

# Important Manufacturing and Purchase Model Formulas PDF



**Formulas  
Examples  
with Units**

## List of 12 Important Manufacturing and Purchase Model Formulas

### 1) EOQ Manufacturing Model with No Shortage Formula ↻

Formula

$$EOQ_m = \sqrt{\frac{2 \cdot C_0 \cdot D}{C_c \cdot \left(1 - \frac{D}{K}\right)}}$$

Example

$$1414.2136 = \sqrt{\frac{2 \cdot 200 \cdot 10000}{4 \cdot \left(1 - \frac{10000}{20000}\right)}}$$

Evaluate Formula ↻

### 2) EOQ Manufacturing Model with Shortage Formula ↻

Formula

$$EOQ_{ms} = \sqrt{2 \cdot D \cdot C_0 \cdot \frac{C_s + C_c}{C_c \cdot C_s \cdot \left(1 - \frac{D}{K}\right)}}$$

Example

$$1523.1546 = \sqrt{2 \cdot 10000 \cdot 200 \cdot \frac{25 + 4}{4 \cdot 25 \cdot \left(1 - \frac{10000}{20000}\right)}}$$

Evaluate Formula ↻

### 3) EOQ Purchase Model with No Shortage Formula ↻

Formula

$$EOQ_p = \sqrt{2 \cdot D \cdot \frac{C_0}{C_c}}$$

Example

$$1000 = \sqrt{2 \cdot 10000 \cdot \frac{200}{4}}$$

Evaluate Formula ↻

### 4) EOQ Purchase Model with Shortage Formula ↻

Formula

$$EOQ_{ps} = \sqrt{2 \cdot D \cdot \frac{C_0}{C_c} \cdot \left(\frac{C_s + C_c}{C_s}\right)}$$

Example

$$1077.033 = \sqrt{2 \cdot 10000 \cdot \frac{200}{4} \cdot \left(\frac{25 + 4}{25}\right)}$$

Evaluate Formula ↻



## 5) Maximum Inventory Manufacturing Model Formula

Formula

$$Q_{\text{mfg}} = \left(1 - \frac{D}{K}\right) \cdot \text{EOQ}_{\text{ms}} - Q_1$$

Example

$$97.4437 = \left(1 - \frac{10000}{20000}\right) \cdot 500 - 152.5563$$

Evaluate Formula 

## 6) Maximum Inventory Purchase Model Formula

Formula

$$Q_{\text{purch}} = \sqrt{2 \cdot D \cdot \frac{C_0}{C_c} \cdot \left(\frac{C_s}{C_s + C_c}\right)}$$

Example

$$928.4767 = \sqrt{2 \cdot 10000 \cdot \frac{200}{4} \cdot \left(\frac{25}{25 + 4}\right)}$$

Evaluate Formula 

## 7) Maximum Stock Out Manufacturing Model Formula

Formula

$$Q_1 = \sqrt{2 \cdot D \cdot C_0 \cdot C_s \cdot \frac{1 - \frac{D}{K}}{C_c \cdot (C_c + C_s)}}$$

Example

$$656.5322 = \sqrt{2 \cdot 10000 \cdot 200 \cdot 25 \cdot \frac{1 - \frac{10000}{20000}}{4 \cdot (4 + 25)}}$$

Evaluate Formula 

## 8) Maximum Stock Out Purchase Model Formula

Formula

$$Q_2 = \text{EOQ}_{\text{ps}} - Q_{\text{purch}}$$

Example

$$148.5563 = 1077.033 - 928.4767$$

Evaluate Formula 

## 9) Number of Order for Purchase Models with No Shortage Formula

Formula

$$N = \frac{D}{\text{EOQ}_p}$$

Example

$$10 = \frac{10000}{1000}$$

Evaluate Formula 

## 10) Total Cost for Purchase Model with No Shortage Formula

Formula

$$\text{TC}_p = D \cdot P + \sqrt{2 \cdot D \cdot C_c \cdot C_0}$$

Example

$$204000 = 10000 \cdot 20 + \sqrt{2 \cdot 10000 \cdot 4 \cdot 200}$$

Evaluate Formula 



## 11) Total Optimum Cost for Manufacturing Model Formula

Formula

$$TOC_m = \sqrt{2 \cdot D \cdot C_c \cdot C_0 \cdot \left(1 - \frac{D}{K}\right)}$$

Example

$$2828.4271 = \sqrt{2 \cdot 10000 \cdot 4 \cdot 200 \cdot \left(1 - \frac{10000}{20000}\right)}$$

Evaluate Formula 

## 12) Total Optimum Cost for Purchase Model Formula

Formula

$$TOC_p = \sqrt{2 \cdot D \cdot C_c \cdot C_0 \cdot \frac{C_s}{C_s + C_c}}$$

Example

$$3713.9068 = \sqrt{2 \cdot 10000 \cdot 4 \cdot 200 \cdot \frac{25}{25 + 4}}$$

Evaluate Formula 



## Variables used in list of Manufacturing and Purchase Model Formulas above

- $C_0$  Order Cost
- $C_c$  Carrying Cost
- $C_s$  Shortage Cost
- $D$  Demand per Year
- $EOQ_m$  EOQ Manufacturing Model No Shortage
- $EOQ_{ms}$  EOQ Manufacturing Model with Shortage
- $EOQ_p$  EOQ Purchase Model No Shortage
- $EOQ_{ps}$  EOQ Purchase Model
- $K$  Production Rate
- $N$  Number of Order Purchase Models no Shortage
- $P$  Purchase Price
- $Q_1$  Maximum Stock out Manufacturing Model
- $Q_2$  Maximum Stock out Purchase Model
- $Q_{mfg}$  Maximum Inventory Manufacturing Model
- $Q_{purch}$  Maximum Inventory Purchase Model
- $TC_p$  Total Cost for Purchase Model No Shortage
- $TOC_m$  Total Optimum Cost for Manufacturing Model
- $TOC_p$  Total Optimum Cost for Purchase Model

## Constants, Functions, Measurements used in list of Manufacturing and Purchase Model Formulas above

- **Functions:** `sqrt`, `sqrt(Number)`  
*A square root function is a function that takes a non-negative number as an input and returns the square root of the given input number.*



## Download other Important Industrial Engineering PDFs

- **Important Industrial Parameters Formulas** 
- **Important Manufacturing and Purchase Model Formulas** 
- **Important Manufacturing Period Formulas** 
- **Important Operational and Financial Factors Formulas** 
- **Important Time Estimation Formulas** 

## Try our Unique Visual Calculators

-  **Percentage decrease** 
-  **HCF of three numbers** 
-  **Multiply fraction** 

Please **SHARE** this PDF with someone who needs it!

This PDF can be downloaded in these languages

[English](#) [Spanish](#) [French](#) [German](#) [Russian](#) [Italian](#) [Portuguese](#) [Polish](#) [Dutch](#)

7/8/2024 | 12:19:10 PM UTC

