chapter 6 WORKING CAPITAL MANAGEMENT

A business enterprise requires not only fixed assets but also current assets for its efficient functioning. Current assets are required to make effective utilisation of fixed assets. The amount invested in fixed assets is called fixed capital (long term or block capital). The amount invested in current assets is known as working capital (short term capital). Thus a business enterprise requires two types of capital, namely, fixed capital and working capital.

Meaning and Definition of Working Capital

Working capital is the capital required for the day-to-day working of an enterprise. It is required for the purchase of raw materials and for meeting the day-to-day expenditure on salaries, wages, rents, advertising etc. It is needed for holding some convertible assets (current assets) such as stock, book debts, bills receivable and cash. It consists of funds invested in current assets. The firm operates its business through these assets. These assets are convertible in the sense that these change from one form of asset to another. Cash is converted into raw materials, raw materials into work in progress, work in progress into finished goods, finished goods into book debts and bills receivable and then book debts and bills receivable into cash. Thus the amount goes on circulating or revolving from cash to current assets and current assets to cash. That is why working capital is also called *circulating capital* or *revolving capital* or *floating capital* or *liquid capital*

The concept of working capital was, perhaps, first evolved by Karl Marx. But he used the term "variable capital". Thus Karl Marx defined working capital as variable capital consisting of wage fund.

According to Shubin, "working capital is the amount of funds necessary to cover the cost of operating the enterprise".

Working capital is the difference between inflow and outflow of funds. In other words, it is the net cash inflow. It is the assets and liabilities required to operate a business on day to day basis.

Concepts of Working Capital

There are two concepts on working capital. These are briefly described as follows:

1. Gross Concept: According to gross concept working capital refers to the amount of funds invested in current assets. Thus working capital is equal to total current assets. The working capital as per gross concept is called *gross working capital*. This concept is used by the management to evaluate the current working capital position and to ensure the optimum investment in individual current assets. Gross concept is a quantitative concept.

The gross working capital concept has the following advantages (or preferred due to the following reasons):

1. This concept is helpful in determining the correct amount of working capital at the right time.
2. It helps in planning and control of individual current assets.
3. It helps to maximise return on investment.
4. It helps in fixation of financial responsibility.

2. Net Concept: According to net concept, working capital refers to excess of current assets over current liabilities. To be more clearly, working capital is equal to total current assets minus total current liabilities. Thus working capital refers to net current asset. The working capital as per net concept is called *net working capital*. The net concept is a qualitative concept because it establishes a relationship between current assets and current liabilities.

Net working capital can be positive or negative. When current assets exceeds current liabilities, it is called positive working capital. When current liabilities are in excess of current assets it is called negative working capital.

The net working capital concept has the following advantages (or preferred to gross concept because of the following reasons):

1. It measures the firm's liquidity.
2. It enables the creditors and investors to assess the short term solvency of the firm.
3. It indicates the extent to which working capital can be financed with long term funds.
4. It is an indicator of the financial soundness of an enterprise.

The gross concept is financial or going concern concept. while net concept is an accounting concept of working capital. The net concept may be suitable only for sole trader or partnership firms. But the gross concept is very suitable to the company form of organisation.

The gross concept is supported by Baker, Mead, Mallott, Field and Mill. Net concept is supported by Lincoln, Stevens, Doris, Gerstenbergh and Saliers. Of the two, the concept of net working capital is most widely used. It may be noted that both the concepts of working capital are two facets of working capital management.

Components of Working Capital

There are two components of working capital. They are current assets and current liabilities. Current assets are those assets which can be converted into cash in the normal course of activity of a firm usually one year. Examples of current assets include cash, short term investment, bank balance, B/R, stock of raw material, stock of work-in-progress, stock of finished goods, sundry debtors, prepaid expenses, advance payment of tax etc. Current liabilities are those liabilities which are repayable during short period usually within a year. Examples of current liabilities include short term borrowings, sundry creditors, B/P, advance payments from customers, outstanding expenses, provision for taxation, dividends payable etc.

Types of Working Capital

Working capital is broadly classified into two-permanent working capital and variable working capital.

Permanent Working Capital

There is always a minimum amount of working capital which is continuously required by the enterprise to carry out its normal business

operations. This is usually called as permanent or fixed working capital. Thus, fixed working capital (hard core element of working capital) is the minimum amount of working capital required to ensure effective utilisation of fixed assets and support the normal operation of the business. It is that part of capital which is permanently blocked in current assets. Permanent working capital is again divided into three- initial working capital, regular working capital and cushion working capital.

(a) ***Initial Working Capital:*** The working capital which is needed in the initial stage of business is called initial working capital. It is the capital with which the project is commenced.

(b) ***Regular Working Capital:*** It is the amount needed for continuous operation of the business. It is the amount of working capital required after the project has been established as a going concern. It is the minimum amount of the liquid capital to keep up the circulating capital from cash to inventories, to receivables and back again to cash.

(c) ***Reserve Margin or Cushion Working Capital:*** It is the excess working capital over the needs or regular working capital that should be kept in reserve for contingencies that may arise at any time. These contingencies may be rising prices, business depression, strikes, special operations such as experiments with new products etc.

Variable Working Capital

Any amount over and above the permanent working capital is variable or temporary working capital. It is the working capital which varies with volume of business. This is the additional capital needed to meet seasonal and special needs. Variable working capital is again divided into two- seasonal working capital and special working capital.

(a) ***Seasonal working capital:*** It is the working capital which is needed to meet the seasonal needs of the firm. It refers to the additional working capital required during busy seasons.

(b) ***Special working capital:*** This refers to the extra working capital to be maintained to meet unforeseen contingencies or to finance special operations. It may be required to carry on a special sales campaign or financing slow moving stock or financing a period of strike or lockout etc.

Need for Working Capital (Importance / Role)

Working capital is just like heart of business. If the heart is weak, it cannot pump blood and human beings cannot work and survive for long. Likewise, if the working capital position is weak, a firm cannot work smoothly although there is large investment in fixed assets. Fixed assets can be effectively utilised only if there is adequate working capital. The need for working capital arises because sales do not convert into cash immediately. There is a time lag between the sale of goods and receipt of cash. Therefore, there is a need for working capital in the form of current assets to deal with the problem arising out of the lack of immediate realisation of cash against goods sold. Without working capital, a firm cannot operate its business. It is a must for the purchase of raw material, and for meeting the day-to-day expenditure on salaries, wages, rents, advertising, lighting etc. The fate of large scale investment is determined by a relatively small amount of current assets.

Both excessive and inadequate working capital positions are harmful. Excessive working capital results in idle funds on which no profit is earned. Meanwhile insufficiency of working capital results in interruption of production and inefficiencies which adversely affect the profit of the firm.

Fixed assets once acquired, create no recurring problems except those relating to their proper maintenance. But the management of working capital is an endless process which involves constant vigil and watch of flow of funds during an operating cycle. A company's profitability is in one way determined by the management of its working capital. Hence financial managers spend a great deal of time on working capital management. There is nothing wrong in saying that the working capital management is a constant head ache of financial manager.

It should be noted that the working capital should be neither too large nor too small. It must be adequate. It is said , "inadequate working capital is disastrous, whereas redundant working capital is a criminal waste". Too much working capital means a good umbrella for creditors against rainy day, but to the management, it reflects faulty financial planning or presence of idle assets or overcapitalisation.

Dangers of Deficiency of Working Capital

Every business unit should have adequate working capital to run the

business. A firm should neither have excess or redundant working capital nor inadequate or shortage of working capital. Both excess as well as short working capital position are bad for any business. However, out of the two, it is the inadequacy of working capital which is more dangerous from the point of view of the firm.

The following are the dangers of deficiency of working capital:

1. It may lead to business failure.
2. The firm cannot take advantage of new opportunities or adapt to changes.
3. Trade discounts will be lost.
4. Cash discounts will be lost.
5. Financial reputation is lost. Creditors may not co-operate in times of difficulty because of the loss of creditworthiness.
6. Creditors may apply to court for winding up.
7. Rate of return on investment falls.
8. It affects dividend policy adversely.
9. The company cannot utilise its fixed assets properly.

As poited out by Ralph, Kennedy and Steward McMuller, the inadequacy or mismanagement of working capital is the leading cause of business failures.

Dangers of Excessive Working Capital

1. Excessive working capital means idle funds which gives no profit. Thus the rate of return falls.
2. The value of shares may fall due to lower rate of return on investment.
3. Efficiency of management may deteriorate.
4. It may encourage speculation.
5. Liberal dividend policy may be encouraged.
6. Inefficiency may be encouraged. There may be increased waste and loss due to bad debts.

Advantages of Adequate Working Capital

Advantages of adequate working capital in the business are outlined as follows:

1. The firm can avail of the cash discount facilities offered by the suppliers.
2. It enhances the liquidity, solvency and creditworthiness of the concern.
3. It is possible to meet unseen contingencies and successfully sail through the periods of crisis.
4. It improves the morale of the executives.
5. Good relations with banks can be maintained.
6. It is possible to utilise fixed assets fully.
7. It enables to undertake research, innovation and expansion programmes.
8. It increases profitability of the business.

Just as circulation of blood is very necessary in the human body to maintain life, smooth flow of fund is very necessary to maintain the health of the business enterprise. The importance of working capital can be very well explained in the words of Kennedy and Mc Millan, "An adequate working capital enables an enterprise to conduct its affairs economically without financial stringency and to face losses and unforeseen emergencies without invitng any disaster".

Operating Cycle Concept

A new concept which is gaining more and more importance in recent years is the *'Operating cycle concept'* of working capital. Operating cycle refers to the average time elapses between the purchase of rawmaterials and the final cash realisation. According to Hunt, William and Donaldson, "The working capital is required because of the time gap between the sale and their actual realisation in cash. This time gap is technically termed as 'Operating Cycle' of the business".

Cash is used to buy raw materials and other stores. Then the raw materials and stores are issued to the production department. Wages are paid and other expenses are incurred in the process and work-in-progress comes into existence. After sometimes the work-in-process become finished goods. Finished goods are sold to customers on credit. In the course of time these customers pay cash. Cash is realised and the cycle is completed. Thus the cash is converted into raw materials which are converted into work in progress. These work-in-progress becomes finished goods which are converted into debtors and bills (when the goods are sold on credit).

Finally cash is realised from debtors and bills. This time period is simply known as operating or cash or working capital cycle.

In case of a manufacturing company, the operating cycle is the length of time necessary to complete the following cycle of events:

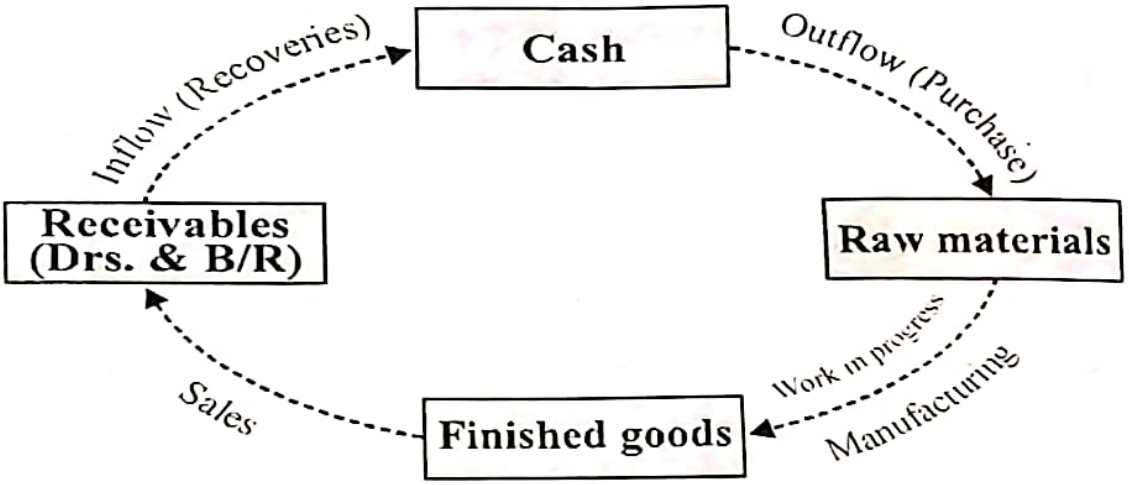
(a) Conversion of cash into raw materials.

(b) Conversion of raw materials into work in progress.

(c) Conversion of work in progress into finished goods.

(d) Conversion of finished goods into accounts receivables (debtors and bills).

(e) Conversion of accounts receivable into cash.



Operating or Cash Cycle

Each cycle starts with a cash outflow and after a time-lag (involving processing, credit sales, receivables etc.) it ends with a cash inflow.

This cycle is repeated again and again during a year. The length of the cycle depends upon certain factors like nature of business, manufacturing time, efficiency of management, turnover etc.

Importance of Operating Cycle Concept

The concept of operating cycle is applied to ascertain the requirement of cash working capital. This is necessary to meet the operating expenses of a going concern. This concept is based on the continuity of the flow of values in a business operation. This is an important concept because the longer the operating cycle, the more working capital the company needs.

Management must ensure that this cycle does not become too long. This concept more precisely measures the working capital requirements, traces its changes and determines the optimum level of working capital requirements.

Factors Determining Working Capital Requirements

The requirement of working capital depends on the followig factors:

1. **Nature of business:** The manufacturing or trading concerns require more amount of working capital because they have to invest heavily in inventories and debtors. In the case of public utilities like transport, electricity undertaking etc, most of the transactions are on cash basis. Further, these concerns do not require large inventories. Hence they require less amount of working capital.
2. **Production Cycle :** Another factor determining working capital is the production cycle. It simply refers to the time required to manufacture a product. It covers the time span between the procurement of material and production of goods. Thus time involved in the manufacturing process is called production cycle. The longer the production cycle, the larger will be the requirement of working capital.
3. **Size of the business:** Generally large business concerns are required to maintain huge inventories. Hence, bigger the size, the larger will be the working capital required and vice versa.
4. **Turnover:** Turnover means the speed with which the working capital is recovered by the sale of goods . If the turnover is higher, it will require less amount of working capital. For example, a hotel which effects quick sales needs comparatively low working capital. But if the sales are slow more working capital will be required.
5. **Terms of trade:** A concern which purchases on credit and sells on cash will require less amount of working capital. If a concern buys everything on cash and sells on credit, it will need a large amount of working capital.
6. **Nature and value of the product :** If the cost of raw material is a larger proportion of the total cost of the finished product, working capital required will be large.

7. **Seasonal fluctuation:** Certain industries manufacture and sell goods only during certain seasons. Such concern require large amount of working capital during the season.
8. **Use of manual labour or machines :** In labour intensive industries larger amount of working capital will be needed than in the machanised industries.
9. **Growth and expansion of business :** A growing concern needs more working capital to finance its increasing activities and expansion. But working capital requirements are low in case of static concerns.
10. **Company policies :** Working capital requirements are also influenced by company policies such as those relating to depreciation, dividends etc.

Hard Core Working Capital

This term was used for the first time by Tandon Committee in its report in 1974. It represents the minimum amount of investment in raw materials, work-in-progress, finished goods, stores and spares, accounts receivable and cash balance which an industrial enterprise is required to carry on a certain level of activity. It is the irreducible minimum amount of current assets required throughout the year for maintaining the circulation of current assets. For example, every concern is required to maintain a minimum stock of raw material, work-in-process, finished goods, loose tools and spares etc. It has to invest in accounts receivable and keep some cash balance to make payment for wages, salaries etc. throughout the year. Thus hard core working capital is the permanent working capital which is required to produce goods and services necessary to satisfy their demand at the lowest point. It is the minimum amount of current assets that must be kept at all times. It has the following characteristics:

(a) It keeps on changing its form from one asset to another.

(b) It cannot be substantially reduced as long as the firm is a going concern.

(c) With the growth of business, the size of hard core working capital also grows.

The amount of hard core working capital is determined by taking into consideration the sales or production policies, technology, financial policies of the firm etc.

Management of Working Capital

Proper management is needed for working capital. Working capital management simply refers to management of working capital. In other words, it is the management of current assets and current liabilities. It involves the problem of decision making regarding investment in various current assets for maintaining the liquidity of funds. According to Smith, "Working capital management is concerned with the problems that arise in attempting to manage the current assets, current liabilities and the interrelationships that exist between them". It involves both formulating working capital policy and carrying out that policy in day-to day operations.

The objectives of working capital management are twofold: (i) maintenance of working capital and (ii)availability of sufficient funds at the time of need.

Importance of Working Capital Management

The importance of the sound and proper management of working capital may be studied from the following facts:

1. Near about 50% to 70% capital of a manufacturing firm is invested in its current assets. In capital budgeting, we consider about fixed investment in very detail that is nearly 30% to 50% of the total funds. Hence the management of current assets should get proper attention of the management.
2. Fixed assets can be acquired even on lease but there is no alternative for current assets. There is no way of avoiding the investment in inventory and in receivable.
3. There is a positive correlation between the sale of a firm and its current assets. With an increase in sales a corresponding increase in current asset is also required. As a result, their proper administration too becomes important.
4. Working capital requirements are generally financed through outside sources. So a continuous effort is necessary to utilise them in the best way. Surveys indicate that most of the part of the financial manager's time is devoted to the management of current assets and current liabilities (i.e. working capital management).

5. Working capital management is particularly important for small firms. A small firm has relatively limited access to the long-term capital markets. Therefore, it must depend heavily on short-term bank loans and trade credit (i.e. current liabilities).

Principles of Working Capital Management

The following are the important principles of working capital management:

1. **Principle of risk variation:** Here risk refers to the inability of a firm to maintain adequate current assets to pay off its obligations. As the level of working capital in relation to sales decreases the degree of risk increases. When the degree of risk increases, the opportunity for gain and loss also increases. If the level of working capital increases, the amount of risk decreases. This affects the opportunity for gain and loss. The size of the working capital depends upon the attitude of management. A conservative management prefers to minimise risk by holding a higher level of working capital. But liberal management assumes greater risk by reducing this level. However, the goal of a management should be that level of working capital which would optimise a firm's rate of return.
2. **Principle of cost of capital:** Different sources of finance have different costs of capital. It can be seen that the cost of capital moves inversely with risk. If the risk is higher, the cost is lower and vice versa. Thus additional risk capital results in the decline in the cost of capital.
3. **Principle of equity position:** According to this principle, the amount of working capital invested in each component should be adequately justified by a firm's equity position. Every rupee invested in the working capital should contribute to the worth or value of the firm.
4. **Principle of maturity of payment:** All efforts should be made to relate maturities of payment to its flow of internally generated funds. There should be the least disparity between the maturities of a firm's short-term debt instruments and its flow of internally generated funds. This is so because a greater risk is generated when there is a greater disparity. A margin of safety should, however, be provided for short-term debt instruments.

Working Capital Policies (Approaches of determining Working Capital Mix)

There are three basic approaches to determine the working capital mix. They are as follows:

1. **Hedging approach:** According to this approach, the maturity of source of funds should match the nature of assets to be financed. That is why it is also known as "Matching Approach". It divides total working capital requirements in two categories- permanent and temporary. The permanent working capital requirements should be financed by long term funds, while the temporary or seasonal working capital requirements should be financed out of short term funds.
2. **Conservative approach:** This approach emphasises upon safety. According to this approach, all requirements of working capital fund should be met from long term sources. The short term sources should be used only during emergency times.
3. **Trade-off approach:** This is a mid way between the two extremes-hedging as well as conservative approaches. One way of determining the trade-off is by finding the average of the minimum and maximum requirements of working capital during a period.

Estimation of Working Capital Requirement

Working capital is the life blood and the controlling nerve centre of a business. No business can be successfully run without adequate amount of working capital. Hence it becomes essential to forecast the required amount of working capital in the future so that there is no difficulty in procuring the working capital. But it is not easy to estimate the working capital requirement. A large number of factors will have to be considered while estimating the working capital required. In case of a manufacturing company, the following factors should be taken into consideration:

(a) Total cost incurred on material, wages and overheads.

(b) The length of time for which raw materials are to remain in stores before they are issued for production.

(c) The length of the production cycle or work in progress (i-e the time taken for the conversion of raw materials into finished goods).

(d) The length of the sales cycle during which finished goods are to be kept waiting for sale.

(e) The average period of credit allowed to customers.

(f) The amount of cash required to pay for day-to-day expenses.

(g) The average amount of cash required to make advance payments, if any.

(h) Time lag in payment of wages and other expenses.

(i) The average period of credit allowed by suppliers.

(j) Amount to be provided for contingencies.

Methods of Estimating Working Capital Requirement

Following methods are generally used in estimating working capital requirement:

(i) Net current asset forecasting method

(ii) Operating cycle method

(iii) Projected Balance Sheet method

(iv) Adjusted Profit and Loss Account method

(v) Cash Flow Forecast method

These methods may be discussed as follows:

Net Current Asset Forecast Method: This is the most practical and widely used method of estimating working capital requirements. Under this method, first of all, value of each current asset is estimated. After this an estimate of current liabilities is made. Difference between the total estimated amount of current asset and current liabilities gives the net working capital requirement of the firm. To this amount some extra amount (or safety margin) by way of provision for contingency is added. This is generally calculated as a fixed percentage of working capital.

The proformas (separately for trading concerns and manufacturing concerns) for estimation of working capital requirements are given as follows:

For a trading concern

Statement of Working Capital Requirements

		Amount Rs.
Current Assets:		
(i)	Cash	xxxx
(ii)	Debtors or Receivables (for .... month's sales)	xxxx

(iii)	Stocks (for .... month's sales)		XXXX
(iv)	Advance payments, if any		XXXX
(v)	Others		XXXX
	Total		XXXXX
Less:	***Current Liabilities:***		
(i)	Creditors (for ..... month's purchases)	XXXX	
(ii)	Lag in payment of expenses (outstanding expenses, if any)	XXXX	XXXXX
	Working Capital (C.A - C.L)		XXXX
	Add: Provision/Margin for Contingencies		XXXX
	Net Working Capital Required		XXXX

Notes: (i) Profits should be ignored while calculating working capital requirements as funds provided by profits may or may not be used as working capital.

(ii) Stock and debtors should be taken at cost unless otherwise stated in the question.

For a manufacturing concern

Statement of Working Capital Requirements

			Amount Rs.
Current Assets:			
(i)	Stock of Raw Material (For ..... month's consumption)		XXXX
(ii)	Work-in-progress (For . months)		
(a)	Raw Materials	XXXX	
(b)	Direct Labour	XXXX	
(c)	Overheads	XXXX	XXXX

(iii) Stock of Finished Goods (For ..... month's sales):		
(a) Raw Materials	XXXX	
(b) Labour	XXXX	
(c) Overheads	XXXX	XXXX
(iv) Sundry Debtors or Receivables (For .... month's sales)		
(a) Raw Materials	XXXX	
(b) Labour	XXXX	
(c) Overheads	XXXX	XXXX
(v) Payments in Advance (if any)		XXXX
(vi) Balance of Cash (Required to meet day-to-day expenses)		XXXX
(vii) Any Other Item (if any)		XXXX
Total		XXXXX
Less Current Liabilities:		
(i) Creditors (For ..... month's purchases of raw materials)	XXXX	
(ii) Lag in payment of expenses (outstanding exp. .... months)	XXXX	
(iii) Others (if any)	XXXX	XXXXX
Working Capital (C.A – C.L)		XXXX
Add: Provision/Margin for Contingencies		XXXX
Net Working Capital Required		XXXX

Notes: (i) Profit should be ignored while calculating working capital requirements for the following reasons:

(a) Profits may or may not be used as working capital.

(b) Even if profits are to be used for working capital it has to be reduced by the amount of income tax, drawings, dividend paid etc.

(ii) Calculation of Work-in-progress depends upon its degree of completion as regards material, labour and overheads. However, if nothing is given in a question as regards the degree of completion, students may take 100% cost of material and 50% in case of labour and overheads on the assumption that labour and overhead accrue evenly during the year.

Example 1

On 01-01-2005 the Board of Directors of X Ltd. desires to know the amount of working capital that will be required to meet the programme they have planned for the year. From the following information, prepare an estimate of working capital requirements:

Issued share capital	Rs. 2,00,000
8% debentures	Rs. 50,000
Fixed assets as on 1st Jan.	Rs. 1,25,000

Production during the previous year was 60,000 units and it is proposed to maintain the same during 2003. The expected ratio of cost to selling price are:

Raw materials 60%..direct wages 10%. overheads 20%

Following further information are available:

(a) Raw materials are expected to remain in stores on an average two months before issue to production.

(b) Each unit of production is expected to be in process for one month.

(c) Finished goods will stay in the warehouse awaiting despatch to customers for approximately three months.

(d) Credit allowed by creditors is two months from the date of delivery of raw materials.

(e) Credit given to debtors is three months from the date of despatch.

(f) Selling price is Rs. 5 per unit.

There is regular production and sale cycle.

Solution

Statement of working capital requirement

	Rs.	Rs.
Current assets: (A)		
1. Stock of raw material (2 months) Rs. 15,000 x 2		30,000
2. Work-in-progress (1 month)		
Material (Rs. 15,000 x 1)	15,000	
Labour (Rs. 2,500 x 0.50)	1,250	
Overheads (Rs. 5,000 x 0.50)	2,500	18,750
3. Stock of finished goods (3 months)		
Material (Rs. 15,000 x 3)	45,000	
Labour (2,500 x 3)	7,500	
Overheads (5,000 x 3)	15,000	67,500
4. Debtors (3 months)		
Materials (Rs. 15,000 x 3)	45,000	
Labour (Rs. 2,500 x 3)	7,500	
Overheads (Rs. 5,000 x 3)	15,000	67,500
Total		1,83,750
Less Current Liabilities: (B)		
Creditors for raw material (2 months) (Rs. 15,000 x 2)		30,000
Net working capital required (A – B)		1,53,750

Working notes:

1. Debtors have been valued at cost. (It should be valued on sales basis if required in the question)
2. Monthly amount of each element of cost is calculated as follows:

Total sales 60,000 x 5 = Rs. 3,00,000

$$\text{Raw materials} = \frac{3,00,000 \times 60}{100 \times 12} = \text{Rs. } 15,000$$

$$\text{Direct labour} = \frac{3,00,000 \times 10}{100 \times 12} = \text{Rs. } 2,500$$

$$\text{Overhead} = \frac{3,00,000 \times 20}{100 \times 12} = \text{Rs. } 5,000$$

3. It is assumed that labour and overheads accrue evenly during the year and hence half of the amount has been included in work-in-progress.
4. Additional capital required will be Rs. 28,750 (Rs. 1,53,750 – 1,25,000) because Rs. 1,25,000 are availble from long term sources (Share capital + Debentures – Fixed assets).

Note: Debtors have been calculated on the basis of cost of goods sold (excluding profit).

Operating Cycle Method: Operating cycle is the duration of time within which one cycle of business operation is completed. Business operations involve a number of stages. The first stage begins with a cash outflow (when purchase of raw material is made). Subsequently, it passes through various stages such as work in progress, finished goods, credit sales, book debts or B/R etc. Finally it ends with cash inflow as a result of recovery from debtors or realisation of B/R. A series of such operating cycles recur one after another and chain continues till the end of the operating period. In this way the entire operating period has a number of operating cycles. Shorter the operating cycle period, lower will be the requirement of working capital and vice versa.

This method of estimation of working capital requirement consists of four steps. These are explained as below:

(a) Calculation of duration of operating cycle: The duration is computed in days by adding together the average storage period of raw materials, work-in-progress, finished goods and the average collection period. Then from this total average payment period is deducted. This can be calculated by the following formula:

$$O = R + W + F + D - C$$

where, O = Duration of operating cycle
R = Raw material average storage period
W = Work in progress average period
F = Finished goods average storage period
D = Debtors collection period
C = Creditors payment period

$$\text{Raw material storage period} = \frac{\text{Average stock of R.M}}{\text{Average daily consumption}}$$

$$\text{Average stock} = \frac{\text{Op. Stock + Cl. Stock}}{2}$$

$$\text{Av. daily consumption} = \frac{\text{Material consumed during the year}}{365}$$

$$\text{Av. period of W.I.P} = \frac{\text{Av. W.I.P}}{\text{Av. daily production cost}}$$

$$\text{Av. W.I.P} = \frac{\text{Op. W.I.P + Cl. W.I.P}}{2}$$

$$\text{Av. daily production cost} = \frac{\text{Total production cost}}{365}$$

$$\text{Finished goods av. storage period} = \frac{\text{Av. stock of F.G}}{\text{Daily av. cost of goods sold}}$$

$$\text{Av. stock of F.G} = \frac{\text{Op. FG + Cl. FG}}{2}$$

$$\text{Daily average stock of goods sold} = \frac{\text{Cost of goods sold}}{365}$$

$$\text{Debtors collection period} = \frac{\text{Av. Drs. (including B/R)}}{\text{Average daily credit sales}}$$

$$\text{Av. Debtors} = \frac{\text{Op. Drs. + Cl. Drs.}}{2}$$

$$\text{Av daily credit sales} = \frac{\text{Credit sales}}{365}$$

$$\text{Creditors payment period} = \frac{\text{Av. Crs. (including B/P)}}{\text{Av. daily credit purchase}}$$

$$\text{Av. Creditors} = \frac{\text{Op. Crs + Cl. Crs}}{2}$$

$$\text{Av. daily credit purchase} = \frac{\text{Total credit purchase}}{365}$$

(b) Calculation of number of operating cycles in operating period: This is found out by dividing the number of days in the operating period (normally 365 days) by the number of days in the operating cycle (as calculated under [a]). It is shown below:

$$\text{Number of operating cycles} = \frac{365}{\text{Period of operating cycle}}$$

(c) Calculation of operating expenses: These expenses include purchase of raw material, direct labour cost and the overhead costs - calculated on the basis of average storage period of raw materials and the time lag in the payment of various expenses. The total of such separate average amounts will give the total operating expenses.

(d) Estimating the working capital requirement: Now the working capital required is calculated by dividing total operating expenses for the period by the number of operating cycles in that period. For example, if the total operatingexpenses for the year amounts to Rs. 2,40,000 and the number of operating cycles in a year is assumed to be 4, the amount of working capital would be Rs. 60,000 (i-e 2,40,000/4).

There is an alternative method to calculate the working capital. It is as follows:

$$WC = C - \frac{OC \times CS}{N}$$

where, WC = Working Capital
C = Cash balance required
OC = Operating Cycle period
N = Number of days in a year
CS = Estimated cost of Sales

After ascertaining the amount of working capital as above, a certain amount as a percentage of working capital may be added as provision for contingency.

Projected Balance Sheet Method: Under this method, estimates of different assets (excluding cash) and liabilities are made taking into consideration the transactions in the ensuing period. Thereafter, a balance sheet is prepared on the basis of these forecasted assets and liabilities. It is called *'Projected Balance Sheet'*. The difference between the total assets and total liabilities of projected balance sheet is treated as shortage or surplus of cash of that period. If the total liability side is more than the total asset side, it represents excess cash which is not required by the firm. The management may plan for its investment. If, on the other hand, the total asset side is more than the total liability side, it indicates deficiency of working capital which is to be arranged either by way of bank overdraft or from other sources.

Adjusted Profit and Loss Method: Under this method, estimated profit is calculated on the basis of transactions of the ensuing period. Thereafter, increase or decrease in working capital is computed adjusting the estimated profit by cash inflows and cash outflows. It is like cash flow statement.

Cash Forecasting Method: In this method, estimate is made of cash receipts and payments in the ensuing period. The difference of these receipts and payments indicates surplus or deficiency of cash. It is like cash budget.

Sources of Working Capital (Financing of working capital)

Working capital is financed through the following sources:

Long term sources: These provide funds for a relatively long period. The main long term sources are share capital, debentures, long term borrowings, retained earnings etc.

Short term sources: These usually provide funds for a short period say upto one year or so. The main short term sources are bank credit (commercial banks and indigenous banks), public deposit, commercial papers, factoring etc.

Transactionary sources: These provide funds to a business through the normal business operation. These are automatic sources of short term funds. These are also called *spontaneous sources* of finance. These are cost free. Trade credit (credit allowed) by suppliers, outstanding expenses, tax liabilities, depreciation etc. fall in this category.

Important sources are briefly discussed as follows:

Long Term or Permanent Sources

1. ***Shares:*** Issue of shares is the most important source for raising the permanent or long term working capital. A company can issue equity shares and preference shares. Preference shares carry preferential rights with regard to dividend and repayment of capital at the time of winding up. Equity shares do not carry any such preference. These are ordinary shares.
2. ***Debentures:*** Debenture is also an important method of raising long term or permanent working capital. Debentures is a creditorship security. Thus it is a part of borrowed capital. A fixed rate of interest is paid on debentures. The interest on debenture is a charge against profit. It means even if a company incurs loss in any year, interest must be paid on debentures.
3. ***Loans from financial institutions:*** Financial institutions such as LIC, IFCI, SFCs, IDBI etc. provide term loans for meeting working capital requirements of business organisations.

4. ***Retained earnings:(Ploughing back of profit):*** This is an internal source of finance. It represents the undistributed profit accumulated every year and retained for meeting financial requirements. Such retained earnings can be reinvested in the business itself whenever the need for working capital arises. It is a cost free source of finance.

Temporary or Short Term Sources

1. ***Commercial banks:*** This is the most important source of short term (temporary) working capital. The major portion of working capital loans are provided by commercial banks. The different forms of financing by commercial bank are loans, cash credit, overdrafts, purchasing and discounting of bills.
2. ***Public deposits:*** Public deposits are the fixed deposits accepted by a business enterprise directly from the public.
3. ***Indigenous bankers:*** Private money lenders and other country bankers also provide working capital loans. They charge a very high rate of interest.
4. ***Factoring:*** When a firm sells goods on credit, it enters into a contract with its customers who agrees to pay for the goods after a specified period of time. If the firm wants to get immediate cash against its sales then it can approach the factoring agents. These agents buy the firm's receivables at a discount and then realises the same after that specified period from the firm's customers. This is called factoring.

Transactionary sources

1. ***Trade creditors:*** Trade credit arrangements of a concern with its suppliers is an important source of short term finance. Trade credit consists of creditors for goods (or sundry creditors) and bills payable.
2. ***Depreciation:*** Amount equal to depreciation written off in a year is not going out of the business. It implies that depreciation is a non cash item. Thus depreciation is a source of working capital.

Usually the entire amount deducted towards depreciation on fixed assets is not invested in the acquisition of fixed assets and is saved and utilised in business as working capital. This is also a temporary source of working capital so long as the acquisition of fixed asset is deferred.

3. Provisions

PRACTICAL PROBLEMS

Illustration 1

From the following information extracted from the books of a manufacturing concern, compute the operating cycle in days:

Period covered	365 days
Average period of credit allowed by suppliers	16 days
	(Rs. '000)
Average total of debtors outstanding	480
Raw material consumption	4,400
Total production cost	10,000
Sales for the year	10,500
Value of average stock maintained:	
Raw materials	320
Work in progress	350
Finished goods	260

Solution

Computation of Operating Cycle

(a) Length of Raw Material Inventory Period

$$= \frac{\text{Average Stock of Raw Material}}{\text{Raw Material Consumption Per Day}}$$

$$= \frac{320}{4,400} \times 365 = 27 \text{ days}$$

(b) Length of Conversion Period $= \frac{\text{Average Stock of Work in Progress}}{\text{Total Cost of Production Per Day}}$

$$= \frac{320}{10,000} \times 365 = 13 \text{ days}$$

(c) *Length of Finished Stock Period* = $\frac{\text{Average Stock Finished Goods}}{\text{Cost of Sales Per Day}}$

$= \frac{260}{10,500} \times 365 =$ 9 days

(d) *Period of credit allowed to Debtors* = $\frac{\text{Average Debtors}}{\text{Sales Per Day}}$

$= \frac{480}{16,000} \times 365 =$ 11 days

Gross period of operating cycle = 27 + 13 + 9 + 11	=	60 days
Less: Average period of credit allowed by suppliers	=	16 days
Net Period of operating cycle	=	44 days

Illustration 2

Prepare an estimate of working capital requirement from the following information of trading concern:

(a) Project annual sales	1,00,000 units
(b) Selling Price	Rs. 8 per unit
(c) Percentage of net profit on sales	25%
(d) Average credit period allowed to customers	8 weeks
(e) Average credit period allowed by suppliers	4 weeks
(f) Average stock holding in terms of sales requirements	12 weeks
(g) Allow 10% for contingencies.	

Solution

Statement of Working Capital Requirements

	Rs.
Current Assets	
Debtors (8 weeks) 6,00,000 x 8/52 (at cost)	92,308
Stock (12 weeks: 6,00,000 x 12/52	1,38,462

	2,30,770
Less: Current Liabilities	
Creditors (4 weeks): 6,00,000 x 4/52	46,154
Net Working Capital	1,84,616
Add: 10% for contingencies	18,462
Working Capital Required	2,03,078

Working Notes:

(a) Sales = 1,00,000 x 8 = Rs. 8,00,000

Profit = 25% of Rs. 8,00,000 = Rs. 2,00,000

Cost of Sales = Sales – Profit = 8,00,000 – 25%

Cost of Sales = Rs. 6,00,000

(b) As, it is a trading concern, cost of sales are assumed to be the purchases.

(c) Profits have been ignored as funds provided by profits may or may not be used as working capital.

Illustration 3

Kerala Ltd sells its products on a gross profit of 20% on sales. The following information is extracted from its annual accounts for the year ended 31st March 2006:

Sales (3 months credit)	Rs. 40,00,000
Raw materials	12,00,000
Wages (15 days in arrears)	9,60,000
Manufacturing expenses (one month in arrears)	12,00,000
Administration expenses (one month in arrears)	4,80,000
Sales promotion expenses (payable half yearly in advance)	2,00,000

The company enjoys one months credit from suppliers of raw materials and maintains two months stock of raw materials and one and half months finished goods. Cash balance is maintained at Rs. 1,00,000 as a precautionary balance. Assuming a 10% margin, find out the working capital requirements of Kerala Ltd.

Solution

Statement of Working Capital Requirements

Current Assets		Rs.
Stock of raw materials (12,00,000 x 2/12)		2,00,000
Stock of finished goods at cost (40,00,000 x 80/100 x 3/2 x 1/12) (as gross profit is 20% on sales, cost is 80% of sales)		4,00,000
Debtors at cost (40,00,000 x 80/100 x 3/12)		8,00,000
Advanced payment of sales promotion expenses (2,00,000 x 6/12)		1,00,000
Cash balance		1,00,000
		16,00,000
Less: Current Liabilities:	Rs.	
Creditors for raw materials (12,00,000 x 1/12)	1,00,000	
Wages outstanding (15 days taken for ½ months in arrears. 9,60,000 x 1/24)	40,000	
Manufacturing expenses outstanding (12,00,000 x 1/12)	1,00,000	
Administration expenses outstanding (4,80,000 x 1/12)	40,000	2,80,000
Net Working Capital		13,20,000
Add: 10% Margin for contingencies		1,32,000
Working Capital Required		14,52,000

Illustration 4

A proforma cost sheet of a company provides the following particulars:

Elements of Cost	Amount per unit Rs.
Raw Materials	80
Direct Labour	30

Overheads	60
Total Cost	170
Profit	30
Selling Price	200

The following further particulars are available:

Raw materials are in stock on an average for one month. Materials are in process on an average for half a month. Finished goods are in stock on an average for one month.

Credit allowed by suppliers is one month. Credit allowed to customers is two months. Lag in payment of wages is 1 ½ weeks. Lag in payment of overhead expenses is one month.

One fourth of the output is sold against cash. Cash in hand and at bank is expected to be Rs. 25,000.

You are required to prepare a statement showing the working capital needed to finance a level of activity of 1,04,000 units of production.

You may assume that production is carried on evenly throughout the year, wages and overheads accrue similarly and a time period of 4 weeks is equivalent to a month.

Solution:

Statement Showing the Working Capital Needed

Current Assets			Rs.
(i)	Stock of Raw Materials (4 weeks) 1,60,000 x 4		6,40,000
(ii)	Work in progress (2 weeks):	Rs.	
	Raw materials 1,60,000 x 2	3,20,000	
	Direct Labour 60,000 x 2	1,20,000	
	Overheads 1,20,000 x 2	2,40,000	6,80,000
(iii)	Stock of finished goods (4 weeks):		
	Raw materials 1,60,000 x 4	6,40,000	

Direct Labour 60,000 x 4	2,40,000	
Overheads 1,20,000 x 4	4,80,000	13,60,000
(iv) Sundry Debtors (8 weeks):		
Raw materials 1,60,000 x ¾ x 8	9,60,000	
Direct Labour 60,000 x ¾ x 8	3,60,000	
Overheads 1,20,000 x ¾ x 8	7,20,000	20,40,000
(v) Cash in hand and at bank (given)		25,000
		47,45,000
Less: Current Liabilities		
(i) Sundry Creditors (4 weeks) 1,60,000 x 4	6,40,000	
(ii) Wages outstanding (1– ½ weeks):60,000 x 3/2	90,000	
(iii) Lag in payment of overheads (4 weeks) 1,20,000 x 4	4,80,000	12,10,000
Net Working Capital Needed		35,35,000

Working Notes:

i. It has been assumed that a time period of 4 weeks is equivalent to one month.

ii. It has been assumed that direct labour and overheads are in process, on average, half a month.

iii. Profit has been ignored and debtors have been taken at cost.

The profit has been ignored because this may or may not be used as a source of working capital.

iv. Weekly calculations have been made as follows:

(taking 52 weeks in a year)

(a) Weekly average of raw materials 1,04,000 x 80/52 = 1,60,000

(b) Weekly labour cost = 1,04,000 x 30/52 = 60,000

(c) Weekly overheads = 1,04,000 x 60/52 = 1,20,000