# Circular Knitting Machine Production

Fabric production of a circular knitting machine from speed, feeders, needles, stitch (loop) length, yarn tex and efficiency.

**Method:** Definitions and mass and energy balances: yarn knitted = speed × feeders × needles × stitch length

## Input parameters

Unit system: SI

| Parameter | Value | Unit |
|---|---|---|
| Machine speed | 25.000 | rpm |
| Feeders | 90.000 | |
| Needles (cylinder) | 2,640.0 | |
| Stitch length | 2.8000 | mm |
| Yarn linear density (tex) | 20.000 | |
| Efficiency | 85.000 | % |

## Calculated results

| Parameter | Value | Unit |
|---|---|---|
| Yarn consumed | 14,137 | m/min |
| Fabric production | 16.965 | kg/h |

## Formula and method

$$\dot{L}_y = NFn_d\ell\eta, \quad \dot{M} = \dot{L}_y T \times 10^{-6} \text{ kg/m per tex}$$

### Variables

| | | |
|---|---|---|
| $N$ | Machine speed | 1/s |
| $F$ | Feeders | - |
| $n_d$ | Needles (cylinder) | - |
| $\ell$ | Stitch length | m |
| $T$ | Yarn linear density (tex = g per 1000 m = $10^{-6}$ kg/m) | - |
| $\eta$ | Efficiency | - |
| $\dot{L}_y$ | Yarn consumed | m/s |
| $\dot{M}$ | Fabric production | kg/s |

### Method and standards

Yarn length balance.

### Assumptions and limits

- Single-jersey type; one loop per needle per feeder.

### References

• Definitions and mass and energy balances: yarn knitted = speed × feeders × needles × stitch length

## Report details

| | |
|---|---|
| Report reference | FCC-PWYC-J072 (the same inputs always give the same reference) |
| Generated | 17 November 2026, 19:37 UTC |
| Calculator | Circular Knitting Machine Production |
| Method last reviewed | 13 November 2026 |
| Software release | FireCAD Calc, release of 17 November 2026 |
| Release checks | 2 reference cases of this calculator, computed independently, are checked on every release |

Results are for engineering estimation. Verify critical designs against the referenced standards and your own data.

### This calculator online

https://calc.firecad.com/chemical/textile-rice-oil/circular-knitting-production

Open this case on calc.firecad.com →

Reopens the calculator with the inputs of this report.