

DWTT Drop Weight Tear Testing System

With integrated cooling chamber and sample feeding system API 5L SR6/ API RP 5L3 / ASTM E436 / GB/T8363

The advanced and popular DWTT-API-30K Drop Weight Tear Impact Testing Machine can test 10 samples consecutively, utilizing a user-friendly and automatic feeding and control system. By initiating the test process by the operator, the samples are automatically inserted via a manipulator from the low temperature chamber to the impact area, and then the test is carried out and the broken samples are being collected with a fully automatic cycle. The DWTT-API-30K system also can be operated manually, thus making it easy to maintain the machine and control the step by step test procedure.

Application:

Steel Pipe and medium thickness ferrite steel sheet production lines with requirements for drop weight tear test equipment. This is a fully automatic procedure consisting of feeding, testing and fractured sample collecting. With multi channel protection system, this unit represents the highest security and safety features while in operation.

Standards:

- 1 - API RP 5L3-Pipe Line Steel Drop Weight Tear Test Recommended.
- 2 - ASTM E436-Ferrite Steel Drop Weight Tear Test Method
- 3 - GB/T8363- Ferrite Steel Drop Weight Tear Test Method

Features:

Main Frame

- Thick pedestal and steady frame
- High accuracy – Guide rail.
- Chain control transmission with high precision.
- Easy sample mounting

Control System

- SIEMENS PLC control with high accuracy and anti-interference capability.
- Servo-motor driven with variable speed.
- User Friendly

Safety Features

- Closed guard net
- Self-lock lifting hook design
- Voice/light alarm for:
 - Sample misplacing
 - Hammer self-locked malfunction
 - Protect fixture malfunction
 - Non-proper hammer lift



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Specifications:

- Impact energy: 30,000J
- Impact energy range: 10,000 – 30,000J
- Convenient weight or height adjustment for energy change
- Impact speed: 5-8 m/s
- Hammer Body Error tolerance: $\pm 0.5\%$
- Hammer edged down center with the bearing span deviation: +1mm
- Sample specifications: $(300 \pm 5) \times (75 \pm 1.5) \times 40\text{mm}$
- The low temperature cooling tank ($20\text{--}100^\circ\text{C}$) with automatic cooling
- Volume: 10 samples
- Temperature tolerance: $\leq \pm 1^\circ\text{C}$
- Temperature uniformity: $\leq \pm 2^\circ\text{C}$
- Temperature resolution $\leq 0.1^\circ\text{C}$, deviation $\leq \pm 0.5^\circ\text{C}$
- Automatic feeding and collection of the specimens
- Cycle time: 8.54 seconds
- Automatic system to ensure the specimen notch with the centerline of the center bearing the same span, the accuracy is consistent with the GB8363
- Automatic lifting, weight can be safely lifted to different heights
- Reliable and rapid release of weights to enhance the accuracy of 0.3% displacement measurement device, the whole measurement range resolution: 1mm
- Fractured specimens can be deliver automatically to the testing machine foundation
- Hammer edge hardness HRC55~60. Hammer blade curvature radius and tolerance test standards meet ASTM E 436 GB8363, API requirements
- When impacting the test specimens, the middle of the hammer edge will be consistent with the support center, the deviation conform to GB8363, API and ASTM E436 standard requirements
- Hammer made with high rigidity
- The hammer head is equipped with self-locking mechanism
- Support HRC58~62 hardness, size and tolerance meets the standards;
- Base made with high rigidity
- Failure control system with audio-alarm function activated if the sample is not in place and the machine setup is not correct
- High resolution Japanese LCD screen and Germany's Siemens PLC optical encoder PLC
- Four columns, polished Chrome plated with precision linear axis
- Slant Preventing Fixture To prevent the thin sample from slanting during the test there is a slant preventing fixture on the mainframe anvil bed

This fixture can adjust the placket size and is designed to be very rugged and reliable.

Low temperature Control System

- Constructed from 304 stainless steel tank and sprayed cold-rolled plates
- Precision of Japanese Fujitsu
- Refrigerator: Italy - Fujitsu closed-cooled
- Refrigeration accessories: Electromagnetic valve oil, condensed evaporator

Technical parameters

- Size: 840x500x150(mm) (width x depth x height)
- Liquid capacity: 88 liters
- Temperature range: $20^\circ\text{C} \sim 100^\circ\text{C}$
- Temperature volatility: $\leq \pm 0.5^\circ\text{C}$
- Temperature uniformity: $\leq \pm 2^\circ\text{C}$
- Cooling rate: Central temperature $\rightarrow -70^\circ\text{C}$ Less than 2 hours
- Ambient temperature: $5^\circ\text{C} - 38.2^\circ\text{C}$

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Automatic Specimen Feeding System: (FESTO capturing manipulator)

The system uses the SPC200 servo controller to carry on the control. The overall system uses the aluminum structure to take the overall frame. X axis for the servo positioning axis, beside the frame lays a DGPL non-pole air cylinder, a built-in belt sensor, uses the SPC200 servo controller to carry on the control, uses in controlling manipulator's X axis direction multi-spot localization;

Because the Y axis must cross the frame gate, therefore it uses two air cylinder two sections to realize; The first pad adds the aluminum block on the above two non-pole air cylinder's slide to increase the height, air cylinder's both sides with keeps off the block to locate the position;

the other air cylinder uses the HMP linear coordinate air cylinder; The Z axis also uses the HMP linear coordinate air cylinder to capture work piece;

First causes the gripping device through the Y axis non-pole air cylinder's movement to locate in A spot, the gripping device drop capture work piece;

After capture work piece is lifted, Y axis non-pole air cylinder movement manipulator to the C position;

Y on the axis HMP air cylinder movement, the capture work break lays aside in the B location;

Notch Pressing Machine (Option)

DWTT test accessory machine required for preparation of the sample size and accuracy according to ASTM E436 (latest version) standards sample size and accuracy; the equipment conforms to API and GB5482 (latest) standard to press test specimen notch.



Chrome-plated columns



Specimen Feeding System



Notch Pressing Machine (Option)

Specifications and Configuration:

- Main frame
- Maximum compression load: 1,000kN Maximum load adjustable
- Compression space: 0-300mm Satisfies all test specimen size
- Compression plate size (Upper & lower): 220x220mm
- Column spacing: 400mm
- Piston stroke: 80mm
- Hydraulic pressure load
- Displacement control methods used to press the notch
- DWTT equipped to meet the requirements for pressing specimen mold
- Compacting the notch sample size, accuracy, Meet GB8363 and the relevant provisions of API and ASTM E436
- Equipped with a special tool steel pressure head Die angle of 45° with an accuracy precision of 2°
- DT sample equipped to meet the requirements of to press die
- Compacting notch in the sample size required precision to meet GB5482 and ASTM E604 With the relevant requirements;
- The notch pressed by the process control systems, while manual intervention is not required;
- Guaranteed safe operation with the protection device
- Over-load protection
- Pressing protection device