

## Ball bearing tester

The BBT enables to test ball bearings for their lifetime under high vacuum up to +300°C.

This facility enables to measure the torque of ball bearings from air to high vacuum. Environments vary from vacuum, non-aggressive gases (e.g. CO<sub>2</sub>) under controllable pressures (e.g. to simulate Martian environment) or to air with controlled humidity. The tests can be performed at temperatures from RT to +300°C.

A testbox is available for 7004 bearings with a maximum preload of 40N. The cages can be manufactured of individual composites (e.g. self-lubricated-polymer-composites). The preload will be measured before and after a BBT-test with a tensile-test-machine.

Post-Analysis may cover measurement of wear by profilometry, SEM or microbalance, investigation of surface structure or material transfer by SEM/EDX.



BBT with inductive heating system

The device is fully PC-controlled. To the control parameters, e.g. sliding distance, motion profiles (uni, oscillating,...), can be selected. On-line-data acquisition offers to post-process data, e.g. for automatic calculation of friction coefficients in running-in- or steady state, as well as endurance of solid lubricant coatings.

### Measurement of

- Torque
- Vacuum, temperature
- Residual gas



Image of a cage size 7004

Specifications	
Test	online measurement of <ul style="list-style-type: none"> <li>• Torque</li> <li>• Environmental Data</li> <li>• residual gas analysis (mass spectrometer of outgassing particles)</li> </ul>
Temperature	from RT up to + 300 °C, thermal cycles available
Loads	20 <> 40 N (other preloads on demand) Pre-load is measured before / after testing
Speed / Motion	Motion selectable from unidirectional to reciprocating (angles selectable) 0,1 to 600rpm
Environments	Vacuum selectable down to 10 <sup>-6</sup> mbar Air with controlled humidity Gases with controllable pressure (e.g CO <sub>2</sub> at 6mbar)
Samples	2 angular ball bearings Testbox available for 7004 bearings, others on demand
Accuracy	Torque ± 0.001 Nm Sample temperature (housing): ±2°C

**This device enables also high temperature testing under vacuum:**

HVT: testing up to +650°C under vacuum in ring-ring-geometry