

(2)

4. (Yarn Diameter) . d

(Thread Spacing) (Fig. 1.1 d/P (Woven Fabric) 1 , (Relative Closeness) , , (Drape)

Inch n , Inch P P Inch .

$$P = \frac{1}{n}$$

. 가

(Free Diameter) , (Gemetry of cloth Structure)

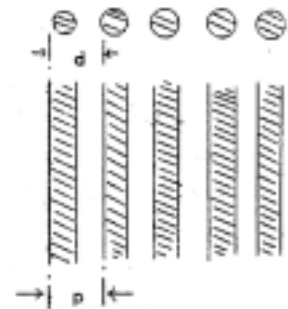


Fig. 1.1

,

.

가

.

N

.

(Constant Overall Density)

(Specific Volume) 가 ,

A

.

.

$$N \propto \frac{1}{A} \propto \frac{1}{d^2}, \quad d \propto \frac{1}{\sqrt{N}} (\quad)$$

()

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$$N \propto A \quad d^2, d \propto \sqrt{N} (\quad)$$

.

(Constant)

.

.

Law Ashenhurst ,

(Working Equation)

.

(in) Law

.

$$d = \frac{1}{\sqrt{FN}}$$

F

.

$F = 500(\quad), N \quad (560\text{yd}/ \quad)$.

$F=530(\quad), N \quad \text{Yorkshire Skein} \quad (256\text{yd}/ \quad),$

$F=800(\quad). N \quad (840\text{yd}/ \quad)$.

(in) Ashenhurst .

$$d = \frac{1}{F\sqrt{N(\text{yd} / \text{hank})}} = \frac{1}{F\sqrt{\text{yd} / lb}}$$

$F = 0.95(\quad), N$

$F = 0.90(\quad), N$

$F = 0.84(\quad), N \quad \text{Yorkshire Skein}$

Law Ashenhurst ,

Ashenhurst F .

$F = 0.973(\quad)$

$F = 0.945(\quad)$

$F = 0.948(\quad)$

(Overall Yarn Density)

.

Shirley Institute Peirce

. Peirce

(Twisted Rope) , (Specific Volume) $1.1\text{cm}^3/\text{g}$

(Overall Density of yarn)

. $1.52\text{g}/\text{cm}^3$, (Specfic

Volume) $1/1.52 \quad 0.658\text{cm}^3/\text{g}$. $1.1 \quad (0.658/1.1) \times 100\%$

, 60%가 , 40%

1.1 가 Peirce

$$1\text{Lb} = 840\text{N yd}$$

$$= 840 \times 36 \times 2.54\text{N cm}$$

$$= \frac{\pi d^2}{4} \text{in}^2 = \frac{\pi d^2 \times 2.54^2}{4} \text{cm}^2$$

$$= 840 \times 36 \times 2.54\text{N} \times \frac{\pi d^2 \times 2.54^2}{4} \text{cc}$$

$$= 1\text{Lb} = 453.6\text{g}$$

$$v = 1.1 = \frac{(\text{cc})}{(\text{g})}$$

$$1.1 = \frac{840 \times 36 \times 2.54^3 \times \pi d^2 \text{N}}{4 \times 453.6}$$

$$d^2 = \frac{1.1 \times 4 \times 453.6}{840 \times 36 \times 2.54^3 \times \pi \text{N}}$$

$$d = \frac{1}{28\sqrt{\text{N}}}(\text{in}) \quad (1.1)$$

Law Ashenhurst

Ashenhurst Peirce

關係糸直徑			
	Law	Ashenhurst	Peirce
總糸	0.99	1.04	1.00
梳毛糸	1.03	1.07	
紡毛糸	1.02	1.15	

. Peirce

, Law,

Ashenhurst

가

Peirc

1.1

(1.) 36⁵

$$d = \frac{1}{F\sqrt{N}} = \frac{1}{22.8\sqrt{36}} = \frac{1}{136.8} \text{ in}$$

(2.) 100Denier

表 1.1 (比体横糸 1.1 보 假定할 때 糸值径의 計算)			
間 接 糸 番 手 方 式		直 接 糸 番 手 方 式	
$d = \frac{1}{F\sqrt{N}}$		$d = \frac{\sqrt{1}}{F}$	
番 手 方 式	F 의 值	横 度 方 式	F 의 值
總 糸	28	Denier	2,036
梳 毛 糸	22.8	Tex	678.6
Linen Lea	16.7	Lb / Spd	115.6
Yorkshire	15.4		
Skein Wollen			

$$d = \frac{\sqrt{N}}{F} = \frac{\sqrt{100}}{2.036} = \frac{1}{203.6} \text{ in}$$

$$1\text{Inch} \quad , \quad \text{Mll}(1\text{Mll} = \frac{1}{1000} \text{ in})$$

가

Peirce

$$d = \frac{1,000}{28\sqrt{N}} \text{ Mlls} \approx \frac{36}{N}$$

$$= 1.1$$

$$d = \frac{36}{\sqrt{N}}, (N = \quad)$$

5. (Twist in Yarn)

(Twist Amount), (Compactness),
(Compressibility) (Extensibility) .
 ,
 . (Single
Twist) (Folding Twist) .

가 , (Spiral)

Fig 1.2

S Z

2

가

Fig1.3 S Z

t.p.i.(Turn Per in)

T.P.M(Turns Per Meter)

Fig 1. 2

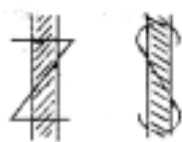
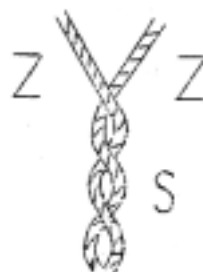


Fig 1.3



5.1

(Twist Factor)

t.p.i.(T.P.M.) ,

. 가 ,

. 가 ,

Fig1.4A . A B , B

A 2 , () t.p.i.

. 가 .

t = t.p.i. , l/t 1 .

Fig 1.4 B Fig 1.4 c . Fig1.4 B

l/t πd .

$$\tan \Theta = \pi d + \frac{1}{t} = \pi d t$$

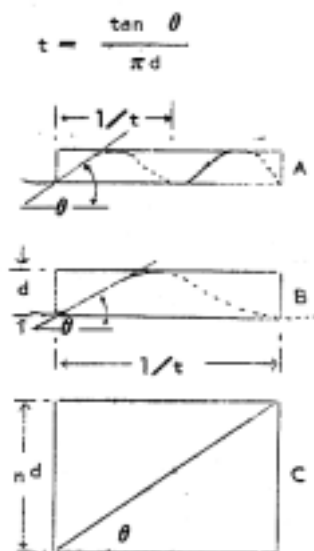


Fig 1.4

($\tan \Theta$)

$$t = \frac{1}{d}$$

$$d = \frac{1}{\sqrt{N}}$$

$$t = \frac{1}{\sqrt{N}} = k\sqrt{N}$$

k (Twist Factor Twist Multiplier) .

t.p.i. ,

.

,

.

(1) .

(a) 36's 27t.p.i.

(b) 16's 16t.p.i.

$$() (a) k = \frac{t}{\sqrt{N}} = \frac{27}{\sqrt{36}} = 4.5$$

$$(b) k = \frac{t}{\sqrt{N}} = \frac{16}{\sqrt{16}} = 4.0$$

(a) (b) 가 .

(2) (Doubling Twist)

.

(a) 2/50's 15 t.p.i.

(b) 2/48's 12 t.p.i.

$$() (a) k = \frac{15}{\sqrt{25}} = 3.0$$

(b) 2/48's = 24's = 16's

$$k = \frac{12}{\sqrt{16}} = 3.0$$

(a) (b) 가 .

, Tex

Tex

$$t = \frac{k}{\sqrt{N}}$$

가 .

$$t = \frac{k}{\sqrt{N}} (\quad) \cdot \cdot \cdot (1.3)$$

$$t = k\sqrt{N} (\quad) \cdot \cdot \cdot (1.4)$$

Tea, t.p.i. ,

$$t.p.i. = kc\sqrt{Nc}$$

$$kc =$$

$$Nc =$$

$$Nc = 590.5/Nt$$

$$Nt = Tex$$

$$t.p.i. = kc \sqrt{\frac{590.5}{Nt}} = \frac{24.3kc}{\sqrt{Nt}}$$

$$t.p.i. ,$$

$$kt = 24.3kc \cdot \cdot \cdot \cdot \cdot (1.5)$$

Tex (Metric Yarn Numbering System)

T.P.M .

$$Kt = 24.3 \times 39.37Kc = 956.8kc$$

T. P. M.

$$K_t = 956.8 \text{kc} \cdot \cdot \cdot \cdot \cdot (1.6)$$

1.2 1.1 , .

1. 2

扭 角 度	轉米扭常数	Tex 扭 常 数	
		t. p. l.	T. P. M.
16° 36'	3.0	72.9	2,870
24° 10'	4.0	97.2	3,827
29° 18'	5.0	121.5	4,784

5.2

Fig1.5 .

가 0 가 가

(Binding Effect)

(Tensile Property) 가

가 , 가 0 , 가 가

t 가 .
 $t/\cos\Theta$, 가 t
 가 .

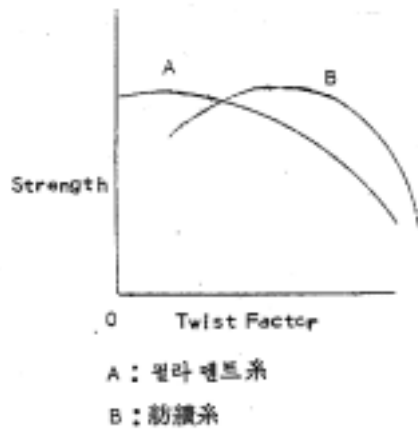


Fig 1. 5

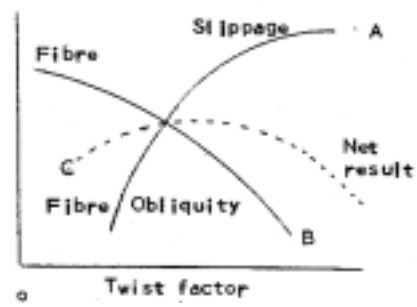


Fig 1.6

가 .
 ,
 가 , 가 (slippage)
 .
 , - Fig 1.6 A

가 (fibre oblique)
 가 . (.)

Fig 1.5 A Fig1.6 B

Fig1.5 B - Fig1.6 A B 가
 .

. 가 , ,
 (Rigidity) .

,
 가 ,
 가 가 , . 가
 , .

가
 (Single Twist) (Folding Twist)

. , .

5.3 (Extensibility)
 (spiraling) 가 .

가 ,
가 .
.
가 , 가 , .
.
.
가 .
가 , ,
.

5.4

가 .
가 가 , .
“1.2 ” .
가
.
 , 2
가 가 0.7 ,
2 mercerizing
 , .