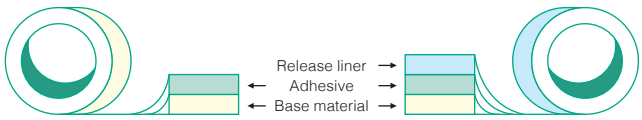
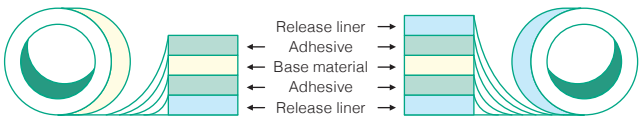
Measurement Methods and Terminology

Tape structure

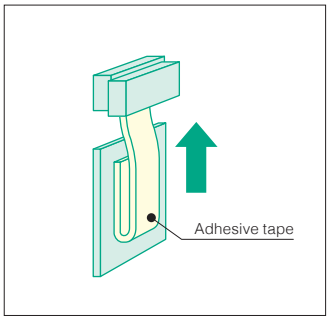
Single-coated adhesive tape



Double-coated adhesive tape



Measurement method

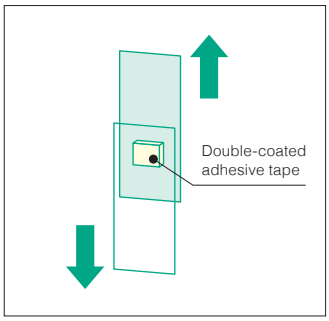


Peel adhesion
(Unit: N/25mm)

The force generated by contact between the adhesive face of the tape and the adherend. A method of indicating the strength of adhesion. The higher the value, the stronger the peel adhesion.

Measurement method

Attach the tape to a stainless steel plate and, after a period of time, peel it off in a 180° or 90° direction for measurement. Measurements in the 180° direction are shown on our website and in our catalogs.

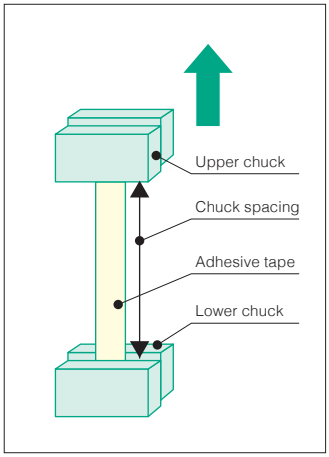


Shear adhesive strength
(Unit: N/400mm²)

The force required to pull the tape in a parallel direction and remove it.
The higher the value, the heavier the object that can be fixed in place.

Measurement method

Attach the double-coated tape to the two test plates and pull the test plates parallel to each other.
Measure the maximum load that causes the tape to break.



Tensile strength
(Unit: N/25mm)

The force required to pull and cut the tape. The higher the value, the greater the strength of the base material.

Measurement method

Pull the tape and measure the load at which the tape breaks.

Elongation
(Unit: %)

Elongation of the tape as it is pulled and cut. The smaller the value, the harder it is to stretch.

Measurement method

Pull the tape and measure the elongation at which the tape breaks.

Related international standards

UL: Acronym for Underwriter's Laboratories Inc. (USA)

UL510 Flame retardant: UL File No.E56086

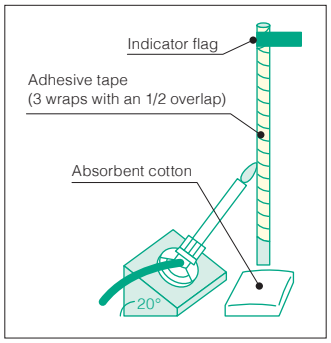
UL94 VTM-0: UL File No.E125972

UL969: UL File No.MH19815

UL flammability tests

UL510 FR (FR: Flame Retardant)

Flammability test standard for insulating tape.
This test determines whether or not the product is flame retardant.

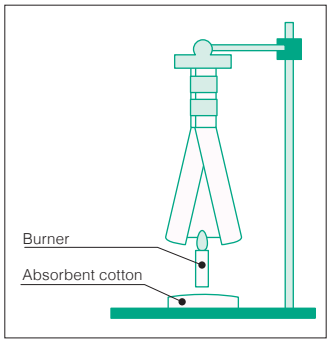


Measurement method

Wrap the specimen around a metal rod and place an indicator flag in a defined position at the top.
Apply the flame to the specimen 5 times at an angle of 20 ° for 15 seconds every 15 seconds.
The tape is judged as flame retardant if the specimen does not show more than 25 percent of the indicator flag burned away or charred, does not emit flaming or glowing particles or flaming drops at any time that ignite the cotton, and does not continue to flame longer than 60 seconds after any application of the gas flame.

UL 94 VTM
(VTM: Vertical testing for Thin Materials)

Tests for flammability of plastic materials for parts in devices and appliances.
This test is performed on thin and flexible specimens that are not suitable for the V test.
The test determines VTM-0, VTM-1, and VTM-2 levels, with the lower number indicating higher flame resistance.



Measurement method

Clamp a specimen vertically with the upper part wrapped into a cylindrical form. Apply the flame to the lower end for 3 seconds, and measure the afterflame time t1. After extinguishing the flame, apply the flame again for 3 seconds, and measure the afterflame time t2 and afterglow time t3 after the second flame contact.
VTM-0, VTM-1, and VTM-2 are judged based on t1 to t3, the presence or absence of flame up to the reference line, and by the presence or absence of ignition of cotton under the specimen by flaming particles or drops.

Standard name	UL510(FR)	UL94	
Description	Flammability test for insulating tape (FR: Flame Retardant)	Tests for Flammability of Plastic Materials for Parts in Devices and Appliances	
Classification	—	V	VTM
Applicable materials	Pressure-sensitive adhesive tapes for electrical purposes	Plastic materials used for parts in appliances (Laminates and molding materials)	Plastic materials prone to deformation and shrinkage due to thin thickness (Sheets and films)
Specimen	Tape wrapped around a steel rod so that it wraps with an overlap equal to one half the width of the tape	127 mm x 12.7 mm Specimen thickness: not more than 12.7 mm	Upper part wrapped into a cylindrical form and taped
Classification	Flame retardant	V-0.1.2	VTM-0.1.2