

Managerial Accounting

Lesson FA-20-130-02

Budgeting for Manufacturers - Part 2 - Manufacturing Budget Example: Direct Materials, Direct Labor, and Manufacturing Overhead Budgets

Workbook

This workbook contains notes and worksheets
to accompany the corresponding video lesson
available online at:



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Budgeting for Manufacturers - Part 2 - Manufacturing Budget Example: Direct Materials, Direct Labor, and Manufacturing Overhead Budgets

[Clips 06,07,08] Comprehensive Manufacturing Budget Example - Direct Materials Budget (Parts 1-3)

Direct Materials Budget

Spears Manufacturing Assumptions:

Desired ending inventory of direct materials	15% of next quarter's production requirements
Pounds of direct materials required to manufacture each finished good	3 pounds
Direct Materials cost per pound	\$9

(direct materials worksheet is on the next page)

Direct Materials Budget Worksheet

**Spears Manufacturing
Direct Materials Budget
For Quarterly Periods 2010**

	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	Year Total
Required Units to be Produced					
Direct Materials Required per Unit					
Required materials for production					
Desired Ending Direct Materials Inventory					
Total Direct Materials Required					
Expected Beginning Direct Materials Inventory					
Required Purchases of Direct Materials					
Cost per pound of direct materials					
Total cost of required purchases of direct materials					

(expanded production budget worksheet is on the next page)

Production Budget Worksheet (Expanded to include 1st and 2nd quarter of 2011)

Spears Manufacturing
Production Budget
For Quarterly Periods 2010, 2011

	2010				2011	
	1 st Quarter	2 nd Quarter	3 rd Quarter	4 th Quarter	1 st Quarter	2 nd Quarter
Sales of Finished Goods Units	10,600u	11,200u	11,800u	12,400u		
Desired Ending Inventory of Finished Goods	1,120u	1,180u	1,240u	1,300u		
Total Finished Goods Requirements	11,720u	12,380u	13,040u	13,700u		
Expected Beginning Inventory of Finished Goods	(1060)u	(1120)u	(1180)u	(1240)u		
Required Production Units	10,660u	11,260u	11,860u	12,460u		

[Clip 09] Comprehensive Manufacturing Budget Example - Direct Labor Budget**Direct Labor Budget****Spears Manufacturing Assumptions:**

Hours of direct labor required to manufacture each finished good	1.5 hours
Direct labor cost per hour	\$18 per direct labor hour

**Spears Manufacturing
Direct Labor Budget
For Quarterly Periods 2010**

	1 st Quarter	2 nd Quarter	3 rd Quarter	4 th Quarter	Year Total
Required Production Units					
Direct Labor hours Required per Unit					
Required direct labor hours for production					
Cost per hour of direct labor					
Total cost of required direct labor					

**[Clips 10, 11, 12] Comprehensive Manufacturing Budget Example -
Manufacturing Overhead Budget (Parts 1, 2, 3)****Manufacturing Overhead Budget****Spears Manufacturing Assumptions:**

Manufacturing Overhead is Applied on the Basis of Direct Labor Hours	
Variable Manufacturing Overhead <ul style="list-style-type: none"> • Indirect Materials (\$1.40 per direct labor hour) • Indirect Labor (\$1.00 per direct labor hour) • Utilities (\$1.50 per direct labor hour) • Maintenance (\$1.10 per direct labor hour) 	\$5 per direct labor hour total
Fixed Manufacturing Overhead <ul style="list-style-type: none"> • Supervisory salaries (\$90,000 per year) • Depreciation on factory equipment (\$20,000 per year) • Property taxes and insurance (\$30,336 per year) • Maintenance (\$40,000 per year) 	\$180,336 per year

(manufacturing overhead budget worksheet is on the next page)

Spears Manufacturing
Manufacturing Overhead Budget
For Quarterly Periods 2010

	1 st Quarter	2 nd Quarter	3 rd Quarter	4 th Quarter	Year Total
Variable Mfg Overhead Costs:					
Indirect Materials					
Indirect Labor					
Utilities					
Maintenance					
Total Variable Mfg Overhead					
Fixed Mfg Overhead Costs					
Supervisory salaries					
Depreciation on factory equip.					
Property taxes and insurance					
Maintenance					
Total Fixed Mfg Overhead					
Total Mfg Overhead Costs					

APPENDIX 1 - SOLUTIONS

Budgeting for Manufacturers - Part 2 - Manufacturing Budget Example: Direct Materials, Direct Labor, and Manufacturing Overhead Budgets

[Clips 06,07,08] Comprehensive Manufacturing Budget Example - Direct Materials Budget (Parts 1-3)
SOLUTION:

Direct Materials Budget

Spears Manufacturing
Direct Materials Budget
For Quarterly Periods 2010

	1 st Quarter	2 nd Quarter	3 rd Quarter	4 th Quarter	Year Total
Required Units to be Produced	10,660u	11,260u	11,860u	12,460u	46,240u
Direct Materials Required per Unit	X 3 lbs	X 3 lbs	X 3 lbs	X 3 lbs	X 3 lbs
Required materials for production	31,980lb	33,780lb	35,580lb	37,380lb	138,720lbs
Desired Ending Direct Materials Inventory	5067lb	5337lb	5607lb	5877lb	
Total Direct Materials Required	37,047lb	39,117lb	41,187lb	43,257lb	
Expected Beginning Direct Materials Inventory	(4797lb)	(5067lb)	(5337lb)	(5607lb)	
Required Purchases of Direct Materials	32,250lb	34,050lb	35,850lb	37,650lb	139,800lbs
Cost per pound of direct materials	X \$9	X \$9	X \$9	X \$9	X \$9
Total cost of required purchases of direct materials	\$290,250	\$306,450	\$322,650	\$338,850	\$1,258,200

Production Budget

Spears Manufacturing Assumptions:

Desired ending inventory of finished goods

10% of next quarter's sales

Spears Manufacturing
Production Budget
For Quarterly Periods 2010, 2011

	2010				(5) 1 st Quarter	(6) 2 nd Quarter
	1 st Quarter	2 nd Quarter	3 rd Quarter	4 th Quarter	Quarter	Quarter
Sales of Finished Goods Units	10,600u	11,200u	11,800u	12,400u	13,000u	13,600u
Desired Ending Inventory of Finished Goods	1,120u	1,180u	1,240u	1,300u	1,360u	
Total Finished Goods Requirements	11,720u	12,380u	13,040u	13,700u	14,360u	
Expected Beginning Inventory of Finished Goods	(1,060)u	(1,120)u	(1,180)u	(1,240)u	(1,300)u	
Required Production Units	10,660u	11,260u	11,860u	12,460u	13,060u	

Spears Manufacturing
Direct Materials Budget - SOLUTION
For Quarterly Periods 2010

	1 st Quarter	2 nd Quarter	3 rd Quarter	4 th Quarter	Year Total
Required Units to be Produced	10,660u	11,260u	11,860u	12,460u	46,240u
Direct Materials Required per Unit	X 3 lbs	X 3 lbs	X 3 lbs	X 3 lbs	X 3 lbs
Required materials for production	31,980 lbs	33,780 lbs	35,580 lbs	37,380 lbs	138,720 lbs
Desired Ending Direct Materials Inventory	5067 lbs	5337 lbs	5607 lbs	5877 lbs*	
Total Direct Materials Required	37,047 lbs	39,117 lbs	41,187 lbs	43,257 lbs	
Expected Beginning Direct Materials Inventory	(4797) lbs	(5067) lbs	(5337) lbs	(5607) lbs	
Required Purchases of Direct Materials	32,250 lbs	34,050 lbs	35,850 lbs	37,650 lbs	139,800 lbs
Cost per pound of direct materials	X \$9.00	X \$9.00	X \$9.00	X \$9.00	X \$9.00
Total cost of required purchases of direct materials	\$290,250	\$306,450	\$322,650	\$338,850	\$1,258,200

* 13,060 units planned production in 1st Quarter 2011 (see the revised production budget on the next page) X 15% x 3 lbs = 5877 lbs

Revised Production Budget to Include 1st and 2nd Quarter of 2011

Spears Manufacturing
Production Budget - SOLUTION
For Quarterly Periods 2010, 2011

	2010				2011	
	1 st Quarter	2 nd Quarter	3 rd Quarter	4 th Quarter	1 st Quarter	2 nd Quarter
Sales of Finished Goods Units	10,600u	11,200u	11,800u	12,400u	13,000u	13,600u
Desired Ending Inventory of Finished Goods	1,120u	1,180u	1,240u	1,300u	1,360u	
Total Finished Goods Requirements	11,720u	12,380u	13,040u	13,700u	14,360u	
Expected Beginning Inventory of Finished Goods	(1060)u	(1120)u	(1180)u	(1240)u	(1300)u	
Required Production Units	10,660u	11,260u	11,860u	12,460u	13,060u	



[Clip 09] Comprehensive Manufacturing Budget Example - Direct Labor Budget**SOLUTION:****Direct Labor Budget****Spears Manufacturing Assumptions:**

Hours of direct labor required to manufacture each finished good	1.5 hours
Direct labor cost per hour	\$18 per direct labor hour

Spears Manufacturing
Direct Labor Budget
For Quarterly Periods 2010

	1 st Quarter	2 nd Quarter	3 rd Quarter	4 th Quarter	Year Total
Required Production Units	10,660u	11,260u	11,860u	12,460u	46,240u
Direct Labor hours Required per Unit	X 1.5hrs	X 1.5hrs	X 1.5hrs	X 1.5hrs	X 1.5hrs
Required direct labor hours for production	15,990hrs	16,890hrs	17,790hrs	18,690hrs	69,360hrs
Cost per hour of direct labor	X \$18	X \$18	X \$18	X \$18	X \$18
Total cost of required direct labor	\$287,820	\$304,020	\$320,220	\$336,420	\$1,248,480

Spears Manufacturing
Direct Labor Budget - SOLUTION
For Quarterly Periods 2010

	1 st Quarter	2 nd Quarter	3 rd Quarter	4 th Quarter	Year Total
Required Production Units	10,660 u	11,260 u	11,860 u	12,460 u	46,240 u
Direct Labor hours Required per Unit	X 1.5 hrs	X 1.5 hrs	X 1.5 hrs	X 1.5 hrs	X 1.5 hrs
Required direct labor hours for production	15,990 hrs	16,890 hrs	17,790 hrs	18,690 hrs	69,360 hrs
Cost per hour of direct labor	X \$18.00	X \$18.00	X \$18.00	X \$18.00	X \$18.00
Total cost of required direct labor	\$287,820	\$304,020	\$320,220	\$336,420	\$1,248,480



[Clips 10, 11, 12] Comprehensive Manufacturing Budget Example - Manufacturing Overhead Budget (Parts 1, 2, 3)**SOLUTION:**

Spears Manufacturing Manufacturing Overhead Budget For Quarterly Periods 2010					
	1 st Quarter	2 nd Quarter	3 rd Quarter	4 th Quarter	Year Total
Variable Mfg Overhead Costs:	15,990 hrs	16,890 hrs	17,790 hrs	18,690 hrs	69,360 hrs
Indirect Materials (1.40)	\$22,386	\$23,646	\$24,906	\$26,166	\$97,104
Indirect Labor (1.00)	\$15,990	\$16,890	\$17,790	\$18,690	\$69,360
Utilities (1.50)	\$23,985	\$25,335	\$26,685	\$28,035	\$104,040
Maintenance (1.10)	\$17,589	\$18,579	\$19,569	\$20,559	\$76,296
Total Variable Mfg Overhead	\$79,950	\$84,450	\$88,950	\$93,450	\$346,800
Fixed Mfg Overhead Costs					
Supervisory salaries	\$22,500	\$22,500	\$22,500	\$22,500	\$90,000
Depreciation on factory equip.	\$5,000	\$5,000	\$5,000	\$5,000	\$20,000
Property taxes and insurance	\$7,584	\$7,584	\$7,584	\$7,584	\$30,336
Maintenance	\$10,000	\$10,000	\$10,000	\$10,000	\$40,000
Total Fixed Mfg Overhead	\$45,084	\$45,084	\$45,084	\$45,084	\$180,336
Total Mfg Overhead Costs	\$125,034	\$129,534	\$134,034	\$138,534	\$527,136

$$\text{Predetermined Mfg. OH Rate} = \text{POHR} = \frac{\text{Annual Budgeted MOH}}{\text{Annual Budgeted Activity Level}}$$

$$= \frac{\$527,136}{69,360 \text{ d.l. hrs}}$$

$$= \$7.60 / \text{d.l. hr.}$$

$$\begin{aligned} \text{per unit} &= \$7.60 \times 1.5 \text{ hrs} \\ \text{50 F. G.} &= \$11.40 \text{ per finished good unit} \end{aligned}$$

**Spears Manufacturing
Manufacturing Overhead Budget - SOLUTION
For Quarterly Periods 2010**

	1 st Quarter	2 nd Quarter	3 rd Quarter	4 th Quarter	Year Total
Budgeted Direct Labor Hours	15,990 hrs	16,890 hrs	17,790 hrs	18,690 hrs	69,360 hrs
Variable Mfg Overhead Costs:					
Indirect Materials	\$ 22,386	\$23,646	\$24,906	\$26,166	\$97,104
Indirect Labor	\$ 15,990	\$16,890	\$17,790	\$18,690	\$69,360
Utilities	\$ 23,985	\$25,335	\$26,685	\$28,035	\$104,040
Maintenance	\$ 17,589	\$18,579	\$19,569	\$20,559	\$76,296
Total Variable Mfg Overhead	\$79,950	\$84,450	\$88,950	\$93,450	\$346,800
Fixed Mfg Overhead Costs					
Supervisory salaries	\$ 22,500	\$22,500	\$22,500	\$22,500	\$90,000
Depreciation on factory equip.	\$ 5,000	\$ 5,000	\$ 5,000	\$ 5,000	\$20,000
Property taxes and insurance	\$ 7,584	\$ 7,584	\$ 7,584	\$ 7,584	\$30,336
Maintenance	\$ 10,000	\$10,000	\$10,000	\$10,000	\$40,000
Total Fixed Mfg Overhead	\$ 45,084	\$45,084	\$45,084	\$45,084	\$180,336
Total Mfg Overhead Costs	\$125,034	\$129,534	\$134,034	\$138,534	\$527,136

$$\text{Predetermined overhead rate (POHR)} = \$527,136 / 69,360 \text{ hrs} = \$7.60/\text{dlh}$$