

SEMI PV68-0815 (Reapproved 0221) TEST METHOD FOR THE WIRE TENSION OF MULTIWIRE SAWS

This Standard was technically approved by the Photovoltaic Global Technical Committee. This edition was approved for publication by the global Audits and Reviews Subcommittee on December 10, 2020. Available at www.semiviews.org and www.semi.org in February 2021; originally published August 2015.

1 Purpose

1.1 This Document provides a test method for the wire tension of multiwire saws, which helps the customers to confirm the ability of controlling wire tension and provides a reliable basis for wire tension calibration.

1.2 This Document includes test principles, test equipment, test procedures, and calculation for the effective control range of wire tension.

2 Scope

2.1 This Document provides a test method for the wire tension of multiwire saws.

2.2 This Document is applicable to tension test of brick cutter and other wire cutting equipment.

NOTICE: SEMI Standards and Safety Guidelines do not purport to address all safety issues associated with their use. It is the responsibility of the users of the Documents to establish appropriate safety and health practices, and determine the applicability of regulatory or other limitations prior to use.

3 Referenced Standards and Documents

3.1 None

4 Terminology

4.1 Refer to the SEMI Standards Compilation of Terms (COTs) for a list of the current Abbreviations, Acronyms, Definitions, and Symbols.

4.2 Symbols

4.2.1 T_{si} — the i^{th} set value of the wire tension ($i = 1, 2, 3 \dots n$).

4.2.2 T_{pij} — the j^{th} practical value of the wire tension when the set value is T_{si} ($j = 1, 2, 3 \dots m$).

4.2.3 T_{pi} — the average of practical values when the set value is T_{si} .

4.2.4 ΔT — the allowable deviation of the practical value.

4.2.5 T_{max_i} — the maximum allowable value of T_{pi} when the set value is T_{si} .

4.2.6 T_{min_i} — the minimum allowable value of T_{pi} when the set value is T_{si} .

4.2.7 T_{up} — the upper limit value of the control range for wire tension, determined by the performance parameters of equipments.

4.2.8 T_{low} — the lower limit value of the control range for wire tension, determined by the performance parameters of equipment.

5 Summary of Test Method

5.1 This Test Method uses a single-point measurement. Schematic diagram is shown in Figure 1. Select a point between the winding wheel and the main roller, then wire tension values can be measured with a strain-gauge tension meter. With the comparison of practical value and set value, the effective control range of wire tension could be calculated.

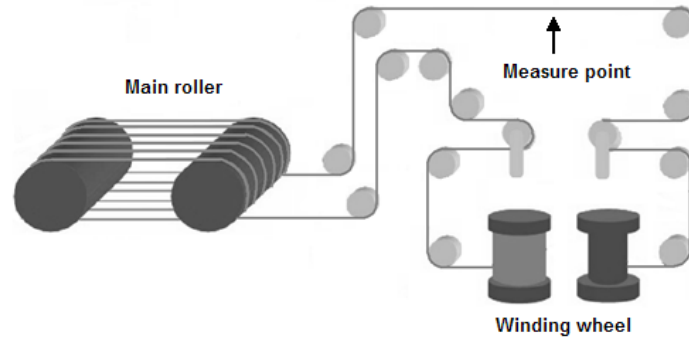


Figure 1
Schematic Diagram of the Wire Tension Test of Multiwire Saws

6 Test Conditions

6.1 The test conditions must meet the following requirements:

- 6.1.1 Ambient temperature: 18°C to 28°C.
- 6.1.2 Relative humidity: <75%.
- 6.1.3 Voltage fluctuations do not exceed rating of $\pm 10\%$.

7 Apparatus

7.1 Test devices must be approved by a professional metrology institute and certified within the validity period.

7.1.1 Strain-gauge tension meter with wire diameter compensator (accuracy better than 0.5%, the maximum wire speed ≥ 1000 m/min.).

7.1.2 Wire for test. The maximum tension value of wire should be higher than T_{up} .

8 Procedure

8.1 The multiwire saws is set and wired.

8.2 Place the strain-gauge tension meter on a point between the winding wheel and the main roller. Measurement is shown in Figure 2.

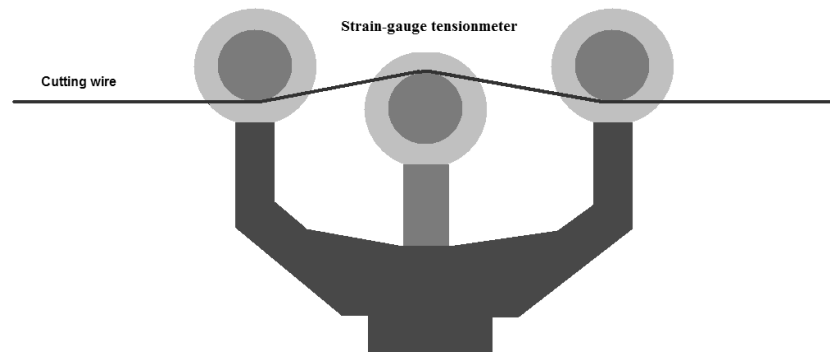


Figure 2
Schematic Diagram of Tension Test

8.3 The selection of set value T_{si} .