

Universal Testing Machine (UTM) with Furnace

The Universal Testing Machine capable to perform Tension Test, Compression Test & Bend Test, along with High Temperature Furnace.

Machine Specifications:

- **Capacity:** ≥ 30 Tons (300KN)
- **Force Resolution:** ~ 10 N
- **Working Dimension:**
 - Working Height between Grip: ≥ 600 mm
 - Working width (b/t Columns): ≥ 550 mm
- **Testing Speed:** $0.1 \sim 500$ mm/min
- **Testing Speed Control:** it can be controlled of Position, Load, Stress and Strain rate
- **Standard Compliance:** The machine should be in compliance with **Class 0.5** of ISO 7500-1/ASTM E4 and applicable testing standards including ASTM E8 & E21, ISO 6892-1 & 6892-2, EN 10002-1 & EN10002-5, GB228-1 & 228-2.
- **Machine Structure:** Dual Column Floor version preferably with dual testing space
- **Safety Features:** The machine should have over load protection, emergency stop & safety shield for operator safety.
- **Remote controller:** for manual operation (cross head up/down)
- **Computer :**
 - Latest Compatible PC (Core i7 7th generation, memory 8GB, Hard \geq 500GB), with operating system and compatible operating software, printer, keyboard, mouse.
 - **LCD:** LCD (23")
 - **Interfaces:** Computer-Serial interfaces for data acquisition from machine, extensometer/furnace and for External output of measurement results
- **Software:** Compatible data acquisition & system control/operation software, (software installed on PC as well as backup copy on Hard/DVD)
 - interfacing high temperature furnace and extensometer
 - Automatic zeroing, calibration facility through software
 - Standard tensile test with numerical values and graphical display (UTS, Yield stress, modulus of elasticity, upper yield, lower yield, 0.2% yield, elongation etc.)

Load Cells:

- Load Cells having accuracy **Class 0.5** according to ISO 7500-1/ASTM E4 with calibration certificates (Quantity 03 Nos.)

High Temperature Furnace:

- Three zones split Furnace with Controller & mounting brackets
- Temperature: up to 1000°C with $\pm 1^\circ\text{C}$ resolution & accuracy
- Heating rate: $\geq 20^\circ\text{C}/\text{min}$
- Furnace case: Furnace case made of Stainless steel and Ceramics Closures at top & bottom of furnace that fit closely around loading bars (Round & Rectangular) to reduce heat loss
- **Dimension:**
 Outside size (diameter X length): $\sim \Phi 300 \times 400 \text{ mm}$
 Inside size (diameter X length): $\sim \Phi 100 \times 300 \text{ mm}$
- **Thermocouple:** Type K thermocouples with calibration certificates for specimen temperature monitoring at **three points** with display/controller and interface for data acquisition in machine software (Quantity **03 sets** of thermocouples)

Extensometer:

- High temperature Extensometer with attachment Kit & clamping devices capable of
- Temperature range: up to 1000°C
- Gauge length: 25, 50, 80 mm
- Measuring range (travel / % of gauge length): $\geq 80 \text{ mm}$
- Resolution: $\leq 0.05 \text{ mm}$
- Accuracy Class: Class-1 of ISO 9513 or better

Specimen Grips:

- **Tensile test:** Hydraulic or Pneumatic operated Self-Tightening Wedge Grips capable of handling inserts for flat/round and wire specimen
 - **Jaws:** Face scratched diamond/pyramidal type jaws (hardness $\geq 50\text{HRC}$)
 - Sets of Jaws for flat specimens (0-70 mm thick) (Qty. 02 sets for each thickness range)
 - Sets of Jaws for round specimens (0-50 mm diameter) (Qty. 02 sets for each diameter range)
 - Sets of fixture/adaptor for wire specimens (Qty. 02 sets)
 - Set of Connecting Adaptors with spherical Seat for High temperature (HT) Tensile tests to insert high temperature pull rods. (Qty. 02 sets)

- Pair of HT pull rods to fix with spherical Seat Adaptors and other side threaded to connect with HT sample adaptors (Qty. 02 sets)
 - Pair of sample adaptors with threaded ends (Thread M20, M16, M12) (Qty. 02 sets each)
 - **Compression Test:** Compression test plates with adaptors to fix to the machine
 - Diameter: ~ 200mm
 - Hardness: ≥ 50 HRC
 - **Bend Test:** 3-Point bending fixture comprising of
 - Lower bending table with adjustable supports
 - Lower support span: up to 300mm
 - Length/height of roller in lower span: ≥ 120 mm
 - 2 sets of lower rollers $\Phi 38$ mm
 - One set of upper mandrels and adaptor to fix to the grip/machine with rollers of diameter 5, 7, 10, 20, 24, 32, 40, 60, 90 mm
 - **Tool Kit:** Tool kit having necessary tools for assembling/disassembling fixtures and for machine maintenance
- Accessories:** All other Compatible accessories/Adaptors should be quoted
- Optional:** Optional accessories may also be mentioned.
- Manuals:** Operating and Maintenance Manual in English language.
- Installation and Training:** Installation and training of the machine operation/maintenance by the manufactured authorized/trained person
- Warranty/Guarantee:** At least 01 year
- Origin:** USA, Western Europe, Japan

CHECK LIST! ATTACHED! Ann-B

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Annexure-B

CHECK LIST

Please carefully fill all the entries by either encircling "YES" or "No" and mention specifications of offered components when "No" is encircled. Use separate sheet if required. Duly filled check list must be submitted along with offer.

Universal Testing Machine (UTM) with Furnace

Machine Specification:			Encircle		Offered Specs (Where "No" is encircled)
1	capacity	≥ 30 Tons (300KN)	Yes	No	
2	Force Resolution:	~ 10 N	Yes	No	
3	Working Height between Grip	≥ 600 mm	Yes	No	
4	Working width (b/t Columns)	≥ 550 mm	Yes	No	
5	Testing Speed Control mode	Position, Load, Stress and Strain rate	Yes	No	
6	Testing Speed	(0.1~500mm/min)	Yes	No	
7	Machine Class	Class 0.5 of ISO 7500-1/ASTM E4	Yes	No	
8	Machine Structure	Floor version preferably with dual testing space	Yes	No	
9	Safety Features	over load protection, emergency stop & safety shield for operator safety	Yes	No	
10	Remote controller	for manual operation	Yes	No	
11	CPU	Core i7 7 th generation, memory 8GB, Hard 500GB	Yes	No	
12	LCD	(23")	Yes	No	
13	Software	Compatible data acquisition & system control/operation software,	Yes	No	
14	Load Cell	Class 0.5 of ISO 7500-1/ASTM E4 with certificate	Yes	No	
		Spare Load cell quoted	Yes	No	
15	Furnace	Temperature: up to 1000°C with $\pm 1^\circ\text{C}$ resolution, Heating rate: $\geq 20^\circ\text{C}/\text{min}$, Three zones split Furnace with Controller & mounting brackets, Dimension mentioned	Yes	No	
16	Thermocouple	Type K with calibration certificate	Yes	No	
		Spare thermocouple quoted	Yes	No	
17	High temperature Extensometer	Extensometer with attachment Kit & clamping devices	Yes	No	
		Gauge length: 25, 50, 80 mm	Yes	No	
		Measuring range (% of gauge length) ≥ 80 mm	Yes	No	
		Accuracy Class: Class-1 of ISO 9513 or better	Yes	No	
18	Specimen Grips	Hydraulic/Pneumatic Self-Tightening Wedge Grips	Yes	No	
19	Jaws sets for each range	Sets of Jaws for flat specimens	Yes	No	
		Sets of Jaws for round specimens	Yes	No	
		Sets of fixture/adaptor for wire specimens	Yes	No	
		HT Connecting adaptor/Rods/threaded sample adaptor	Yes	No	
20	Compression Fixture	Compression test plates with adaptors	Yes	No	
21	Bending Fixture	3-Point bending fixture with accessories	Yes	No	
22	Tool Kit:		Yes	No	
23	Manuals	Operating and Maintenance Manual in English language	Yes	No	
24	Installation and Training	Installation and training by the manufactured authorized/trained person	Yes	No	
25	Warranty/Guarantee:	At least 01 year	Yes	No	
26	Country of Origin	USA/ European / Japan	Yes	No	