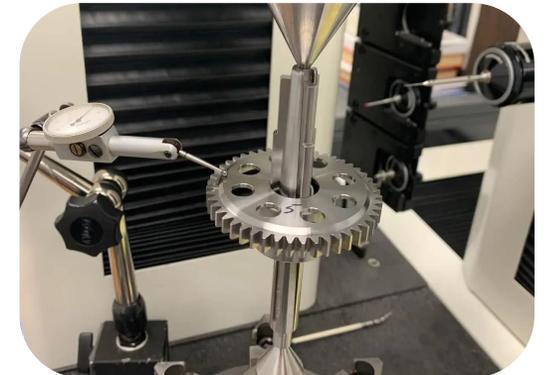
- Measure inside & outside diameters and tooth thickness (as applicable)

## 2. Runout tester

- Measures side face runout and circumferential (radial) runout

## 3. Hardness testing machine

- Measures hardness (heat treatment verification)



## Gear Accuracy-Testing and Inspecting

### 4. Micrometer calipers (span measurement)

- Used to find span measurement across teeth

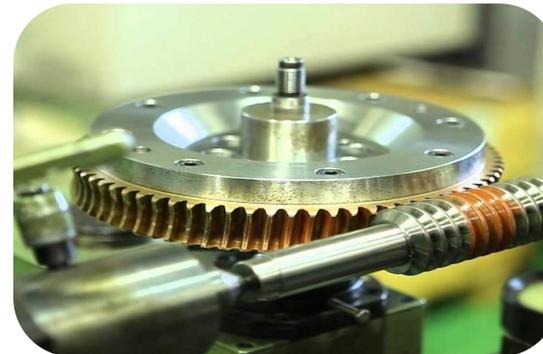


### 5. Gear tooth vernier calipers

- Measures tooth thickness (commonly used for worm/wheel tooth checks)

### 6. Worm gear tester

- Measures tooth contact pattern and backlash



### 7. Bevel gear tester

- Measures tooth contact pattern and backlash



# THANK YOU

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Our gear guides help engineers and sourcing professionals better understand gear design, selection, and applications.

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