

**Fatigue Test Systems in TCR Engineering Services Pvt Ltd,  
Mumbai**

Model Number Bi-04-CP-310 free standing 2-column tension compression Universal Testing Machines, available in capacity of 50KN and 250KN that can perform variety of tests on materials and components. These test systems are very economical and easy to install.

**Standard features**

- Make/Brand name – BiSS, Bangalore, India. Now BiSS is taken over by **ITW, IL, USA, a Fortune 200 company.**
- 0–100 Hz cycling frequency [depends on load]
- Hydraulic lifts and clamps
- 50 and 250 KN force rating actuators
- +/- 80 mm stroke actuators
- Adaptable to wide range of fixtures & grips
- Actuator on fixed bottom crosshead
- Electronically servo-controlled variable flow, variable pressure, low noise, energy efficient pump
- 5+ kHz 32-bit digital closed loop control
- 24-bit data acquisition
- User friendly MTL-Windows software with dedicated application software
- Provision for user programmability



**Applications [ASTM E8/8M, E21, E 399, E1290, E1820, E813, E466, E606, E647, BS 7448, ISO 12135]**

- Fatigue crack propagation [ $da/dN$  vs  $\Delta K$  Studies]
- Fracture mechanics [ $K1c$ ,  $J1c$ , CTOD] Testing
- 3 – point bend testing of materials
- Spring Fatigue Testing
- Room temperature and high temperature tests [up to 1000C]
- Tension/compression
- Low/High cycle fatigue (LCF/HCF) Testing
- high temperature tensile tests [up to 1000C]
- High strain rate testing [300mm/sec on 50KN and 100mm/sec on 250KN UTM]
- Slow strain rate testing [ $10^{-7}$  mm/sec on 100kN UTM]

**Standard Specimen size Requirements as per ASTM standards:**

**For CTS Geometry** [Thickness 12.5mm]: 60mm x 62.5mm [K1c test] and 61mm x 63.5mm [J1c Test]

**For SENB Geometry:** [L x B x W]: [55mm x 5mm x 10mm] and [114.4mm x 12.7mm x 25.4mm]

**TCR Engineering Services Pvt Ltd.**

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## Accessories used in BiSS UTM [50kN and 250kN]

### Grips and Fixtures:

1. **Tensile Wedge Grips:** [50 kN & 250 kN with multiple wedge selection].

For 50kN machine, Wedges to grip specimens of thickness up to 15 mm and round specimens of diameter 2.5 mm to 7.0 mm.

For 250kN machine, Wedges to grip specimens of thickness up to 24 mm and round specimens of diameter 3.0 mm to 27.0 mm.

2. **LCF / tensile Grips:** 50 kN & 250 kN with mounting cups for M8, M12 & M16 round threaded specimens
3. **Compression Platen:** These Platens are made up of Hardened steel. They are having etched concentric rings on the surface for specimen centering and for inhibiting slide without affecting the test. 100mm diameter for 50 kN and 150mm diameter for 250 kN BiSS machine.
4. **3-Point Bend Fixture Fatigue & Fracture Mechanics Applications**  
3-point Bend Fixtures with adjustable span widths of 50-300mm. For 50 kN [50-160 mm span] and for 250 kN [50-300 mm span]. They are used to conduct fatigue and fracture mechanics tests as per ASTM standards.
5. **Clevis Grip set for CTS specimen** [For Fatigue and Fracture Mechanics K1c, CTOD, J1c testing].  
Clevis Grips for **Specimen Thickness [width]:** 6.54/12.7/25.4 mm. Pin Diameter: 6.30mm and 12.70mm.

### Displacement Transducers:

#### [COD gages and Extensometers for Room temperature and high temperature]

1. **COD Gauge for Fatigue & Fracture Mechanics Applications**
  - Room Temperature COD Gage with 10mm gage length & +7/-1 mm travel
  - High Temperature COD Gage with 5mm gage length & +2/-0.5 mm travel
2. **Tension/compression extensometer [Room Temperature]**
  - Room Temperature extensometer with 12.5mm gage length & +1/-1 mm measuring range.
  - Room Temperature extensometer with 25mm gage length & +6/-3 mm measuring range.
3. Room Temperature extensometer with 50mm gage length & +6/-3 mm measuring range.
4. **LCF/tensile Extensometer for high temperature:**
  - High Temperature extensometer with 10mm gage length & +1.5/-1.5 mm measuring range.

### Others

1. 3 Zone Split Tube type Furnace rated up to 1200°C. This is built with an outer stainless steel shell. Quartz window for viewing. PID control system with auto-tuning options. Temperature control accuracy +/- 5 deg C.
2. 100 kN load cell
3. Alignment Fixtures

#### TCR Engineering Services Pvt Ltd.

**Overview of TestResource Asia [TRA], BiSS – Bangalore, India:**

**[Now BiSS is taken over by ITW, IL, USA, a Fortune 200 company]**

TestResources is a global partnership offering products and services related to mechanical testing for performance, durability, strength and fracture.

TestResources Asia (TRA) is the largest single member of the partnership with over a hundred personnel spread across the continent. TRA is administered by Bangalore Integrated System Solutions (P) Ltd (BiSS), the country's largest developer and manufacturer of servo-hydraulic test equipment. TRA distributors and service personnel support a number of BiSS testing machines installed in India, Malaysia, China and Taiwan, as well as in Russia, Ukraine and Belarus.

BiSS is also a major equipment and component vendor to Test Resources Incorporated (TRI), Minneapolis, USA. TRI is the exclusive distributor for BiSS testing machines in North and South America, TRI have installed a number of BiSS servo-hydraulic testing machines and control systems in the US, supporting industry, academia and private test laboratories.

BiSS has over 15 years' experience in the development, manufacture and support of a wide variety of servo-controlled mechanical testing machines. The 70-strong team at BiSS has over 100 man years of experience in engineering test equipment; these have made BiSS technology unique in many ways. We are proud to be associated with leading aerospace, defence and nuclear power establishments.

**20 years of innovation in cost effective solutions in servo-hydraulics and now a unit of ITW, IL, USA, a Fortune 200 company. ITW-BiSS is a Partnership company with DSIR recognized R&D unit including testing services, developmental laboratory and calibration facility.**



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