Model HTT-5000 Computer Control Horizontal Tensile Testing Machine

Applications:

This testing machine is special designed for tensile test of chain, long steel-wire rope, sling, belt, cable and other flexible specimens etc. It adopts horizontal type structure with servo and computer control and mainly used for the standard load holding and broken test. This testing machine adopts H-type steel welding frame. The test space can be adjusted through the inserted pin according to the different specimens. The one-way & double action actuator applies the test force and the load cell measures the test force. It can realize load, speed (displacement) control such as constant speed testing load, constant speed displacement, holding the testing load, holding the displacement etc. The users can realize the automatic control and testing process through the intelligently programming system, software under Windows system can realize the collection of testing data and testing curves, monitor display in real time. Data and testing curves can be stored through database management, and also equipped with network system interface.

Applied Standard:

➢ Load meets or exceeds the following standards: ASTM E4, ISO7500-1, EN 10002-2, BS1610, DIN 51221.

➢ Strain measurement meets or exceeds the following standards: ASTM E83, ISO 9513, BS 3846 and EN 10002-4

Specification:

1. Max. Test load: 5000kN
2. Test load range: 2%-100% of full scale
3. Load accuracy: ±1%
4. Piston stroke: 1500mm
5. Piston diameter: 650mm
6. Test tensile space: 600-3500mm
7. Piston moving speed: 80mm/min
8. Clearance between column: 1200mm
9. Test space: manually adjusted & fixed by pin
10. Load measurement: load cell
11. Displacement measurement: photoelectrical encoder
12. Control mode: automatic control
12. Display of testing parameters: value and real time curve
13. Power supply: 380V, 50Hz, 3PH
14. Dimension of load frame: 13500x2600x1600mm
15. Weight: approx. 35,000kg

Structures:

1. Load frame

The load frame consists of cylinder seat, cylinder, piston, moveable crosshead, fixed crosshead and load cell etc. The cylinder seat, H-type steel welding frame, moveable and fixed crossheads forms the bearing frame. On the moveable and fixed crossheads, the tensile attachment base is mounted for connecting the U-type grip. The one-way & double-direction low friction piston cylinder with diameter of 650mm & stroke of 1500mm drives the crosshead movement in the action of hydraulic oil, thus to apply the test force to the specimens. The electro-hydraulic servo system controls the loading speed till the test over
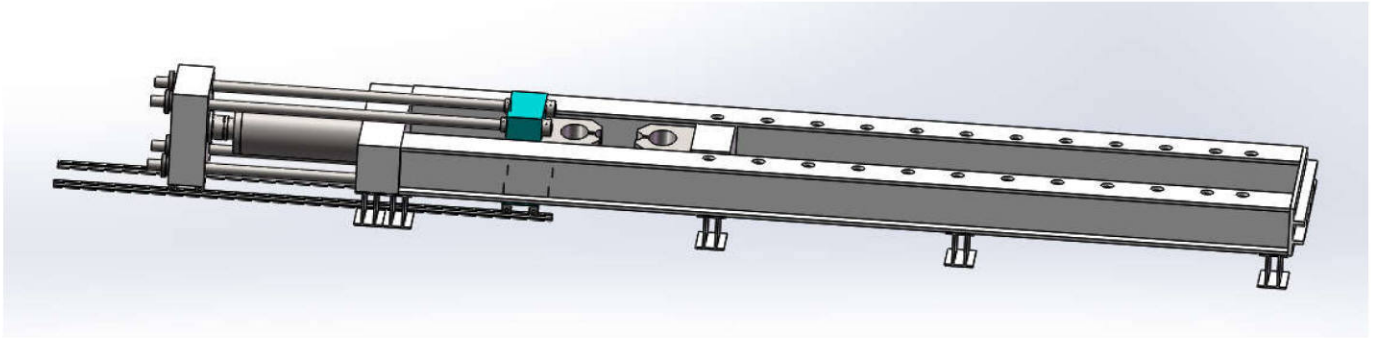
2. Hydraulic power pack

Max. Flow of main oil source is 40L/min and the max. high pressure is 26MPa. Hydraulic principle: the hydraulic oil from oil tank enters into the oil circuit by the motor driving the high-pressure gear pump, which flows through the single-direction valve, 10μ high pressure oil filter, electro-hydraulic servo valve and goes into the cylinder. The servo valve adjusts the flow of hydraulic oil that enters into the cylinder, so the control of piston speed is letting the oil enter into the cylinder to do the test.

3. Control, Measure & Display System

a. Altos Servo valve from Italy controls the loading of test force, the loading of constant speed, and the displacement of constant speed

b. By adopting overflow valve to control the peak load

c. By adopting load cell to measure test load.

d. By adopting high accuracy photoelectric encoder to measure displacement

e. Computer screen monitor all kinds of test data, and plot Time-Load curve

4. Operation safety:

a.   Overload protection function.

When overloading more than 2%-5% of maximum test load, the machine will be stopped automatically.

b.   Possess the automatic stop function when reaching the limiting position of ram and crosshead.

c.   Possess the automatic alarming function when the oil filter is choked and the automatic control device to oil temperature

d.   Emergency shut down

e.   Safety cover on top of load frame.

Configuration:

1. Load frame	1 set
1.1 Low frictional cylinder with single action & double actions	1 set
1.2 Cylinder seat	1 set

|	
1.3 Front & rear pin roll puller	2 sets
1.4 Safety protection cover	1 set
1.5 Load cell 5000kN	1 set
2. Hydraulic power pack	1 set
2.1 Motor	1 set
2.2 High quality hydraulic pressure parts, pipeline & oil filter 10μ	1 set
2.3 Servo Valve	1 set
2.4 Oil pump	1 set
3. Control panel and electricity power	1 set
4. Measuring and data processing system	1 set
5. Computer with software	1 set
6. Heavy-current control system	1 set
7. Load cell	1 set
8. Safety device—shielding cover	1 set

Product photo (for reference):

Please see more photos for **similar machine** as below:


HTT-2000 machine in customer's site
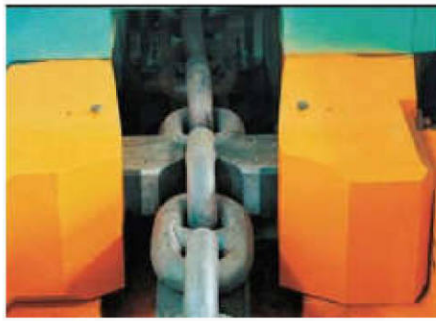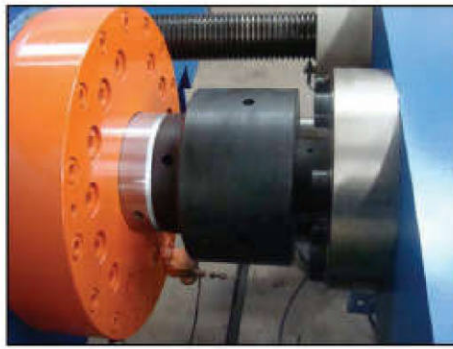
Main part of HTT-2000

500kN tensile testing machine

Annex-1 Software Instruction

Features of Measuring & Control software

software refers to the software characteristics of the top manufacturers of testing machine in the world and proposals of various testing requirements from the end users, and combines all the advantages of former versions of software with lots of new features. Optimized software structure makes the testing operation easy, convenient and powerful. Main interface as following,
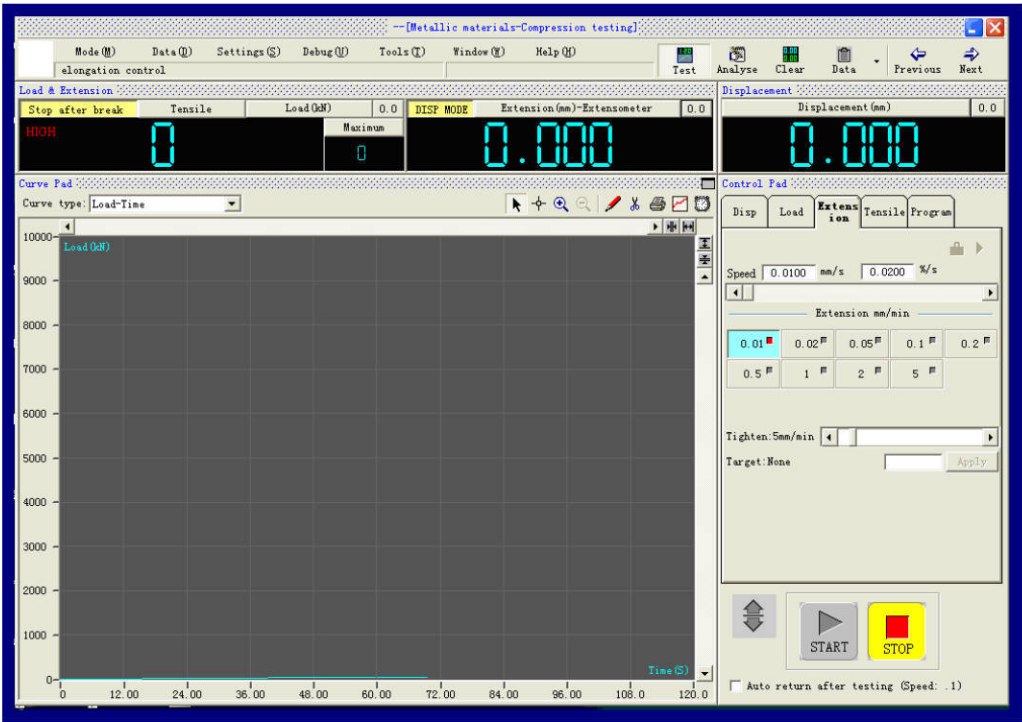
Features:

Full digital control

The whole measuring and control system adopts the special controller, which can achieve the digital adjustment of zero point and gain of load, deformation and displacement, and it's easy to operate and possesses the high reliability.

2. Possess the functions of storage, setting and loading for various kinds of parameters, which make it convenient to connect multiple transducers with one load frame.

3. Realize the close-loop control, and show the reference curve during the executive operator adjusting the close-loop parameters, so the user can observe the close-loop effect caused by the parameters.

4. Perfect intelligent expert system of control mode to offer the automatic programming function. The user can set control mode during the test or each step of the test as the regulation according to the user's actual needs to compile the program, which can meet the test requests of various kinds of materials and test standards at home and abroad.

5. Perfect graphic function to complete the functions of the reappearance, amplification, reduction, self-adaptation, lapping of the curves, display and print the curve at the appointed range, observe the coordinate of the test point.

6. Data processing supports automatic analysis and graphic man-machine mutual processing, which is convenient to check and compare the test results.

7. The user can self-define the output of the test reports, which has the utmost flexibility.

8. Perform the automatic inspection of the operation system,; real-time acquisition and control under the platform of Win2000、WinXP, etc. NT mode; accurate timing and high-speed sampling;

9. Multilevel identity management integrates the flexible function of the testing machine with easy operation, which not only makes the operation easy by ordinary operator but also protect the system effectively.

10. Framework type design concept and open type program structure make it easy to extend the function of the machine and further exploitation for the user. It can also connect externally internet program module to complete the requests of data connecting internet.

11. Based on the database, test data is stored by form of text file, which is convenient for the user to inquire about and utilize the various kinds of commercial report forms to reprocess the test data, meanwhile transfer the data to the internet conveniently.

12. Multilevel identity management

Multilevel identity management, different identity has different functions, which not only makes the operation quick by ordinary operator, but also protect the system effectively.

Please see more information with some pictures:
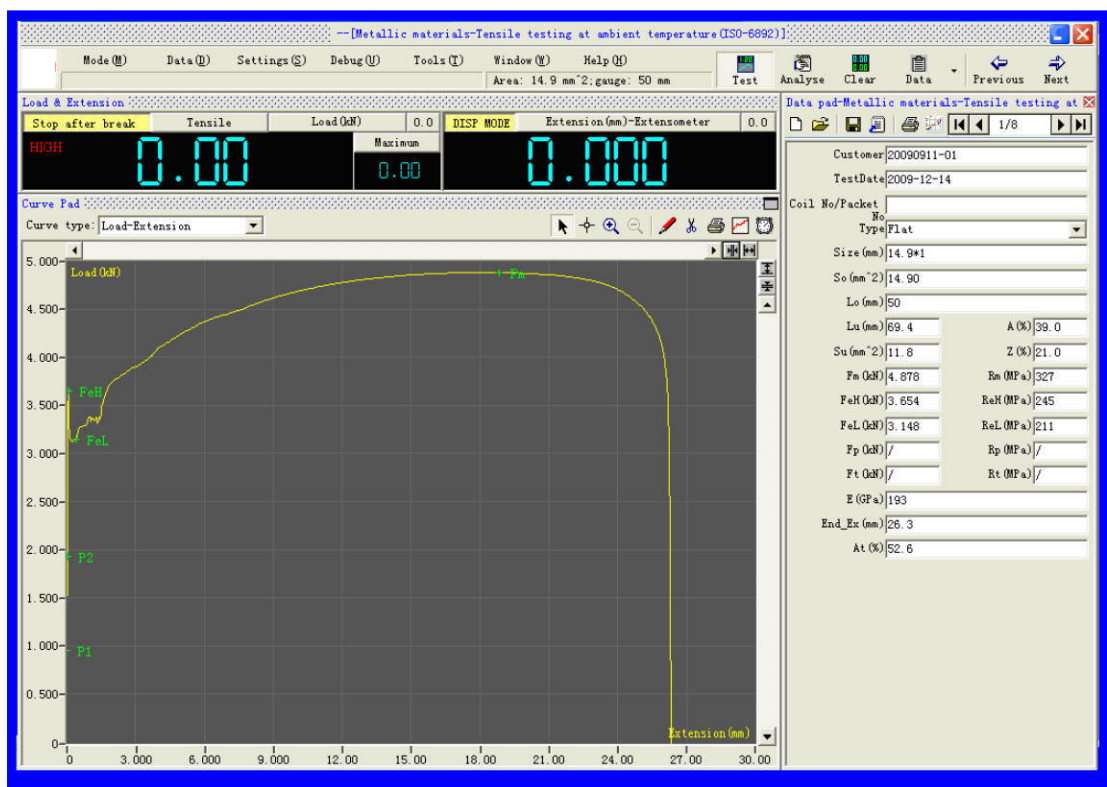
The control modes, test data and curves can be displayed in real time in the main interface and can be shifted at any time.
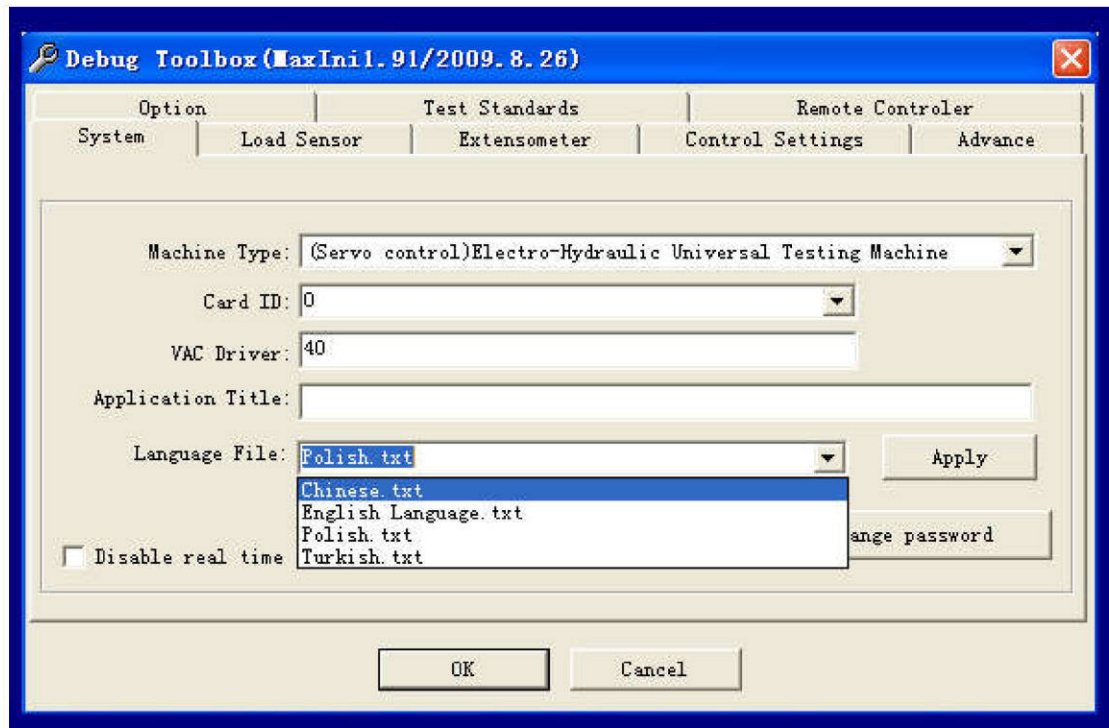
The deep-seated parameters of software are contained in Debug Toolbox

Multi-language function:

With the flexible language edited function, it can support multi-language such as English, Chinese etc. and you can translate the software language into the native language by yourself.

Software supports all kinds of popular testing standards i.e. ISO, ASTM, BS EN, DIN, JIS, GB etc. Users can modify and add own testing standards and methods.

Test Standard Creater 3.0 (Standards amount = 70)

System (S)

| Modify Standard Caption and ID... |
| Modify Standard Definition... |
| Modify Standard Structure... |
| **Copy Current Standard for Creating New Standard...** |
| Save Current Standard as Tdf File... |
| Import Form Tdf File... |
| Delete Current Standard |
| Find Standard... |

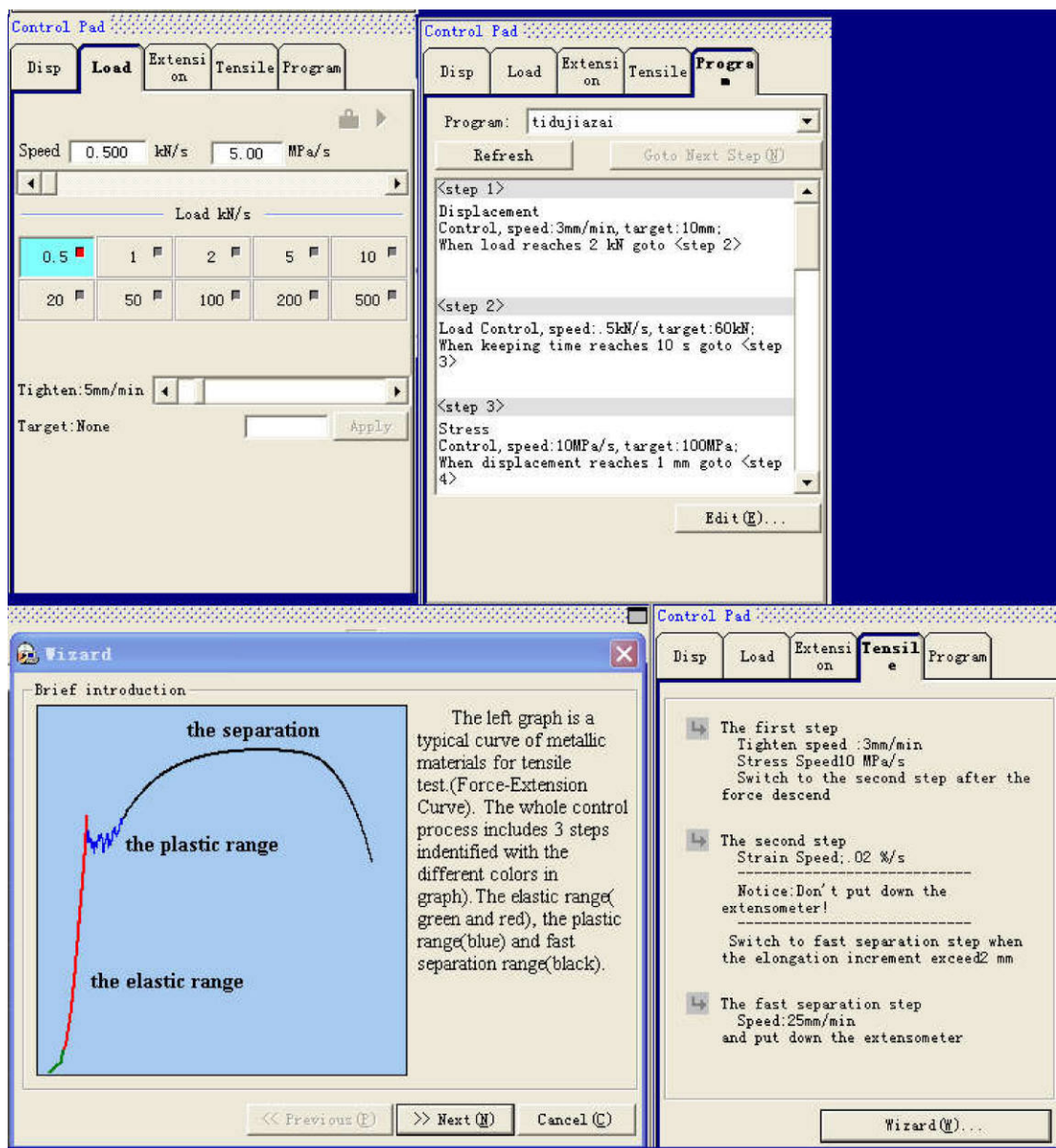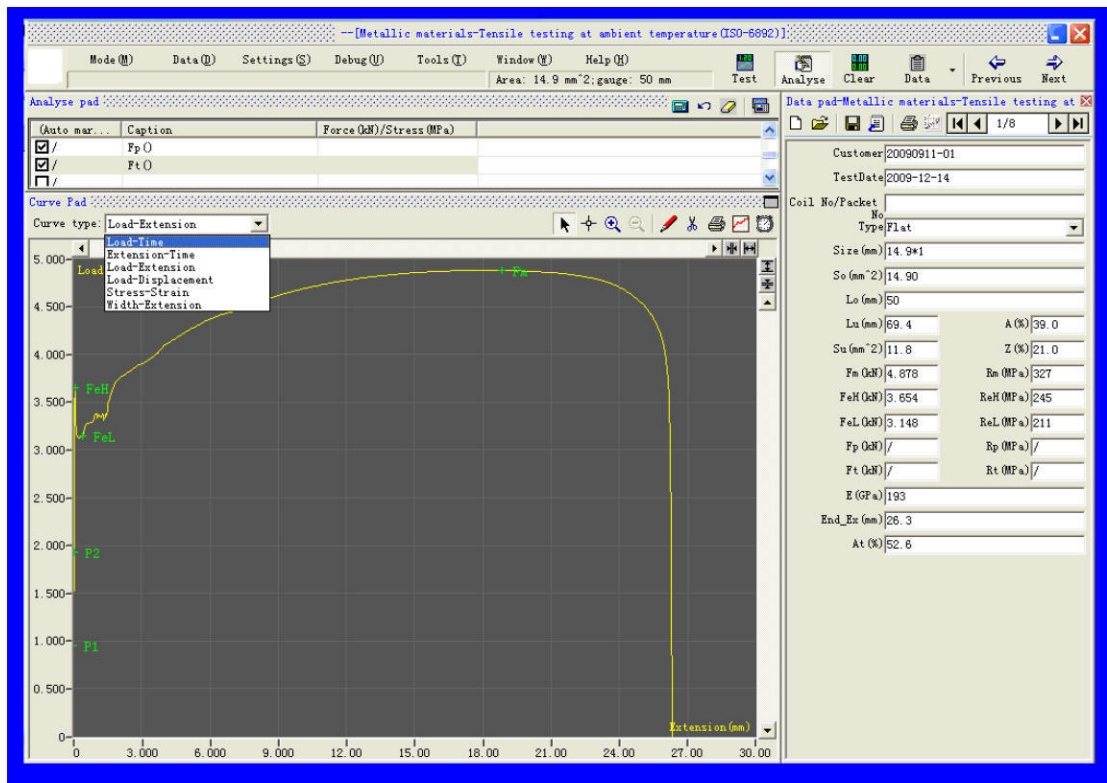|			Tooltips	Formula	Decimal	Key...	Vis...	
							False	
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			Size Format...				True	
						Area	True	
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							False	
10	Self2	2					False	
11	Self3	3					False	
12	Self4	4					False	
13	Self5	5					False	
14	Self6	6					False	
15	Self7	7					False	
16	Self8	8					False	
17	Self9	9					False	
18	Self10	10					False	
19	Self11	11					False	
20	Self12	12					False	
21	Self13	13					False	
22	Self14	14					False	
23	Self15	15					False	
24	Fbc	Fbc(kN)				MaxY	True	
25	Rbc	Rbc(MPa)		[Fbc]*1000/[Area]	200,5,1		True	
26	Fsc	Fsc(kN)				QfY	True	
27	Rsc	Rsc(MPa)		[Fsc]*1000/[Area]	200,5,1		True	
28	Fpc	Fpc(kN)				Poi...	True	
29	Rpc	Rpc(MPa)		[Fpc]*1000/[Area]	200,5,1		True	
30	Ftc	Ftc(kN)				Poi...	True	
31	Rtc	Rtc(MPa)		[Ftc]*1000/[Area]	200,5,1		True	
32	Slope					Slope	False	
33	Ec	Ec(GPa)		[Slope]*[Gauge]/[Area]	0,0.01,0.01		True	
34	TestFlag					Tes...	False	

MaxProgram1.4(2007.8.26)

New Save Delete Rename Vertify   Add Insert Remove

Program: Tensile Program ▼   ⦿ Tensile   ○ Compress

Step	Control type	Speed/Target	Jump	Loop	Remark
1	Displacement Control	speed:3mm/min, target:10mm	When stress reaches 10		
2	Stress Control	speed:15MPa/s, target:400MPa	When stress reaches 300		
3	Strain Control	speed:.02%/s, target:4%	When strain reaches 2	return loops 3, goto 1	
4	Displacement Control	speed:20mm/min, target:70mm	When displacement reach		
5	Stop				

Open-loop displacen
Displacement Contro
Load Control
Stress Control
Extension Control
Strain Control
Output Keeping
Stop

MaxProgram Editor possesses of multiple full digital control modes, i.e Displacement control, Stress (Load) control, Strain (Deformation) control, Low cycle control. User can edit the most complex and logical

procedure by MaxProgram Editor. The combination of above functions can meet all kinds of routine test purpose.


Through the Tensile Program Editor, user can setup test steps according to the requirements of standards.

Multiple curves function in real time display including Load-Extension, Load-Displacement, Stress-Strain, Load-Time, Extension-Time, and Width-Extension.

Characteristic points such as Elastic Modulus, Yield points, Rp, Rm etc. can be marked on the curves, for a highlighted and visual observation.

Test result can be obtained automatically and also it can be got from the test curves manually.
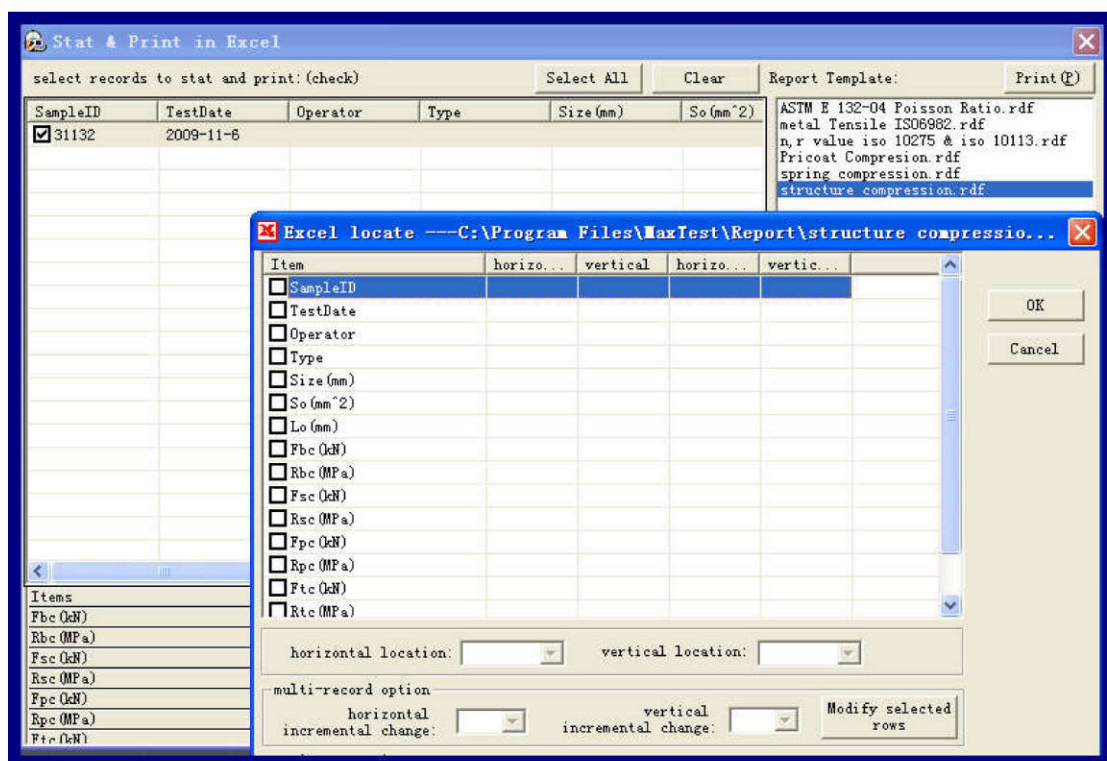
software contains all kinds of Report Templates. Customer can design various testing reports according to the requirements. Test result and curve can be printed in Excel or the auto-creating report template.

Metallic materials -- Tensile testing at ambient temperature
ISO 6892 : 1998

TestDate	2009-9-11			Operator	LW		
Temperature	20℃			Size(mm)	14.9*1		
Lo(mm)	50			So(mm^2)	14.9		

PrintID	SampleID	Rm(MPa)	ReH(Mpa)	ReL(MPa)	Rp(MPa)	E(GPa)	A(%)	Z(%)
1	QD01	327	245	210	233	193	39	21
2	QD02	334	251	223	234	198	42	23
3	QD03	335	240	229	228	205	39	27
4								
Max value		335	251	229	234	205	42	27
Min value		327	240	210	228	193	39	21
Average value		332	245.3333	220.6667	231.6667	198.6667	39.6667	23.667

Load-Extension Curve

Print Date:　　　　2009-12-8

Except the clip-on Extensometer, software supports Long Travel Extensometer, Full Automatic Extensometer, video Extensometer, laser Extensometer, and it can be added eight Extensometers at most.

software supports four load cells.