

**Production budget**

Production budget is a schedule showing planned production in units which must be made by a manufacturer during a specific period to meet the expected demand for sales and the planned finished goods inventory. The required production is determined by subtracting the beginning finished goods inventory from the sum of expected sales and planned ending inventory of the period. Thus:

$$\begin{aligned} & \textbf{Planned Production in Units} \\ & = \textbf{Expected Sales in Units} \\ & + \textbf{Planned Ending Inventory in Units} \\ & - \textbf{Beginning Inventory in Units} \end{aligned}$$

Production budget is prepared after [sales budget](#) since it needs the expected sales units figure which is provided by the sales budget. It is important to note that only a manufacturing business needs to prepare the production budget.

The following example illustrates the production budget format. The expected sales units are obtained from the [sales budget](#) of Company A. The planned ending units of 1st, 2nd and 3rd period are the beginning units in 2nd, 3rd and 4th period respectively.

**Company A**

**Production Budget**

**For the Year Ending December 30, 2010**

|                                    | Q1           | Q2         | Q3           | Q4           | Year         |
|------------------------------------|--------------|------------|--------------|--------------|--------------|
| Budgeted Sales Units               | 1,320        | 954        | 1,103        | 1,766        | 5,143        |
| + Planned Ending Units             | 210          | 168        | 213          | 225          | 225          |
| – Beginning Units                  | –196         | –210       | –168         | –213         | –196         |
| <b>Planned Production in Units</b> | <b>1,334</b> | <b>912</b> | <b>1,148</b> | <b>1,778</b> | <b>5,172</b> |

**Schedule of Expected Cash Payments**

Schedule of expected cash payments to suppliers shows the budgeted cash payments on purchases during a period. The schedule of expected cash payments is a component of [master budget](#) and it is prepared after direct material purchases budget but before cash budget.

The expected cash collections during a period is calculated on the basis of total purchases figure, that is obtained from direct material purchases budget, and on the percentage / proportion in which purchases are to be paid for in the current and following periods.

**Format and Example:** The following example shows the format of schedule of expected cash payments to suppliers. The purchases figures are obtained from the [direct material purchases budget](#) of company A. The company expects to pay **80%** of the purchases in the period of purchase and 20% in following period. Ending AP of last year was \$2,350.

a) Q1 Purchases = \$15,757

Payments in Q1 =  $\$15,757 \times 80\% = \mathbf{\$12,606}$ ;    Payments in Q2 =  $\$15,757 \times 20\% = \mathbf{\$3,151}$

b) Q2 Purchases = \$12,128

Payments in Q2 =  $\$12,128 \times 80\% = \mathbf{\$9,702}$ ;    Payments in Q3 =  $\$12,128 \times 20\% = \mathbf{\$2,426}$

c) Q3 Purchases = \$17,398

Payments in Q3 =  $\$17,398 \times 80\% = \mathbf{\$13,918}$ ;    Payments in Q4 =  $\$17,398 \times 20\% = \mathbf{\$3,480}$

d) Q4 Purchases = \$28,060

Payments in Q4 =  $\$28,060 \times 80\% = \mathbf{\$22,448}$

Company A

Schedule of Expected Cash Payments

For the Year Ending December 30, 2010

| Q1 | Q2 | Q3 | Q4 | Year |
|----|----|----|----|------|
|----|----|----|----|------|

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## Production, DM, DL, and MOH budgets

Ahmed F. Saleh

|                         |                 |                 |                 |                 |                 |
|-------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Beginning AP            | \$2,350         |                 |                 |                 | \$2,350         |
| Quarter 1 Purchases (a) | 12,606          | \$3,151         |                 |                 | 15,757          |
| Quarter 2 Purchases (b) |                 | 9,702           | \$2,426         |                 | 12,128          |
| Quarter 3 Purchases (c) |                 |                 | 13,918          | \$3,480         | 17,398          |
| Quarter 4 Purchases (d) |                 |                 |                 | 22,448          | 22,448          |
| Total Expected Payments | <b>\$14,956</b> | <b>\$12,853</b> | <b>\$16,344</b> | <b>\$25,928</b> | <b>\$70,081</b> |

## Direct Material Purchases Budget

Direct material purchases budget shows budgeted beginning and ending direct material inventory, the quantity of direct material that will be used in production, the amount of direct material that must be purchased and its cost during a specific period. Direct material purchases budget is a component of [master budget](#) and it is based on the following formula:

$$\begin{aligned} & \text{Budgeted Direct Material Purchases in Units} \\ &= \text{Budgeted Beginning Direct Material in Units} \\ &+ \text{Direct Material in Units Needed for Production} \\ &- \text{Budgeted Ending Direct Material in Units} \end{aligned}$$

In the above formula, the direct material in units that is needed for production is calculated as follows:

$$\begin{aligned} & \text{Budgeted Production during the Period} \\ & \times \text{Units of Direct Material Required per Unit} \\ & = \text{Direct Material in Units Needed for Production} \end{aligned}$$

Since the budgeted production figure is provided by the production budget, the direct material purchases budget can be prepared only after the preparation of production budget.

**Format and Example :** The following example shows the format of a simple direct material purchases budget. Budgeted production figures are obtained from [production budget](#) of Company A. Note that the budgeted ending direct material of 1st, 2nd and 3rd period is the beginning direct material in 2nd, 3rd and 4th period respectively.

| <b>Company A</b>                             |                 |                 |                 |                 |                 |
|--|-----------------|-----------------|-----------------|-----------------|-----------------|
| <b>Direct Material Purchases Budget</b>      |                 |                 |                 |                 |                 |
| <b>For the Year Ending December 30, 2010</b> |                 |                 |                 |                 |                 |
|  | <b>Quarter</b>  |                 |                 |                 |                 |
|  | Q1              | Q2              | 3               | 4               | Year            |
| Budgeted Production in Units                 | 1,334           | 912             | 1,148           | 1,778           | 5,172           |
| × DM Required per Unit (lb.)                 | 4.00            | 4.00            | 4.00            | 4.00            | 4.00            |
| DM Required of Production (lb.)              | 5,336           | 3,648           | 4,592           | 7,112           | 20,688          |
| + Budgeted Ending DM (lb.)                   | 547             | 689             | 1,068           | 961             | 961             |
| – Beginning Direct Material (lb.)            | –800            | –547            | –689            | –1,068          | –800            |
| Budgeted DM Purchases (lb.)                  | 5,083           | 3,790           | 4,971           | 7,005           | 20,849          |
| Cost per Pound                               | \$3.10          | \$3.20          | \$3.50          | \$4.00          |                 |
| Budgeted DM Purchases in \$                  | <b>\$15,757</b> | <b>\$12,128</b> | <b>\$17,398</b> | <b>\$28,020</b> | <b>\$73,304</b> |

**Direct Labor Budget**

Direct labor budget shows the total direct labor cost and number of direct labor hours needed for production. It helps the management to plan its labor force requirements.

Direct labor budget is a component of master budget. It is prepared after the preparation of production budget because the budgeted production in units figure provided by the production budget serves as starting point in direct labor budget.

Following are the calculations involved in the direct labor budget:

**Planned Production in units**  
 × **Direct Labor Hours Required per Unit**  
 = **Budgeted Direct Labor Hours Required**  
 × **Cost per Direct Labor Hours**  
 = **Budgeted Direct Labor Cost**

**Format and Example**

Following is an example showing a simple direct labor budget format. The planned production figures are obtained from the [production budget](#) of Company A.

| <b>Company A</b>                             |       |     |       |       |       |
|--|-------|-----|-------|-------|-------|
| <b>Direct Material Purchases Budget</b>      |       |     |       |       |       |
| <b>For the Year Ending December 30, 2010</b> |       |     |       |       |       |
|  | Q1    | Q2  | Q3    | Q4    | Year  |
| Planned Production in Units                  | 1,334 | 912 | 1,148 | 1,778 | 5,172 |
| × Direct Labor Hours per Unit                | 3.5   | 3.5 | 3.5   | 3.5   | 3.5   |

## Production, DM, DL, and MOH budgets

Ahmed F. Saleh

|                              |          |          |          |          |          |
|------------------------------|----------|----------|----------|----------|----------|
| Budgeted Direct Labor Hours  | 4,669    | 3,192    | 4,018    | 6,223    | 18,102   |
| × Cost per Direct Labor Hour | \$4      | \$5      | \$5      | \$5      |          |
| Budgeted Direct Labor Cost   | \$18,676 | \$15,960 | \$20,090 | \$31,115 | \$85,841 |

## Factory Overhead Budget

The factory overhead budget shows all the planned manufacturing costs which are needed to produce the budgeted production level of a period, other than direct costs which are already covered under [direct material budget](#) and [direct labor budget](#). The overhead budget is an operational budget contained in the master budget of a business. It has two sections, one for variable overhead costs and other for fixed overhead costs.

### Format and Example

The following example illustrates the format of a simple overhead budget. The variable overhead per unit of Company A during the first, second, third and fourth quarter is estimated to be \$12, \$15, \$16 and \$19 respectively. The production units figures are obtained from the [production budget](#) of the company. The company expects to incur **monthly** depreciation of \$3,000 and monthly rent of \$2,500. There are no other fixed costs.

## Company A

## Factory Overhead Budget

For the Year Ending December 30, 2010

|                               | Q1              | Q2              | Q3              | Q4              | Year             |
|-------------------------------|-----------------|-----------------|-----------------|-----------------|------------------|
| Variable Factory Overhead:    |                 |                 |                 |                 |                  |
| Budgeted Production Units     | 1,334           | 912             | 1,148           | 1,778           | 5,172            |
| × Variable Overhead Rate      | \$12            | \$15            | \$16            | \$19            |                  |
| Total Variable Overhead       | \$16,008        | \$13,680        | \$18,368        | \$33,782        | \$81,838         |
| Fixed Factory Overhead:       |                 |                 |                 |                 |                  |
| Depreciation                  | 9,000           | 9,000           | 9,000           | 9,000           | 36,000           |
| Rent                          | 7,500           | 7,500           | 7,500           | 7,500           | 30,000           |
| Total Fixed Overhead          | \$16,500        | \$16,500        | \$16,500        | \$16,500        | \$66,000         |
| <b>Total Factory Overhead</b> | <b>\$32,508</b> | <b>\$30,180</b> | <b>\$34,868</b> | <b>\$50,282</b> | <b>\$147,838</b> |
| – Depreciation                | 9,000           | 9,000           | 9,000           | 9,000           | 36,000           |
| Cash Disbursements for FOH    | \$23,508        | \$21,180        | \$25,868        | \$41,282        | \$111,838        |



**Cost of Goods Manufactured Budget**

Cost of goods manufactured budget is an operational component of master budget. It is prepared to calculate the manufacturing costs that are expected to be incurred on budgeted finished goods. The cost of goods manufactured budget is based on direct material purchases budget, direct labor cost budget and factory overhead budget.

The figures from direct labor budget and overhead budget are directly used in the preparation of cost of goods manufactured budget but the direct material purchase cost needs to be adjusted as shown below:

$$\begin{aligned} & \text{Direct Material Purchases} \\ + & \text{Direct Material Beginning Inventory} \\ - & \text{Direct Material Ending Inventory} \\ = & \text{Cost of Direct Material Used in Production} \end{aligned}$$

The next step is to calculate the budgeted cost of goods manufactured as follows:

$$\begin{aligned} & \text{Cost of Direct Material used in Production} \\ + & \text{Direct Labor Cost} \\ + & \text{Factory Overhead Cost} \\ = & \text{Manufacturing Cost} \\ + & \text{Beginning Work in Process} \\ - & \text{Ending Work in Process} \\ = & \text{Cost of Goods Manufactured} \end{aligned}$$

**Format and Example:** The format of cost of goods manufactured budget is shown in the following example. For the sake simplicity, we have assumed zero work in process at the beginning and at the end of the periods.

**Production, DM, DL, and MOH budgets****Ahmed F. Saleh****Company A****Cost of Goods Manufactured Budget****For the Year Ending December 30, 2010**

|  | Q 1      | Q2       | Q3       | Q4        | Year      |
|--|----------|----------|----------|-----------|-----------|
| Direct Material Purchases              | \$15,757 | \$12,128 | \$17,398 | \$28,020  | \$73,304  |
| Beginning Direct Material              | 2,400    | 1,696    | 2,205    | 3,738     | 2,400     |
| Ending Direct Material                 | -1,696   | -2,205   | -3,738   | -3,844    | -3,844    |
| Direct Material Cost                   | \$16,461 | \$11,619 | \$15,865 | \$27,914  | \$71,860  |
| Direct Labor Cost                      | 18,676   | 15,960   | 20,090   | 31,115    | 85,841    |
| Manufacturing Overhead                 | 23,508   | 21,180   | 25,868   | 41,282    | 111,838   |
| Total Manufacturing Costs              | \$58,645 | \$48,759 | \$61,823 | \$100,311 | \$269,539 |
| Beginning Work in Process              | 0        | 0        | 0        | 0         | 0         |
| Ending Work in Process                 | -0       | -0       | -0       | -0        | -0        |
| Budgeted Cost of Goods<br>Manufactured | \$58,645 | \$48,759 | \$61,823 | \$100,311 | \$269,539 |

**Cash Budget**

Cash budget is a financial budget prepared to calculate the budgeted cash inflows and outflows during a period and the budgeted cash balance at the end of the period. Cash budget helps the managers to determine any excessive idle cash or cash shortage that is expected during the period. Such information helps the managers to plan accordingly. For example if any cash shortage is expected in future, the managers plan to change the credit policy or to borrow money and if excessive idle cash is expected, they plan to invest it or to use it for the repayment of loan.

All businesses need to maintain a safe level of cash to enable them to carry on business activities. The managers of a business need to determine that safe level. The cash budget is then prepared by taking into consideration, that safe level of cash. Thus, if a cash shortage is expected during a period, a plan is made to borrow cash.

**Format and Example:** The following example illustrates the format of cash budget.

Company A maintains a minimum cash balance of \$5,000. In case of a deficiency, loan is obtained at 8% annual interest rate on the first day of the period.

**Production, DM, DL, and MOH budgets****Ahmed F. Saleh****Company A****Cash Budget****For the Year Ending December 30, 2010**

|                              | Q1       | Q2       | Q3       | Q4       | Year      |
|------------------------------|----------|----------|----------|----------|-----------|
| Beginning Cash Balance       | \$5,200  | \$5,000  | \$5,000  | \$11,740 | \$5,200   |
| Add: Budgeted Cash Receipts: | 37,150   | 54,190   | 53,730   | 62,300   | 207,370   |
| Total Cash Available for Use | \$42,350 | \$59,190 | \$58,730 | \$74,040 | \$212,570 |
| Less: Cash Disbursements     |          |          |          |          |           |
| Direct Material              | 14,960   | 16,550   | 16,810   | 19,410   | 67,730    |
| Direct Labor                 | 8,830    | 9,610    | 9,750    | 11,900   | 40,090    |
| Factory Overhead             | 10,020   | 10,400   | 11,000   | 11,780   | 43,200    |
| Selling and Admin. Expenses  | 7,640    | 8,360    | 8,500    | 9,610    | 34,110    |
| Equipment Purchases          |          | 6,000    |          | 14,000   | 20,000    |
| Total Disbursements          | \$41,450 | \$50,920 | \$46,060 | \$66,700 | \$205,130 |
| Cash Surplus/(Deficit)       | \$900    | \$8,270  | \$12,670 | \$7,340  | \$7,440   |
| Financing:                   |          |          |          |          |           |
| Borrowing                    | 4,100    |          |          |          | 4,000     |
| Repayments                   |          | -3,188   | -912     |          | -4,000    |
| Interest                     |          | -82      | -18      |          | -100      |
| Net Cash from Financing      | \$4,100  | -\$3,270 | -\$930   |          | -100      |
| Budgeted Ending Cash Balance | \$5,000  | \$5,000  | \$11,740 | \$7,340  | \$7,340   |

**Homework**

ABC company shows the following estimates for unit sales for 2021 as below:

- Quarter ended march 2021 (first 3 months).
- The company sells products units for \$500.
- The company generally collects 70% of sales revenue in the month of the sale. And 20% in the month following the sale and the remaining 10% in the second following after the sale

| <b>2021 forecasted sales</b> |              |
|------------------------------|--------------|
| <b>Time</b>                  | <b>units</b> |
| November prior year          | 280          |
| December prior year          | 310          |
| January                      | 200          |
| February                     | 250          |
| March                        | 300          |
| April                        | 320          |
| May                          | 330          |

**Finished goods inventory info:**

- The company wants to have 40 units of product X at the beginning of January.
- Company wants to maintain ending inventory 20% of following month's sales.

**Direct material info:**

- It takes 100 pound of materials to make each unit.
- Beginning DM inventory of January is 2,100 pounds.

## **Production, DM, DL, and MOH budgets**

**Ahmed F. Saleh**

- The company wants to maintain ending inventory at 10% of DM needed for the following month's production.
- The budgeted cost for those materials is \$2 per pound.

### **Direct labor info:**

- It takes 10 DL hours to make each unit. the budgeted cost of DL is \$15 per hour.

Required: Prepare the sales and schedule of cash collection, Production, DM, and DL

budgets for the first quarter of 2021!

- As being an accountant , make your own comment ?