

UNIVERSAL TEST MACHINE

Tesla Series (5–50 kN)

The Vector Tesla Double-Column Benchtop series is a dependable workhorse for mid-range materials testing, combining a sturdy dual-column frame with advanced electronics. With models ranging from 5 kN up to 50 kN capacity, these benchtop systems deliver the durability and strength required for demanding industrial quality assurance, while still fitting on a lab bench or optional stand. The twin-column design provides excellent load stability and alignment for tension, compression, flexure, shear, and peel tests on a wide variety of materials. Each system is engineered to handle intensive daily testing - from plastics and metals to components - with high precision. In short, the Tesla double-column benchtop testers offer industrial-grade performance in a compact footprint, ensuring consistent, repeatable results in production QA and mid-level R&D.



VTR-40-0500



Tesla Series

Double-Column (5–50 kN)

Key Features & Benefits

Robust Dual-Column Frame: The rigid twin-column architecture is constructed from high-strength steel, providing superior stiffness and minimal frame deflection even at maximum load. At full 50 kN, frame deformation is practically negligible, ensuring that almost all the applied movement translates into specimen deformation (not frame flex). This rigidity outperforms many single-column or lower-quality frames and is critical for accurate results in high-force tests. The large, reinforced base distributes load evenly and dampens vibrations, which is especially beneficial when testing tougher materials or when the machine is running at high speeds. Competitor benchtop machines can exhibit noticeable flex at similar forces, whereas the Tesla frame maintains alignment and precision under all conditions.

Industry-Leading Electronics: The Tesla benchtop series uses the same high-performance controller as our larger systems, featuring up to 5 kHz data acquisition frequency. This is five times the data rate of typical mid-range testers (which often use 1 kHz sampling). The result is finer resolution in capturing test events – for example, capturing the exact yield point of a metal sample or the failure point of a fastener with more data points for analysis. The controller's high speed, combined with 24-bit analog resolution, ensures even subtle force drops or small specimen slips are recorded. In addition, the system's feedback control loop is extremely responsive (updates ~1000 Hz), matching the best competitor performance to apply loads and displacements smoothly without overshoot.

Wide Force Range & Interchangeable Load Cells: Each tester can be equipped with a range of load cells to cover forces from a few Newtons up to the maximum 50 kN. High-precision, quick-change load cells snap in place and are automatically recognized by the system with stored calibration data. This allows one machine to test both delicate samples and high-strength materials simply by swapping the load cell – a flexibility that reduces the need for multiple test machines. The Tesla's load measurement system is rated to an accuracy better than $\pm 0.5\%$ down to a very small percentage of the load cell range, ensuring Class 0.5 accuracy over a broad spectrum of forces. Competitors may require separate machines or compromise accuracy at the low or high ends, whereas Tesla covers it all in one frame.

High Throughput Capabilities: Built for busy QA labs, the Tesla double-column bench models emphasize speed and efficiency. The crosshead can traverse at high speeds (up to ~1000 mm/min on lower force models, and a swift 500 mm/min even on the 50 kN model) to reduce idle time. A rapid-return function drives the crosshead back to the start position quickly (often >1000 mm/min return) after a test break, saving time between tests. Compared to older systems that often top out at 500 mm/min for safety, Tesla's optimized motion control and dual-column stability allow faster testing cycles without sacrificing safety or control. This means higher throughput – more tests per hour – to meet the demands of production testing.

Integrated Grip Supply and Mounting: To streamline testing workflows, the frame includes quick connection of grips or fixtures. Operators can attach grips directly to the machine, keeping the test area tidy and safe. The columns feature convenient accessory mounting slots (T-slots/grooves) similar to the single-column series, allowing installation of extensometer brackets, protective shields, or other fixtures securely and without obstruction.

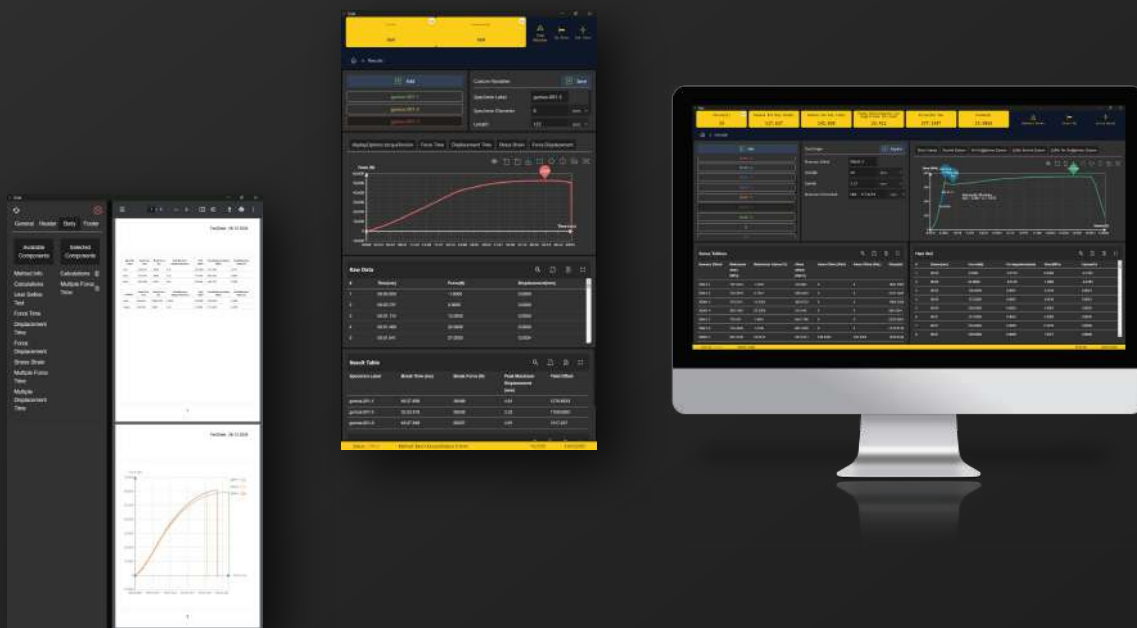
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Advanced Software & Control

Comprehensive Software for QA: The Tesla Series is powered by Vector’s unified testing software, which not only handles test execution but also integrates robust quality control features. Users can select from an extensive library of test methods (covering plastics, metals, elastomers, etc.) or quickly create custom test procedures. The software includes pre-programmed compliance with common standards (ASTM, ISO, EN) – for example, tensile tests per ASTM D638 or metal yield tests per ISO 6892 – ensuring your QA tests meet required protocols by default. Batch testing functionality allows running a sequence of specimens with minimal input (ideal for routine QA). The software automatically calculates statistics (average, standard deviation, pass/fail against tolerances) for each batch, and can output summary reports ideal for quality documentation.

User-Friendly Interface: Even with its advanced capabilities, the software remains user-friendly, featuring an intuitive GUI with a **touchscreen-optimized mode**. Many labs opt for the optional mounted touchscreen tablet interface, which displays large, easy-to-read controls and live results. Operators can start tests, observe force-displacement curves, and accept/reject results all from the touchscreen at the machine – no need to return to a separate PC. This interface is workflow-oriented, showing only relevant options during test setup and execution to minimize operator error. For more advanced analysis or report customization, a full PC interface is available, but routine tests can be conducted via the simplified mode, speeding up training and reducing the learning curve for QA technicians.



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Safety & Ergonomics

Full Safety Enclosure Options: Testing at higher forces demands stringent safety measures. The Tesla benchtop series can be fitted with an optional transparent safety enclosure that surrounds the test area. Even without the enclosure, the machine includes an emergency stop and upper/lower limit switches as standard. The E-stop is dual-circuit and immediately cuts power to the drive, while the software monitors load and position and will automatically stop the test if a limit is exceeded or if specimen break is detected too early, preventing damage.

Ergonomic Working Height: Unlike floor-standing units, these testers sit on a bench or an optional mobile cart/stand, so they can be positioned at a comfortable working height. The crosshead can be lowered to a convenient loading position, and the test area is open on front and back, allowing easy access to install grips and specimens. An operator can easily reach and insert specimens at the center of the test space without awkward stretching. For heavy grips or fixtures, the dual columns and base provide stable support where you can rest components while securing them. Vector also offers an assistive grip mounting tool – essentially a small winch or lever – to help lift heavy wedge grips into place, eliminating strain on the operator. In comparison, some competitor models lack these ergonomic considerations, causing users to manually handle heavy attachments; Tesla addresses this with design and accessory solutions.

Clear Displays and Indicators: The crosshead position and load can be displayed on the display in real time. The machine operation is also quiet and smooth thanks to precision motor drives – noise levels are low, around 60 dB, allowing technicians to work nearby comfortably without hearing protection. The frame's design also keeps the lead screws and moving parts enclosed or guarded, preventing pinch hazards. All controls are logically placed: e.g., the movement buttons and E-stop are front-accessible. The goal is to make the tester as safe and user-friendly as possible, even for continuous daily use.

Reliability for Long-Term Use: In a production QA setting, downtime is not acceptable. The Tesla benchtop testers are built with high-quality components – from the drive motor to the electronics – that are rated for continuous operation. The dual columns and ball screws are coated for corrosion resistance and durability, and the drive system includes overload protection to prevent damage if a specimen unexpectedly requires more force than anticipated. These machines have been lifecycle-tested for millions of cycles at mid-range loads to ensure mechanical longevity. Routine maintenance is minimal: annual calibration check-ups are typically all that's required. Vector backs the system with a comprehensive warranty and readily available support, so your QA process keeps running smoothly year after year.

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Technical Specifications (Model Example)

Load Capacity: 50 kN maximum force (tension & compression)

Frame Type: Dual-column benchtop, high-stiffness construction

Test Space (L×W×H): [DIMENSIONS] (distance between columns × vertical daylight opening)

Footprint (W×D): [DIMENSIONS] (bench space required, not including computer)

Crosshead Speed: 0.001 to 500 mm/min (min to max speed, model-dependent)

Data Acquisition Rate: 5 kHz; Control Loop Frequency ~1000 Hz

Accuracy & Resolution: ±0.5% of reading to 1/10000 load cell; 24-bit data resolution (All systems meet or exceed ASTM E4 / ISO 7500 accuracy standards and include detailed calibration certificates.)

Versatility & Applications

The Double-Column Benchtop Tesla series is the go-to solution for quality assurance and moderate-force testing across industries. Typical applications include tensile testing of plastics, metals, and composites; compression testing of foams and components; bend/flexural testing of plastics and metals; peel and tear tests for packaging; and much more. For example, a 50 kN Tesla model can tension-test steel bolts or plastic specimens with equal ease – making it suitable for an automotive supplier testing both metal fasteners and polymer parts. In aerospace or electronics QA, the Tesla can handle everything from thin wires and solder joints (using a low-capacity load cell) to structural plastic components. The ability to quickly change fixtures and load cells means the same machine supports diverse test setups: one moment a high-temperature tensile test with an environmental oven, next a high-speed puncture test for plastic film. Many labs find that this series strikes the perfect balance between compact size and industrial capability. It is robust enough for 24/7 production testing, yet versatile and precise enough for product development and research projects. With the Tesla double-column benchtop testers, you invest in a platform that grows with your needs – delivering reliable performance for today's QA tasks and adaptable flexibility for tomorrow's testing challenges.



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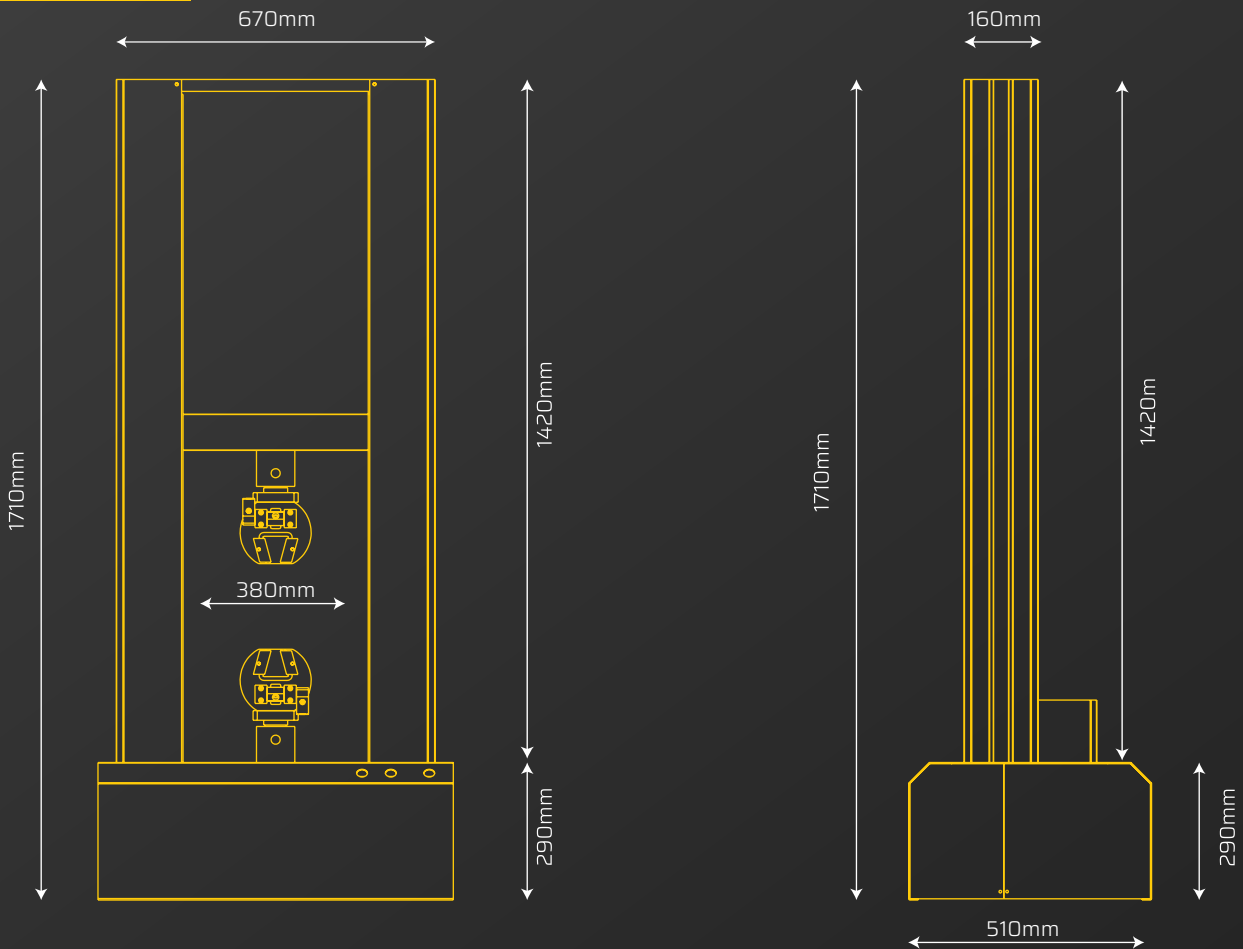
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High-Capacity and Durable Testing Solutions: Tesla Series

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TECHNICAL SPECIFICATION

Specification	VTR-40-0500
Max Capacity	50 kN
Frame Design	Dual-column, steel construction
Overall Dimensions (H×W×D)	1710mm X 670mm X 510mm
Test Space Height	1100 mm (configurable)
Speed Range	0.0001 – 500 mm/min
Data Acquisition	5 kHz; 24-bit resolution
Accuracy Class	±0.5% per ISO 7500-1 (Class 0.5)
Power Requirements	120/240 V, 50/60 Hz
Operator Interface	PC software
Connectivity	USB
Safety Features	Emergency stop, dual limit switches, enclosure
Weight	~300 kg
Optional Accessories	Pneumatic grips, advanced extensometers, custom fixtures