

Test systems for the railway industry | IBMT4-5000

INTRODUCTION

The IBMT4-5000 multipurpose testing machine can perform static and dynamic tests (tensile, compression and bending) on rail joints, supports and concrete sleepers.

TEST STANDARDS

The IBMT4-5000 machine allows testing in accordance with the main international standards, including:

- RAIL JOINTS: EN 14587-1, EN 14587-2, EN 14730-1, AREMA chapter 4, AS 1085.12, AS 1085.20, etc.
- SUPPORTS AND SLEEPERS: EN 13230-2, EN 13230-3, EN 13230-4, AREMA chapter 30, AS 1085.14, etc.

FEATURES AND ADVANTAGES

TESTING FRAME

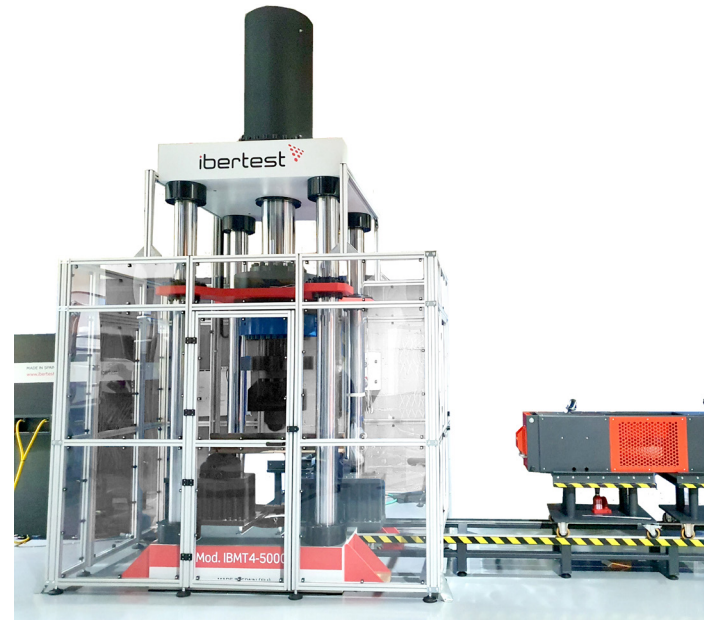
- Very high stiffness testing frame with a versail design including the standard bending device (3 points) and an integral protection system, with side doors for the introduction of the sample (rail). The doors are equipped with electric safety locks.
- As an option, is it possible to install additional test devices.

HYDRAULIC SYSTEM AND ACTUATOR

- It incorporates the new *EcoHydraulic* system, which provides major improvements over traditional hydraulic control systems in terms of efficiency (up to 20% higher), adaptive flow and pressure control depending on the instantaneous test load, giving it a longer life, less maintenance and lower oil consumption.
- Closed-loop control of force and travel by a high-response servo valve.
- Thanks to its integration with the testing software, it is possible to automatically perform safe shutdown operations, check the operating time of the hydraulic plant for scheduled maintenance and digitalize all the alarms of the hydraulic system.
- Double acting single rod hydraulic actuator for static and pseudo-static loads with a typical capacity of 5000 kN compression and 2700kN tensile.
- The low friction seal and scraper are designed to allow smooth and precise movements for accurate control with minimal wear to reduce maintenance requirements over the life of the machine.

CONTROL ESLECTRONICS

- The system incorporates the new *MD5i* control electronics with 24-bit resolution and 10 kHz closing loop frequency for fast and accurate control of test parameters. This means, among other advantages, that minimal variations in force or deformation can be observed during the test.



Force Transducer (Load Cell)

- High stiffness force transducer for static and dynamic testing.

Stroke Transducer

- Magnetostrictive linear position sensor, absolute, non-contact, digital output, with direct mounting inside the piston, resolution 0.5 μm .

Safety

- Protection including side doors with electric safety locks that allow the introduction of the specimens in an easy way and a total security during the test.
- Complete system alarmas (Temperature, Oil level, Dirty filter detection, pressure filter, maximum pressure, etc) integrated with control software for safety stops and test protection.
- Hydraulic piston safety lock system that immediately stops the piston in case of electrical failure to protect system and the test sample.

Maintenance and Support

- Intelligent maintenance system, which evaluates the condition and count operating hours to warns the user of all necessary preventive and corrective maintenance actions.

Options:

- The UCRD-8i remote control (optional) allows testing without a computer. 16 Function keys: Up, Down, Stop, open and close jaws, configurable keys (machine control), DigiPoti for precise movement control and a 400x200 pixel colour touch screen.



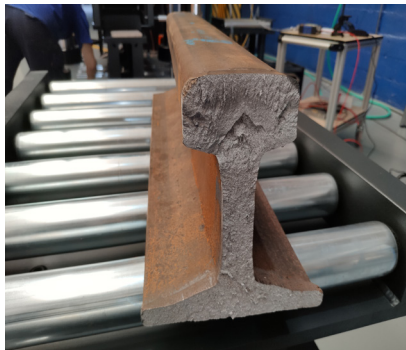
Technical specifications

MODELS AND FEATURES

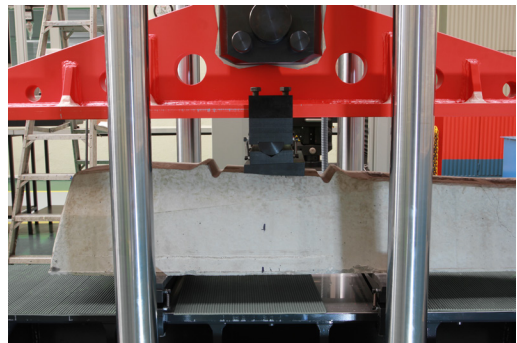
MODEL	IBMT4-5000
Maximum traction-compression force	5000/2700 kN
Force measurement	High stiffness strain gauge force transducer for static and dynamic tests.
Calibrated measuring range	1% to 100% of the nominal capacity of the load cell
Class	0.5 according to EN-ISO 7500-1 standard
Resolution in force	24 bits (10 ⁷ points).
Frame	4 hardened steel columns
Vertical distance between compression plates ¹	0-1550 mm
Horizontal distance between columns.	1000 mm
Heavy-duty protection cage for rail bending test	Made of steel. With access door for sample placement and another for sample extraction.
Heavy-duty protective cage for tensile-compression testing of insulated rail joints	Made of steel. With removable housings
Perimeter protection for sleeper testing and general projection avoidance.	Manufactured with aluminium profiles and high impact resistant polycarbonate
Loading speed	Up to 150 kN/s
Position transducer	Magnetostrictive transducer. Inside piston mounting. Resolution: 0.5 micron
Piston stroke	800mm
Power supply	3ph 400V + N + PE, 50/60Hz
Test frame dimensions ⁴ (Width x Depth x Height) without feeding device and perimeter protection.	2130 x 1540 x 4855 mm
Approx. weight without testing devices	22.000 kg

NOTES:

- (1) Greater distances are possible on request.
- (2) Other strokes available
- (3) The characteristics of the hydraulic unit are specific to the application and the needs of each customer.
- (4) IBERTEST can design and manufacture other larger frames according to the customer's needs.



Support with rollers for feeding and/or removing the sleepers and/or rail coupons (optional)



View of a sleeper during the under-rail section fatigue test