

OE

?

3가

가 가

1.

20

가

가

-

가

가

가

-

가

가

3가

•

•

•

$$W_c = W_{sp} + W_r$$

OA

Q

Q

Q

$$\frac{dr}{dt} = -V_c \cdot \sin \gamma$$

$$W_r = W_f - \frac{V_c}{r} \cdot \cos \gamma = V_c (\frac{1}{R} - \frac{\cos \gamma}{r})$$

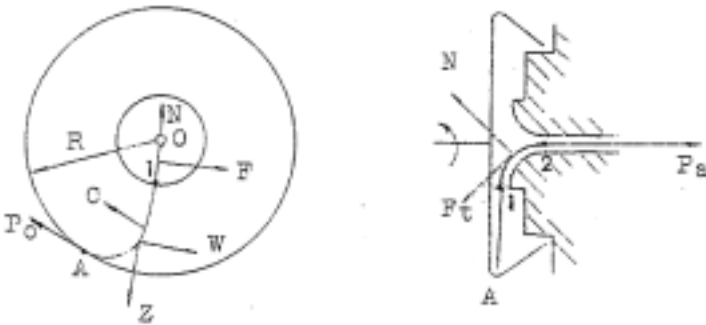
$$r=R,$$

$$\gamma=0 \qquad \frac{dr}{dt} \qquad W_r$$

$$W_r=0$$

$$\frac{dr}{dt} = 0$$

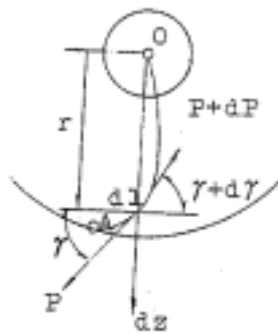
2



< 2>

- P ;
- Po;
- Pa;
- Z;
- C;
- W;
- F;
- d1;
- t; ()

- P 가 가 .
- () $F=0(F1=0)$ r가 가 . (r가)
- () $W+C=0$ r
- () $Wc = W_{sp} + \frac{Vc}{R}$.($\frac{Vc}{r} \cdot \cos \gamma = 0$)
- ()
- 가 .]



< 3>

$$P \cos \gamma = (P + dp) \cos (\gamma + d\gamma)$$

$$dp \cos \gamma = P \sin \gamma d\gamma$$

$$\int_{p_0}^p \frac{dp}{p} = \int_0^\gamma \tan \gamma d\gamma$$

$$\ln\left(\frac{P}{P_0}\right) = \ln\left(\frac{1}{\cos \gamma}\right)$$

$$P = \frac{P_o}{\cos \gamma} \dots \dots \dots (1)$$

$$dZ + P \sin \gamma = (P + dp) \sin (\gamma + d \gamma)$$

$$dZ = P \cos \gamma d \gamma + dp \sin \gamma = t \gamma W^2 c dl$$

(1)

$$t \gamma W^2 c dl = P_o d \gamma + P_o \frac{\sin^2 \gamma}{\cos^2 \gamma} d \gamma$$

$$= P_o d \gamma (1 + \tan^2 \gamma)$$

$$= P_o d \gamma \frac{1}{\cos^2 \gamma}$$

$$\frac{P_o d \gamma}{t W^2 c \cos^2 \gamma} = r dl = -r \frac{dr}{\tan \gamma}$$

$$\frac{P_o}{t W^2 c} \int_0^\gamma \frac{\sin \gamma}{\cos^2 \gamma} d \gamma = - \int_R^\gamma r d \gamma$$

$$r = \sqrt{R^2 + \frac{2 P_o}{t W^2 c} \left(1 - \frac{1}{\cos \gamma}\right)} \dots \dots \dots (2)$$

(1) (2)

$$r^2 = R^2 + \frac{2}{t W^2 c} (P_o - P)$$

$$P = P_o + \frac{t W^2 c}{2} (R^2 - r^2) = P(r) \dots \dots \dots (3)$$

Po가

가 C() Z() (2

)

$$0$$

$$\sum M(0)=0$$

가

$$dZ=0$$

$$dN$$

$$PoR=\int_l^2rdF+\int_A^2rdW-\int_A^2rdc$$

$$Po=\frac{1}{R}\left\{\int_l^2rdF+\int_A^2rdW-\int_A^2rdc\right\}\cdots\cdots(4)$$

가

$$Po$$

가

$$Po$$

가

(Lord¹⁾).

$$Po\langle\mu Z=\mu mRW_s^2p$$

$$Po\langle\mu t\frac{\bar{l}_f}{2}RW_s^2p\cdots\cdots(5)$$

$$,\bar{l}_f:$$

$$\mu:$$

Po가

30tex

$$N_{sp}=45,000 \qquad R=2.25cm \qquad ,$$

$$P_o < 2.5g$$

$$P_o$$

가

$$P_a \qquad P_o \qquad 가$$

$$P = \frac{tW_c^2R^2}{2} = P(r = 0)$$

$$90^{\circ}$$

$$.(\qquad^2 \quad Ft \quad),$$

$$P_a$$

$$P_a = P_e \mu \beta$$

$$P_a = \frac{tW_c^2R^2}{2}e^{\frac{\mu\pi}{2}}$$

$$e^{\frac{\mu\pi}{2}}$$

$$e^{\frac{\mu\pi}{2}}=1.3 \qquad , \quad \mu = 0.17$$

$$P_a$$

(Swiss

$$RES \quad) \quad < \quad 4>$$

$$10KHZ$$

(GSP 109, Swiss

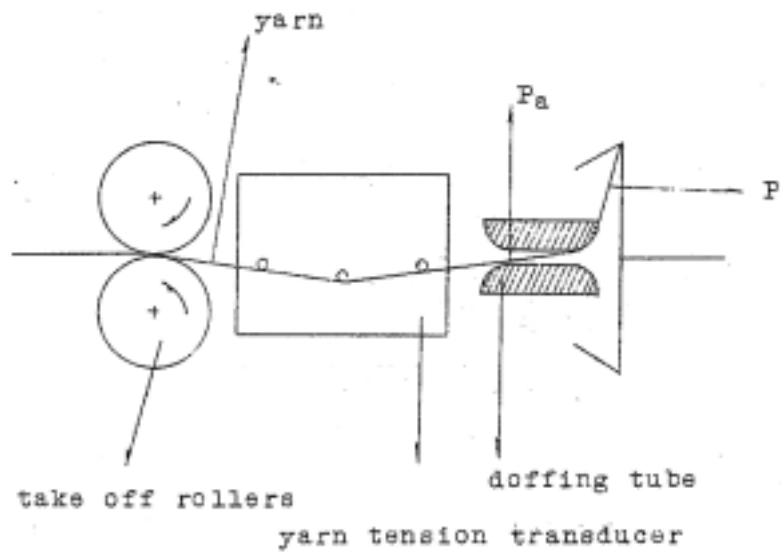
$$RES \quad) \qquad 가 \qquad Pa$$

$$가 \qquad . \qquad GSP \ 109$$

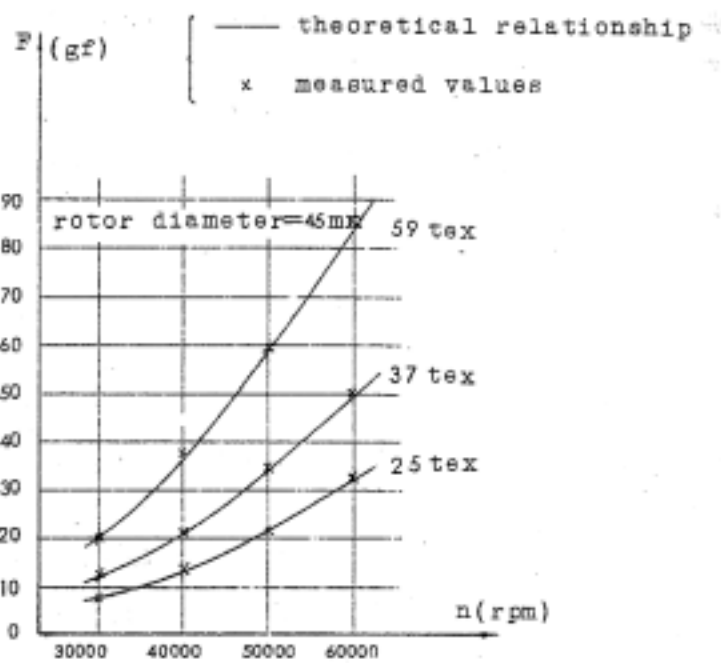
sec)

.(

50 μ



< 4>



< 5> (F) (n)

(gf r.p.m.

Pa

100

. < 5>

,

가

.

가 가

. Po

.

(Pa N_{sp}²)

(Pa R²)

. (Pa (tex))

Pa t (7)

(7) Pa가

t

Pa t (CV)

CV(Pa) CV(t)

CV(t)

CV(Pa) CV(Uster)*

가 .

* 가

(

2.25cm가) CV(Uster)

8mm가

CV(Pa) CV(Uster)

Uster

300

3×100 Pa 3 CV(Pa) CV(Pa)

$\overline{CV}(\text{Pa})$

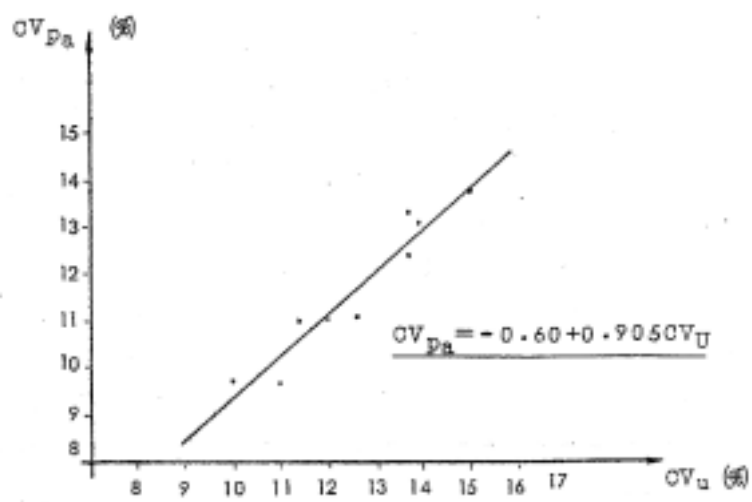
Uster Evenness Tester

3 CV(Uster)

$\overline{CV}(\text{Uster})$ 3 (,

,) 3 (16, 25, 37 tex)

9 < 6>



< 6> CV(Pa) CV(Uster)

CV(Pa) CV(Uster)

CV(Pa)=-0.60+0.905CV(Uster) (9)

0.95

0.1%

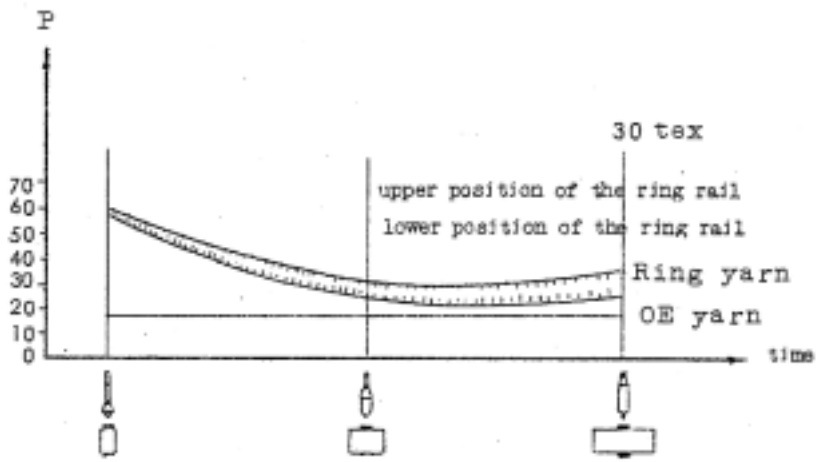
Uster

Uster

CV(Pa)

CV(Uster)

Po가



< 7>

< 7>

(

Grade

Rottmayr

2)

)

<

7>

<

7>

가

(a)

가

()

(b) OE

. (

가)

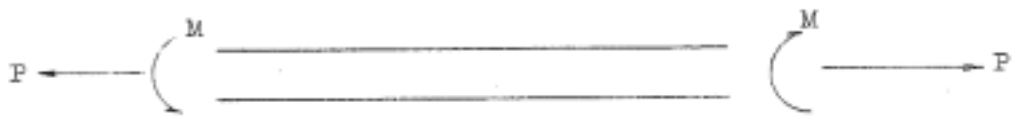
,

(Blue Jean)

. (

가)

3.



< 8>

< 8>

P M 가 3)

$$M = cP\gamma_c \alpha \cdot \cdot \cdot \cdot (10)$$

, α

γ_c

c

가

P

M가

가

(Mê)

.(9)

(Më)

Me

(A-o)

(A)

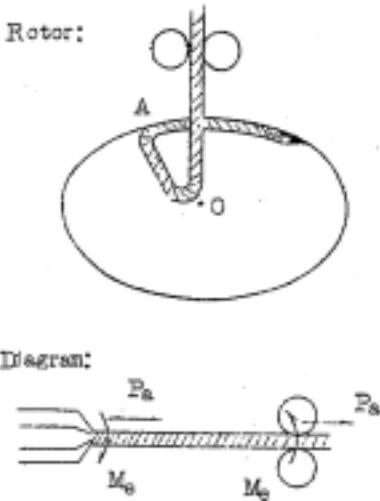
가

.(

.)*

*

가



< 9>

< 10>

가

가

P_i 가

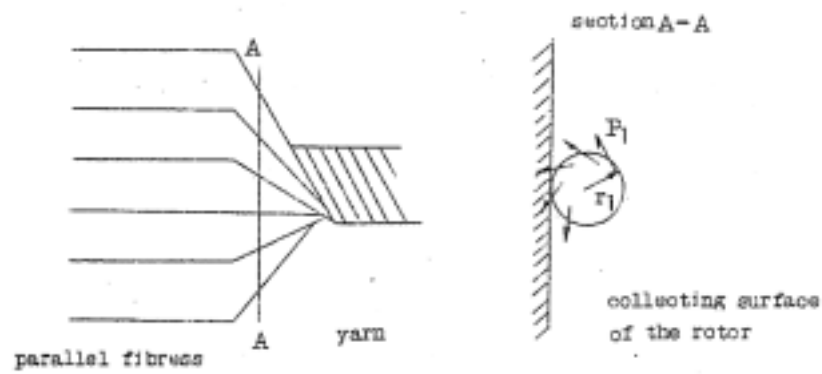
P_i

$$M = \sum_{i=1}^{N_f} r_i P_i = M_o$$

$$N_f ;$$

$$r_i :$$

$$P_i :$$



< 10>

Me

$$M_o$$

$$(10)$$

$$M_o = c P_o r_c \alpha \quad \cdot \cdot \cdot (11)$$

$$M_o < c P_o r_c \alpha$$

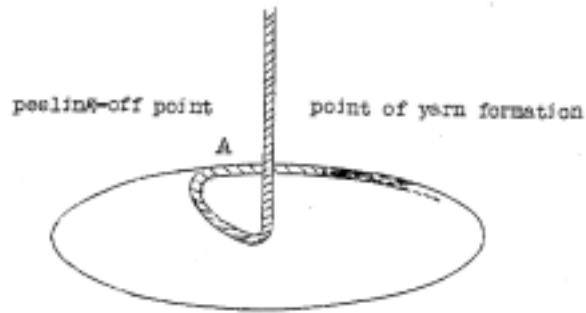
$$\text{가} \qquad \qquad \qquad < \qquad \qquad \qquad 11>$$

$$M_o > c P_o r_c \alpha$$

$$\text{가} \qquad \qquad \qquad < \qquad \qquad \qquad 11>$$

$$M_o > c P_o r_c \alpha$$

가 . (
 Mo가)



< 11>

$$M_o \leq cP_o r_c \alpha \cdot \cdot \cdot \cdot \cdot (12)$$

2 Po가
 Mo 가

$$\alpha \geq \alpha_{\min}$$

가 $\alpha_{\min}$ (
)

가 1 1/16 "

가 가 25tex
 < 12>

α 가

< 12>

가

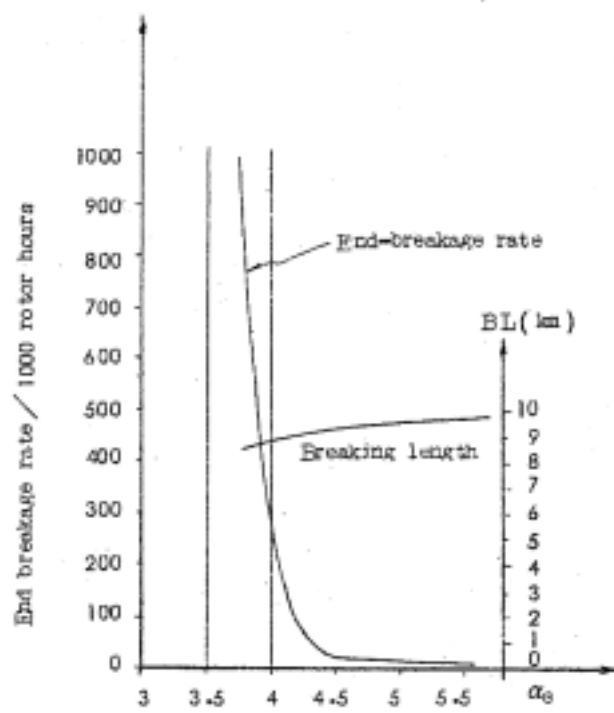
α

α

α

α min

α min



< 12> (a) (b) (BL) (α e)

(25tex OE)

가 가

(a)

가

(b) 가 (α min)가

(b)

α min

Po

Mo

4.

4.1

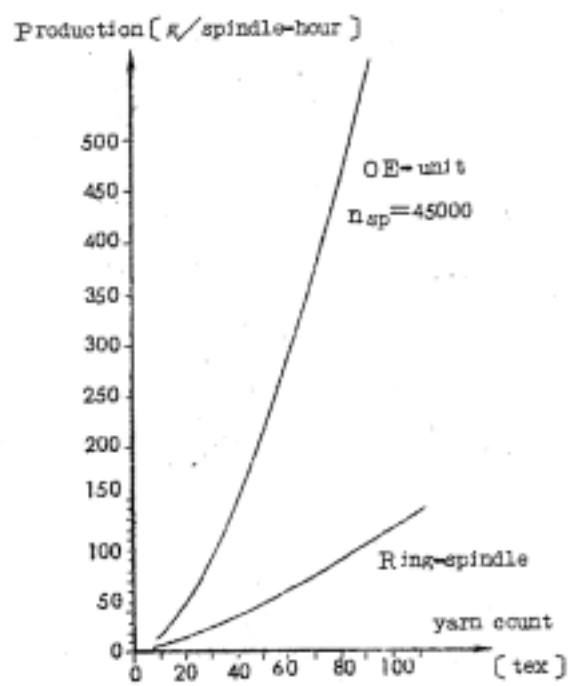
< 13> (g)

1 (tex)

가

()

(가)



< 13> (tex) (g/spdl/Hr)

가

$$P = \frac{CN_{sp}t^{\frac{3}{2}}}{\alpha_e}$$

P : 1 (g)

C : 6.25×10^{-5}

t : (tex)

α_e :

<

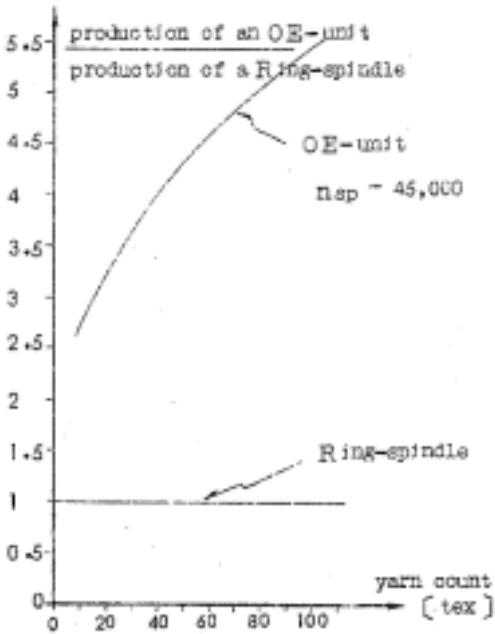
14>

1 2.5 5

*

*

가



< 14>

4.2

4,5000r.p.m

50%

가

(1kg

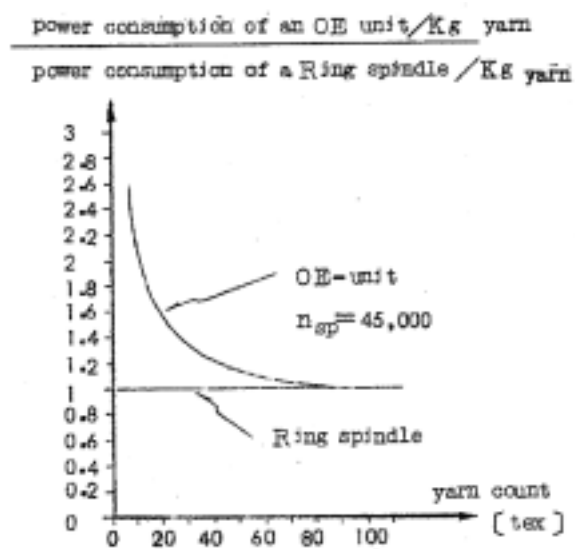
)

가

.(

3

)



< 15>

1

(tex)

< 15>

1

1

1

2 .

4.3

50

. (, ,
) < 16, 17, 18> .

4.3.1

< 16>

가

가

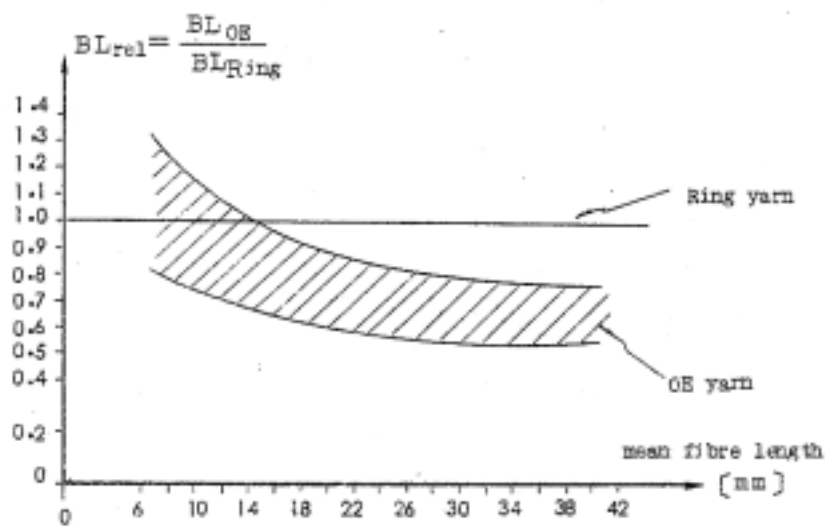
가

가 .(

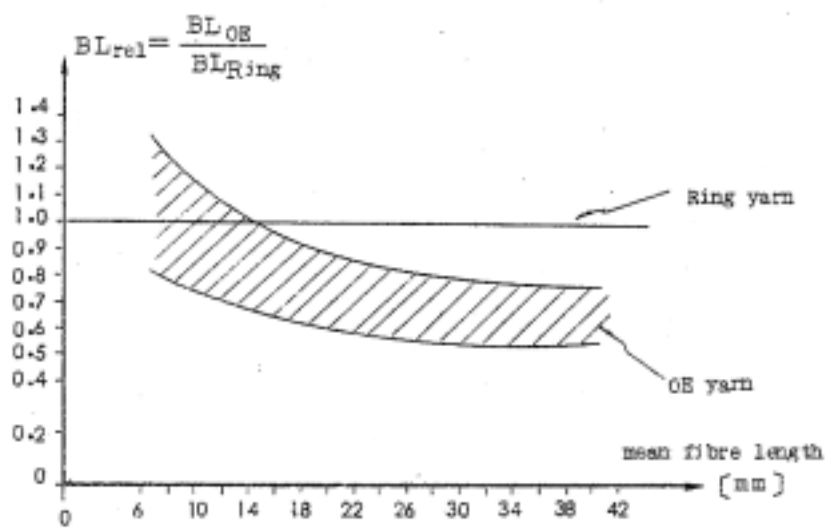
.)

4

(bridging fibre)가 가



< 16> (U%)



< 17> (BL)

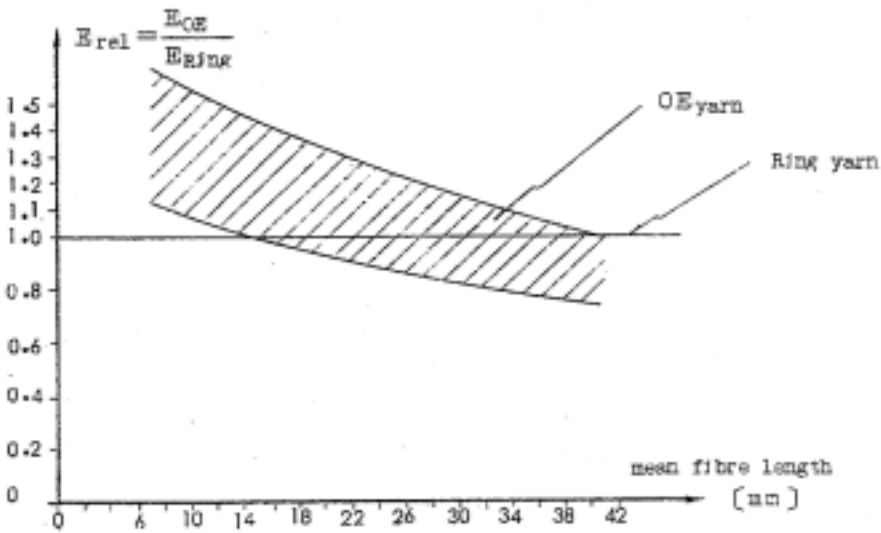
4.3.2

. < 17>

.(Krause Soliman).

가

가



< 18> (E)

4.3.3

가

. < 18>

.(Krause Soliman).

가

가

5.

가

가

(a)

가

(b)

가

가

가

가

(c)

가

(20tex)

가

가

가

가

가

가

10