# NDG5

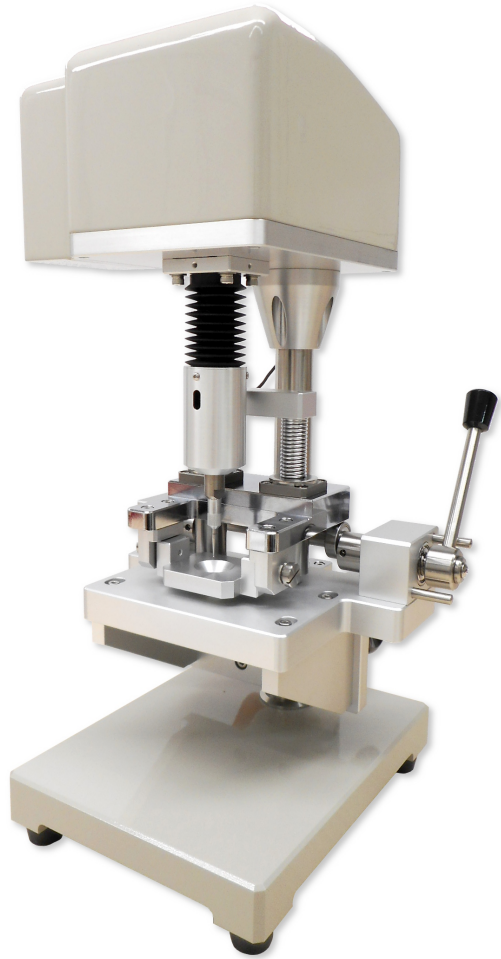
## Puncture Strength Tester

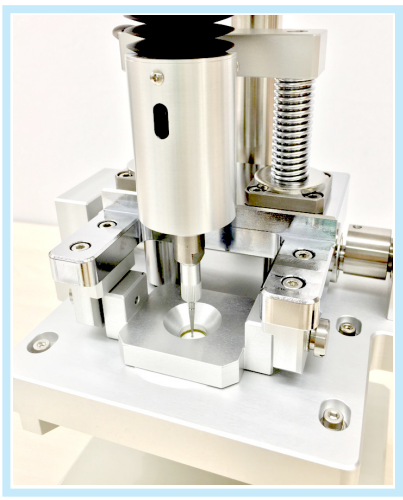
This testing machine measures the *piercing strength* required for a needle to penetrate a sample. It is to measure rupture strength by *applying a vertical force*, used for testing physical properties of battery separators.

The NDG5 can be used to evaluate the strength of film inside lithium-ion batteries (separators) and to measure the strength required to pierce packaging materials such as food packaging films.

**Measurement Examples**

- Strength evaluation for separators inside lithium-ion batteries
- Piercing strength evaluation for food packaging films

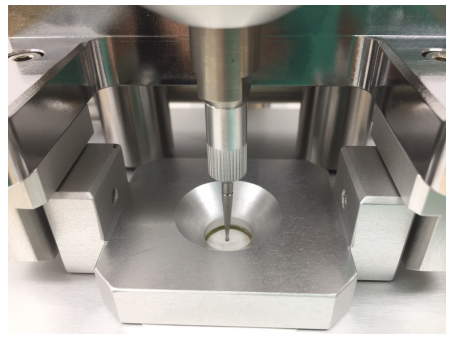




## FEATURE

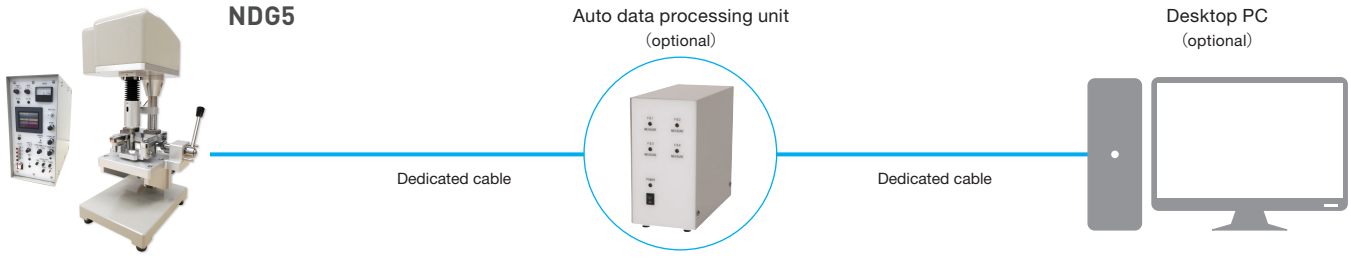
### ● Specialized needle

Designed with separator measurement in mind (size: ø1, 0.5R tip shape)

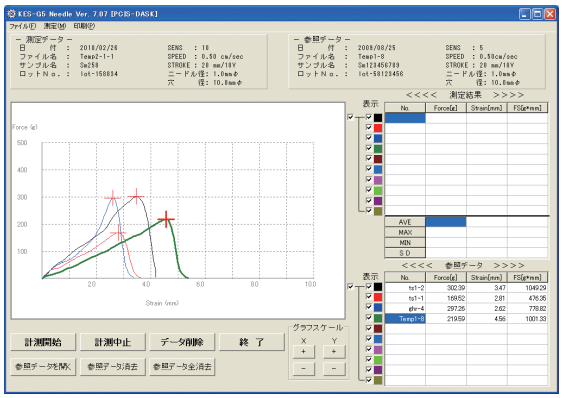


* The photo shows a needle with a holder.
Holder is not included in a single needle purchase.

## SYSTEM CONFIGURATION DIAGRAM / MEASUREMENT DATA

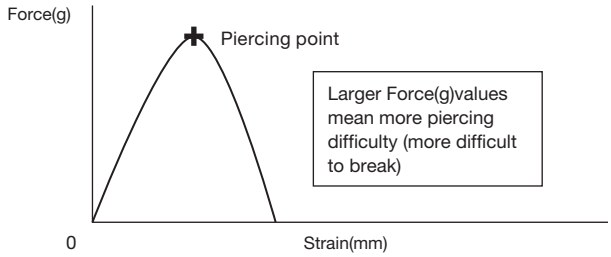



### ■ Sample Measurement Software Screens



▲ Piercing point

### ■ Obtainable Data




**Force(g)=Penetrating power**
**Strain(mm)=Amount of displacement**
**FS(g·mm)=Load to penetration (Force × Strain)**

*Larger Force (g) values mean more piercing difficulty (more difficult to break)
*Larger Strain (mm) values mean more piercing difficulty (more stretchy)
*Larger FS (g·mm) values mean more piercing difficulty (more difficult to break and more stretchy)

# NDG5 Puncture Strength Tester

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|---|---|
| **Dimensions/Weight (approx.)** | Measuring unit: W170 × D220 × H460 (mm) / 13 kg<br>Electronic unit: W180 × D400 × H400 (mm) / 13 kg |
| **Power source** | 100 VAC, power consumption: 20 W Max. |
| **Measurement environment temperature and humidity** | 20 to 30°C / 50 to 70% RH. (No condensation.)<br>Temperature and humidity should be kept constant during measurement.<br>(Standard temperature and humidity conditions: 20°C / 65% RH)<br>*The instrument should be located to minimize influence from wind or vibrations. |
| **Load detection** | Detector: Ring-type detector with differential transformer<br>Load (full scale): Switchable between 4 ranges (100 gf, 200 gf, 500 gf, 1000 gf)<br>Accuracy: ±0.5% or less of full scale |
| **Displacement detection** | Detector: Potentiometer<br>Displacement quantity: Max. 20 mm<br>Accuracy: ±0.5% or less of full scale |

| | |
|---|---|
| **Needle diameter** | 1.0 mm |
| **Sample diameter after setting the sample** | 10 mm |
| **Displacement rate** | Standard measurement: 0.02 mm/sec <1 mm/50 sec><br>High-sensitivity measurement: 0.0067 mm/sec <1 mm/150 sec><br>Other rates can be specified by settings. |
| **Measuring movement** | Load control system<br>Displacement control system<br>The above 2 systems are switchable |
| **Specimen size (recommended)** | Dimensions: 15mm×15mm (min.)<br>Thickness: 1mm (max.) |

**⚠ Precaution** For safety use, please read the operation manual / the instruction carefully and throughly before using the tester.

Specification details recorded here are subject to change without notice.
We appreciate your understanding.

KatōTech KATO TECH CO.,LTD.

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