Brickwork Quantity: Bricks, Cement and Sand

Number of bricks and the cement and sand for mortar in a volume of brick masonry from brick size, joint thickness, mortar mix and allowances.

Method: Masonry quantity estimation from brick and joint dimensions

Input parameters

Unit system: SI

Parameter	Value	Unit
Volume of brickwork	10.000	m³
Brick length	190.00	mm
Brick width	90.000	mm
Brick height	90.000	mm
Mortar joint thickness	10.000	mm
Sand parts per part of cement in the mortar	6.0000	
Dry volume factor of mortar Allowance for voids and bulking of sand; 1.27 to 1.33 is usual.	1.3300	
Allowance for broken bricks	5.0000	%
Bulk density of cement	1,440.0	kg/m³
Mass of one cement bag	50.000	kg

Calculated results

Parameter	Value	Unit
Bricks per m³ of masonry (with joints)	500.00	
Bricks to order, with the allowance	5,250.0	
Wet mortar	2.3050	m³
Dry mortar materials	3.0657	m³
Cement	630.65	kg
Cement bags	12.613	
Sand	2.6277	m³

Notes for this case

- Solid bricks without frogs; frogs filled with mortar and wastage of mortar add to the cement and sand.

Formula and method

$$n = \frac{1}{(l+j)(w+j)(h+j)}, \quad N = nV(1+k_w)$$

$$V_m = V - nVlwh, \quad V_{m,d} = f_d V_m$$

$$m_c = \frac{V_{m,d}}{1+s}\rho_c, \quad V_s = V_{m,d}\frac{s}{1+s}$$

Variables

V	Volume of brickwork	m³
l	Brick length	m
w	Brick width	m

h	Brick height	m
j	Mortar joint thickness	m
s	Sand parts per part of cement in the mortar	-
f_d	Dry volume factor of mortar	-
k_w	Allowance for broken bricks	-
ρ_c	Bulk density of cement	kg/m³
m_b	Mass of one cement bag	kg
n	Bricks per m³ of masonry (with joints)	-
N	Bricks to order, with the allowance	-
V_m	Wet mortar	m³
$V_{m,d}$	Dry mortar materials	m³
m_c	Cement	kg
N_b	Cement bags	-
V_s	Sand	m³

Method and standards

Each brick with its share of joint occupies (l + j)(w + j)(h + j); the mortar is the wall volume not taken by bricks, converted to dry materials with a dry volume factor and shared in the mix ratio.

Assumptions and limits

- Solid bricks; uniform joints.
- The count puts a joint on all three faces of every brick (a modular cell), which suits walls one brick thick or more. In a half-brick wall the thickness has no joint, so it takes fewer bricks per m³ and less mortar; compute such walls from the face area instead.
- Mortar wastage not included.

References

- Masonry quantity estimation from brick and joint dimensions

Report details

Report reference	FCC-09F8-7AP6 (the same inputs always give the same reference)
Generated	17 November 2026, 19:34 UTC
Calculator	Brickwork Quantity: Bricks, Cement and Sand
Method last reviewed	12 November 2026
Software release	FireCAD Calc, release of 17 November 2026
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/quantities/brick-masonry-quantity

Open this case on calc.firecad.com →

Reopens the calculator with the inputs of this report.