

( )

( Traveller )

1.

, Spindle

Traveller

가

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가 .

Traveller

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(Traveller , spindle )

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2.

Lift, Ring , Ring

, Traveller

Spindle

Ring

Lift

Traveller

Spindle

1 .

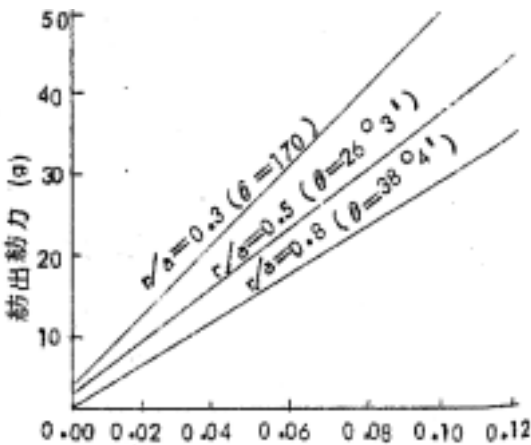
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2.1

Traveller 1

$r/a$ ( $r$  ; ,  $a$  ; Ring )

가 Traveller .



트라베라重量 (g)  
20'S 紡出 ,  $a$  ; Ring 半径 ,  $r$  ; 木管半径  
트라베라 角速度 838 rad/sec

< 1> ( )

1 ,  $r/a=0.5$ ( 22mm, Ring 44mm)  
26 ° 3 ' .

2.2

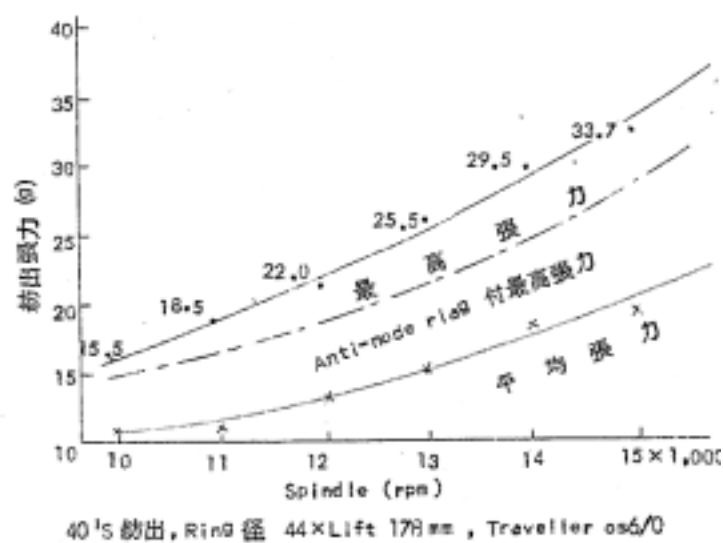
1 [6/0 ] Traveller가 6/0

6/0 12.0g 1/0 19.8g 6/0

1/0 19.8 ÷ 12.0=1.65 가 .

< 1>

| 트래베러<br>番 号 | 트래베러<br>重 量<br>(g/100) | 規 準 張 力<br>(g) | 6/0용 規<br>準으로 보합<br>력의 倍率 | 回 転 數 및 트래베러別 負荷張力(40's実測値に換算) |                 |                 |                 |                 |                 |
|-------------|------------------------|----------------|---------------------------|--------------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|
|             |                        |                |                           | 10,000<br>r p m                | 11,000<br>r p m | 12,000<br>r p m | 13,000<br>r p m | 14,000<br>r p m | 15,000<br>r p m |
| 10          | 16.85                  | 61.5           | 5.12                      | 404.5                          | 473.6           | 562.2           | 652.8           | 755.2           | 862.7           |
| 9           | 14.90                  | 54.0           | 4.50                      | 348.7                          | 416.2           | 495.0           | 573.7           | 663.7           | 758.2           |
| 8           | 12.96                  | 47.0           | 3.91                      | 303.0                          | 356.6           | 430.1           | 498.5           | 576.7           | 658.8           |
| 7           | 11.66                  | 41.0           | 3.41                      | 264.2                          | 315.4           | 375.1           | 434.7           | 503.0           | 574.5           |
| 6           | 10.37                  | 37.5           | 3.13                      | 242.5                          | 289.5           | 344.3           | 399.0           | 461.6           | 527.4           |
| 5           | 9.07                   | 33.0           | 2.75                      | 213.1                          | 254.3           | 302.5           | 350.6           | 405.6           | 463.3           |
| 4           | 8.42                   | 31.0           | 2.58                      | 199.9                          | 238.6           | 283.8           | 328.9           | 380.5           | 434.1           |
| 3           | 7.78                   | 29.0           | 2.41                      | 186.7                          | 222.9           | 266.2           | 307.2           | 355.4           | 406.0           |
| 2           | 7.13                   | 26.5           | 2.21                      | 171.2                          | 204.4           | 243.1           | 281.7           | 325.9           | 372.3           |
| 1           | 5.83                   | 22.6           | 1.88                      | 145.7                          | 173.9           | 206.8           | 239.7           | 277.3           | 366.7           |
| 1/0         | 5.13                   | 19.8           | 1.65                      | 127.6                          | 152.6           | 181.5           | 210.3           | 243.3           | 278.0           |
| 2/0         | 4.54                   | 17.5           | 1.46                      | 113.1                          | 135.0           | 160.6           | 186.1           | 215.3           | 246.0           |
| 3/0         | 3.89                   | 15.0           | 1.25                      | 98.4                           | 115.6           | 137.5           | 159.3           | 184.3           | 210.6           |
| 4/0         | 3.56                   | 14.0           | 1.16                      | 89.9                           | 107.3           | 127.6           | 149.2           | 171.1           | 195.4           |
| 5/0         | 3.24                   | 13.0           | 1.08                      | 83.7                           | 99.9            | 118.8           | 137.7           | 159.3           | 181.9           |
| 6/0         | 2.92                   | 12.0           | 1.00                      | (15.5)<br>77.5                 | (18.5)<br>92.5  | (22.0)<br>110.0 | (25.5)<br>127.5 | (29.5)<br>147.5 | (33.7)<br>168.5 |
| 7/0         | 2.70                   | 11.0           | 0.916                     | 71.0                           | 84.7            | 100.7           | 116.8           | 135.1           | 154.3           |
| 8/0         | 2.59                   | 10.5           | 0.875                     | 67.8                           | 80.9            | 99.2            | 111.0           | 129.0           | 147.4           |
| 9/0         | 2.43                   | 10.0           | 0.833                     | 64.5                           | 77.0            | 91.6            | 106.2           | 122.8           | 140.3           |
| 10/0        | 2.27                   | 9.5            | 0.792                     | 61.3                           | 73.2            | 87.1            | 100.1           | 116.8           | 133.1           |
| 11/0        | 2.11                   | 9.0            | 0.750                     | 58.1                           | 69.3            | 82.5            | 95.6            | 110.6           | 126.3           |
| 12/0        | 1.94                   | 8.5            | 0.708                     | 54.8                           | 65.5            | 77.9            | 90.3            | 104.4           | 119.3           |



< 2> Spindle

2.3

( ; 26 ° 3 ' , Lift ; 1.78mm, ; 40's, Traveller 6/0)

Spindle

2 1 Traveller 6/0 ( ) .

2.4

가

Traveller

( Traveller Ballooning

Snail Wire 가 ) 1.7 , Ring, Traveller

( 3 ) .

=  $\times 17 \times 3$

. 1 6/0 , Spindle rpm 10,000

$15.5 \times 5 = 77.5g$ , 15,000  $35.5 \times 5 = 168.5(g)$ 가 ( 5.1 가 1 5 ).

Traveller

Traveller . 1/0 1.65 10,000r.p.m.

6/0 1.65 가 .  $77.5 \times 1.65 = 127.8(g)$ , 1

1,000

가 .

1/0 12,600r.p.m , 12,000r.p.m 181.5g,

13,000r.p.m 210.3g, 600r.p.m.

$(210.3 - 181.5) \times 0.6 = 17.28$  71.3

$181.5 + 17.3 = 198.8(g)$

198.8g가 12,600r.p.m .

2.5

a.

Traveller

. Traveller 가

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b. Lift, Ring

1 Ring 44mm, Lift 178mm(7in)

Ring 3mm( 1/8in) 6.6%,

Lift 25.4mm(1in) 6.6%, Lift 25.4mm(1in) 7%

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3.

(Work)

80% (Weak

point) . 가

. 2 lea (lb)

$$= \frac{\text{Lea (lb)} \times 453.6}{160} \times 1.25 \times \frac{80}{100}$$

Gram ,

$$= \frac{\text{Lea (g)}}{160} \times 1.25 \times \frac{80}{100}$$

, Lea .

< 2>

| Lea<br>弦力<br>(lb) | 実用単<br>糸弦力<br>(g) | Lea<br>弦力<br>(lb) | 実用単<br>糸弦力<br>(g) | Lea<br>弦力<br>(lb) | 実用単<br>糸弦力<br>(g) |
|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| 20                | 56.7              | 58                | 164.4             | 96                | 272.1             |
| 22                | 62.3              | 60                | 170.1             | 98                | 277.1             |
| 24                | 68.0              | 62                | 175.7             | 100               | 283.5             |
| 26                | 73.7              | 64                | 181.4             | 102               | 289.1             |
| 28                | 79.4              | 66                | 187.1             | 104               | 294.8             |
| 30                | 85.0              | 68                | 192.8             | 106               | 300.5             |
| 32                | 90.7              | 70                | 198.4             | 108               | 306.1             |
| 34                | 96.4              | 72                | 204.0             | 110               | 311.8             |
| 36                | 102.1             | 74                | 209.7             | 112               | 317.4             |
| 38                | 107.7             | 76                | 215.4             | 114               | 323.1             |
| 40                | 113.4             | 78                | 221.1             | 116               | 328.8             |
| 42                | 119.1             | 80                | 226.8             | 118               | 334.4             |
| 44                | 124.7             | 82                | 232.4             | 120               | 340.2             |
| 46                | 130.4             | 84                | 238.1             | 122               | 345.8             |
| 48                | 136.1             | 86                | 243.8             | 124               | 351.5             |
| 50                | 141.7             | 88                | 249.5             | 126               | 357.2             |
| 52                | 147.4             | 90                | 255.1             | 128               | 362.8             |
| 54                | 153.1             | 92                | 260.7             | 130               | 368.5             |
| 56                | 158.7             | 94                | 266.4             | 132               | 374.1             |

$$[ \quad ] = \frac{\text{Lea (lb)} \times 453.6}{160} \times 1.25 \times \frac{80}{100} \text{Lea}$$

1

< 3>

| 項<br>目<br>Lea<br>弦力 (lb) | 実用単<br>糸<br>弦 力<br>(g) | Lift×<br>Ring 径<br>(mm) | Spindle<br>r.p.m | 負荷弦力 (g)         |                  |
|--------------------------|------------------------|-------------------------|------------------|------------------|------------------|
|                          |                        |                         |                  | Traveller<br>7/0 | Traveller<br>8/0 |
| 48                       | 136.1                  | 178×44                  | 12,500           | 108.8            | 103.6            |
|                          |                        |                         | 13,000           | 116.8            | 110.0            |
|                          |                        |                         | 13,500           | 125.9            | 119.5            |
|                          |                        |                         | 14,000           | ※135.1           | 129.0            |
|                          |                        |                         | 14,500           | 144.7            | 138.1            |
|                          |                        |                         | 15,000           | 154.3            | 147.4            |

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4.

|               |            |           |            |             |
|---------------|------------|-----------|------------|-------------|
| Weak point    |            |           |            | Traveller   |
|               | Traveller  |           |            | .           |
| Traveller     |            | 3         |            | .           |
| 4.1 Traveller |            |           |            |             |
|               |            |           |            | Traveller 가 |
|               | Traveller가 | 가         | Ballooning |             |
|               | 가          |           |            | Traveller 가 |
|               | 가          | .         | Ballooning | Seperator   |
|               | Ballooning |           | 가          | .           |
| 40's          | 7/0, 30's  | 3/0, 20's | No.1       | 가 가         |
|               | Traveller  |           |            |             |
|               |            |           |            | .           |