Fillet Weld Metal and Electrode Consumption

Weld metal mass of a fillet weld from leg length, length and reinforcement, and the electrodes or wire needed from the deposition efficiency.

Method: Triangle area $z^2/2$ with reinforcement; consumables = deposit / deposition efficiency

Input parameters

Unit system: SI

Parameter	Value	Unit
Leg length z (not the throat; throat a = 0.707 z)	8.0000	mm
Weld length	50.000	m
Reinforcement allowance (share of the triangle)	15.000	%
Weld metal density	7,850.0	kg/m³
Deposition efficiency (deposited / consumed) Your figure: about 0.55–0.65 for stick electrodes with stub loss, 0.9–0.95 for solid wire.	60.000	%
Mass of one electrode (0 for wire)	30.000	g

Calculated results

Parameter	Value	Unit
Weld cross-section	36.800	mm²
Weld metal deposited	14.444	kg
Consumables needed	24.073	kg
Electrodes (rounded up)	803.00	

Formula and method

$$A = \frac{z^2}{2}(1 + k_r), \quad m_w = AL\rho, \quad m_c = \frac{m_w}{\eta_d}$$

Variables

z	Leg length z (not the throat; throat a = 0.707 z)	m
L	Weld length	m
k_r	Reinforcement allowance (share of the triangle)	-
ρ	Weld metal density	kg/m³
η_d	Deposition efficiency (deposited / consumed)	-
m_e	Mass of one electrode (0 for wire)	kg
A	Weld cross-section	m²
m_w	Weld metal deposited	kg
m_c	Consumables needed	kg
N_e	Electrodes (rounded up)	-

Method and standards

Geometry.

Assumptions and limits

- Equal-leg fillet. Enter the leg length; a throat size a corresponds to a leg of a/0.707 (entering the throat as the leg understates the weld metal by half).

References

- Triangle area $z^2/2$ with reinforcement; consumables = deposit / deposition efficiency

Report details

Report reference	FCC-HCSQ-TWYP (the same inputs always give the same reference)
Generated	17 November 2026, 19:34 UTC
Calculator	Fillet Weld Metal and Electrode Consumption
Method last reviewed	12 November 2026
Software release	FireCAD Calc, release of 17 November 2026
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/materials/welding/weld-metal-fillet

Open this case on calc.firecad.com →

Reopens the calculator with the inputs of this report.