A novel method
On tear function test

SMTube®
Strip Meniscometry Tube

5 seconds
Dry eye screening

ECHO ELECTRICITY CO., LTD.
We are pleased to introduce our novel medical instrument, “Strip Meniscometry Tube (SMTube)”, developed for a simple, accurate, swift and minimally-invasive assessment of tear volume. The SMTube enables very quick test with minimized pain in eyes. All you do is immerse the SMTube into a tear meniscus for 5 seconds.

SMTube has a tubular structure designed to examine tear function by absorbing tear fluid, and to be used as a simple and fast method for the screening or diagnostic purpose. SMTube is the latest version of the SM testing[*] strip with enhanced handiness and improved design for safety. Our in vitro experiments to assess tear-absorbing ability confirmed that the device error stayed within ±1.2 mm in the score, which is precise enough to evaluate the human tear volumes.

We carried out a clinical investigation to assure the safety of SMTube strip in vivo; none of the damage was found on examinee’s ocular surfaces. The SM test using SMTube has also proved to have strong correlations with other ocular surface tests on the basis of the Spearman’s rank correlation evaluations.

Configuration / Structure

SMTube is thin strip with a central ditch filled with absorber. Scale is printed on the both side of absorber to measure the tear volume. Each SMTube is packaged individually in sterile pouch.

When SMTube is applied to the tear meniscus in lateral lower lid of an eye, it absorbs tears via the capillary action of absorber taking effect in the center of the strip. The indicator, placed at the end of the strip, is dissolved in the absorbed tear fluid. At the end of 5 seconds, the length of the stained tear column is marked and read to quantify the tear meniscus volume.

⚠️ Single use only

Size: Length: 85mm
Width: 7mm
Height: 0.3mm

Material: Indicator: Blue dye 1
Tape: Polyurethane, Polyester
Backings: Polyurethane
Absorber: Rayon, Pulp
Instruction for use

Hold the center of SMTube.
Do not touch the dye area.

Immerse a tip of the SMTube into the tear meniscus in lateral lower lid for 5 seconds.
Take extra care so that the SMTube would not touch the patients’ cornea nor the conjunctiva.

in 5 seconds, read the tear absorbing length and mark it by an oil-based pen.

Repeat the test for the other eye.

Measure the length of the column stained by blue colour.
Comparison with the traditional tear function test

<table>
<thead>
<tr>
<th>Usage</th>
<th>The traditional Schirmer’s test</th>
<th>SMTube®</th>
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</thead>
<tbody>
<tr>
<td>Inserting the Schirmer strip inside the lower eyelid (conjunctival sac)</td>
<td>Immersing the SMTube into the tear meniscus</td>
<td></td>
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<tr>
<td>Required time</td>
<td>5 minutes</td>
<td>5 seconds x 2 (for both eyes)</td>
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<tr>
<td>Invasiveness</td>
<td>invasive</td>
<td>Minimally-invasive</td>
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</tbody>
</table>

Application of SMTube

Advantage of SMTube over the traditional Schirmer test is its swiftness and handiness in measuring tear volume. Applicable circumstance of exploiting the advantage of SMTube is not only for dry eye diagnosis. A variety of application in clinical research and experiments have been reported.

1. Monitoring the change in tear volume associated with certain tasks (such as VDT work).

2. Time series variation of the amount of tears before and after a certain treatment and medication.

3. Screening of a number of subjects such as group health checkup. [2]
   Please see page 7 for the Relevant papers.

4. It is also suitable for tear volume evaluation in pediatrics, owing to its minimal invasiveness.
Product Information

**Pouch**: Each SMTube is individually sterilized

**Package**: 50 strips/box

- PCT patented
- European Medical Device Directive 93/42/EEC, CE marked as Class I
- FDA device registered as Class I
- MHLW Japan registered as Class I medical device

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**Relevant papers**

SMTube has been already introduced in an ophthalmic article.[1] Moreover, SM test using SMTube would be useful for rapid screening of the tear function. This advantage is more pronounced when a large number of examinees are involved in some specific examinations under specific situation.[2]


Our SMTube technical documents are available at:

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- Medical devices manufacturer licensed by MHLW Japan
- MHLW third-class medical devices marketing authorization holder
- FDA registration

Thank you