Blast Burden and Spacing by Konya's Method

Burden from hole diameter and explosive and rock density or relative bulk strength, corrected for rows and geology, with stemming, subdrill and spacing.

Input parameters

Unit system: SI

Parameter	Value	Unit
Explosive (hole) diameter	4.0000	in
Burden basis	Explosive density, eq. 11.18	
Explosive density (specific gravity)	1.2000	
Relative bulk strength (ANFO = 100)	140.00	
Rock specific gravity	2.6000	
Bench height	30.000	ft
Row correction	First two rows, 1.0	
Geology correction	Average rock, 1.0	

Calculated results

Parameter	Value	Unit
Burden before corrections	9.7373	ft
Corrected burden	9.7373	ft
Stemming	6.8161	ft
Subdrill	2.9212	ft
Spacing, instantaneous holes	16.492	ft
Spacing, delayed holes	12.270	ft
Stiffness ratio	3.0809	

Formula and method

$$B = 3.15 D_e \sqrt[3]{\frac{SG_e}{SG_r}} \text{ or } 0.67 D_e \sqrt[3]{\frac{St_v}{SG_r}}, \quad T = 0.7B, \; J = 0.3B$$

$$S_i = \frac{L + 2B}{3}, \; S_d = \frac{L + 7B}{8} \; (L/B < 4); \quad S_i = 2B, \; S_d = 1.4B \; (L/B \geq 4)$$

Variables

D_e	Explosive (hole) diameter	m
basis	Burden basis	-
SG_e	Explosive density (specific gravity)	-
St_v	Relative bulk strength (ANFO = 100)	-
SG_r	Rock specific gravity	-
L	Bench height	m
K_r	Row correction	-
K_g	Geology correction	-

B_0	Burden before corrections	m
B	Corrected burden	m
T	Stemming	m
J	Subdrill	m
S_i	Spacing, instantaneous holes	m
S_d	Spacing, delayed holes	m
L/B	Stiffness ratio	-

Method and standards

Konya and Walter's surface blast design.

Assumptions and limits

- Empirical; the B formulas take De in inches and give feet.

Report details

Report reference	FCC-WY9C-GR8V (the same inputs always give the same reference)
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Calculator	Blast Burden and Spacing by Konya's Method
Method last reviewed	17 November 2026
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Release checks	3 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/civil/mine-design/blast-burden-konya

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Reopens the calculator with the inputs of this report.