

Tension-Free U-shape Folding Test



Further Improve Relia bility



YUASA SYSTEM Co., Ltd. will Research and Develop required systems through quickly getting the worldwide trend of product developments or test standards. And will provide various solution systems (Laboratory Automation) for customer's product development process, or systems for Factory Automation and quality control.



Folding Test without Tension nor **Friction**



Problem During General Folding Test

When conducting test with equipment shown in the above diagram, a large tension occurs on the sample when the test starts. The cause of this is clear when drawing a circle with radius the same length as the sample on the movement track of the test machine. The length of the sample is too short against the movement track of the clamp. If one uses a rod, this becomes more remarkable and occurs friction as well. This causes the unexpected breaks and disperse in the test results in actual test.

Purpose of this test is to evaluate the endurance against bending load. In order to solve the problem, YUASA propose to change the movement of the sample without changing this purpose. When the sample movement is changed to that the one end of the sample moves straightly forward to the other end, it enables to apply only the bending load, without applying tension. On "Tension-Free U-shape Folding Test", the sample is attached on to the tilt clamp with horizontally stretched, and then is stretched repeatedly. At the timing of the sample shrank, tilt clamp moves to downward, and make the sample be bent naturally.



Folding Test without Tension nor Friction

Tension-Free U-shape Folding Test Jig









Changes Occur on Bending Load Only



Changes Occur on General Bending Test



Generally, the sample consists of multiple layers. Compression for the inside, and Tension for the outside may occur on the bent sample. So, on the test with using "Tension-Free U-shape Folding Test Jig", may cause rupture by tension / delamination by compression at the center of bending point, or delamination by stretch at the flat area. These changes prove that this test succeed to apply the bending load only. On general folding test, tension or friction caused by rod, could cause rupture or delamination at unexpected area.





ENDURANCE TEST





DLDMLH-FS

Small Desk Top Model Endurance Test Machine **Tension-Free U-shape Folding Test**

Maximum sample thickness : 3 mm Maximum sample width : 224 mm Bending radius : 0~18 mm Operating speed : 10~90 rpm

Minimum sample length : 56+clamp space mm Operating stroke : 0~±60 mm Dimension : 743 mm x 485 mm

Bending angle : 0°~180° Weight : approx. 29 kg (including cover weight)

DLD-FS **Desk Top Model Endurance Test Machine** Tension-Free U-shape Folding Test

Bending radius : 0~50 mm Operating speed : 10~90 rpm

Maximum sample thickness : 3 mm Maximum sample width : 245 mm Minimum sample length : 46+clamp space mm Operating stroke : 0~±120 mm Dimension : 1260 mm x 675 mm



Bending angle : 0°~180° Weight : approx. 72 kg (including cover weight)

ENDURANCE TEST \times **ENVIRONMENTAL TEST**

Movement / Speed of the sample can be changed by interlocking with presetting of Temperature / Humidity.



CL09-typeD01-FSC90

Constant Temperature and Humidity Environment Endurance Test Machine

Tension-Free U-shape Folding Environmental Test For Planar Materials

Maximum sample thickness : 3 mm Maximum sample width : 245 mm Bending radius : 0~50 mm Operating speed : 10~90 rpm Dimension : W 2540 mm x D 2450 mm x H 1980 mm

Minimum sample length : 46+clamp space mm Operating stroke : 0~±120 mm Applicable setting range : Temp. -40~ +90°C Humid. 30.0~95.0%Rh

Bending angle : 0°~180° Weight : approx. 850 kg





STATIC										CHAMBER	
			TIME (HOUR)			TEMP. (℃)	HUM. (%)				
										85.0	90.0
	REAR END		CENTER		FRONT END			2.0		85.0	90.0
										85.0	90.0
										24.0	30.0
ŀ											
_ (C H	DOP END HANBER	STO	P	ТЕМ	P. ((C)	Н	UM. (%)			
CONTROL 0.0 0.0											

STEP 1

Set thermo-hygrostat to 85°C/90%Rh.

STEP 2

Wait 2 hours maintaining thermo-hygrostat at 85°C/90%Rh.

STEP 3

Conduct the test 100,000 times with thermo-hygrostat set at 60 rounds/minute.

STEP 4

Adjust the thermo-hygrostat to room temperature (24°C/30%Rh) and finish the operation.

ENDURANCE TEST MEASUREMENT

Measurement devices for various samples can be connected via PC, so this enables to synchronize the measurement process and endurance test process.

Application Example 1

Programmed operation for measuring conductor resistance



[Small Desktop Model Endurance Test Machine DLDM11LH], which is the drive source to operate the "Tension-Free U-shape Folding Test Jig", can be operated and monitored via PC or Tablet. For example, on this case, series of endurance tests and measurement processes, such as measuring the Conductor resistance at required timing, are programmed, by presetting the number of operations and variation of operation speeds.











ENDURANCE TEST × MEASUREMENT

YUASA SYSTEM provides various Test Jigs, so that to measure the Samples easily during the Endurance Test.



This example is the case to check the change of sample condition during the endurance test. On this case, by using the cartridge which unite the sample and the jig around the sample, the sample component can be removed without removing the sample itself from the endurance test machine. And only to move the sample component on to another jig on microscope, it can be measured by microscope.





Further Improve Reliability

YUASA SYSTEM ENDURANCE TEST SYSTEM



Bending

Torsion

Folding Rolling









Our product information is also available on



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Safety Note To ensure your safe and proper usage, please observe all the manuals before using these machines.

To improve our products, please note that their outer appearances and/or designs are subject to change without notice.