In management accounting, reorder level (or reorder point) is the inventory level at which a company would place a new order or start a new manufacturing run.

Reorder level depends on a company's work-order lead time and its demand during that time and whether the company maintain a safety stock. Work-order lead time is the time the company's suppliers take in manufacturing and delivering the ordered units.

Identifying the correct reorder level is important. If a company places a new order too soon, it may receive the ordered units earlier than expected and it would have to bear additional carrying costs in the form of warehousing rent, opportunity cost, etc. However, if the company places an order too late, it would result in stock-out costs, for example lost sales, etc.

Formula

Reorder level depends on whether a safety stock is maintained.

If there is no safety stock, reorder level can be worked out using the following formula:

Reorder Level = Average Demand × Lead Time

Both demand and lead time must be in the same unit of time i.e. both should in in days or weeks, etc.

If a company maintains a safety stock, reorder level calculation changes are follows:

Reorder Level = Average Demand × Lead Time + Safety Stock

Examples

Example 1: ABC Ltd. is a retailer of footwear. It sells 500 units of one of a famous brand daily. Its supplier takes a week to deliver any ordered units

The inventory manager should place an order before the inventories drop below 3,500 units (500 units of daily usage multiplied with 7 days of lead time) in order to avoid a stock-out.

Example 2: ABC Ltd. has decided to hold a safety stock equivalent to average usage of 5 days. Calculate the reorder level.

Safety stock which ABC Ltd. has decided to hold equals 2,500 units (500 units of daily usage multiplied by 5 days).

In this scenario, reorder level would be 6,000 units (2,500 of safety stock plus 3,500 units based on 7 days of lead time).

Average Daily Unit Sales Calculation

In any case, knowing the lead time alone isn't sufficient. You'll additionally need to figure out the demand amid this period. Assuming Mobile First sells a normal of 14 mobiles every week (14/7 = 2), they'd be selling around two mobiles a day.

So, the lead time demand for Mobile First is (23 x 2 = 46), which means Mobile First will require 46 mobiles to hold them over until the point that their next shipment arrives if nothing surprising happens.

The Need For A Safety Stock

Most of the times, surprising things can happen. This can appear as a sudden surge in demand, mainly due to some remarkable celebrity support, and now, your item is selling quickly. Or maybe your provider's manufacturing plant has encountered a breakdown, and it'll take seven days for them to repair the harmed parts and get their plant up and running once again.

Here's the place safety stock comes into the picture. Safety stock is shield stock you carry as the last guard against unpredictable occasions that can either deplete your stock (demand surge) or unforeseen assembling time (lead time skyrockets due to the supply chain).

You'd like to have enough stock to bring the probability of leaving the stock down to zero. However, it is not possible in the real world. Safety stock is for a stormy day that may never come! So, how would we choose what amount of stock to keep as a backup?

Here's the formula to calculate safety stock:

Safety Stock = (Maximum Daily Usage * Maximum Lead Time) – (Average Daily Usage * Average Lead Time)

Let's proceed with the business scenario of Mobile First! On a normal day, they sell two mobiles.

Be that as it may, amid weekends, their sales go up to 5 mobiles. Concerning lead times, their standard lead time is 23 days. However, amid peak season, it can reach up to 32 days.

(5 x 32) – (2 x 23) = 114

This implies that Mobile First needs around 114 units of safety stock to guard against the unseen or peak season.

Subsequently, with 114 units in safety stock, selling around 20 mobiles on a normal week (2 every day on weekdays and five on weekends), Mobile First will have enough stock to last about a month and a half.

Your safety stock can protect you against all possible lead and demand time, furnishing you with enough stock to handle any sudden events. However, if your product is season-based, similar to winter jackets, you'll need to modify your safety stock level to oblige the peak season demand.

Once the pinnacle seasons pass, it's a great time to reduce your safety stock levels once more, as more security stock is directly proportional to higher conveying costs. All things considered, individuals are significantly less interested in buying a set of winter jackets amidst the summer season rather than the winter season.
Example
Following example is given to understand the calculation of reorder level of Stock:

Maximum consumption = 15,000 units per week
Maximum delivery time = 10 weeks

Re-order Level = Maximum per day/per week etc. x Maximum delivery üme
= 15,000 units x 10 weeks
= 1,50,000 units.
Calculation of Economic Order Quantity (EOQ)!

The quantity to be ordered at one time is known as 'ordering quantity' and should be determined with good care. If it is small, a number of orders will have to be placed in a year involving costs in terms of clerical labour, material handling, etc. Also there will be loss in terms of price and transport costs. Large orders avoid these losses and will lead to economy in transport costs and price concessions.

But there will be costs in terms of interest payments for the money locked up and in terms of storing costs. An order should be large enough to enable the firm to earn proper discounts and to take advantage of bulk transport but it should not be too large to involve too heavy payment of interest. If the price to be paid is stable, the optimum quantity to be ordered or economic order quantity (EOQ) can be determined by the formula.

where A – Consumption of the article concerned (in units) during a year;

O = Cost of placing one order including the cost of receiving the goods or ordering cost; and

C = Interest payment per unit per year including other variable cost of storing it (carrying cost per unit per annum)

Suppose a unit of article A cost Rs. 25 and the annual consumption is 2,000 units; the cost of placing an order is Rs.16 and the interest is 10 percent p.a.
The optimum quantity to order is:
Since ordering cost varies inversely as EOQ and inventory carrying cost various directly as EOQ, the total annual cost will be minimum when above two are equal.

There is another method of calculating EOQ i.e. Tabulation Method. This method is normally used when by increase in the quantity of purchases, there is change in the price also. In this method carrying cost is calculated on average i.e. 1/2 of quantity purchased. The least of ordering cost and carrying cost taken together will be the EOQ.
Thus, factors influencing the size of EOQ or standard ordering quantity depend upon the following factors:

(i) Purchase price per unit for different ordering quantities.

(ii) Cost of purchasing per unit for different ordering quantities.
(iii) The size of average inventory in respect of various ordering quantities. This size is again influenced by the Minimum stock level already established (The maximum delivery period and maximum consumption rate decide the reordering level).

(iv) Inventory storage charges per unit. The storage charges include rent of space, lighting etc of the store.

(v) Inventory carrying charges for different ordering quantities. These include insurance, taxes, depreciation, manual or clerical labour, interest on capital locked up in inventory, risk of spoilage, fall of market price of inventory, obsolescence etc.

It is to be noted that EOQ can be easily calculated when above factors remain stable and not varying. These may be taken as assumptions in the calculation of EOQ
Illustration 1:

X Ltd. bought and consumed during the year 2005, 3,600 units of material Y. The cost of placing an order is 1,000 and the cost of carrying one unit for a year is 20. Calculate economic order quantity.

Solution: $EOQ = \sqrt{\frac{2AO}{C}}$

A = 3,600 units
O = ₹. 1,000
C = ₹. 20

$= \sqrt{\frac{2 \times 3600 \times 1000}{20}}$

= 600 units.