MATH OF SIZING

Rule:

1. **Machine efficiency** $= \frac{Actual\ Production}{Calculation\ production} \times 100 = Result\%$
2. **Count of sized yarn = Count of unsized yarn** $\times \frac{100}{100+\%of\ sized\ mateiral}$
3. **% of size material** $= \frac{Wt.of\ size\ on\ yarn}{Wt.of\ unsized\ yarn} \times 100$

Problem:

1) **The actual production of sizing m/c is 32400 yds per 8hrs. If the calculated production is 90 yds per min, find the efficiency of the m/c.**

Solution:

Actual production in yds/hr $= \frac{32400}{8} = 4050$

Calculated production in yds/hr $= 90 \times 60 = 5400$

Machine efficiency $= \frac{4050}{5400} \times 100 = 75\%$

2) **A beam of 250kg contains sized yarn of 15% take up. If the sized yarn count is 40 Ne, calculate the count of unsized yarn.**

Solution:

We know,

Count of sized yarn = Count of unsized yarn $\times \frac{100}{100+\%of\ sized\ mateiral}$

40 = Count of unsized yarn $\times \frac{100}{100+15}$

Count of unsized yarn $= \frac{40}{0.87} =$ **45Ne**

3) A warp beam contains 12950 yds of warp sheet on it. The no. of ends in the warp sheet is 430 and wt. of full beam is 365 lbs. if the weight of empty beam is 52 lbs, calculate the count (Ne) of warp yarn.

Solution:

Weight of yarn = wt. of full beam – wt. of empty beam = 365 lbs–52 lbs = 313 lbs

Weight of single yarn= 313/430

= 0.728 lb

Let, Count of yarn=x

Wt of single warp = 12950/(840 X x)
=15.42/x

So,
15.42/x = 0.728

X = 21.18

Count of yarn 21

4) **A warp beam has 15000 yds of warp. The of full beam is 302 lbs & empty beam is 52 lbs. The count of yarn is 32 Ne. Calculate the no. of warp in the warp sheet.**

Solution:

Wt. of yarn = wt. of (full beam – empty beam) = (302−52) lbs = 250 lbs

Wt of single warp = 15000/(840x32)
=0.5580 lbs
No of warp = (250/.5580)
=448

5) If calculated production is 100 yds/min & eff is 75%
a) Calculate actual production/shift
b) Total length of yarn if no ends is 3250
c) Wt. of sized yarn if count is 40 & take up is 10%

Solution:

a) Actual production /shift = calculate production × efficiency
=100x60x8x.75
=36000 yds/shift

b) Total length = Total production × No. of ends =36000 x 3250=117000000 yds

c) Wt. of unsized yarn = 117000000/(840 x40)

=3482.142 lbs

Total wt. of sized warp yarn with 10% take up
= (wt. of sized yarn) + (wt. of size yarn × take up)

=3482.142+3482.142x (10/100)

= 3830.356 lbs.

6) Wt. of sized beam is 82.5 lbs. Beam have 1050 yds yarn whose yarn count before sizing was 50 Ne, if no. of ends is 3000. Then

a) The wt. of size on the yarn

b) %of size material

c) Count of sized yarn