

## MATERIAL TEST **i25**

### Tensile Strength Tests Performed on Knitting Machines Needles by Shimadzu Autograph



The Shimadzu Autograph is a high performance universal testing machine completed with excellent measuring and controlling features and data processing system. It is applicable to the measurement of the strength and mechanical behaviors of various parts and materials, including metal, rubber, plastics, ceramics, electronic parts, medical supplies, and daily necessities.

The following presents the results of strength tests performed on crochet needles of consumer knitting machines.

#### **Properly quenched crochet needles**

##### **Test conditions**

Screw type 100kgf flat grip (with hanger for crochet needles)

0.5mm/min

10kgf/full scale

Material : Hard steel wire material (Hardness HV660)

Grip :

Loading rate :

Load :

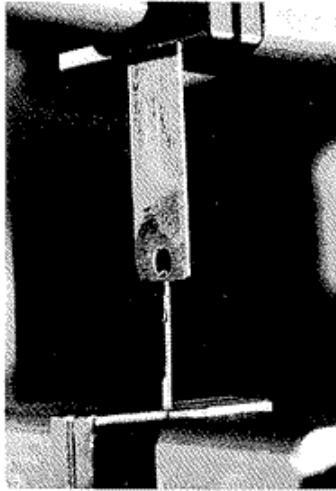


Fig.1  
View of Tensile Test of Crochet Needle Performed by Autograph

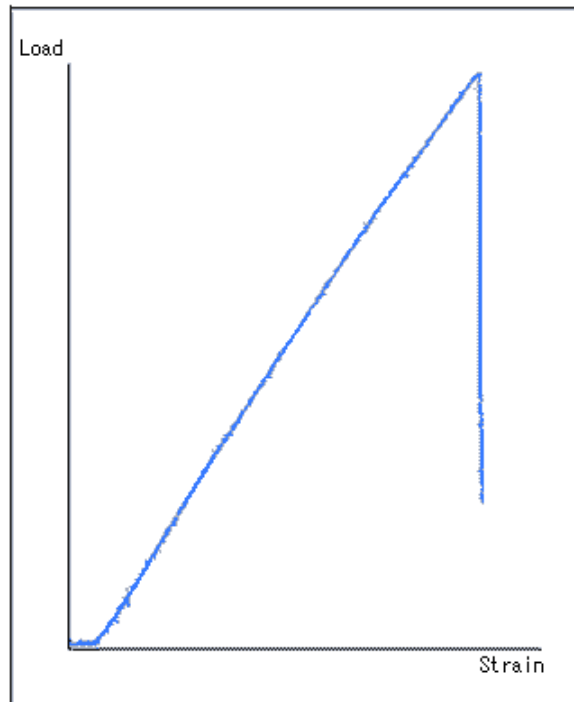


Fig.2  
Tensile Test Curve of Properly Quenched Crochet Needle

### Improperly quenched crochet needle

#### Test conditions

- Material : Hard steel wire material (hardness HV570)
- Grip : Screw type 100kgf flat grip (with hanger for crochet needle)
- Loading rate : 0.5mm/min
- Load : 10kgf/full scale

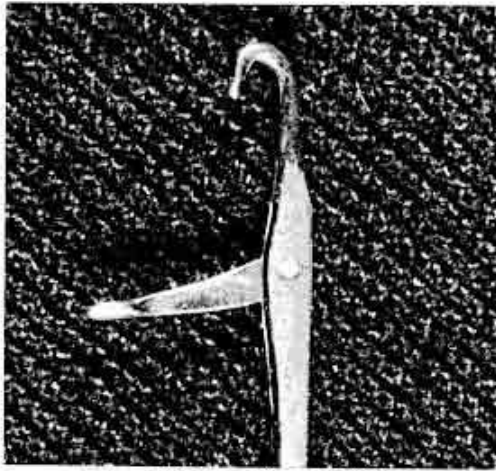


Fig.3 Improperly Quenched Crochet Needle

The mechanical behavior of a crochet needle with an improperly quenched tip is significantly different from that of a normally quenched one.

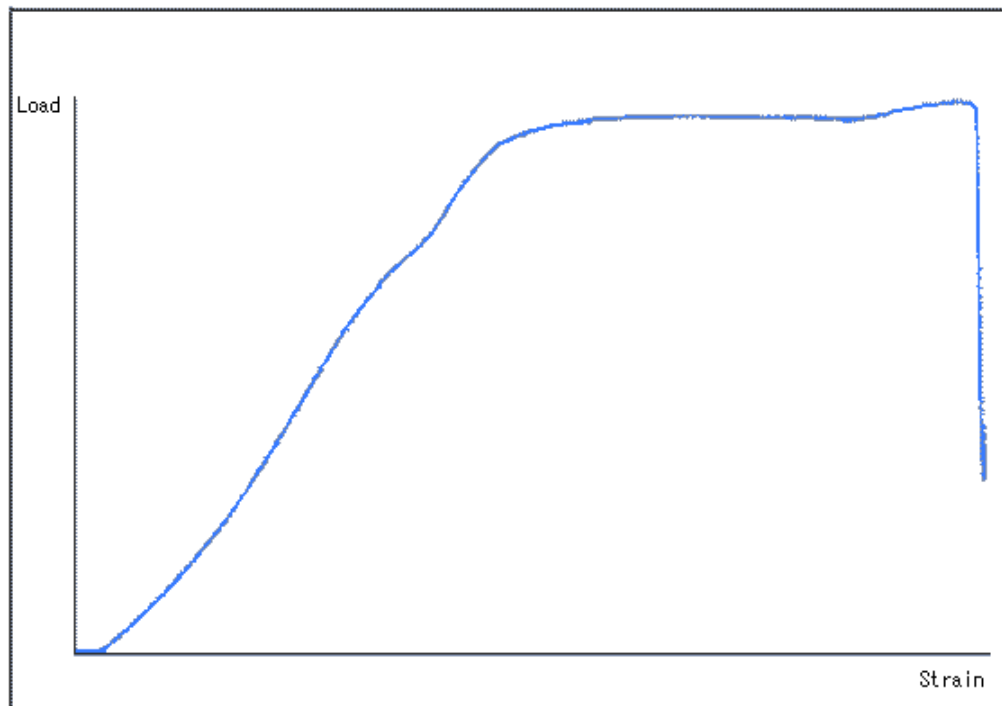


Fig.4 Tensile Test Curve of Improperly Quenched Crochet Needle

\* Please be advised that data obtained before the implementation of the current Weights and Measures Law may be presented in terms of gravimetric unit.



**SHIMADZU CORPORATION International Marketing Division**  
3,Kanda-Nishikicho 1-chome, Chiyoda-ku,Tokyo 101-8448,  
JapanPhone: 81(3)3219-5641 Fax: 81(3)3219-5710  
Cable Add,;SHIMADZU TOKYO

**SHIMADZU SCIENTIFIC INSTRUMENTS, INC.**

7102, Riverwood Drive, Columbia, Maryland 21046, U.S.A.

Phone: 1(410)381-1227 Fax: 1(410)381-1222 Toll Free:1(800)477-1227

**SHIMADZU DEUTSCHLAND GmbH**

Albert-Hahn-Strasse 6-10, D-47269 Duisburg, F.R. Germany

Phone: 49(203)7687-0 Fax: 49(203)7666-25

**SHIMADZU (ASIA PACIFIC) PTE LTD.**

16 Science Park Drive #01-01, Singapore Science Park, Singapore 118227, Republic of Singapore

Phone: 65-778-6280 Fax: 65-779-2935

**SHIMADZU SCIENTIFIC INSTRUMENTS(OCEANIA)PTY. LTD.**

Rydalmere Business Park, Unit T, 10-16, South Street Rydalmere, N.S.W. 2116, Australia

Phone: 61(2)9684-4200 Fax: 61(2)9684-4055

**SHIMADZU DO BRASIL COMERCIO LTDA.**

Rua Cenzo Sbrighi, 25 CEP 05036-010 Agua Branca, Sao Paulo, BRAZIL

Phone: 55(11)3611-1688 Fax: 55(11)3611-2209

**SHIMADZU (HONG KONG) LIMITED.**

Suite 1028, Ocean Centre, Harbour City, Tsim Sha tsui, Kowloon, HONG KONG

Phone: 852(2375)4979 Fax: 852(2199)7438

**Overseas Office**

Istanbul,Beijing,Shanghai,Guangzhou,Shenyang,Chengdu,Moscow