SETT OF WARP.

FOR A PERFECT FABRIC
How to figure it out?

We wrote on this subject twice (MW 8/1, 19/3) and explained
the difficulties of the problem. The graphs we have given help
selecting the proper number of ends per inch or rather the lowest
number of them. One curve is for tabby, another for twill, without
specyfying what kind of twill. This however does not help when we
have an entirely different weave, or a mixture of tabby and pattern.

If we really want to calculate the warp sett wihout taking
any risk we must use the same methods as employed in the textile
industry. The surest way is to use a formula which is not too dif-
ficult and which can be adapted to handweaving. We are not going
to explain the formula because it takes higher mathematics to do
so.
The idea is to find first a so called "diameter number".
As we have already explained the diameter of yarns cannot be
measured with any accuracy, but it can be calculated. What we are
really interested in is not so much the diameter, but the number
of ends which will cover one inch just touching each other. This
is found from the formula:

$$N = .9 \times \sqrt{yds/lb.}$$

Since not everybody remembers how to figure out a square
root, we are giving a table (Table No.1) of the value for N.
This table should be kept handy when we figure out a new warp.

To find out the sett of warp we use a second formula:

$$S = \frac{N \times R}{R + T} \; ;$$

where S is sett of warp; N - diameter number; T - number of ties
in one pick of weft in one repeat, and R - number of ends in one
repeat of the weave.

All these factors are selfexplanatory except the T.
The number of ties means the number of times the weft comes from

the back to the front of the fabric and vice versa (fig.1). For
instance in tabby it is 2, so it is in basket and simple twills
in 2:2:1:1 twill it is 4 (fig.1),
and in 3:1:1:1:1:1 twill (fig.2)
it is 6. Whenever the black chan-
ges to white and the white to
black in the draw-down of a weave,
we count it as a tie. So far this
is simple. But there are weaves
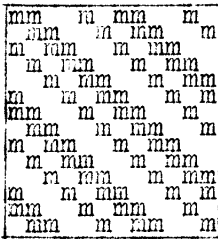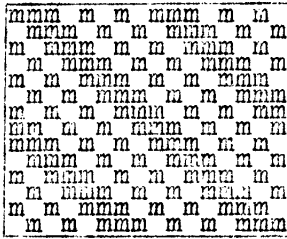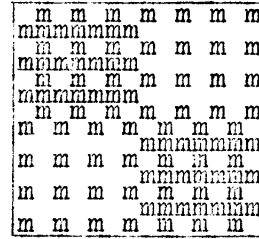

ties

Fig.1

Fig.1a

Fig.2

Fig.3

where one pick of weft may make 14 ties, and another only 2, as
in fig.3 for instance. Here the proper way to calculate the T is
to count all the ties in one repeat of the weave and divide it by
the number of picks in one repeat. In the case of fig.3 we have
124 ties, which divided by 14 gives roughly 9.

TABLE 1

Yds/lb	N	Yds/lb	N	Yds/lb	N
100,000	285	10,000	90	1,000	29
90,000	270	9,000	85	900	27
80,000	254	8,000	81	800	25
70,000	238	7,000	76	700	24
60,000	221	6,000	70	600	22
50,000	201	5,000	63	500	20
45,000	191	4,500	60	450	19
40,000	180	4,000	57	400	18
35,000	168	3,500	53	350	17
30,000	156	3,000	49	300	16
25,000	142	2,500	45	250	14
20,000	127	2,000	40	200	13
18,000	121	1,800	38	180	12
16,000	114	1,600	36	160	11
14,000	107	1,400	34	120	10
12,000	99	1,200	31	100	9

In most pattern weaves where tabby alternates with pattern
shots we take the average between tabby and pattern. E.g. for
overshot we can take a repeat of 12 with 12 ties in tabby and 6
ties in overshot, which gives an average of 9.

For those who do not like formulas we give also a second
table which contains the coefficient: (R+T):R.

TABLE 2

Warp-face fabrics, double weaves	1,0
4:4 basket	1.25
16-frame damask, twill od satin 1:7	1.25
3:3 basket	1.3
10-frame damask, twill or satin 1:4	1.4
twill 2:2, 1:3; basket 2:2; 8-frame damask	1.5
waffle, dornick (8-frame), dropped tabby	1,5
1:2 twill, 6-frame dimity, spot weave	1.7
twill with tabby, crackle, summer-&-winter	1.75
huckaback lace	1.8
huckaback	1.9
tabby, swivel	2.0
Overshot, crackle, summer-&- winter, heavy weft	2.5
Diamond twill, heavy pattern weft & binder	2.7
Satinet, weft twice as heavy as warp	3.0
Pattern weaves with weft 4 times heavier	3.5
Weft face fabrics, bound weaves, rugs (flat) ..	4.0

Now, to find a sett of warp we simply multiply the number
found in the first table by the number found in the second table.
For instance: we are making towels of fine single linen No 30.
The number of yds/lb is 30 times 300 = 9,000. In the first table
we found the diameter number which is 85. In the second table,
if the towels are going to be woven in tabby - 2. Now we divide
85 by 2 which is 42.5. The nearest convenient sett will be 42 -
reed No.14, 3 ends per dent. Another possibility is reed No.22 if
available with 2 ends per dent, which gives us a sett of 44 - close
enough.

Another example: woolen fabric woven in 2:2 twill; yarn
- 16/2. The first table gives for 4480 yds/lb (8x560) the diameter
number: 60. The second - 1,5. Therefore the sett is 40.

When using table No.2 we must remember that the numbers
from one to two apply to the frabics with approximately the same
count of warp and weft. The number higher than 2 are only for
fabrics which have the weft much heavier than the warp.

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