Ring Spinning Production per Spindle and per Frame

Yarn delivery speed and production of a ring frame from spindle speed, twists per metre, count, spindles and efficiency.

Method: Definitions and mass and energy balances: delivery = spindle speed / twist per metre

Input parameters

Unit system: SI

Parameter	Value	Unit
Spindle speed	18,000	rpm
Twists per metre	900.00	
Yarn linear density (tex = g/km)	19.700	
Spindles per frame	1,200.0	
Efficiency	92.000	%

Calculated results

Parameter	Value	Unit
Delivery speed	20.000	m/min
Production per spindle	21.749	g/h
Production per frame	26.099	kg/h

Formula and method

$$v = \frac{N}{TPM}, \quad p_s = vT \times 10^{-6}\,\eta \;(T \text{ in tex},\ \text{kg/m} = 10^{-6}\,T), \quad P_f = n_s\,p_s$$

Variables

N	Spindle speed	1/s
TPM	Twists per metre	-
T	Yarn linear density (tex = g/km)	-
n_s	Spindles per frame	-
η	Efficiency	-
v	Delivery speed	m/s
p_s	Production per spindle	kg/s
P_f	Production per frame	kg/s

Method and standards

Delivery definition.

Assumptions and limits

- Traveller lag neglected.
- Tex is a plain number in g/km; 10^{-6} T is the linear density in kg/m.

References

• Definitions and mass and energy balances: delivery = spindle speed / twist per metre

Report details

Report reference	FCC-3P48-4DYR (the same inputs always give the same reference)
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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/ring-spinning-production

Open this case on calc.firecad.com →

Reopens the calculator with the inputs of this report.