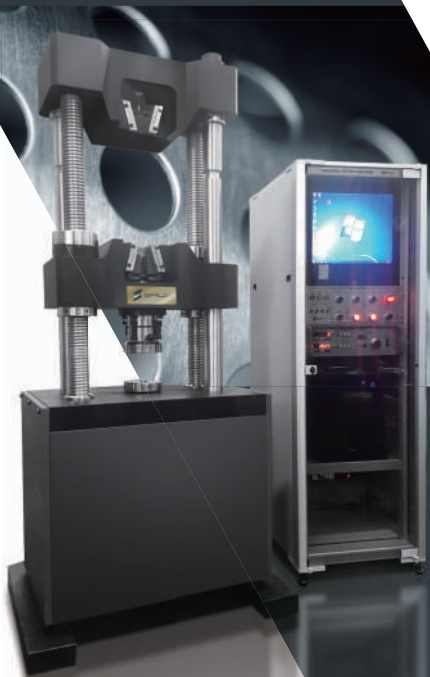




SALT

Technology and Art,
Dignity and Dynamics
impress customers at last.



ST-1005 Fatigue Testers with Hydraulic Dynamic Actuator for testing materials, parts and components. Special hydrostatic (non-packing) actuating cylinder system for increased durability, repeatability, minimal friction wear and consistent accuracy. The ST-1005 line of products are engineered with ease of use, versatility and minimized foot print in mind. Usage ranges from materials, parts and components of film, rubber, plastic, metal, composites in the fields of automotive, aerospace, defense, medical, civil etc. Salt Co. specializes in the production of made to order machines to fit your applications as well as our general line up of offerings.



 **ST-1005**



 **ST-1005**
Chamber Type



 **ST-1005**
Compression Testing Type

ST-1005 Fatigue Testers with Hydraulic Dynamic Actuator for testing materials, parts and components. Special hydrostatic (non-packing) actuating cylinder system for increased durability, repeatability, minimal friction wear and consistent accuracy. The ST-1005 line of products are engineered with ease of use, versatility and minimized foot print in mind. Usage ranges from materials, parts and components of film, rubber, plastic, metal, composites in the fields of automotive, aerospace, defense, medical, civil etc. Salt Co. specializes in the production of made to order machines to fit your applications as well as our general line up of offerings.



ST-1005
Table Top Type



ST-1005
4 Post Guide Compression Type

ST-1004 Hydraulic Universal Testing Machines. Offers a dynamic range of tests including tensile, compression, flexural/bending, shear etc. for testing of materials such as metals, concrete, woods etc. The ST-1004 is engineered with durability, accuracy and repeatability in mind. The frames are over spec'd to be as durable as possible with the highest in class frame rigidity and stiffness, Salt Co. offers more than the competitors when it comes to testing rebar, stranded wire, concrete etc.



ST-1004
Compression Testing Type



ST-1004
6 Column Structure Type



ST-1004
4 Column Structure Type

ST-1003 Environmental Chamber Type Universal Testing Machines. Engineered to be used in conjunction with an environmental chamber for testing materials, parts and components. General model chambers range from -60°C to 300°C and high temperature furnaces range from $+300^{\circ}\text{C}$ to 1200°C . Chambers are typically fixed to the frame via track and rail system to be easily positioned for testing and moved out of position when not in use. ST-1002 Servo Electrical Universal Testing Machines for midrange force applications ($\sim 30\text{kN}$ to 300kN). Frame is aesthetically designed to fit well in any laboratory or R&D lab and mechanically durable enough for QC and manufacturing floor. Wide range of accessories offer testing a vast field of materials parts from cords, belts, wires, rebars, automotive parts, concrete etc.



ST-1003
Electrical U.T.M Chamber Testing Type



ST-1002
Electrical U.T.M Floor Standing Type

ST-1001 Electrical Universal Testing Machine for low to mid-range force applications (~20kN). Designed to fit on top any sturdy table for compact use and minimized footprint. Engineered to offer a dynamic range of testing applications from tensile, compression, flexural/bending, peel, shear, tear, puncture etc. for light metals, plastics, rubber, textiles etc.

ST-1000 Single Column Table Top Electrical UTM for low range force applications (~3kN). Designed for universal usage for testing film, textiles, wires etc. The most compact frame, under 70kg) with the most versatility.

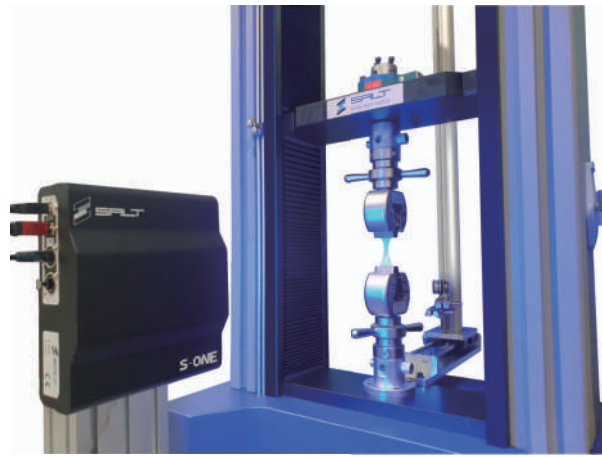


ST-1001
Table Top 2 Column Type



ST-1000
Table Top Single Column Type

Non-Contact Video Extensometer



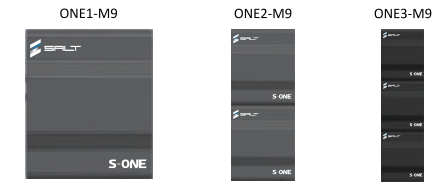
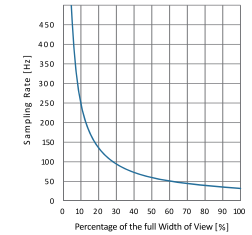
ST-S-ONE

Salt Co.'s S-ONE Non-Contact Video Extensometer can be used for a dynamic range of samples that are often difficult or impossible with a traditional extensometer. The high resolution (0.1µm) allows for detailed analysis of modulus, yield point, elongation, specimen deformation and stress. In addition post-processing analysis and DIC (Digital Image Correlation) measurement and analysis are possible.

- Features and Functions
- All-in-one body solution
 - Easy mounting
 - Calibration grid for easy set up
 - Integrated LED light bar
 - Interchangeable lens 1.3MP to 9MP

Specification

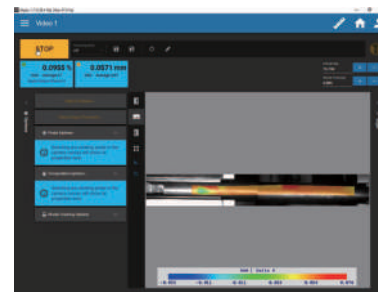
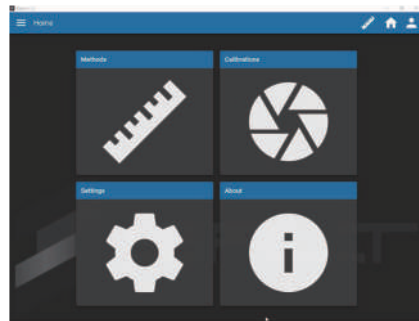
- Single camera resolution 9MPx
- 1" sensor size
- CMOS sensor
- 3.45µm pixel size
- USB 3.0 interface
- 32Hz at a full resolution
- C-Mount lens mounting
- Recommended lens serie - H



ISO 9513	Field of View [mm]						Working Distance [mm]				
	ONE3-M9		ONE2-M9		ONE1-M9		Lens Focal Length				
	Height	Width	Height	Width	Height	Width	32mm	35mm	25mm	35mm	50mm
Class 0.5	220	136	420	136	620	136	330	380	330	485	720
Class 1	440	232	840	262	1240	262	335	440	715	1025	1485
Class 2	880	464	1680	464	2480	464	690	935	1500	2120	3055

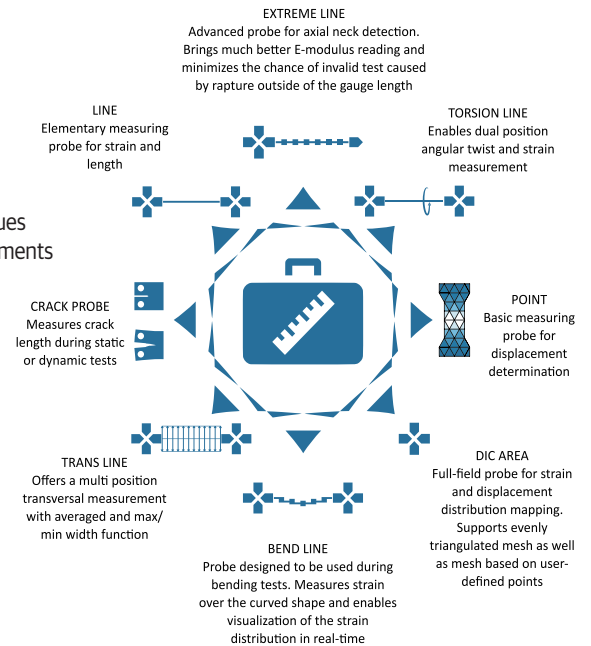
*All specifications for 9MP camera

Alpha Strain Analysis Software



- Features and Functions
- Dedicated calibration grid for simple calibration
 - Method presets linked with calibration
 - Simultaneous multi-probe measurement
 - Post-process analysis and DIC
 - Wide palette of available outputs and measurement values
 - Incline, torsion, crack length, flexural, point etc. measurements

Software, lens, LED light, dongle, all connections required and calibration grid included. Other accessories include multiple camera set ups, frame mount, different lenses etc. Inquire for more information



ST-1000 Series UTMs offer a wide range of accessories such as grips and jigs, extensometers, environmental chambers etc. for different testing applications and testing solutions. From paper, plastics, metals and composites covering all fields such as bio, medical, automotive, aerospace, defense etc.



**Hydraulic Wedge
Action Grips**
Metals, composites, etc.



**Pneumatic Micro
Tensile Grips**
Plastics, film,
rubber etc.



**Pneumatic Side
Action Grips**
Film, thin metals,
paper etc.



**Pneumatic Type
Yarn Grips**



Capstan Type Grips
Wires, yarn, cords etc.



Wedge Action Grips
Metal, hard plastic,
rubber etc.



**Hydraulic Side
Action Grips**
Metals, composites etc.

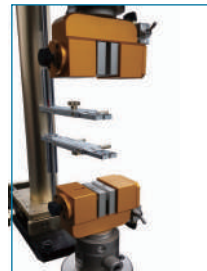


Screw Side Action Grips
Plastics, rubbers,
textiles etc.

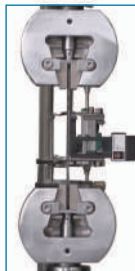
Extensometer



High elongation extensometer (Encoder type)



Breaking point extensometer for metals



Yield point extensometer (Strain Gauge Type)



Compressive strain extensometer (LVDT Type)



Tensile Grip for Rubber



Tensile Grip for Film



Tensile Grip for Belt & Geotextile



3-Point bending Grip



Tensile Grip for 90° Peel



Drum Peel Jig ASTM D1781



Mortar (Briquette) grips ASTM C307

Order made and standard specific jigs and solutions available



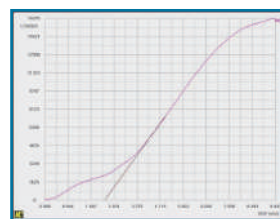
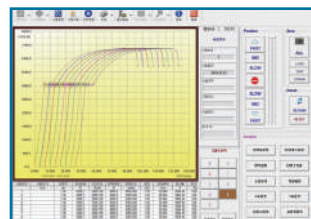
Chamber Type Universal Testing Machine



Interior Photos

Salt UTM Software exclusively for the ST-1000 Series of enables the testing, data acquisition, test data management and analysis. Test methods include: Tensile, Compression, Flexural/Bending, Cyclic, Shear etc.

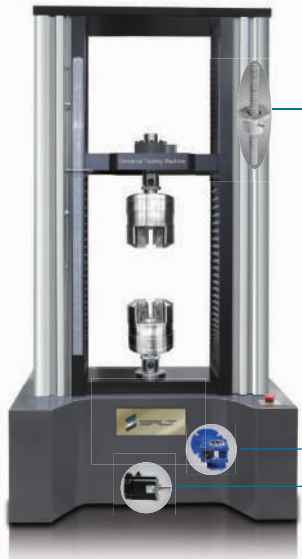
The software can be modified to meet any standard (ISO, ASTM, KS, JIS etc.) for any measurement possible with our UTMs after consultation. Analysis of the software include measurements of stress/force, strain/displacement, time and calculates the modulus, yield point, elongation % etc.



민장시험결과서			
Test No.	Test Date	Test Speed	Test Force
001	2013-08-17	1.0mm/min	1000N
002	2013-08-17	1.0mm/min	1000N
003	2013-08-17	1.0mm/min	1000N
004	2013-08-17	1.0mm/min	1000N
005	2013-08-17	1.0mm/min	1000N
006	2013-08-17	1.0mm/min	1000N
007	2013-08-17	1.0mm/min	1000N
008	2013-08-17	1.0mm/min	1000N
009	2013-08-17	1.0mm/min	1000N
010	2013-08-17	1.0mm/min	1000N

Test No.	Test Date	Test Speed	Test Force	Test Displacement	Test Time
001	2013-08-17	1.0mm/min	1000N	10.0mm	10.0s
002	2013-08-17	1.0mm/min	1000N	10.0mm	10.0s
003	2013-08-17	1.0mm/min	1000N	10.0mm	10.0s
004	2013-08-17	1.0mm/min	1000N	10.0mm	10.0s
005	2013-08-17	1.0mm/min	1000N	10.0mm	10.0s
006	2013-08-17	1.0mm/min	1000N	10.0mm	10.0s
007	2013-08-17	1.0mm/min	1000N	10.0mm	10.0s
008	2013-08-17	1.0mm/min	1000N	10.0mm	10.0s
009	2013-08-17	1.0mm/min	1000N	10.0mm	10.0s
010	2013-08-17	1.0mm/min	1000N	10.0mm	10.0s

Electrical Servo Motor UTM

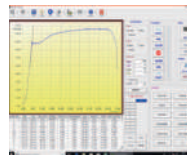


Touch Screen Type

Only the highest quality, proven parts for performance, accuracy and repeatability. The ST-1000 Series Electrical UTMs are equipped with the industry leading parts such as Mitsubishi Servo Motors and Drivers (Japan) and Motorvario Worm Gear Reducers (Italy). Precision balls screws and bearings are used to minimize backlash and improved accuracy in position and speed as well as control in applied force. Quality checks are done at every stage from the raw components and parts to manufacturing, assembly and all the way to packing and shipment.

Salts UTMs are controlled by our intuitive Touch Screen Indicator. With load cell resolution at 1/300,000 and displacement reading down to 0.001mm. Closed loop controller for a fully independent system.

Hydraulic Servo Valve UTM



SALT_UTM Software

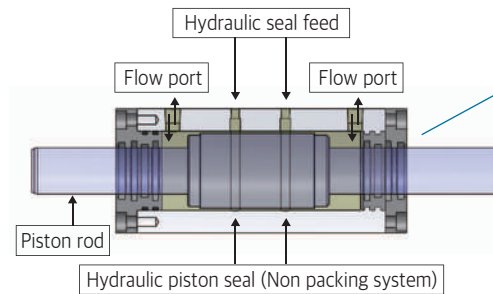


Our Hydraulic UTMs features the open hydraulic chuck system. Changing the tensile jaw faces are intuitive and simple. The open chuck system is individually controlled via wireless remote for ease of use, convenience and safety. With the wireless chuck remote, gripping samples in the tensile zone is much easier, safer and can be done by one operator.

All input outputs are relayed through a dedicated touch screen controller. Fully independent closed-loop system is paired with Salts innovative Hydraulic control UTM software.

Salt Co.,'s Hydraulic UTMs are equipped with the best in class hydraulic components. The power packs and hydraulic power units control the load precisely and accurately.

Hydraulic Servo Type Fatigue Testing Machine



- Salt Co.'s ST-1005 Fatigue Testing Machines are equipped with high-precision non-packing hydrostatic bearing cylinders. The reduced friction of the non-packing system allows for better control and accuracy of low and high load dynamic control of the actuator, the core component of the fatigue testing machine.

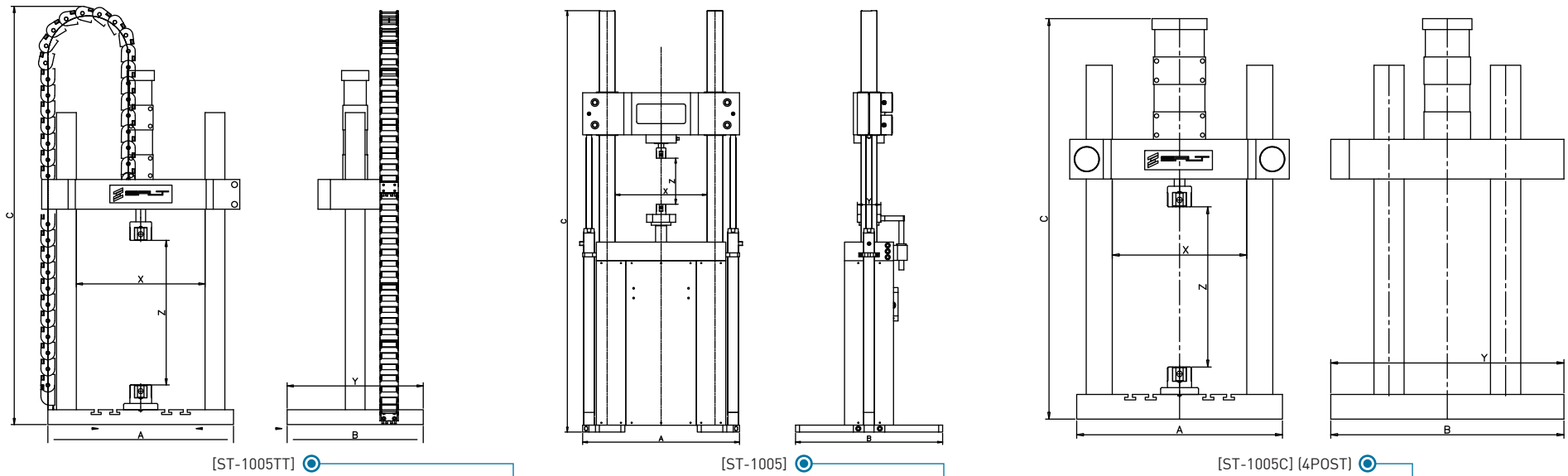
MOOG



- Salt Co.'s Digital Servo Controller (ARM 32bit CPU and DSP unit) is paired with MOOG Servo Valve for the highest degree in control and measurement. The hardware in our units guarantees precise repeatability with to the use of world class processing hardware, software and control. With Salt Co.'s dynamic fatigue testing machines the fatigue limit, deformation, cyclic trend and S-N Curve.

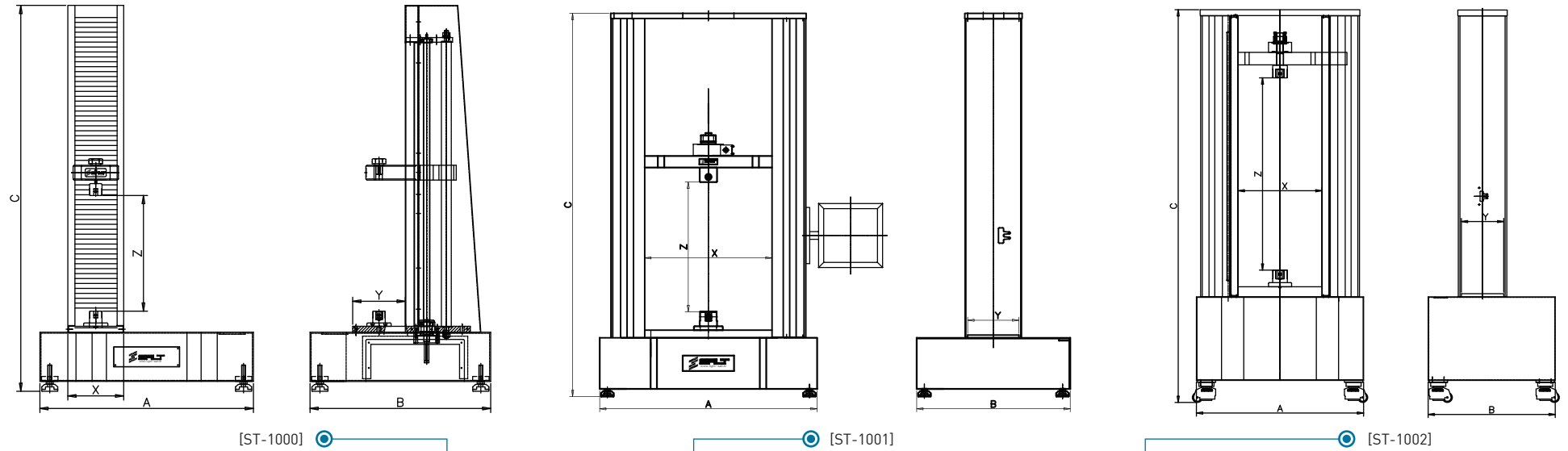
- Engineered with vibration, operation noise and smaller footprint in mind. For lower force dynamic testing we offer the ST-1005TT (Table top model). The table top ST-1005TT model is paired with the Hydraulic Power Unit which can be designed to fit under the frame. The specially designed power unit can act as a table or stage for the frame as well as dampening noise and vibration.

Hydraulic Servo Type Fatigue Testing Machine (Dynamic)



Model		ST-1005TT	ST-1005				ST-1005C	
Loading unit / Frame type	Frame type	Compact Table Top T-slotted bed type	General (Classic) Standing Type Actuator Bottom Mounted				2 post	4 post
	Loading method	Fixed bottom plate with transversal crosshead (hydraulic lift) mounted cylinder	Transversal crosshead (hydraulic lift) with bottom mounted cylinder				T-slotted bed type	
	Test Zone Dimensions (X x Y x Z)	450 x 450 x 1000mm	500 x 300 x 900mm	600 x 300 x 950mm	750 x 300 x 950mm	680 x 300 x 950mm	700 x 750 x 900mm	750 x 950 x 1000mm
	Frame Dimensions (A x B x C)	700 x 500 x 2400 mm	800 x 600 x 1900mm	900 x 650 x 2200mm	1150 x 700 x 2550mm		900 x 800 x 1800mm	1000 x 1000 x 1950mm
	Usable Testing Table (X x Y)	450 x 450mm	500 x 300mm	600 x 300mm	750 x 300mm	680 x 300mm	700 x 750mm	750 x 950mm
	Frame Weight	350kg	550kg	700kg	1,000kg		700kg	2000kg
	Frame Stiffness	33kN/mm	40kN/mm	58kN/mm	120kN/mm	225kN/mm	330kN/mm	3,250kN/mm
Specifications	Max Dynamic Load – kN (kgf/lbf)	±25kN (2,549kgf/5,620lbf)	±30kN (3,059/6,744)	±50kN (5,098/11,240)	±100kN (10,197/22,480)	±200kN (20,394/44,961)	±300kN (30,591/67,422)	±3000kN (305,914/674,226)
	Actuator Stroke	up to 100mm (±50mm)	up to 200mm (±100mm)				up to 100mm (±50mm)	
	Actuator Speed	35mm/s for general purpose models (upgradable)	50mm/s for general purpose models (upgradable)				100mm/s (upgradable)	
System	Controller	ST-1000C-DS – Digital Servo Controller						
	Hydraulic Unit	Gear pump, hydraulic tank, air cooled or chiller cooling system						
	Hydraulic Servo Valve	Moog 2 stage flow control (MFB) Servo valve						
	Power	3 Phase 220V 60Hz or 3 Phase 380V 60Hz						

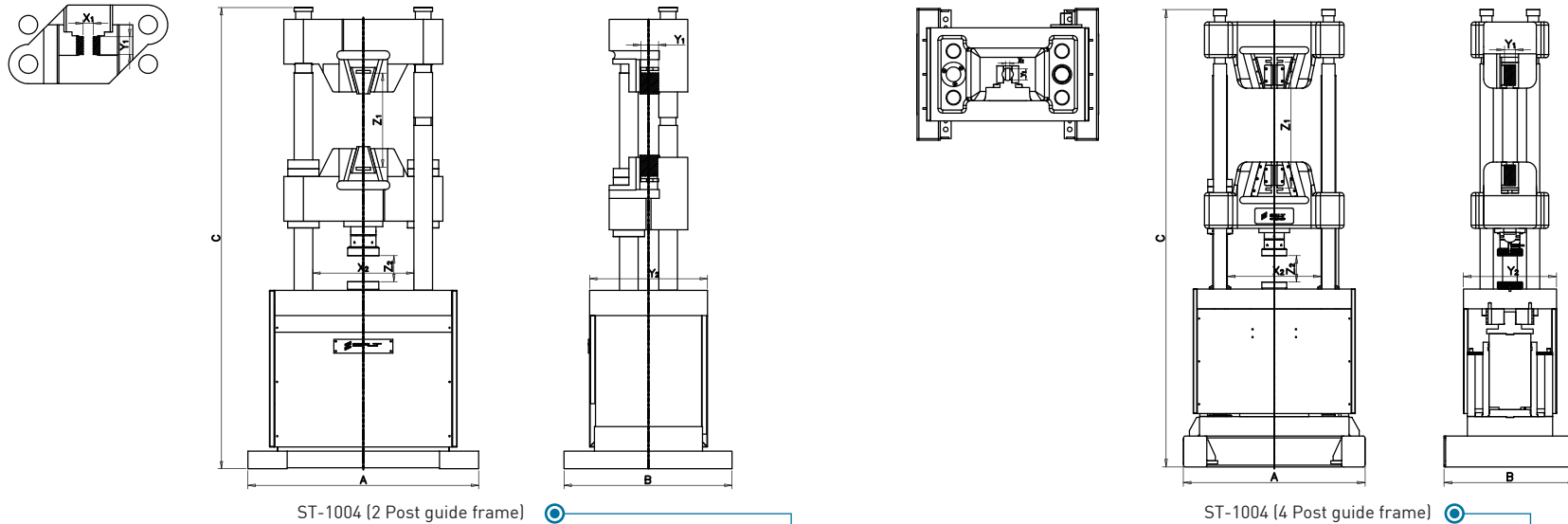
Specifications on this table are for standard models. Some specifications may vary depending on application and model. Size, speed, force, size etc. are all configurable. Order made machines and solutions available.



Model	ST-1000	ST-1001	ST-1002		
Loading method	Servo Motor (MITSUBISHI) Operation method of electronic control measuring				
Frame Capacity	300kgf (3KN)	500kgf (5KN) 1,000kgf (10KN) 2,000kgf (20KN)	3,000kgf (30KN) 5,000kgf (50KN)	10,000kgf (100KN)	3,000kgf (300KN)
Digital Display Force Resolution	1/300,000 [class 1.0 or 0.5 calibration]				
Stroke Resolution	0,001mm				
Test Room (W X H mm)	170 X 1000	460 X 1200	470 X 1300	500 X 1400	660 X 1500
Colum	Single	Dual			
Controller	LCD Digital Indicator Force Control, Position Control				
Crosshead Speed	0,01-1000mm/min				
Driving System	MITSUBISHI Servo Motor & Servo Driver (JAPAN)				
Safety Device	Up, Down Limit, Load, Stroke Limit, Emergency Stop				
Power Supply	AC 220V, single phase / 50,60Hz				AC 220V, 3 phase / 50,60Hz
Total Weight	70kg	150kg	400kg	750kg	900kg
Dimension (W X D X H) mm	650 X 450 X 1450	850 X 650 X 1500	950 X 700 X 1900	1000 X 750 X 2100	1300 X 950 X 2500
Grips for Testing	Option				
Extensometer	Encoder Type, Strain Gage Type, Position Meter Type (Option)				
Computer Software OS	Window U.T.M Version 12,6,0(Option)				
Environmental Chamber	High & Low temperature -40°C ~ + 150°C (Option) Tensile for High temperature RT ~ + 1200°C (Option)				

Specifications on this table are for standard models. Some specifications may vary depending on application and model. Size, speed, force, size etc. are all configurable. Order made machines and solutions available.

Hydraulic Type Universal Testing Machine



ST-1004 (2 Post guide frame)

ST-1004 (4 Post guide frame)

Model	ST-1004				
Load unit / Frame type	2 post guide Actuator bottom mounted			4 post guide Actuator bottom mounted	
Loading method	Transversal crosshead (motor and ball screw) with bottom mounted cylinder				
Max Force capacity – kN (kgf/lbf)	300kN (30,591kgf/67442lbf)	500kN (50,985kgf/112,404lbf)	1000kN (101,972kgf/224,808lbf)	1000kN (101,972kgf/224,808lbf)	2000kN (203,943kgf/449,617lbf)
Stroke resolution	0.001mm (1μ m)				
Digital Display Force Resolution	1 / 300,000 (Class 1.0 or 0.5 calibration)				
Tensile zone (X1 x Y1 x Z1)	30 x 60 x 600mm	40 x 60 x 600mm	40 x 90 x 600mm	65 x 70 x 1000mm	65 x 90 x 1200mm
Tensile inserts (Flats)	0~15, 15~30mm	0~15, 15~40mm	0~30, 30~60mm	0~30, 30~60mm	0~30, 30~60mm
Tensile inserts (Round)	Ø8~25, Ø25~40	Ø8~25, Ø25~40, Ø40~50	Ø10~20, Ø20~40, Ø40~60	Ø10~20, Ø20~40, Ø40~60	Ø10~35, Ø35~60, Ø60~85
Table size (X2 x Y2)	490 x 560mm	480 x 580mm	515 x 600mm	615 x 600mm	760 x 880mm
Compression plate	Ø120	Ø160	Ø160	Ø180	Ø200
Bending jig span distance				500mm	
Bending jig punch/tips	Ø30	Ø50	Ø50	Ø50	Ø70
Bending jig width	150mm				
Frame Dimensions (A x B x C)	980 x 700 x 2040mm	1010 x 790 x 2110mm	1175 x 855 x 2348mm	1265 x 850 x 3200mm	1490 x 1350 x 3400mm
Frame Weight	2300kg	2500kg	3300kg	4500kg	8000kg
Actuator max stroke	200mm				
Hydraulic control valve	Bosch Servo Valve or MOOG G761 Series (Optional)				
Test speed	0.1~80mm/min				
Crosshead speed	400mm/min				
Power pack / Hydraulic unit	500 x 600 x 650mm	650 x 650 x 700mm	750 x 750 x 1000mm	940 x 760 x 1000mm	
Hydraulic pump capacity	2cc	2.7cc	4.4cc	7cc	
Rack panel	Control panel unit (PC and controls) 700 x 700 x 950mm				

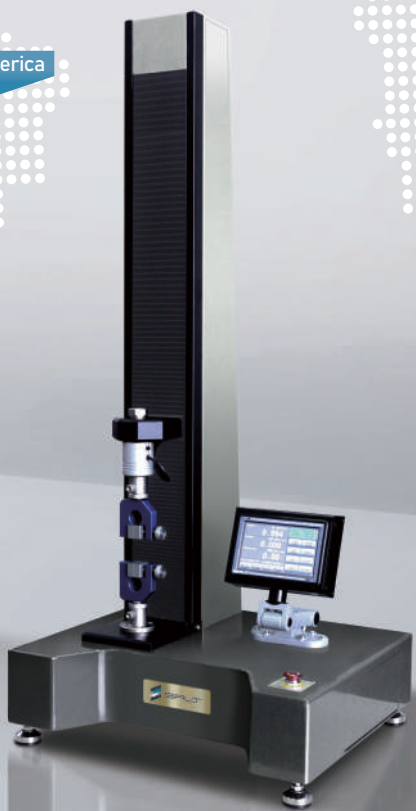
Specifications on this table are for standard models. Some specifications may vary depending on application and model. Size, speed, force, size etc. are all configurable. Order made machines and solutions available.



ST-1000 Series

Technology and Art,
Dignity and Dynamics
impress customers at last.





Technology and Art,
Dignity and Dynamics
impress customers at last.



SALT Co., Ltd.

Head Office/Plant 1 | 3rd floor, 15Ho, Juan Smart Techno Tower,
681, Baekbeom-ro, Seo-gu, Incheon, Republic of Korea

Plant 2 | 18, Gilju-ro, Seo-gu, Incheon, Republic of Korea

Email | salt-s@light-salt.kr

T E L | +82-70-4288-0978

F A X | +82-32-560-0677

www.light-salt.kr