Reorder Point and Safety Stock for a Service Level

Safety stock and reorder point for spare parts or materials from the mean and spread of demand, the lead time and the service level wanted.

Method: Normal-demand safety stock for a cycle service level

Input parameters

Unit system: SI

Parameter	Value	Unit
Mean demand per day (units)	40.000	
Standard deviation of daily demand	12.000	
Lead time	10.000	d
Cycle service level (chance of no stock-out per cycle)	95.000	%

Calculated results

Parameter	Value	Unit
Safety factor	1.6449	
Safety stock (units)	62.418	
Expected demand over the lead time (units)	400.00	
Reorder point (units)	462.42	

Notes for this case

• With demand varying randomly from day to day, demand over the lead time has mean đL and standard deviation σ_d√L. Holding safety stock z σ_d √L covers it with probability SL, where z is the standard normal value for SL (1.645 for 95 %). Reorder when stock falls to đL + SS. Variable lead times need a larger safety stock: σ = √(L σ_d² + đ² σ_L²).

Formula and method

$$SS = z\,\sigma_d\sqrt{L}, \quad ROP = \bar{d}\,L + SS$$

Variables

$\bar{d}$	Mean demand per day (units)	-
σ_d	Standard deviation of daily demand	-
L	Lead time	s
SL	Cycle service level (chance of no stock-out per cycle)	-
z	Safety factor	-
SS	Safety stock (units)	-
$\bar{d}\,L$	Expected demand over the lead time (units)	-
ROP	Reorder point (units)	-

Method and standards

Reorder point.

Assumptions and limits

- Normal, independent daily demand; fixed lead time.

References

Normal-demand safety stock for a cycle service level

Report details

Report reference	FCC-VSWJ-6VN7 (the same inputs always give the same reference)
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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/general/economics/reorder-point-safety-stock

Open this case on calc.firecad.com →

Reopens the calculator with the inputs of this report.