TESCA™
www.tescaglobal.com

STRUCTURE ANALYSIS LAB

Tesca Technologies Pvt. Ltd.
IT-2013, Ramchandrapura Industrial Area,
Sitapura Extension, Near Bombay Hospital,
Vidhani Circle, Jaipur-302022, Rajasthan, India,
Tel: +91-9829132777; Email: info@tesca.in,
tesca.technologies@gmail.com
Website: www.tescaglobal.com

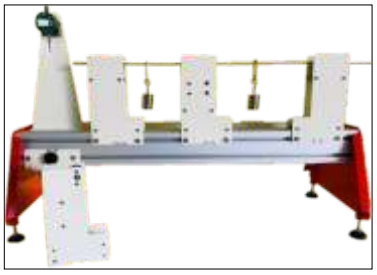
The structures range consists of teaching equipment for understanding basic structural principles focusing on beams, bridges and cantilevers for students of mechanical, civil and structural engineering .

The structure comes with a universal structure platform , consist of a data logging unit. All the structure modules can be attached with the data logging unit via USB interface hub and thus can be directly connected to computer running software. (computer not to be supplied with the set up)

TOPICS COVERED IN PRODUCT RANGES



ARCHES , BRIDGES AND TRUSS


DEFLECTION, TORSION AND STRESS

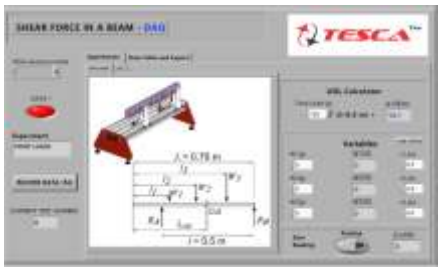


Moment

FAILURE

Note: Specifications are subject to change.

04.06.2024
Tesca Technologies Pvt. Ltd.
IT-2013, Ramchandrapura Industrial Area, Sitapura Extension,
Near Bombay Hospital, Vidhani Circle, Jaipur-302022, Rajasthan, India,
Tel: +91-9829132777; Email: info@tesca.in, tesca.technologies@gmail.com
Website: www.tescaglobal.com



ORDER CODE - TST100 - UNIVERSAL STRUCTURE FRAME

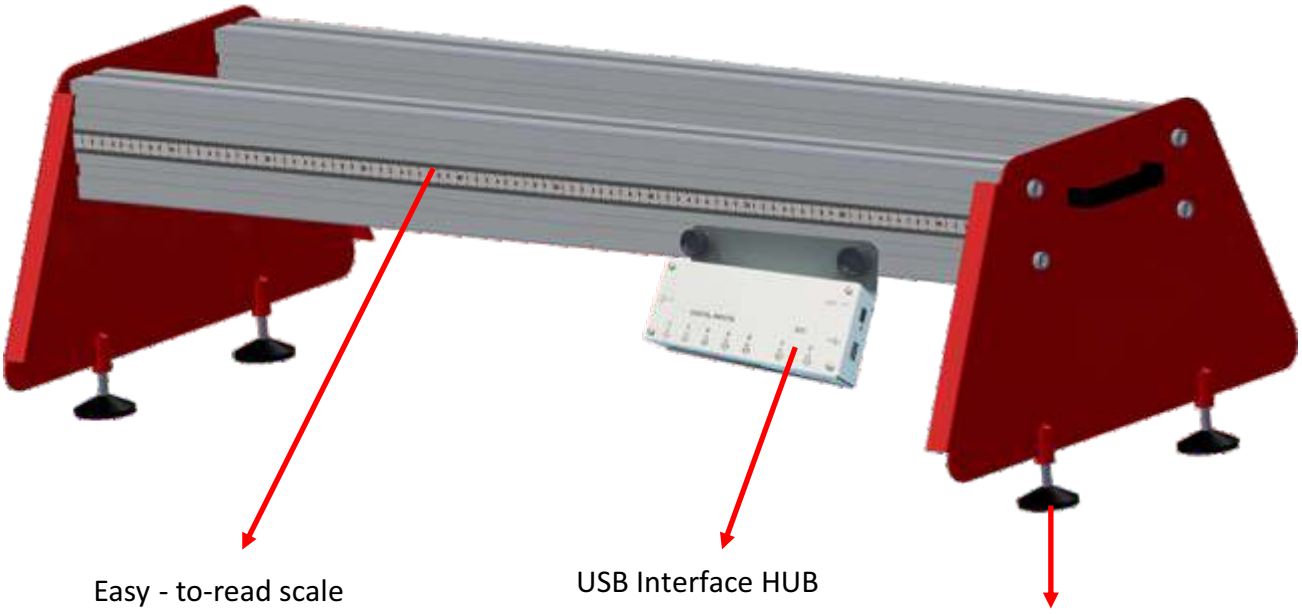
Supports Structures Experiment Modules, providing a cost-effective platform.

KEY FEATURES AND BENFITS

Supports any of the finite Structures Experiment Modules, providing a cost-effective platform.
Only four major parts and includes a hexagon tool—for easy assembly.
Compact design with lifting handles for excellent mobility and sized to fit on any standard desk for ergonomic use and convenient storage.
Rigid design with adjustable feet and a low centre of gravity for stability and accurate results.
Includes measuring scales for easy and accurate positioning of parts. Changing experiments is as quick and simple as possible.
Includes a USB Interface 'Hub' for connection to a suitable computer for display and data acquisition.
Supplied with user-friendly display and data acquisition (DAQ) software made using LabVIEW- from National Instruments.

Note: Specifications are subject to change.

04.06.2024
Tesca Technologies Pvt. Ltd.
IT-2013, Ramchandrapura Industrial Area, Sitapura Extension,
Near Bombay Hospital, Vidhani Circle, Jaipur-302022, Rajasthan, India,
Tel: +91-9829132777; Email: info@tesca.in, tesca.technologies@gmail.com
Website: www.tescaglobal.com



Experiments module available

ORDER CODE - TST101 - Deflection of beam and cantilever.
ORDER CODE - TST102 - Bending moment in a beam.
ORDER CODE - TST103 - Shear force in a beam.
ORDER CODE - TST104 - Unsymmetrical bending and shear center.
ORDER CODE - TST105 - Equilibrium of a simply supported beam.
ORDER CODE - TST106 - Continuous and intermediate beam.
ORDER CODE - TST107 - Euler buckling of struts
ORDER CODE - TST108 - Portal frame deflection and reactions
ORDER CODE - TST109 - Bending moment in a portal frame
ORDER CODE - TST110 - Three pinned arch
ORDER CODE - TST111 - Two Pinned arch
ORDER CODE - TST112 - Fixed Arch
ORDER CODE - TST113 - Simple suspension bridge
ORDER CODE - TST114 - Suspended beam bridge
ORDER CODE - TST115 - Deflection of curved bars and davits
ORDER CODE - TST116 -Torsion of circular sections
ORDER CODE - TST117 - Redundant frame truss
ORDER CODE - TST118 - pin jointed framework
ORDER CODE - TST119 - Bending stress in a beam
ORDER CODE - TST120 - Plastic deformation of beams

Note: Specifications are subject to change.

04.06.2024
Tesca Technologies Pvt. Ltd.
IT-2013, Ramchandrapura Industrial Area, Sitapura Extension,
Near Bombay Hospital, Vidhani Circle, Jaipur-302022, Rajasthan, India,
Tel: +91-9829132777; Email: info@tesca.in, tesca.technologies@gmail.com
Website: www.tescaglobal.com

ORDER CODE - TST101 - DEFLECTION OF BEAMS AND CANTILEVER

Deflection due to point loads and UDLs (uniformly distributed loads).
How beam fixings affect deflection of:
- Simply Supported beams
- Fixed or 'Encastre' beams
- Cantilever beams
- Propped Cantilever

Shape of a deflected beam.
Beam length and deflection.
Beam material and deflection—the Elastic (Young's) Modulus.
Beam cross-section and deflection—the Second Moment of Area ('I' value)
Pure Bending of a beam.
Reciprocal Theorem (Maxwell-Be).

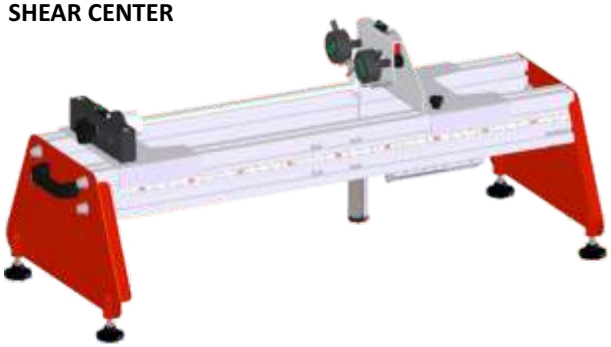
ORDER CODE - TST 102 - BENDING MOMENT IN A BEAM

Bending moment at the cut due to a varying single point load.
Bending moment at the cut due to a moving single point load.
Bending moment at the cut due to a uniformly distributed load.
Influence lines and superposition.

ORDER CODE - TST103 - SHEAR FORCE IN A BEAM

Shear force at the cut due to a varying single point load.
Shear force at the cut due to a moving single point load.
Shear force at the cut due to a uniformly Distributed load.
Influence lines and superposition.

ORDER CODE - TST104 - UNSYMMETRICAL BENDING AND SHEAR CENTER



Demonstrates shear centre can be outside beam section boundaries.

Shear centre of an unsymmetrical section.
Horizontal and vertical deflection in symmetrical and unsymmetrical sections at different loads and load angles.
Using Mohr's circle to find Principal Axes and Second Moments of Area.

Note: Specifications are subject to change.

04.06.2024
Tesca Technologies Pvt. Ltd.
IT-2013, Ramchandrapura Industrial Area, Sitapura Extension,
Near Bombay Hospital, Vidhani Circle, Jaipur-302022, Rajasthan, India,
Tel: +91-9829132777; Email: info@tesca.in, tesca.technologies@gmail.com
Website: www.tescaglobal.com

ORDER CODE - TST105 - EQUILIBRIUM OF A SIMLY SUPPORTED BEAM

Principle of Moments.
Influence Lines.
Reactions for a point load along a beam.
Reactions for a uniformly distributed load (UDL) on a beam.
The Principle of Superposition.

ORDER CODE - TST106 - CONTINOUS AND INTERMEDIATE BEAM

Principle of moments.
Reactions for a point load along a simply supported beam.
Reactions for a uniformly distributed load (UDL) on a simply supported beam.
The principle of superposition.
Influence Lines.
- Deflection of a simply supported beam.
- Reactions for a continuous beam.
- Reactions and moments of a propped cantilever.

ORDER CODE - TST107 - EULER BUCKLING OF STRUTS

Strut length and the collapse load.
Euler's critical load.
Slenderness ratio.
Effective Length.
The collapse load and strut fixings, including:
- Pinned-pinned
- Fixed-pinned
- Fixed-fixed

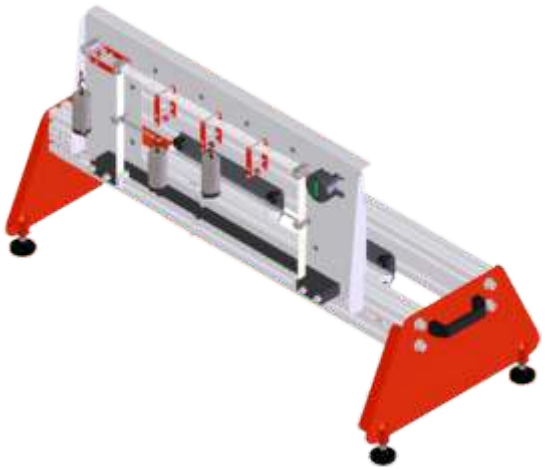
ORDER CODE - TST108 - PORTAL FRAME DEFLECTIONS AND REACTIONS

Horizontal reaction and fixing moment due to a varying single point load on a portal frame.
Uniform and non-uniform cross-section portal frames.
Predicting sway direction by consideration of shear forces.
Use of the Moment Distribution (Hardy Cross) Method to calculate bending moments, sway magnitude and horizontal support reactions.
Deflection (sway) of a portal frame due to loading asymmetry.
Deflection (sway) of a portal frame due to asymmetry of the uprights.
Plo ng bending moment diagrams.

Note: Specifications are subject to change.

04.06.2024
Tesca Technologies Pvt. Ltd.
IT-2013, Ramchandrapura Industrial Area, Sitapura Extension,
Near Bombay Hospital, Vidhani Circle, Jaipur-302022, Rajasthan, India,
Tel: +91-9829132777; Email: info@tesca.in, tesca.technologies@gmail.com
Website: www.tescaglobal.com

ORDER CODE - TST109 - BENDING MOMENT IN A PORTAL FRAME



Strain gauges as instruments.
Relationship between measured strain and bending moment.
Elastic bending of portal frames, and linear relationship between the bending moments in the frame and the load.
Use of the Moment Distribution (Hardy Cross) Method to calculate bending moments, sway magnitude and horizontal support reactions.
The generation and measurement of sway deflections and bending moments around the
Frame due to:
Vertical loads on the beam
Horizontal loads at the junction of the beam and uprights
Moments applied to the uprights
Any combination of the above
Plo ng of bending moment diagrams.

ORDER CODE - TST110 - THREE PINNED ARCH

Horizontal reaction due to a varying single point load on a statically determinate structure.
Horizontal reaction due to a moving single point load on

ORDER CODE - TST111 - TWO PINNED ARCH

Horizontal reaction due to a varying single point load on a statically indeterminate structure.
Horizontal reaction due to a moving single point load on a statically indeterminate structure.
Horizontal reactions due to a uniformly distributed load on a statically indeterminate structure.
Influence lines and superposition.
Lines of thrust in an arch.
Graphical construction of a bending moment diagram for point loads.
The Secant assumption.
Maximum bending moments due to a load on an arch.

Note: Specifications are subject to change.

04.06.2024
Tesca Technologies Pvt. Ltd.
IT-2013, Ramchandrapura Industrial Area, Sitapura Extension,
Near Bombay Hospital, Vidhani Circle, Jaipur-302022, Rajasthan, India,
Tel: +91-9829132777; Email: info@tesca.in, tesca.technologies@gmail.com
Website: www.tescaglobal.com

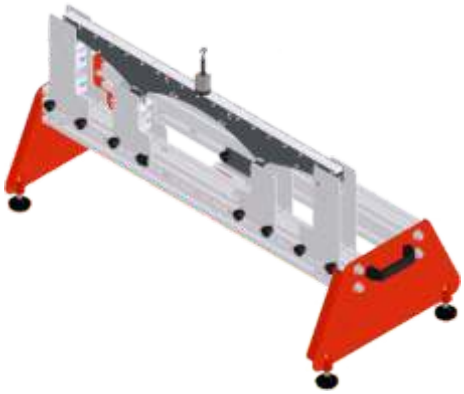
ORDER CODE - TST112 - FIXED ARCH

Horizontal reaction and fixing moment due to a varying single point load on a statically indeterminate structure.
Horizontal reaction and fixing moment due to a moving single point load on a statically indeterminate structure.
Horizontal reactions and fixing moment due to a uniformly distributed load on a statically indeterminate structure.
Influence lines and superposition.
Lines of thrust in an arch.
The Secant assumption.
Graphical construction of a bending moment diagram for point loads.
Maximum bending moments due to a load on an arch.

ORDER CODE - TST113 - SIMPLE SUSPENSION BRIDGE

How bridge load affects the tension in a suspension cable.
Comparing a central point load with a UDL.
Exploring the ratio of bridge 'deck' mass and a moving load.
Comparing simple parabola-based theory with a more realistic analysis of the model.

ORDER CODE - TST114 - SUSPENDED BEAM BRIDGE



Introduction to the suspended beam (or Gerber) bridge.
Support reactions for an increasing point load and a uniformly distributed load (UDL)
How loads affect bridge support reactions and internal reactions between the cantilever and suspended sections.
Influence lines for supports and internal reactions due to a load moving across the beam structure.
The Principle of Superposition.

ORDER CODE - TST115 - DEFLECTION OF CURVED BARS AND DAVITS

How loads affect the vertical and horizontal deflection of:

- A Quarter Circle
- A Semicircle
- A Curved Davit
- An Angled Davit

Elastic bending.
Comparison of elastic deflection analysis techniques.

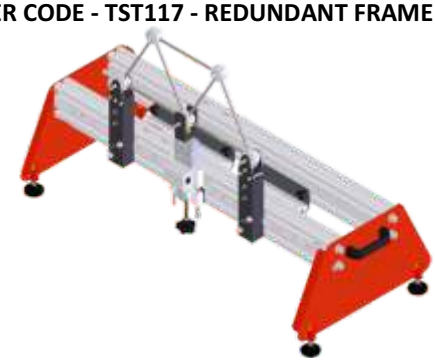
Note: Specifications are subject to change.

04.06.2024
Tesca Technologies Pvt. Ltd.
IT-2013, Ramchandrapura Industrial Area, Sitapura Extension,
Near Bombay Hospital, Vidhani Circle, Jaipur-302022, Rajasthan, India,
Tel: +91-9829132777; Email: info@tesca.in, tesca.technologies@gmail.com
Website: www.tescaglobal.com

ORDER CODE - TST116 - TORSION OF CIRCULAR SECTION

Torsion formula.
Rod length and angle of twist relationship.
Rod material and angular deflection—the Elastic (Shear) Modulus (G).
Rod cross-sectional dimensions and torsion— the Polar Second Moment of Area (J).
Comparison of angular deflection in similar hollow and solid rods.
Mass per unit length and torsional resistance e ciency of tubes compared to solid rods.

ORDER CODE - TST117 - REDUNDANT FRAME TRUSS



Strain Gauges as instruments.
Forces within and deflections of:
A truss structure that is statically determinate
A truss structure that is statically indeterminate
Member forces by the Method of Joints and Method of Sections.
Member forces by the use of the strain energy method.
Advantages and disadvantages of both versions of the truss.

ORDER CODE - TST118 - PIN JOINTED FRAMEWORK

Introduction to Bow's Notation.
Strain gauges as instruments.
Forces and deflections in different frameworks.
The Warren Truss.
The Roof Truss (or Howe/Pratt Truss).
Simple and advanced Cantilever Trusses
Force analysis by Method of Joints and Method of Sections.
Deflection analysis by the strain-energy method.
Wind loads on a roof truss.
Effect of a swaying load on a cantilever truss

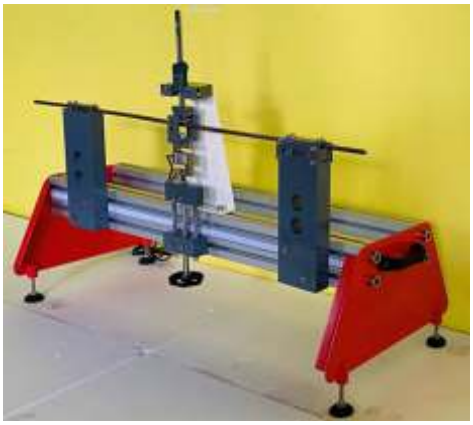
ORDER CODE - TST119 - BENDING STRESS IN A BEAM

Stress and strain relationship.
Strain gauges as instruments.
Finding the neutral axis by experiment and Calculation.
How the beam cross-section dimensions
Affect the second moment of area (I value) and neutral axis.

Note: Specifications are subject to change.

04.06.2024
Tesca Technologies Pvt. Ltd.
IT-2013, Ramchandrapura Industrial Area, Sitapura Extension,
Near Bombay Hospital, Vidhani Circle, Jaipur-302022, Rajasthan, India,
Tel: +91-9829132777; Email: info@tesca.in, tesca.technologies@gmail.com
Website: www.tescaglobal.com

ORDER CODE - TST120 - PLASTIC DEFORMATION OF BEAM



Elastic bending to plastic deformation of hot rolled mild steel.
How the plastic region moves through the
Specimen section as the load increases.
Collapse load and the formation of plastic 'hinges'.
Yield stress.
How beam fixings affect deformation of:

- Simply Supported beams
- Fixed or 'Encastre' beams
- A Propped Cantilever

Shape of a collapsed beam due to hinge formation.
Form or shape factor of a beam and the additional factor of safety it provides.

For detailed technical specifications kindly contact us

Note: Specifications are subject to change.

04.06.2024
Tesca Technologies Pvt. Ltd.
IT-2013, Ramchandrapura Industrial Area, Sitapura Extension,
Near Bombay Hospital, Vidhani Circle, Jaipur-302022, Rajasthan, India,
Tel: +91-9829132777; Email: info@tesca.in, tesca.technologies@gmail.com
Website: www.tescaglobal.com