Economic Order Quantity (EOQ)

Economic order or batch quantity minimising ordering and holding cost from annual demand, cost per order or set-up and holding cost per unit, with orders per year.

Method: Harris (1913)/Wilson EOQ Q* = √(2DS/H)

Input parameters

Unit system: SI

Parameter	Value	Unit
Annual demand (units)	12,000	
Cost per order or set-up	2,500.0	
Holding cost per unit per year Often 15–30 % of the unit value a year.	40.000	

Calculated results

Parameter	Value	Unit
Economic order quantity	1,224.7	
Orders per year	9.7980	
Annual ordering plus holding cost	48,990	

Notes for this case

- The cost curve is flat near the optimum: ±20 % in quantity changes cost by only about 2 %.

Formula and method

$$Q^* = \sqrt{\frac{2DS}{H}}, \quad C = \frac{D}{Q}S + \frac{Q}{2}H$$

Variables

D	Annual demand (units)	-
S	Cost per order or set-up	-
H	Holding cost per unit per year	-
Q^*	Economic order quantity	-
N	Orders per year	-
C	Annual ordering plus holding cost	-

Method and standards

Harris–Wilson.

Assumptions and limits

- Steady demand, instant replenishment.

References

- Harris (1913)/Wilson EOQ Q* = √(2DS/H)

Report details

Report reference	FCC-8JB2-5JYV (the same inputs always give the same reference)
Generated	17 November 2026, 19:45 UTC
Calculator	Economic Order Quantity (EOQ)
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/mechanical/manufacturing/economic-order-quantity

Open this case on calc.firecad.com →

Reopens the calculator with the inputs of this report.