



## Engineering Services

### Computer Design & Analysis

NHBB utilizes computerized design capabilities which allow complex ball bearing applications to be examined and analyzed. These capabilities ensure the ultra-precision ball bearing you select will meet your specific requirements for performance, life and cost.

### Engineering Test Laboratory

NHBB maintains a fully-equipped Engineering Test Laboratory which allows us to confirm the performance characteristics of our ball bearing designs. The lab contains a full complement of commercially available equipment, as well as specialized equipment developed by NHBB and precisely tailored for specific test requirements, such as our high speed bearing vibration tester (patent pending).

### Materials Laboratory

NHBB Materials Laboratory has been specifically designed and equipped to perform complex chemical, metallurgical and visual analysis of the many component parts in ball bearings. The lab can also be used to perform wear and failure studies on customer bearings.

Metallurgical studies are done with a metallograph and micro-hardness testers. The metallograph performs micro-structure photography at magnifications from 25 to 2000 times. Micro-hardness testers, using diamond indentors under loads from 1 to 10,000 grams, are used to test material hardness.

During laboratory wear studies, ball bearings are disassembled and examined under a laminar flow hood. All findings can be recorded permanently with

a 200X photo-microscope for analysis and future reference.

### Functional Tests for Ball Bearings

NHBB has devised a series of rigidly monitored tests which measure starting and running torques, as well as vibration or "noise" levels. During testing, a ball bearing is normally mounted with a thrust load applied.

Starting torque is a measure of the effort required to initiate bearing rotation under a thrust load and can be a critical factor in applications requiring multiple, low-speed start/stop movements.

Running torque is a measure of the effort required to maintain rotation, under a certain load, after rotation has been initiated. NHBB measures running torque values at standard speeds of 1/2 to 2 RPM with applied thrust loads of 75 or 400 grams. The test is fully monitored with results permanently recorded onto a strip chart. This chart can also be analyzed for various ball bearing characteristics such as surface finish, contamination, brinelling and overall geometry. Testing running torque is time consuming and primarily used on a sample basis or for performing diagnostic analysis. Both torque tests meet MIL-STD-206 requirements.

NHBB has developed Anderson Meter "noise ratings" to assure the consistent performance of every bearing we manufacture. After assembly, Anderson Meters are used to test for bearing noise and vibration under a controlled load and speed.

Please consult NHBB Engineering for recommendations on the many specialized tests we can perform.