Chapter 37

Manufacturing accounts

Learning objectives

After you have studied this chapter, you should be able to:

- calculate prime cost and production cost of goods manufactured
- draw up manufacturing accounts, and appropriate trading and profit and loss accounts
- adjust the manufacturing account in respect of work in progress
- explain and calculate a further five methods of providing for depreciation

Introduction

In this chapter, you'll learn how to prepare manufacturing accounts and the reasons for doing so. You'll also learn five further methods that can be used for calculating depreciation and the circumstances in which each of them may be used.

37.1 Manufacturing: not retailing

We now have to deal with businesses which are manufacturers. For these businesses, a **manufacturing account** is prepared in addition to the trading and profit and loss accounts. It is produced for internal use only. People other than the owners and managers of the organisation rarely see a manufacturing account.

If a business is using manufacturing accounts, instead of a figure for purchases (of finished goods) the trading account will contain the cost of manufacturing the goods that were manufactured during the period. The manufacturing account is used to calculate and show the cost of manufacturing those goods. The figure it produces that is used in the trading account is known as the **production cost**.

37.2 Divisions of costs

In a manufacturing business the costs are divided into different types. These may be summarised in chart form as follows:

Direct materials Direct labour Direct expenses	Prime cost	Production cost	Total cost
Plus Indirect manufacturing costs			
Plus Administration expenses Selling and distribution expenses Financial charges			

The prime cost items and the production cost items are shown in the manufacturing account. The administration expenses, selling and distribution expenses and the financial charges appear in the profit and loss account.

37.3 Direct and indirect costs

With reference to the above chart, when you see the word *direct* followed by a type of cost, you know that it has been possible to trace the costs to an item being manufactured.

The sum of all the **direct costs** is known as the **prime cost**. If a cost cannot easily be traced to the item being manufactured, then it is an indirect cost and will be included under **indirect manufacturing costs** (which are also sometimes known as 'factory overhead expenses'). 'Production cost' is the sum of prime cost plus the indirect manufacturing costs.

For example, the wages of a machine operator making a particular item will be direct labour. The wages of a foreman in charge of many men on different jobs will be indirect labour, and will be part of the indirect manufacturing costs. Other examples of costs being direct costs would be:

1 Cost of raw materials including carriage inwards on those raw materials.
2 Hire of special machinery for a job.

Activity 37.1 Think about it for a minute and then list five costs you think are direct and five that you think are indirect.

37.4 Indirect manufacturing costs

'Indirect manufacturing costs' are all those costs which occur in the factory or other place where production is being done, but which cannot easily be traced to the items being manufactured. Examples are:

- wages of cleaners
- wages of crane drivers
- rent of a factory
- depreciation of plant and machinery
- costs of operating forklift trucks
- factory power
- factory lighting

37.5 Administration expenses

'Administration expenses' consist of such items as managers' salaries, legal and accountancy charges, the depreciation of accounting machinery and secretarial salaries.

37.6 Selling and distribution expenses

'Selling and distribution expenses' are items such as sales staff's salaries and commission, carriage outwards, depreciation of delivery vans, advertising and display expenses.

37.7 Financial charges

'Financial charges' are expense items such as bank charges and discounts allowed.

Activity 37.2 Place a tick in the appropriate column for each of the following cost items:

	Direct materials	*Direct labour*	*Direct expenses*	*Indirect manufacturing costs*	*Administration expenses*	*Selling and distribution expenses*	*Financial charges*
(*a*) Purchases of raw materials							
(*b*) Direct wages							
(*c*) General factory expenses							
(*d*) Depreciation of machinery							
(*e*) Commission on sales							
(*f*) Factory rent							
(*g*) Carriage inwards of raw materials							
(*h*) Royalties							
(*i*) Stock of raw materials							
(*j*) Administration salaries							
(*k*) Indirect labour							
(*l*) Bank charges							
(*m*) Carriage outwards							
(*n*) Discounts allowed							
(*o*) Factory lighting							

37.8 Format of financial statements

Manufacturing account part

This is debited with the production cost of goods completed during the accounting period. It contains costs of:

- Direct materials
- Direct labour
- Direct expenses
- Indirect manufacturing costs

The manufacturing account includes all purchases of raw materials, including the stock adjustments for raw materials. It also includes stock adjustments for **work in progress** (goods that are part-completed at the end of a period). Let's put this into a series of steps:

1. Add opening stock of raw materials to purchases and subtract the closing stock of raw materials.
2. Add in all the direct costs to get the prime cost.

3 Add in all the indirect manufacturing costs.
4 Add the opening stock of work in progress and subtract the closing stock of work in progress to get the production cost of all goods completed in the period.

Thus, when completed, the manufacturing account shows the total of production cost that relates to those manufactured goods that have been available for sale during the period. This figure will then be transferred down to the profit and loss account where it will replace the entry for purchases.

Trading account part

This account includes:

- Production cost brought down from the manufacturing account
- Opening and closing stocks of finished goods
- Sales

When completed this account will disclose the gross profit. This will then be carried down to the profit and loss account part.

The manufacturing account and the trading account can be shown in the form of a diagram:

Manufacturing Account

	£
Production costs for the period:	
Direct materials	xxx
Direct labour	xxx
Direct expenses	xxx
Prime cost	xxx
Indirect manufacturing costs	xxx
Production cost of goods completed c/d to trading account	xxx

Trading Account

		£	£
Sales			xxx
Less Production cost of goods sold:			
Opening stock of finished goods	(A)	xxx	
Add Production costs of goods completed b/d		xxx	
		xxx	
Less Closing stock of finished goods	(B)	(xxx)	
Gross profit			(xxx)
			xxx

(A) is production costs of goods unsold in previous period.
(B) is production costs of goods unsold at end of the current period.

Profit and loss account part

This is prepared in the way you learnt in earlier chapters in this book. You know, therefore, that it includes:

- Gross profit brought down from the trading account
- All administration expenses
- All selling and distribution expenses
- All financial charges

However, some of the items you would normally put in the profit and loss account part are already included in the manufacturing account, e.g. depreciation on machines, and canteen wages. When completed, this account will show the net profit.

Activity 37.3 Why do you think some expenses have been moved to the manufacturing account?

37.9 A worked example of a manufacturing account

Exhibit 37.1 shows the necessary details for a manufacturing account. It has been assumed that there were no partly completed units (work in progress) either at the beginning or end of the period.

Exhibit 37.1

Details of production costs for the year ended 31 December 20X7:

	£
1 January 20X7, stock of raw materials	5,000
31 December 20X7, stock of raw materials	7,000
Raw materials purchased	80,000
Manufacturing (direct) wages	210,000
Royalties	1,500
Indirect wages	90,000
Rent of factory – excluding administration and selling and distribution blocks	4,400
Depreciation of plant and machinery in factory	4,000
General indirect expenses	3,100

Manufacturing Account for the year ended 31 December 20X7

	£	£
Stock of raw materials 1.1.20X7		5,000
Add Purchases		80,000
		85,000
Less Stock of raw materials 31.12.20X7		(7,000)
Cost of raw materials consumed		78,000
Manufacturing wages		210,000
Royalties		1,500
Prime cost		289,500
Indirect manufacturing costs		
Rent	4,400	
Indirect wages	90,000	
General expenses	3,100	
Depreciation of plant and machinery	4,000	
Production cost of goods completed c/d		101,500
		391,000

Sometimes, if a business has produced less than the customers have demanded, then the business may well have bought in some finished goods. In this case, the trading account will have both a figure for purchases and a figure for production cost of goods completed.

37.10 Work in progress

The production cost to be carried down to the trading account is that of production cost of goods completed during the period. If items have not been completed, they cannot be sold. Therefore, they should not appear in the trading account.

For instance, if we have the following information, we can calculate the transfer to the trading account:

	£
Total production costs expended during the year	50,000
Production costs last year on goods not completed last year, but completed in this year (work in progress)	3,000
Production costs this year on goods which were not completed by the year end (work in progress)	4,400

The calculation is:

Total production costs expended this year	50,000
Add Costs from last year, in respect of goods completed in this year (work in progress)	3,000
	53,000
Less Costs in this year, for goods to be completed next year (work in progress)	(4,400)
Production costs expended on goods completed this year	48,600

37.11 Another worked example

Exhibit 37.2

	£
1 January 20X7, Stock of raw materials	8,000
31 December 20X7, Stock of raw materials	10,500
1 January 20X7, Work in progress	3,500
31 December 20X7, Work in progress	4,200
Year to 31 December 20X7:	
Wages: Direct	39,600
Indirect	25,500
Purchase of raw materials	87,000
Fuel and power	9,900
Direct expenses	1,400
Lubricants	3,000
Carriage inwards on raw materials	2,000
Rent of factory	7,200
Depreciation of factory plant and machinery	4,200
Internal transport expenses	1,800
Insurance of factory buildings and plant	1,500
General factory expenses	3,300

This information produces the following manufacturing account:

Manufacturing Account for the year ended 31 December 20X7

	£	£
Stock of raw materials 1.1.20X7		8,000
Add Purchases		87,000
Carriage inwards		2,000
		97,000
Less Stock of raw materials 31.12.20X7		(10,500)
Cost of raw materials consumed		86,500
Direct wages		39,600
Direct expenses		1,400
Prime cost		127,500
Indirect manufacturing costs:		
Fuel and power	9,900	
Indirect wages	25,500	
Lubricants	3,000	
Rent	7,200	
Depreciation of plant	4,200	
Internal transport expenses	1,800	
Insurance	1,500	
General factory expenses	3,300	
		56,400
		183,900
Add Work in progress 1.1.20X7		3,500
		187,400
Less Work in progress 31.12.20X7		(4,200)
Production cost of goods completed c/d		183,200

The trading account is concerned with finished goods. If in the foregoing exhibit there had been £3,500 stock of finished goods at 1 January 20X7 and £4,400 at 31 December 20X7, and the sales of finished goods amounted to £250,000 then the trading account would appear:

Trading Account for the year ended 31 December 20X7

	£	£
Sales		250,000
Less Cost of goods sold:		
Stock of finished goods 1.1.20X7	3,500	
Add Production cost of goods completed b/d	183,200	
	186,700	
Less Stock of finished goods 31.12.20X7	(4,400)	
		182,300
Gross profit c/d		67,700

The profit and loss account is then constructed in the normal way.

37.12 Apportionment of expenses

Quite often expenses will have to be split between

- Indirect manufacturing costs: to be charged in the manufacturing account part
- Administration expenses:
- Selling and distribution expenses:
- Financial charges:

} to be charged in the profit and loss account part

An instance of this could be the rent expense. If the rent is paid separately for each part of the organisation, then it is easy to charge the rent to each sort of expense. However, only one figure of rent may be paid, without any indication as to how much is for the factory part, how much is for the selling and distribution part and how much is for the administration buildings.

How the rent expense will be apportioned in the latter case will depend on circumstances, using the most equitable way of doing it. A range of methods may be used, including ones based upon:

- floor area
- property valuations of each part of the buildings and land.

37.13 Full set of financial statements

A complete worked example is now given. Note that in the profit and loss account the expenses have been separated so as to show whether they are administration expenses, selling and distribution expenses, or financial charges.

The trial balance in Exhibit 37.3 has been extracted from the books of J Jarvis, Toy Manufacturer, as at 31 December 20X7.

Exhibit 37.3

J Jarvis
Trial Balance as at 31 December 20X7

	Dr	Cr
	£	£
Stock of raw materials 1.1.20X7	21,000	
Stock of finished goods 1.1.20X7	38,900	
Work in progress 1.1.20X7	13,500	
Wages (direct £180,000; factory indirect £145,000)	325,000	
Royalties	7,000	
Carriage inwards (on raw materials)	3,500	
Purchases of raw materials	370,000	
Productive machinery (cost £280,000)	230,000	
Administration computers (cost £20,000)	12,000	
General factory expenses	31,000	
Lighting	7,500	
Factory power	13,700	
Administration salaries	44,000	
Sales reps' salaries	30,000	
Commission on sales	11,500	
Rent	12,000	
Insurance	4,200	
General administration expenses	13,400	
Bank charges	2,300	
Discounts allowed	4,800	
Carriage outwards	5,900	
Sales		1,000,000
Debtors and creditors	142,300	64,000
Bank	16,800	
Cash	1,500	
Drawings	60,000	
Capital as at 1.1.20X7		357,800
	1,421,800	1,421,800

Notes at 31.12.20X7:

1 Stock of raw materials £24,000; stock of finished goods £40,000; work in progress £15,000.
2 Lighting, rent and insurance are to be apportioned: factory 5/6, administration 1/6.
3 Depreciation on productive and administration computers at 10 per cent per annum on cost.

J Jarvis
Manufacturing, Trading and Profit and Loss Account for the year ending 31 December 20X7

	£	£	£
Stock of raw materials 1.1.20X7			21,000
Add Purchases			370,000
" Carriage inwards			3,500
			394,500
Less Stock raw materials 31.12.20X7			(24,000)
Cost of raw materials consumed			370,500
Direct labour			180,000
Royalties			7,000
Prime cost			557,500
Indirect manufacturing costs:			
General factory expenses		31,000	
Lighting 5/6		6,250	
Power		13,700	
Rent 5/6		10,000	
Insurance 5/6		3,500	
Depreciation of productive machinery		28,000	
Indirect labour		145,000	
			237,450
			794,950
Add Work in progress 1.1.20X7			13,500
			808,450
Less Work in progress 31.12.20X7			(15,000)
Production cost of goods completed c/d			793,450
Sales			1,000,000
Less Cost of goods sold:			
Stock of finished goods 1.1.20X7		38,900	
Add Production cost of goods completed		793,450	
		832,350	
Less Stock of finished goods 31.12.20X7		(40,000)	
Gross profit			(792,350)
			207,650
Administration expenses			
Administration salaries	44,000		
Rent 1/6	2,000		
Insurance 1/6	700		
General expenses	13,400		
Lighting 1/6	1,250		
Depreciation of administration computers	2,000		
		63,350	
Selling and distribution expenses			
Sales reps' salaries	30,000		
Commission on sales	11,500		
Carriage outwards	5,900		
		47,400	
Financial charges			
Bank charges	2,300		
Discounts allowed	4,800		
		7,100	
Net profit			(117,850)
			89,800

J Jarvis
Balance Sheet as at 31 December 20X7

	£	£
Fixed assets		
Productive machinery at cost	280,000	
Less Depreciation to date	(78,000)	
		202,000
Administration computers at cost	20,000	
Less Depreciation to date	(10,000)	
		10,000
		212,000
Current assets		
Stock		
Raw materials	24,000	
Finished goods	40,000	
Work in progress	15,000	
Debtors	142,300	
Bank	16,800	
Cash	1,500	
	239,600	
Less Current liabilities		
Creditors	(64,000)	
Net current assets		175,600
		387,600
Financed by		
Capital		
Balance as at 1.1.20X7		357,800
Add Net profit		89,800
		447,600
Less Drawings		(60,000)
		387,600

37.14 Market value of goods manufactured

The financial statements of Jarvis, just illustrated, are subject to the limitation that the respective amounts of the gross profit which are attributable to the manufacturing side or to the selling side of the business are not known. A technique is sometimes used to bring out this additional information. This method uses the cost which would have been involved if the goods had been bought in their finished state instead of being manufactured by the business. This figure is credited to the manufacturing account and debited to the trading account so as to throw up two figures of gross profit instead of one. It should be pointed out that the net profit will remain unaffected. All that will have happened will be that the figure of £207,650 gross profit will be shown as two figures instead of one. When added together, they will total £207,650.

The financial statements in summarised form will appear:

Manufacturing, Trading and Profit and Loss Account for the year ending 31 December 20X7

	£	£
Market value of goods completed c/d		950,000
Less Production cost of goods completed (as before)		(793,450)
Gross profit on manufacture c/d		156,550
Sales		1,000,000
Stock of finished goods 1.1.20X7	38,900	
Add Market value of goods completed b/d	950,000	
	988,900	
Less Stock of finished goods 31.12.20X7	(40,000)	
		(948,900)
Gross profit on trading c/d		51,100
Gross profit		
On manufacturing	156,550	
On trading	51,100	
		207,650

37.15 Further methods of providing for depreciation

In Chapter 26, the straight line and reducing balance methods for calculating depreciation were examined. We can now look at some other methods.

There is no information easily available to show how many organisations are using each method. It is possible to devise one's own special method. If it brings about an equitable charge for depreciation for the organisation, then the method will be suitable.

The revaluation method

When there are a few expensive items of fixed assets, it is not difficult to draw up the necessary accounts for depreciation. For each item we:

(*a*) Find its cost.
(*b*) Estimate its years of use to the business.
(*c*) Calculate and provide depreciation.
(*d*) Make the adjustments when the asset is disposed of.
(*e*) Calculate profit or loss on disposal.

This is worth doing for expensive items. There are, however, many examples of fixed assets for which the calculation would not be worth doing and, in fact, may be impossible. Some businesses will have many low cost fixed assets. Garages or engineering works will have a lot of spanners, screwdrivers and other small tools; brewers will have crates; laboratories will have many small, low cost glass instruments.

It would be impossible to follow procedures (*a*) to (*e*) above for every screwdriver or crate. Instead the revaluation method is used.

The method is not difficult to use. An example is shown in Exhibit 37.4.

A typical format of a manufacturing account is shown below:

MANUFACTURING ACCOUNT
FOR THE YEAR ENDED 31 DECEMBER 200X

RAW MATERIALS:-	₦	₦
Opening inventories	X	
Purchases	X	
Carriage Inward	X	
Less:	XX	
Closing Stock	(X)	
Cost of Raw materials consumed		XX
DIRECT WAGES:-		
Manufacturing wages	X	Xx
DIRECT EXPENSES:-		
Royalties	X	XX
PRIME COST		XX
FACTORY OVERHEADS:		
Rent of factory	X	
Depreciation on Equipment	X	
Supervisors Salaries	X	XX
Cost of production		XX
ADJUSTMENT FOR WORK-IN-PROGRESS:	X	
Add: Opening work in progress (WIP)	(X)	
Factory cost of goods completed transferred to Trading A/c		XXX

Details of the costs shown in the manufacturing account format above are as follows:-

(i) **RAW MATERIALS:-** These are physical items which are used in producing the finished product. For example in a cocoa factory, the following would be classified as raw materials: cocoa bean, jute bags etc.

(ii) **DIRECT LABOUR:-** This is the remuneration paid to factory workers for works directly related to production. Note that this will not include supervisory or clerical labour.

(iii) **DIRECT EXPENSES:-** This is the cost incurred specifically for a particular product. An example is royalties paid per unit of copyright design.

(iv) **PRIME COST:-** This is an important costing terminology which consists of cost of direct materials, direct labour and direct expense as earlier highlighted.

(v) **DIRECT COST:-** These are costs which can be directly identified with particular jobs or products.

(vi) **FACTORY OVERHEADS:-** These are costs which are incurred in operating the works in the factory but which cannot be identified directly with a particular job or product.

(vii) **INDIRECT LABOUR:-** This includes remuneration paid to supervisors, clerks, maintenance staff etc.

(viii) **INDIRECT MATERIAL:-** This includes lubricating oil, spare parts for machinery, cleaning materials, maintenance materials etc.

(ix) **WORK-IN-PROGRESS (WIP):-** These are products that have not completed the manufacturing cycle hence they are semi-finished products..

ILLUSTRATION 9.1

The following information were obtained from the books of GO-GO Manufacturing Company Ltd. For the year ended 31 December, 2006.

	₦
Raw materials 1/1/2006	175,000
Work in progress 1/1/2006	120,400
Finished goods 1/1/2006	207,200
Purchase of raw material	954,800
Carriage inward on raw materials	47,740
Rent of factory building	67,200
Rent of office building	75,600
Bad debt	12,440
Office general expenses	181,020
Factory equipment depreciation	227,920
Office & distribution, equipment depreciation	208,320
Sales (Net)	3,010,000
Light & Power (General)	44,800
Light & Power (Factory)	78,540
Salaries & Wages of salesmen	315,980
Salaries of factory supervisors	122,360
Factory general expenses	117,040
Factory wages	257,460
Insurance of factory equipment	39,760
The closing stocks of the company at the end of the year are as follows:	
Raw materials	[illegible]
Work in progress (WIP)	[illegible]
Finished goods	257,460
Work-in-progress is normally valued at prime cost plus related portion of factory overheads	

Required:

Prepare the Manufacturing Account for the year ended 31 December, 2006.

SUGGESTED SOLUTION TO ILLUSTRATION 9.1

MANUFACTURING ACCOUNT

FOR THE YEAR ENDED 31 DECEMBER, 2006

	₦	₦
Raw materials		
Opening stock	175,000	
Purchase of raw material	954,800	
Carriage on raw material	47,740	
	1,177,540	
Less Closing stock	(202,720)	
Cost of raw materials consumed		974,820
DIRECT WAGES		
Factory wages		257,460
PRIME COST		1,232,280
Add: FACTORY OVERHEADS		
Rent on factory buildings	67,200	
Supervisors salaries	122,360	
Insurance of equipment	39,760	
Light & power (factory)	78,540	
Factory general expenses	117,040	
Depreciation of factory equipment	227,920	
		652,820
FACTORY COST OF PRODUCTION		1,885,100
Add:		
Opening work in progress		120,400
Less:		
Closing work in progress		(143,500)
		(23,100)
Factory cost of goods produced transferred to trading account		1,862,000

TUTORIAL NOTE

You will observe that in preparing the manufacturing account only relevant figures we obtained from the list of information provided. The remaining figures would be required i preparing trading and profit and loss accounts.

Also students/readers should take note of the manner in which the PRIME COST an FACTORY COST OF PRODUCTION were derived.

9.2.7 ADJUSTMENT IN MANUFACTURING ACCOUNTS

(I) APPORTIONMENT OF EXPENSES

Sometimes some examination questions require the apportionment o overheads between manufacturing and other functions such as selling and dist ution or administration. The ratio or proportion of apportionment would be stat Based on this, the portion that relates to manufacturing would be cha ed to manufacturing account while the balance would be treated in the ap priate account (trading or profit and loss account)

ILLUSTRTION 9.2

XYZ Co. Ltd paid ₦25,000 as insurance expenses during the year. However, it wasdiscovere that ₦5,000 insurance expenses was still outstanding for the year while out of the payment made ₦7,500 related to period after the year end.

Insurance apportionment is considered to be 2/5 for factory and 3/5 for [illegible] insurance expenses that would be treated in the manufacturing account.

SOLUTION TO ILLUSTRATION 9.2

	₦
Insurance paid in the year	25,000
Less:	
Amount paid in advance	(7,500)
Add:	
Amount outstanding	5,000
Total Insurance Exp. For the year	22,500
Amount chargeable to manufacturing account	22,500 x 2/5 = ₦9,000

9.2.8 ASCERTAINMENT OF PROFIT OR LOSS ON MANUFACTURED GOODS

Sometimes cost of manufactured goods transferred to trading account is adjusted to reflect PROFIT OR LOSS arising from manufacture. The profit (or loss) on manufacture is ascertained on the basis of opportunity cost principle, i.e. is by reference to what the company would have paid for identical goods if it were purchased instead of manufacturing them.

If such imputed total purchase value exceeds the cost of manufacture then a GROSS PROFIT on manufacture would result. A LOSS on manufacture will occur if the cost of manufacture exceeds the imputed purchase value.

ILLUSTRATION 9.3

Based on information provided in illustration 7.1 and assuming that the company estimated that had it not manufactured the goods, the total cost of purchase would have been N2,100,000, calculate the profit or loss on manufacture.

SUGGESTED SOLUTION TO ILLUSTRATION 9.3

	₦
Purchase value of goods manufactured	

	and transferred to trading A/c	2,100,000
Less:	Cost of goods manufactured transferred to trading A/c (per illustration 7.1)	1,862,000
	Profit on manufactured goods transferred to trading account	238,000

9.3 OTHER INFORMATION REQUIRED FOR PREPARATION OF FINANCIAL STATEMENTS OF COMPANIES

The following financial statements are required by IAS 1:

1. Income Statement
2. Statement of comprehensive income
3. Statement of financial position
4. A statement of cash flows

9.3.1 STRUCTURE AND CONTENT OF FINANCIAL STATEMENT

IDENTIFICATION OF FINANCIAL STATEMENTS

Financial statements should be clearly identified from the other information in the same published account. The name of the entity, the period covered and so on must be displayed.

The following items must be presented on the face of the statement of financial position; assets, equity and liabilities.

Current and Non-Current Assets and Liabilities

Current and non-current assets and liabilities should be classified separately on the face of the statement of financial position.

Current and Non-current Assets

A current asset is one that is likely to be realised within the normal operating cycle or within 12 months, held for trading purposes, or its cash or cash equivalent. All other assets are non-current assets. Inventory and receivables are examples of current assets.