ZCJ2304 30000J Drop Weight Tear Tester & QYJ4401 Sample Notching Machine & ZYS2801-A Low Temperature Chamber

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ZCJ2304 30000J Drop Weight Tear Tester

1. Description: Drop Weight Tear Tester

2. Model: ZCJ2304

3. Capacity: 30000J

4. Functions:

4.1 The model ZCJ2304 Drop Weight Impact Testing Machine is designed to perform drop weight tear test (DWTT) for the ferrite steel materials including plank, section bar, cast steel and forged steel so as to observe specimen fracture character after impact within the temperature that the fracture is converted from non-ductility to ductility. This test method is to raise a striker with some weights to a height then released it; free drop striker impacts and tears the specimen. After the impact, observe the shape and features of the fracture surface.

4.2 This testing machine is composed of machinery, electric, pneumatic, and automatic technology.

Furthermore, there are several measures to make sure safety of operators as well as machine.

4.3 This testing machine strictly complies with **API RP*5L3-96**<Recommended Practice for Conducting Drop-Weight Tear Tests on Line Pipe> & **ASTM E436-03**<Standard Test Method for Drop-Weight Tear Tests of Ferrite Steels> and other equivalent standards.

5. Introduction

5.1 Load frame

5.1.1 Although the machine is high, the strength and stability of the machine has been fully considered. The bottom board of the machine is made from casting steel, with a dimension of 1.58m*1.38m*0.2m and a weight up to 2100 Kg. Both volume and weight is enough for its solidity. The load frame adopts four-column structure, each column has two parts, the upper part is made from high strength steel pipe; the lower part is made from coniform casting iron, the diameter of the bottom flange on the lower part is about two times that of the upper part. So that such a structure has a strong ability of anti-inclination. The lower part of two-part column is much heavier than the upper part. The whole center of gravity is lower than one-part column testing machine, obviously, the stability is better.

5.1.2 The casting iron has strong seismatic and vibration-insulating abilities, when the vibration occurs because of impacting; the casting steel won't transfer the vibration to the top board of the machine. The guide rod of the testing machine is beyond 5m, considering its rigidity; two high precision homocentric rods with 80mm in diameter are adopted, which are made from high-carbon steel (bearing steel). The surface of them are plated with chrome, the rigidity is more than HRC58. The guide rods have very high linearity and are strictly vertical to the bottom board, so as to reduce the friction between hammer and guide rods.

5.2 Specimen supporter

5.2.1 The specimen supporter can be replaced after it's worn out.

5.2.2 The part of the supporter touching specimen is a cylinder with a radius of 20mm, this is made from 6CrW2Si, impact-resistant steel. The base of the supporter is made from casting steel. There is a scale in the center of the supporter, it's easy to adjust the distance between the supporters

5.3 Hammer body

The radius of hammer is 25mm; the hammer is made from 6CrW2Si, the same material with supporter, which has high strength, high rigidity. The hammer is easy to be taken down and changed from hammer body when it is required. The hammer body is made from casting steel and fixed with easy to take-down guide copper bushing. The guide copper bushing and guide rod have very high smoothness and high processing accuracy, which can maximum reduce the friction body.

5.4 Lifting system

5.4.1 The motor of the lifting system adopts Panasonic servo-motor, which has advantage of lower noise, light weight, high efficiency, low noise and accurate performance. This motor is equipped on the bottom of the machine, it is very easy and safe to install and maintain.

5.4.2 The rotate speed of the motor can be adjusted arbitrarily, so that the speed of lifting hammer is adjustable. The reducer adopts a combination of Turbine reducer and cycloidal gear reducer, which has lower noise, compacted structure, light weight, high efficiency and high transferring rate (more than 80%). The hammer is lifted by anchor chain; compare with normal steel wire rope lifting, the chain has the advantages of smaller elasticity, which can make sure the accuracy of the height measurement; further more, the anchor chain has a stronger strength than the steel wire rope, which is much more safe, and can be used for a longer period.

5.5 Hammer grasps and doffs system

This system is special designed self-lock equipment, it lock the hammer after grasp it automatically, it can make sure the safety of the operators and machine, even in the circumstance of sudden power break, it will not doff the hammer. Also, it has the system of automatically inspect the hook, if the hammer is not grasped, the crosshead can not be lifted. The doff system adopts AC magnetic, without gas sources, which is very convenient to install and operate.

5.6 Automatically sample feeding system

5.6.1 This system adopts rotating motor for sample feeding. The speed of

sample feeding is 4 seconds with high speed and accuracy, it is easy to operate. The feeding frame is manufactured in whole body with high strength and intensity, without welding. Further more, it mates with the anvil, which decrease the stress to the motor, and pro-long the life of the motor. In order to avoid the lateral collapse of thin specimens on the process of testing, there is a system equipped on the feeding system for preventing the specimen lateral collapse.

5.6.2 This system can adjust the opening size by changing different fixture block according to different sample width. The fixture block mates with the fixture block supporter by dovetail groove structure, it is very easy and convenient to install and change the fixture block. The material of the fixture block is made from high quality steel, which processed by quenching; this fixture block has strong strength and hardness, and it is wear resistant.

5.6.3 This sample feeding system also has the function of sample centering. When the sample is feed automatically, the sample is centered at the same time.

5.7 Automatically sample colleting system

This system adopts high rubber conveyor which is driven by rotating motor to perform the sample collecting. This is protective device around the conveyor, after the impact, the broken samples will be on the conveyor; this system works automatically after the impact, bring the broken samples out of the machine, it avoids the operators to collect the broken samples in the machine, which completely increase the efficiency and safety.

5.8 Buffering system

5.8.1 Because the DWTT require the hammer to tear the samples by one impact, so after the impact, there will be big energy left on the hammer, thousands J, or even bigger on the lower temperature circumstance.

5.8.2 This will be definitely influence the testing accuracy and the machine using-life. In order to avoid this case, our machine adopts hydraulic buffer which is specially designed for this case; the structure, especially the damping orifice is strictly computed and verified by mass tests, the cushioning properties can reduce the impact at maximum extent, the single buffer is enough to absorb thousands J cushioning energy; the damping force during the whole cushioning process is uniform and steady, it can reduce to impact to the machine at maximum extent. There are double buffers with same structure.

5.9 Control system

5.9.1 Adopting Taiwanese EVIEW LCD touch screen, abundant information display, can monitor the status of executive elements on real time and has a function of self-diagnosis failure. Combined with SIEMENS PLC controller, the displacement sampling is processed by Japanese encoder, which has the advantage of good accuracy, precise control and strong interference resistance performance.

5.9.2 Control unit: Adopting SIEMENS PLC controller, the height of hammer or impact energy can be set accordingly; the operator can also input every impact height by manual.

5.9.3 Adopting Japanese imported encoder to carry out the displacement sampling; the resolution is 0.1mm.

5.9.4 Control system has sound warning functions in case of failure operation, such as, the hammer doesn't make self-locked; Safety equipment don't work and the hammer is not lifted to the preset height, etc.

5.10 Safety measures

5.10.1 The load frame has a close steel safety enclosure, which has a safety shield with a height of 1.8m. All these can prevent operator's body from entering dangerous area and avoid operator be hurt from specimen fragment.

5.10.2 At the same time, the door of enclosure is completely interlocked so that all operations are invalid unless all the safe measures are in place.

5.10.3 Adopting self-locked reducing motor, when power is off suddenly, the release organ of the hammer is self-locked; the hammer will hurt neither operator nor the equipment. If power is break during lifting hammer, the motor will be self-locked and the hammer will stop, so as to guarantee the operator and the equipment.

5.10.4 The hammer won't release unless the operator press hammer-release key by hands. There is a sensor to monitor specimen, if there is no specimen right on the supporter, the hammer can not be released.

5.10.5 When a specimen is broken by impacting and the second specimen is not in its position, in order to prevent hammer's release from damaging the testing machine, the machine is

equipped with buffering fixture. The buffering fixture adopts imported special impact resistant buffering oil cylinder, which can bear high speed impact and absorb impact energy about 15000J. The buffering fixture has the characteristics of stable buffer, low noise, and long life and free of maintenance.

5.10.6 There is safety pin in the guide rod, if the operator needs to work under hammer; the safety pin can be inserting to the hole, which guarantees the safety of the operator.

5.10.7 The testing machine has reliable upper and lower traveling position limiter; In any case, the hammer won't be over-impact and locked.

6. Technical specification:

1) maximum impact energy: 30000J
2) minimum impact energy: 8000J
3) the weight of the main hammer body: 630kgs
4) the error of the main hammer body: ±1%
5) the weight of the poise/weight: 30kgs x 13 pieces (390kgs)
6) the error of the poise: ±0.5%
7) the total weight of the impact hammer: 1020kgs
8) impact height range: 1275-3000mm
9) impact speed range: 5m/s-- 7.67m/s
10) the hammer lifting speed: about 4m/min
11) the error of height measurement: ≤±10mm
12) the resolution of height measurement: 0.1mm
13) the material of the striker: 6CrW2Si, the rigidity: HRC58~62
14) the radius of striker: R25±1mm
15) the material of anvil: 6CrW2Si, the rigidity: HRC58~62
16) the radius of anvil/supporter: R20±0.1mm
17) The alignment error between the center of the hammer striker and the center of the span of the supporter. ±1.5mm
18) The span of the anvil/supporter: 254mm±1.5mm
19) the dimension of the specimen: (300±5)mm×(75±1.5)mm ×（3~40）mm
20) the dimension of the load frame: 1900mm(L)×1300mm(W)×5100mm(H)
21) the power supply: **3 phase 5 lines, 4kW, 415V±10%, 20A，50Hz.**
22) the weight of machine : about 8000kg

Note: The foundation for this machine should be ready before the installation.

7. Standard accessory (parts of the machine):

7.1 Loading frame, 30000J, one set

7.2 Impact body, one set

7.3 Impact Harmer: two sets (one for spare parts)

7.4 Poise/weight: 30kgs * 13 sets

7.5 Harmer lifting system, one set

7.6 Hammer grasps and doffs system, one set

7.7 Safety cover: one set

7.8 Automatic sample feeding system: one set

7.9 Buffering oil cylinder: two sets

7.10 Japan made AC servo motor: one set

7.11 Sample feeding motor, one set

7.12 Reducer, one set

7.13 Electronic Siemens PLC control system: one set

7.14 Supporter: four sets (two for spare parts)

7.15 Foundation bolts: four sets

7.16 Inner Hexagon Spanner, one set

7.17 Operation and maintenance manual, English version, two sets

8. Working condition:

★Work between ambient temperature and 40℃.

★Relative humidity less than 80%;

★Work on 3 phase 5 lines, 415V±10%: 50Hz, 20A;

★Voltage of power is less than ±10% of rate value.

★Work without obvious magnetic interfering around.

★Work without shaking and caustic medium around.

★Keeping space between 0.7m and 1m to other objects.

★Keeping neat and clean working environment;

★Grounding: resistance less than 5Ω;

ZYS2801-A Low Temperature Chamber

Capacity: -80℃

(Compressor Cooling)

Low Temperature Chamber

1. Description: Low Temperature Chamber (Compressor Cooling)

2. Model: ZYS2801-A

3. Capacity: -80℃

4. Introduction

4.1 ZYS2801-A Low Temperature Chamber for DWTT is strictly designed according to the requirements from **API RP*5L3-96《Recommended Practice for Conducting Drop-Weight Tear Tests on Line Pipe》**, and other equivalent international standards.

4.2 This equipment adopts cascade compressor cooling technology, uses principles of heat balance and cycle stirred, to uniform cooling the samples and preserves the temperature automatically, which satisfy the standard temperature requirements.

4.3 This equipment is easy to operate with high efficiency; it is the ideal choice for the DWTT low temperature tests to cool the samples and preserve the temperature.

4.4 The two cooling compressors are from France.

5. Technical specification:

1) Temperature range: Ambient temperature to -80℃

2) Accuracy: ±0.5℃

3) Cooling speed:

Ambient temperature～0℃ about 1.2℃/min

0℃～-20℃ about 0.9℃/min

-20℃～-40℃ about 0.6℃/min

-40℃～-80℃ about 0.3℃/min

4) Working space: 690×380×200mm

5) Sample dimension: (300±5)mm×(75±1.5)mm ×(3~40） mm

6) Capacity of holding samples: ≥8

7) Cooling Medium: Pure alcohol (Purity≥99.7%)

8) Digital timer: 1-99minutes

9) Resolution of the digital timer: 1 minute

10) Quantity of the cooling medium: about 60L (Should be prepared by the customer itself)

11) Power: 3 phase 5 lines, 415V±10%, 50Hz, 15A, 8000W

12) Outer dimension: 1350mm×950mm×1220mm

13) Net weight: 250kg

QYJ4401 Notch Broacher for DWTT

1. Description: Notch Broacher for the DWTT

2. Model: QYJ4401

3. Introduction and Functions:

3.1 This machine is specialized for the samples making of DWTT tests.

3.2 This machine is hydraulic motorized and electric controlled; the lifting of the oil cylinder is controlled by electromagnetic reversing valve.

3.3 The machine is equipped with stroke limit switch, which functions for stopping the machine automatically when the pressed notch reaches defined depth. This switch can make sure the accuracy of the sample making and the safety of the machine as well.

3.4 The press cutter is made of W18Cr4V cutting tool alloys, which is abrasion resisting and long-life using.

3.5 The machine is easy to operate with high accuracy and efficiency for samples making.

3.6 This machine can also be used to make the pipeline steel samples.

3.7 This machine is manufactured strictly according to **API RP*5L3-96《Recommended Practice for Conducting Drop-Weight Tear Tests on Line Pipe》**, and other equivalent international standards.

4 Technical Specification:

4.1 Maximum capacity: 1000Kn

4.2 Sample dimension: （300±5）×（75±1.5）×（5～40）mm

4.3 Notch type: V notch, depth 5mm, angle 45º±2 º , radius of the arc r = 0.025mm

4.4 Travel of the oil cylinder: 120mm

4.5 Distance between the columns: 410mm

4.6 Diameter of the columns: 100mm

4.7 Compression space: 230mm

4.8 Loading: hydraulic loading

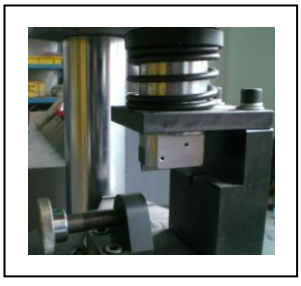
4.9 The maximum oil pressure of the hydraulic system: 16MPa

4.10 Hydraulic oil: L-HM46, 38 Liters (Should be prepared by the customer itself)

4.11 Dimension of the machine: 1300mm×420mm×1460mm

4.12 Power supply: 3 phase 5 lines, 415V, 5 A

4.13 Weight: about 400kgs



5 Standard accessories

5.1 Main machine, one set

5.2 Press cutter: two sets. (One for spare)

5.3 Press platen: 3 sets.

10. Services:

1. WARRANTY: 12 Months from the date of Installation, or 15 months from date of Shipment, against defects in workmanship or in material under normal use & service, whichever is earlier. (Remark: The warranty excludes expendable parts. And the Seller reserves the right to reject those claims for warranty where it is determined that failure is caused by the Buyer's modification, improper maintenance, misuse, or abusing the equipment).
2. Software upgrade, free of charges;
3. Training service in MTS CHINA: Free of charge