

High Alignment Mechanical Grips for Static and Fatigue Tests

The Application Challenge

- For testing metal test samples with buttonhead or threaded attachments.
- For static tension tests, tension-tension stress controlled fatigue tests, and for reversing tension-compression strain controlled tests.
- For Low Cycle (LCF) and High Cycle Fatigue (HCF)
- For Tests such as ASTM E606.

The Solution

- Ratings available to 50 kN (11 kip)
- Backlash free
- Per ASTM E606
- Lightweight and easily mountable without special tools
- Adapter Cups for threaded & button head specimens

GB5-900 mechanical grips are specially engineered for the unique challenges associated with stress and strain controlled tests where loads and strains traverse goes through zero position or zero load, such as low cycle fatigue tests. The grips are also capable of performing static tensile tests and tension-tension fatigue tests.

Experienced users who perform ASTM E606 tests will appreciate and value the unique design features of these grips, which make it possible to achieve the special high alignment requirements of ASTM E606 without all the special tools and efforts normally needed. Once first aligned, the grips hold their alignment and test samples can be loaded and tested quickly and efficiently. The grips feature spherical seals at both ends to ensure minimum angular and axial misalignment of load frame crossheads, load cell and actuator mountings. Using these grips does not require load train alignment prior to testing. Note that alignment checks can be done on the grips using strain gauged high strength LCF steel specimen, in accordance with ASTM E 606 and other such alignment requirements.

In low cycle and even high cycle fatigue testing applications, the test frame lateral and vertical stiffness changes as the test mode reverses from tension to compression, making initial alignment more critical in these applications.



ASTM E606 Strain-Controlled Fatigue Testing

...to minimize bending strains, specimen fixtures should be aligned such that the major axis of the specimen closely coincides with the force axis throughout each cycle. It is important that the accuracy of alignment be kept consistent from specimen to specimen. Alignment should be checked by means of a trial test specimen with longitudinal strain gages placed at four equidistant locations around the minimum diameter. The trial test specimen should be turned about its axis, installed, and checked for each of four orientations within the fixtures. The maximum bending strains so determined should not exceed 5% of the minimum axial strain range imposed during any test program. For specimens having a uniform gage length, it is advisable to place a similar set of gages at two or three axial positions within the gage section. One set of strain gages should be placed at the center of the gage length to detect misalignment that causes relative rotation of the specimen ends about axes perpendicular to the specimen axis.

Note that achieving high compressive strain levels depends on the design of the test sample, the grips and the test frame. These grips meet ASTM E606 requirements.

Grip Models

GB5-901	25 kN (5500 lb)
GB5-902	50 kN (11250 lb)

Sample Inserts

JB5-90X-RTMC8	Insert for Sample mounting - threaded specimen M8 (or English Equivalent)
JB5-90X-RTMC10	Insert for Sample mounting - threaded specimen M10 (or English Equivalent)
JB5-90X-RTMC12	Insert for Sample mounting - threaded specimen M12 (or English Equivalent)
JB5-90X-RTMCB8	Insert for Sample mounting - button headed specimen dia 8 (or English Equivalent)
JB5-90X-RTMCB10	Insert for Sample mounting - button headed specimen dia 10 (or English Equivalent)
JB5-90X-RTMCB12	Insert for Sample mounting - button headed specimen dia 12 (or English Equivalent)

Optional hydraulic versions available (GB5-600) with higher forces and with high temperature options – to 1000C (1800 F)