



ITALSIGMA

Rotary Bending Machine

RB35-22



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Description

Electromechanical testing machine with integrated system in a tubular steel base with polycarbonate protective carter. Test control and management through command console with touchscreen interface and possibility of remote connection to the software application via computer and/or mobile device (smartphone or tablet).

Test system capable of generating 4-point bending with constant bending moment on the axis of the specimen and continuous variation of the rotation speed around the longitudinal axis.

- Specimen gripping diameter : (7÷20) mm
- Specimen length : (90÷220) mm
- Specimen rotation speed : (2000÷9000) giri/min
- Overall RB35 machine dimensions : (1100x600xH1400) mm
- Overall command console dimensions : (600x600xH1300) mm

Electromechanical actuator for the generation and maintenance of the necessary strength to apply the set bending moment.

- Maximum bending moment : 35 Nm
- Maximum stroke : 100 mm

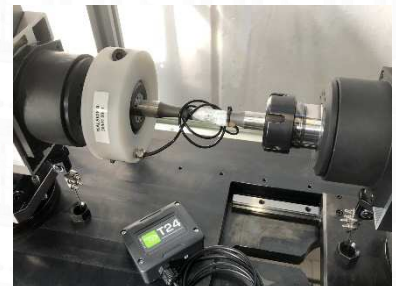
Load cell with 2 kN nominal dynamic capacity, class 1.



DYNAMIC CALIBRATION SYSTEM (OPTIONAL)

Dynamic calibration system for rotary bending fatigue testing machines consisting of a rotating dynamometer, data transmission system and reception system on USB key and software for reading the voltage values.

- Specimen gripping diameter : 15 mm
- Maximum specimen rotation speed : 2000 rpm
- Maximum bending moment : 75 Nm



HEATING FURNACE (OPTIONAL)

Specimen heating system for rotary bending fatigue testing machines independently managed via temperature controller to be integrated on the command console.

Carpentry in AISI304 steel consisting of two half-shells hinged and kept closed by quick lever hooks.

Heating made with preformed ceramic fiber blocks with built-in resistors.

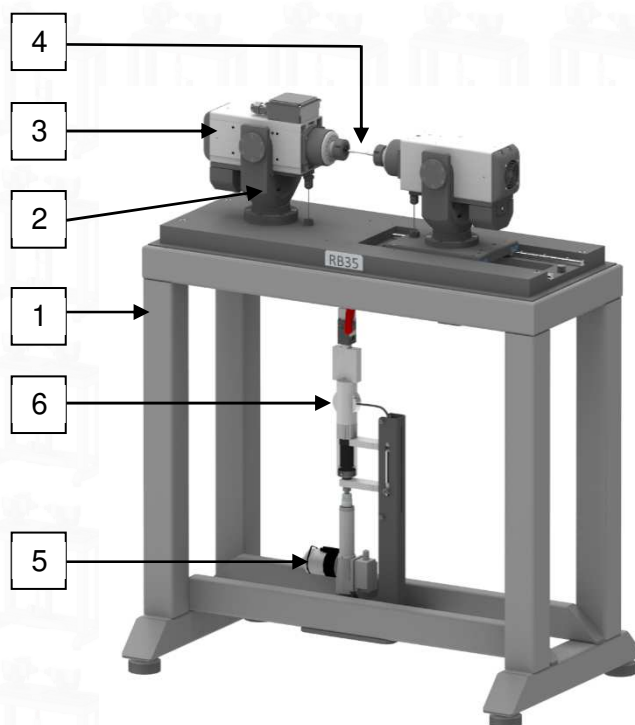
- Maximum adjustable temperature : 800°C
- Overall dimensions : Ø 200 x H 120 mm
- Working area : Ø 90 x H 60 mm



The standard supply of a RB35 machine for rotating bending tests includes a frame and a command console, described below.

Machine

The RB35 consists of a steel frame (1) on which two spindle carriers supports are assembled with the relative self-centering chucks (2). The rotation is applied by an electric motor (3) which allows electronic control of both the number of revolutions and the number of cycles performed by the specimen (4). The bending moment is applied by a direct current motor (5) controlled with PWM logic, which drives an electric actuator coupled to a group of cup springs for stabilizing the generated load and a load cell (6) for reading and control of applying the load to the spindles.



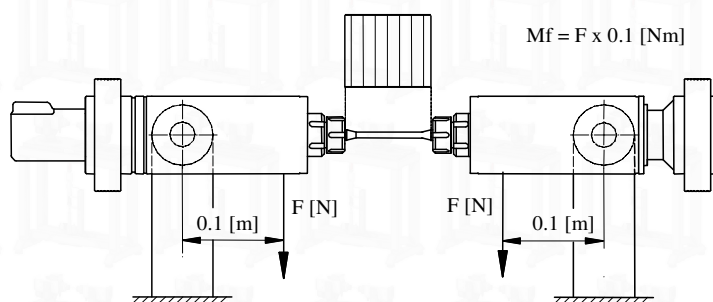
The gripping of the specimen is achieved by standard elastic grippers inserted inside the rotor of the spindles, fixed with suitable anti-unscrewing nuts.

It is possible to test specimens of different lengths by simply sliding the idle spindle, installed on the longitudinal recirculating ball guides.

On the base of the RB35 there is in fact a test area with an adjustable platform for the idle spindle and an alignment pulley for the steel cable, both adjustable with the aid of a graduated scale.

The bending moment is constant along all the specimen length and it is electronic controlled in closed-loop feedback. Control and data acquisition are performed through HMI.

Test area protection is electrically integrated into the machine safety system.



Functional diagram.

Command console and Software

The control desk integrates all the electric power circuitry and the control system inside.
The main features of this console are:

- Dual channel security system based on Siemens components;
- System for managing power to the actuators integrated with the safety system and controlled by the programmable logic controller (PLC);
- Programmable logic controller (PLC) with machine management and control software;
- Touch-screen monitoring system with interface software and remote connection to devices connected to the same network of the machine;
- Arrangement for connection of the machine to a local network (LAN).

The entire software control system of the machine, with an application developed for the integrated Programmable Logic Controller (PLC), allows numerous functions:

- Parameterization of the specimen to be tested;
- Manual handling of the machine to manage the specimen assembly phases;
- Touch-screen movement of the machine to check the mechanical and dynamic characteristics of the specimen;
- Parameterization of the test to be performed;
- Start/Pause/Restart/End of the test;
- Run-time variation of test parameters (speed and sigma);
- Definition of automatic saving methods;
- Spot acquisition during the test;
- Saving of data on Micro-SD memory card.



During the setting phase of the test to be performed, it is possible to define the settings relating to the specimen (characteristics and dimensions), to the stress (bending moment or unitary tension) and to the test parameters (rotation speed, number of cycles to be performed, max time to reach full speed).

Other software features:

- Feedback compensation for maintaining constant stress;
- Test interruption in conditions of increased strain of the specimen or reaching the limit of performed cycles;
- Test interruption by emergency button or when the safety protections are opened;
- Data acquisition at a definable interval of cycles or automatically upon variation of the set specimen strain;
- Archiving of data relating to the tests carried out.

The connection between the machine and the console takes place via a bundle of wired cables in a single insulated connector, equipped with a locking system.

The standard RB35 machine supply also includes the following:

- Two pairs of elastic gripping (10 mm and 12 mm);
- Two pairs of steel specimens (10 mm and 12 mm);
- A set of wrenches for installing and removing specimens from the spindles;
- A Micro-SD card and its USB adapter.

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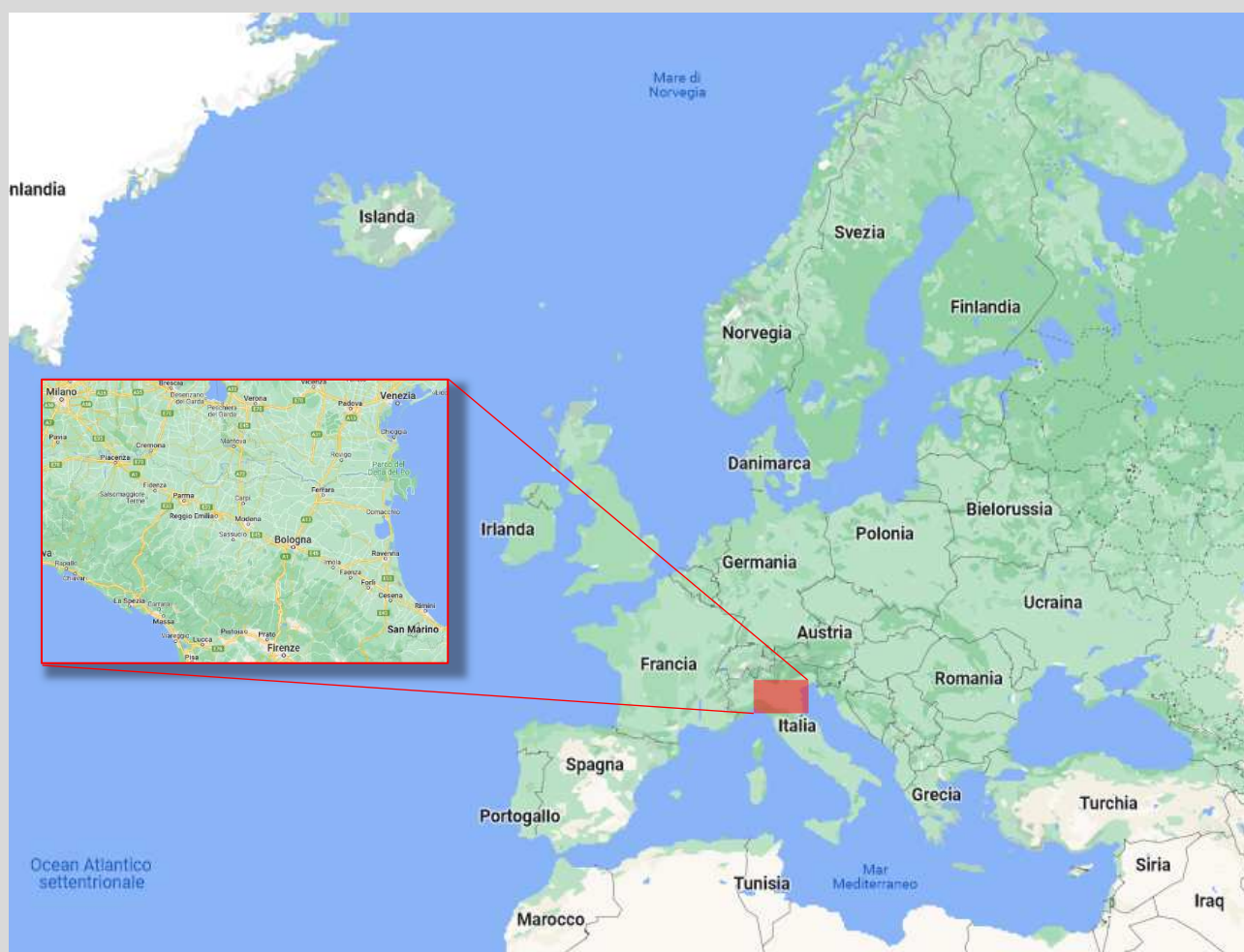
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REFERENCES: Universities - Industries – Research Centers





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