Knitting Calculation Formula:

Some important formula of knitting production calculation have mentioned in the below:

1. Production in length,

= Course per minute/ Course per inch,

Or,

= CPM/CPI

Or,

$$= \frac{\text{Number of feeder} \times \text{cylinder RPM} \times \text{time} \times \text{efficiency}}{\text{CPI} \times 36}$$

2. Course per inch,

= Course per minute/production in length

3. Course per minute,

= course per inch× production in length

4. Stitch density,

= Course per cm/ Wales per cm

5. Fabric width,

= {(∏× diameter of cylinder× machine gauge)/wales per cm}

Or,

= Number of wales/Wales per cm

Or,

= Number of needle/ wales per cm

6. Fabric weight,

= {(Course per minute× yarn length per course)/ yarn count}

7. Needle number of machine,

= ∏× diameter of cylinder× gauge

8. Yarn length per course,

= Total number of machine× loop length

9. Production of single jersey machine in weight (kg) per hour,

$$= \frac{\text{∏×cylinder dia (inch)×cylinder RPM× feeder no.× gauge×stitch length (mm)× tex×60×efficiency}}{\text{..}}$$

$$1000 \times 1000 \times 1000$$

10. Production of double jersey in length,
= Single jersey production in length/2
11. Production of double jersey in weight,
= Single jersey ×2

Production Calculation of Knitting Machine in Textile:

Example-01:
If machine diameter= 20 inch, feeder number= 90, course per cm= 15, machine speed= 25 RPM and machine efficiency is 90% then calculate the production per shift of a single jersey circular **knitting machine**.
Solution:
Here,
Diameter of machine= 20 inch,
Number of feeder= 90,
Machine speed or machine cylinder RPM= 25 RPM,
Machine efficiency= 90%= 0.9,
Time= 1 shift= 8 hours = (8×60) =480 minute
Course per cm= 15,
Course per inch (CPI) = (15/0.3937) = 38.10≈38
So,
Production in meter per shift,

$$= \frac{\text{No. of feeder} \times \text{cylinder RPM} \times \text{time} \times \text{efficiency}}{\text{CPI} \times 36}$$

$$= \frac{90 \times 25 \times 480 \times 0.9}{38 \times 36}$$

= 710.53 yds
= (710.53×0.9144) m
= 649.7 m per shift
So, production per shift for single jersey **circular knitting machine** is 649.7m
Example-02:
Calculate the length in meter of a plain single jersey fabric at 16 courses per centimeter on a 26 inch diameter and 28 gauge machine having 100 feeders. The knitting machine operates for 8 hours at 29 RPM at efficiency of 90%.

Solution:

Given that,

Machine dia= 26 inch,

Machine gauge= 28,

Number of feeder= 100,

Machine speed or cylinder RPM=29 RPM,

Efficiency= 90%= 0.9,

Time= 8 hours= (8×60) =480 minute,

Course per centimeter= 16,

Course per inch (CPI) = 16/0.3937=40.64≈41

So,

Production in meter per shift,

$$= \frac{\text{Number of feeder} \times \text{machine speed} \times \text{time} \times \text{efficiency}}{\text{CPI} \times 36}$$

$$= \frac{100 \times 29 \times 480 \times 0.9}{41 \times 36}$$

= 848.78 meter per 8 hours,

= (848.78×0.9144) m

= 776.12 m per 8 hours

So, production for this calculation stands at 776.12m per 8 hours.