



HST19 – Pin Jointed Frameworks

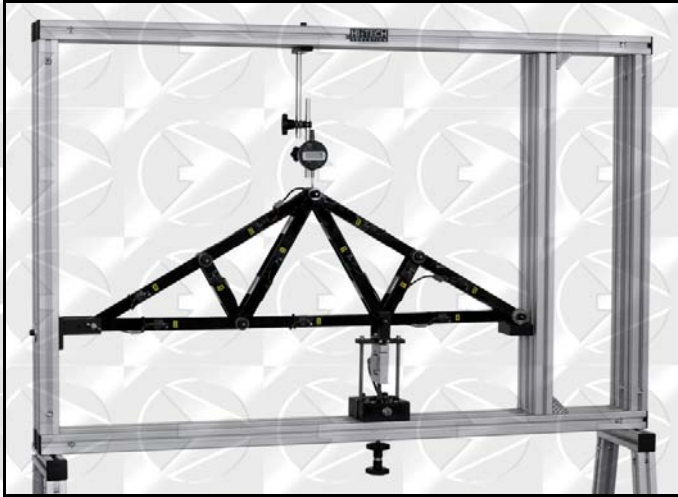


Figure 1: Roof Truss

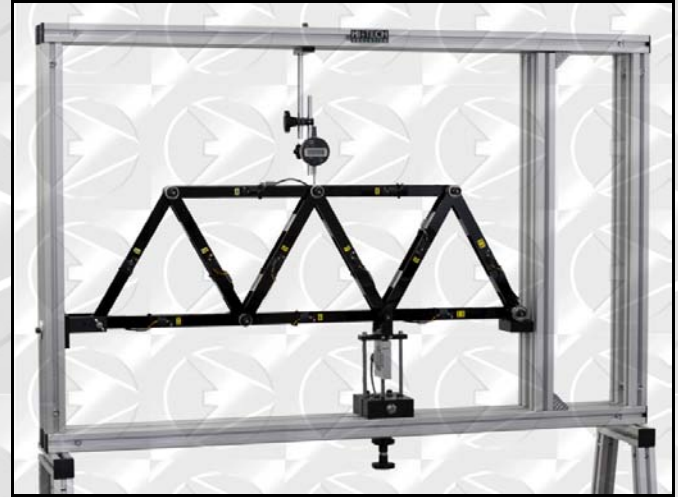


Figure 2: Warren Truss

Product Summary

- Apparatus to allow the study of stresses, strains, forces and deflections of various true pin jointed frameworks
- Two truss frameworks supplied
- Frameworks attached to supports at each end which allow pivoting and pivoting/rolling arrangements
- Loading mechanism using screw jack with integral load cell
- Additional loading mechanism (HST19a) available to create simultaneous loading of two or more joints (sold separately)
- Joint deflection measured using digital dial gauge
- Framework member strains measured using strain gauging technology which is directly fed into the HDA200 Interface (sold separately)
- Load cell output fed directly into HDA200 Interface (sold separately)
- Experimental software HST19S available
- Comprehensive instruction manual provided
- 2-year warranty

Tender Specification

- To be an experiment which allows the study of stresses, strains, forces and deflections in a roof and warren truss
- To have each framework member strain gauged with output to HDA200 Interface (sold separately)
- To have load applied at different joints using loading mechanism with integral load cell and output to HDA200 Interface (sold separately)
- To have available an additional loading mechanism (HST19a) for applying simultaneous loads at other joints
- Must have digital dial gauge on movable arm to measure joint deflection
- Must be used in conjunction with the HST1 Universal Frame and Stand (sold separately)
- To have experimental software available
- A comprehensive instruction manual to be supplied along with all necessary tools, accessories and connection cables
- 2-year warranty supplied



Description

The HST19 apparatus enables students to measure the stresses, strains, forces and joint deflections created from two truss frameworks supplied. Each joint of the trusses are truly pin jointed and the arrangement of the truss members allows interconnection at a single joint. The trusses mount onto two end supports. One support has a pivoting arrangement whilst the other has pivoting and rolling arrangement. Each truss member has a strain gauge arrangement attached. The signal from the strain gauges is fed directly into the HDA200 Interface (sold separately).

The loads on the framework are applied at known joints by using the loading mechanism supplied. It has an integral load cell and screw jack. This offers fine and accurate loading to the framework. The load cell output is fed directly into the HDA200 Interface (sold separately).

To measure the deflection at known joints a digital dial gauge is mounted on an extendable arm which can be rotated onto the joint being measured. This arm can be manoeuvred over the joint accurately. The arm extends from one of the truss supports, thus removing any additional deflection errors which may occur from the minimal movement of the HST1 Universal Frame and Stand (sold separately). The output from the digital dial gauge can also be connected directly into the HDA200 Interface (sold separately).

The HST19 must be fitted into the HST1 Universal Frame and Stand (sold separately). Should the students wish to apply simultaneous loads to more than one joint, the HST19a additional load cell is available (sold separately).

Connecting the member strain gauges, load cell output, and digital dial gauges to the HDA200 Interface allows all the key experimental parameters to be displayed via one easy to read screen. The HDA200 Interface also allows the hardware and key experimental parameters to be fed directly into a host computer when using the experimental software HST19S.

To compliment the HST19 hardware, the HST19S experimental software is available giving the student an opportunity to simulate the experiment before undertaking it, compare actual experimental data along side theoretical data and to capture, review, store and print actual and theoretical results. The HST19S has a graphical front end with actual experiment hardware images to create continuity and has all key experiment parameters being recorded.

When the HDA200 Interface is purchased as an essential accessory with the HST19 Hardware, the HST19S is supplied as standard. Alternatively the HST19S can be purchased separately.

Supplied with this experiment is a comprehensive instruction manual, all necessary tools and accessories and a 2-year warranty.

Experimental capabilities

- To allow the study of strains within various true pin jointed frameworks
- To allow the study of stresses within various true pin jointed frameworks
- Introducing students to strain gauging technology
- Comparison of different frameworks
- Comparison of actual and theoretical results



Specification

- Roof Truss containing 11 truss members; 900mm truss length; 30° truss member angle
- Warren Truss containing 11 truss members: 900mm truss length; 60° truss member angle
- Truss width: 100mm at maximum point
- Ground pin used at joints
- 500N integral load cell within loading mechanism with connection cable to HDA200 Interface (sold separately)
- Digital Dial gauge on adjustable arm: 12.7mm travel, 0.01mm resolution, supplied with data cable for direct connection into HDA200 Interface (sold separately)
- 120Ω strain gauges, arranged in ½ bridge configuration
- Weight of each truss approximately: 3kg

Accessories and spares

- All assembly and operational tools
- Full instruction manual which includes:
 - Operating instructions
 - Experimental set-up
 - Experiment procedure
 - Example set of results

Essential Accessories

- HST1 Universal Frame and Stand
- HST100 Bench Mounted Frame
- HDA200 Interface

Recommended Extras

- HST19S available separately
- HST19a Additional Load cell

Operational Conditions

- Storage temperature: -10°C to +70°C
- Operating temperature range: +10°C to +50°C
- Operating relative humidity range: 0 to 95%, non condensing