Formula Sheet

Saw and Tooth Shape

d	Circular saw diameter or bandmill wheel dia.(inch)
P	Tooth pitch (inch)
n	Number of teeth
k	Kerf
h	Thickness of saw plate
s	Side clearance (inch)
s_{MIN}	Minimum recommended side clearance (inch)
a	Gullet area (square inch)

Operating Conditions

N	Shaft speed (rpm)
c	Blade (or rim) speed (sfpm)
b	Bite per tooth (inch)
D	Depth of cut (inch)
f	Feed speed (fpm)
f_{MAX}	Maximum recommended feed speed (fpm)
f_{MIN}	Minimum recommended feed speed (fpm)

Performance Prediction

GFI	Gullet Feed Index
GFI_{MAX}	Maximum allowable Gullet Feed Index
	0.3 for circular saws
	0.7 for bandsaws

Power Consumption

E	Estimated power required (hp)
C	Energy factor depending on wood properties

$$C = \text{35 for North American softwoods}$$
$$\text{40 for dry fir}$$
$$\text{70 for hardwoods}$$

Evidence from the Wood

X	Distance taken by 'm' bites on the board
m	The number of bites in distance X

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$$c = \frac{3.14 \times d \times N}{12} \qquad \text{or} \qquad N = \frac{12 \times c}{3.14 \times d}$$

$$b = \frac{X}{m} \qquad \text{or} \qquad X = m \times b$$

$$f = \frac{b \times c}{p} \qquad \text{or} \qquad b = \frac{f \times p}{c}$$

$$GFI = \frac{b \times D}{a} \qquad \text{or} \qquad b = \frac{GFI \times a}{D}$$

$$f_{MAX} = \frac{GFI\ max \times a \times c}{D \times P}$$

$$f_{MIN} = \frac{s \times c}{P}$$

$$s = \frac{k - h}{2} \qquad \text{or} \qquad k = h + 2 \times s$$

$$E = \frac{C \times k \times f \times D}{144}$$

For Circular Saws Only

$$P = \frac{3.14 \times d}{P} \qquad \text{or} \qquad n = \frac{3.14 \times d}{P}$$

$$b = \frac{12 \times f}{N \times n} \qquad \text{or} \qquad f = \frac{b \times n \times N}{12}$$

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