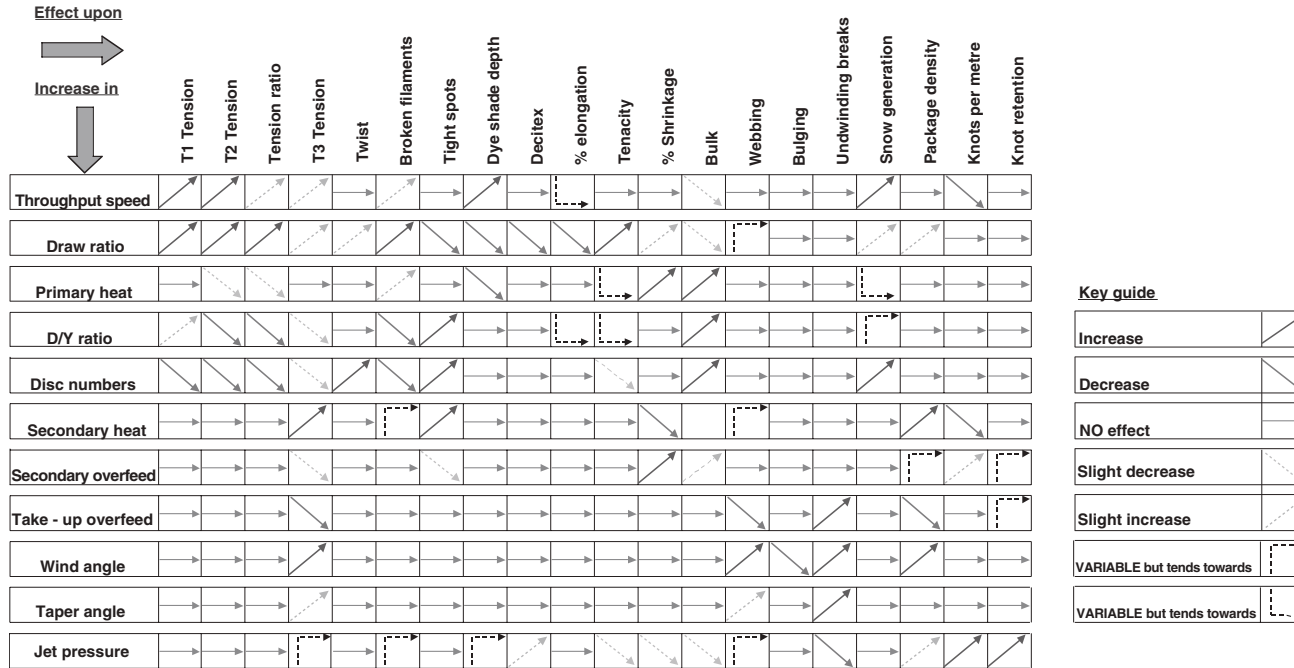


Appendix 1

Textured condition reference chart



Appendix 2

Machine speed and general calculations

D/Y ratio

$$\text{D/Y ratio} = \frac{\text{disc dia. (meters)} \times \pi \times \text{disc rpm.}}{\text{throughput speed}}$$

Disc rpm

$$\text{disc rpm} = \frac{\text{throughput speed} \times \text{D/Y ratio}}{\text{disc dia (meters)} \times \pi}$$

Input shaft speed

$$\text{input shaft speed} = \frac{\text{centre shaft speed}}{\text{draw ratio}} \text{ m/min}$$

Bottom shaft speed

$$\text{bottom shaft speed} = \text{centre shaft speed} \times \frac{(100 - \text{SH overfeed \%})}{100}$$

Take up shaft speed

$$\text{take up shaft speed} = \text{centre shaft speed} \times \frac{(100 - \text{take up overfeed \%})}{100}$$

Traverse rate

$$\text{traverse rate} = 2 \times \tan(\text{wind angle}) \times \text{take up speed}$$

Production rate

production in kgs/machine/hour at 100% efficiency

$$= \frac{\text{POY decitex} \times \text{input shaft speed} \times \text{no of spindles} \times 60}{10000 \times 1000} + \% \text{ oil on yarn}$$

Taper angle

$$\text{taper angle} = \tan\left(\frac{\text{yarn depth on package (mm)} \times 2}{(\text{initial stroke} - \text{final stroke}) \text{ mm}}\right)$$

Ribbon phase diameters

$$\text{diameter} = \frac{\text{take up speed (m/min)}}{(\text{Traverse cycles per min.} \times \pi \times N)} \times 1000 \text{ mm}$$

where N is a whole number between 1 and 9

Package density

A = initial stroke length (mm)

B = final stroke length (mm)

C = yarn depth on package (from tube wall to outside of package) (mm)

D = nett weight of package in grams

$$\text{Density} = \frac{954.9297 \times D}{2(AC + 2BC + 112.5A + 112.5B)} (\text{g/cm}^3)$$

To convert rpm to metres per minute

$$\text{metres per min.} = \text{shaft diameter in metres} \times \text{rpm} \times \pi$$

To convert metres per minute to rpm

$$\text{rpm} = \frac{\text{shaft speed (m/min)}}{\text{shaft diameter in metres} \times \pi}$$

To convert decitex to denier

$$\text{denier} = \text{decitex} \times 0.9$$

$$\text{i.e. } 167 \text{ dtex} = 150.3 \text{ denier}$$

To convert denier to decitex

$$\text{decitex} = \text{denier} \times 1.11$$

$$\text{i.e. } 70 \text{ denier} = 77.7 \text{ decitex}$$

To convert units of specific stress

$$1 \text{ N/tex} = 10 \text{ cN/dtex} = 11/3 \text{ g/den} = 102 \text{ gf/tex}$$

$$\text{i.e. } \text{N/tex} \times 11.3 = \text{g/den} \quad \text{where } 11.3 = \frac{1}{0.9 \times 9.81} \times 1000$$

To calculate mangle air consumption. m³/hr/JET

$$\text{Constants} \quad 1 \text{ bar} = 14.504 \text{ psi}$$

$$1 \text{ m}^3/\text{hr} = 0.588 \text{ cfm}$$

Z = No. of air orifice within jet

D = Diameter of air orifice mm

Pe = operating pressure (bar)

$$\text{Air consumption m}^3/\text{hr/jet} = (Z^2 \times D \times 0.4648) \times (Pe + 1)$$

To convert to ft³/min multiply by 0.588

General conversions**To convert metres to yards multiply by 1.0936**

e.g. $100 \text{ metres} \times 1.0936 = 109.39 \text{ yards}$

To convert yards to metres multiply by 0.9144

e.g. $500 \text{ yards} \times 0.9144 = 457.2 \text{ metres}$

To convert inches to metres divide by 39.37

e.g. $100 \text{ inches} / 39.37 = 2.54 \text{ metres}$

To convert inches to centimetres multiply by 2.54

e.g. $12 \text{ inches} \times 2.54 = 30.48 \text{ centimetres}$

To convert square yards to square metres multiply by 0.8361

e.g. $8 \text{ square yards} \times 0.8361 = 6.6888 \text{ square metres}$

To convert kilogrammes to lb multiply by 2.2046

e.g. $100 \text{ kilogrammes} \times 2.2046 = 22046 \text{ lb}$

To convert lb to kilogrammes multiply by 0.4536

e.g. $100 \text{ lb} \times 0.4536 = 45.36 \text{ kg}$

To convert ton to metric tonne multiply by 0.9842

e.g. $2 \text{ ton} \times 0.9842 = 1.9684 \text{ metric tonne (i.e. } 1968.4 \text{ kg)}$

To convert gallons to litres multiply by 4.546

e.g. $5 \text{ gallons} \times 4.546 = 22.73 \text{ litres}$

To convert pints to litres multiply by 0.5682

e.g. $5 \text{ pints} \times 0.5682 = 2.841 \text{ litres}$

To convert pressure, in bar, to psi multiply by 14.504

e.g. $2.5 \text{ bar} \times 14.504 = 36.26 \text{ psi}$

To convert flow (air consumption) from m³/hr to ft³/min, multiply by 0.588

e.g. $6.0 \text{ m}^3/\text{hr} \times 0.588 = 3.528 \text{ ft}^3/\text{min}$

To convert degrees to radians

$$1 \text{ radian} = \frac{\pi}{180} \text{ degrees}$$

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