# CHAPTER 9

# Cost accounting systems

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# ADDITIONAL PROBLEMS

## Problem 9.1 Job order costing and factory overhead

McGoo Pty Ltd uses a job order costing system to control production costs in its two departments. Accounting records for Job 433 show the following data:

| | Department A | Department B |
|---|---|---|
| Direct labour hours | 1600 | 2280 |
| Direct labour cost | $19 200 | $319 380 |
| Raw materials cost | $7200 | $10 320 |
| Machine hours | 120 | 168 |

The company applies overhead to production on the basis of direct labour cost in Department A and on the basis of machine hours in Department B. At the beginning of the year, the company estimated the following production performance:

| | Department A | Department B |
|---|---|---|
| Direct labour hours | 104 000 | 232 800 |
| Direct labour cost | $1 248 000 | $1 978 800 |
| Machine hours | 15 600 | 16 280 |
| Factory overhead | $1 497 600 | $488 400 |

***Required:***

A. Calculate the overhead rate for each department.
B. Calculate the total cost of Job 433.
C. If actual machine hours used in Department B were 16 640 and the actual factory overhead was $507 200, was the overhead overapplied or underapplied? By what amount?

## Solution

McGOO PTY LTD

A.

Departmental overhead rates:

Department A: $1 497 600 ÷ $1 248 000 = $1.20 per DL$
Department B: $488 400 ÷ $16 280 = $30 per Mach hr

B.

Total cost Job 433

**Department A — Job 433**

| | | | | | |
|---|---|---|---|---|---|
| DL | 19 200 | DB | 49 440 | | |
| RM | 7 200 | | | | |
| FOH (1) | 23 040 | | | | |
| | 49 440 | | 49 440 | | |

**Department B — Job 433**

| | | | |
|---|---|---|---|
| DA | 49 440 | FG | 384 180 |
| DM | 319 380 | | |
| RM | 10 320 | | |
| FOH (2) | 5 040 | | |
| | 384 180 | | 384 180 |

(1) $1.20 ($19 200) = $23 040
(2) $30 ($168) = $5 040
Total cost of Job 433 = $384 180

C.

Department B:

| | |
|---|---|
| Actual factory overhead: | $507 200 |
| Applied overhead 16 640 ($30) | 499 200 |
| Factory overhead underapplied | $ 8 000 |

## Problem 9.2 Job order costing

Masthead Ltd manufactures playground equipment, and uses a job order costing system. On 1 January 2002, Jobs 43 and 44 were in process, with costs of $840 and $910 respectively. The accounting records showed the following information for January.

1. Raw materials requisitioned were charged as follows.

| | |
|---|---|
| Job 43 | $1990 |
| Job 44 | 3200 |
| Job 45 | 4442 |
| Job 46 | 2100 |
| Indirect use | 1330 |

2. Factory wages and salaries of $10 400 were paid. Each worker earns $8 per hour. Ignore income taxes and other payroll deductions.
3. The payroll was distributed as follows.

| | |
|---|---|
| Job 43 | $2600 |
| Job 44 | 3400 |
| Job 45 | 2560 |
| Job 46 | 720 |
| Indirect labour | 1 120 |

4. Factory overhead is applied at $10 per direct labour hour.
5. Additional factory overhead costs incurred and paid during the month totalled $10 200.
6. Jobs 43, 44 and 45 were completed and transferred to finished goods.
7. Jobs 43 and 45 were sold at cost plus a 40% mark-up on cost.

***Required:***

A. Prepare the journal entries to record the January transactions.
B. Prepare a schedule of the costs in the beginning inventory and the amount incurred for each cost element during the month by job.
C. Prepare a summarised job cost sheet for Job 45 that shows the amount of each cost element required for the job.
D. What is the balance in the Work in Process Inventory account on 31 January?
E. What is the balance in the Finished Goods Inventory account on 31 January?

(*continued*)

## Solution

MASTHEAD LTD

**A. General journal entries**

| | | | | |
|---|---|---|---|---|
| January 2002 | | | | |
| 1 | Work in process | | 11 732 | |
| | Factory overhead | | 1 330 | |
| | Raw materials | | | 13 062 |
| 2 | Factory wages and salaries | | 10 400 | |
| | Wages payable | | | 10 400 |
| | Wages payable | | 10 400 | |
| | Cash at bank | | | 10 400 |
| 3 | Work in process | | 9 280 | |
| | Factory overhead | | 1 120 | |
| | Factory wages and salaries | | | 10 400 |
| 4 | Work in process | | 11 600 | |
| | Factory overhead applied | | | 11 600 |
| | ($10 (9 280 ÷ 8)) | | | |
| 5 | Factory overhead | | 10 200 | |
| | Accounts payable (various) | | | 10 200 |
| 6 | Finished goods | | 30 642 | |
| | Work in process | | | 30 642 |
| | Job 43: $ 840 + 1 990 + 2 600 + 3 250 | = | $8 680 | |
| | Job 44: $ 910 + 3 200 + 3 400 + 4 250 | = | 11 760 | |
| | Job 45: $4 442 + 2 560 + 3 200 | = | 10 202 | |
| | | | 30 642 | |
| 7 | Cost of goods sold | | 18 882 | |
| | Finished goods | | | 18 882 |
| | Accounts receivable | | 26 435 | |
| | Sales revenue | | | 26 435 |
| | (1.4 × 18 882 = $26 435 rounded) | | | |

**B. Schedule of costs:**

| Job | Beginning balance | Raw materials | Direct labour | Factory overhead | Total |
|---|---|---|---|---|---|
| 43 | $ 840 | $ 1 990 | $2 600 | $3 250 | $ 8 680 |
| 44 | 910 | 3 200 | 3 400 | 4 250 | 11 760 |
| 45 | | 4 442 | 2 560 | 3 200 | 10 202 |
| 46 | | 2 100 | 720 | 900 | 3 720 |
| | $1 750 | $11 732 | $9 280 | $11 600 | $34 362 |

C.

MASTHEAD LTD
Job Cost Sheet (Summary)

Job 45

| Labour | Materials | Overhead | Total |
|---|---|---|---|
| $4 442 | $2 560 | $3 200 | $10 202 |

D.

Work in process

| | | | |
|---|---|---|---|
| B/B | $1 750 | (6) | $30 642 |
| (1) | 11 732 | | |
| (3) | 9 280 | | |
| (4) | 11 600 | C/F | |
| | $34 362 | | $34 362 |
| Balance | 3 720 | | |

E.

Finished goods

| | | | |
|---|---|---|---|
| (6) | $30 642 | (7) | $18 882 |
| | | C/F | 11 760 |
| | 30 642 | | 30 642 |
| Balance | 11 760 | | |

## Problem 9.3 Process costing

Oldman Ltd manufactures spaghetti sauce and uses a process costing system. The sauce is produced in the Blending Department and then is transferred to the Bottling Department. The company assigns overhead using the relationship between direct labour costs and overhead costs. The production budget for the year ending 30 June 2003 estimated direct labour costs of $260 000, raw material usage of $437 500 and factory overhead of $420 000. The inventory balances as at 1 March 2003 were:

| | |
|---|---|
| Raw materials | $31 250 |
| Work in process – blending | 50 000 |
| Work in process – bottling | 37 500 |
| Finished goods | 23 750 |

During March, the following transactions took place:

1. Raw materials transferred to Blending Department, $56 250.
   Raw materials transferred to Bottling Department, $43 750.
2. Direct labour costs incurred by Blending Department, $52 500.
   Direct labour costs incurred by Bottling Department, $38 750.
   Indirect labour, $36 250.
3. Other production costs for March were:

| | |
|---|---|
| Rates and taxes | $18 750 |
| Supplies | 15 000 |
| Power | 26 250 |
| Depreciation of factory equipment | 30 000 |
| Repairs | 17 500 |

4. Goods with an assigned cost of $156 250 were transferred from the Blending Department to the Bottling Department.
5. Goods with an assigned cost of $256 250 were transferred from the Bottling Department to finished goods.
6. Finished goods with an assigned cost of $237 500 were sold on credit for $285 000.
7. Raw materials purchases were $87 500.
8. Overhead was applied to each department.

***Required:***

A. Prepare journal entries to record the March transactions. Use Factory Overhead and Overhead Applied accounts (assume factory costs were paid when incurred).
B. Was overhead underapplied or overapplied in each department? By what amount?
C. Calculate the ending work in process inventory balances in each department for both raw materials and finished goods.

## Solution

OLDMAN LTD

**A. General journal entries**

| | | | | |
|---|---|---|---|---|
| 30 June 2002 | | | | |
| 1 | | Work in process - blending | 56 250 | |
| | | Work in process - bottling | | 43 750 |
| | | Raw materials | | 100 000 |
| 2 | | Work in process -blending | 52 500 | |
| | | Work in process - bottling | 38 750 | |
| | | Factory overhead | 36 250 | |
| | | Factory wages and salaries | | 127 500 |
| 3 | | Factory overhead | 107 500 | |
| | | Cash at bank | | 77 500 |
| | | Accumulated depreciation | | 30 000 |
| 4 | | Work in process - bottling | 156 250 | |
| | | Work in process - blending | | 156 250 |
| 5 | | Finished goods | 256 250 | |
| | | Work in process - bottling | | 256 250 |
| 6 | | Cost of goods sold | 237 500 | |
| | | Accounts receivable | 285 000 | |
| | | Finished goods | | 237 500 |
| | | Sales revenue | | 285 000 |
| 7 | | Raw materials | 87 500 | |
| | | Accounts payable | | 87 500 |
| 8 | | Work in process - blending | 84 808 | |
| | | Work in process - bottling | 62 596 | |
| | | Factory overhead applied | | 147 404 |

Predetermined factory overhead application rate.
Budgeted overhead ÷ budgeted direct labour cost
$420,000 ÷ 260,000 = 161.538462% direct labour cost.

**B.**

| | | |
|---|---|---|
| Actual overhead | | $107 500 |
| Applied overhead: | | |
| Blending department | $ 84 808 | |
| Bottling department | 62 596 | 147 404 |
| Overapplied overhead | | $ 39 904 |

C.

**Work in Process — Blending**

| | | | |
|---|---|---|---|
| B/B | 50 000 | (4) | 156 250 |
| (1) | 56 250 | | |
| (2) | 52 500 | | |
| (8) | 84 808 | C/F | 87 308 |
| | 243 558 | | 243 558 |
| Bal | 87 308 | | |

**Work in Process — Bottling**

| | | | |
|---|---|---|---|
| B/B | 37 500 | (5) | 256 250 |
| (1) | 43 750 | | |
| (2) | 38 750 | | |
| (4) | 156 250 | | |
| (8) | 62 596 | C/F | 82 596 |
| | 338 846 | | 338 846 |
| Bal | 82 596 | | |

**Raw Materials**

| | | | |
|---|---|---|---|
| B/B | 31 250 | (1) | 100 000 |
| (7) | 87 500 | C/F | 18 750 |
| | 118 750 | | 118 750 |
| Bal | 18 750 | | |

**Finished Goods**

| | | | |
|---|---|---|---|
| B/B | 23 750 | (6) | 237 500 |
| (5) | 256 250 | C/F | 42 500 |
| | 280 000 | | 280 000 |
| Bal | 42 500 | | |

Ending inventory balances:

| | |
|---|---|
| Work in process - blending | $87 308 |
| Work in process- bottling | 82 596 |
| Raw materials | 18 750 |
| Finished goods | 42 500 |

## Problem 9.4 Calculating unit costs with process costing

Fantastic Figurines Pty Ltd produces plastic figurines in three consecutive processes: shaping, finishing and packaging. Materials are added at two points – at the beginning of the shaping process and at the end of the packaging process.

Production data in units for June 2002 are as follows:

| | Beginning inventory | % complete | Units started | Ending inventory | % complete |
|---|---|---|---|---|---|
| Shaping | 10 000 | 50 | 52 000 | 12 000 | 60 |
| Finishing | 4 000 | 60 | ? | 10 000 | 80 |
| Packaging | ? | 60 | ? | 7 000 | 50 |

Beginning inventory costs at 1 June 2002 are:

| | Shaping | Finishing | Packaging |
|---|---|---|---|
| Preceding department | – | $44 400 | $37 800 |
| Materials | $106 400 | – | – |
| Conversion costs | 13 800 | 2 680 | 4 200 |
| | $120 200 | $47 080 | $42 000 |

Production costs incurred during June 2002 are:

| | Shaping | Finishing | Packaging |
|---|---|---|---|
| Materials | $389 600 | – | $60 000 |
| Conversion costs | 153 600 | $69 320 | 29 200 |

At the end of June 2002, 40 000 units were transferred to finished goods.

***Required:***

A. Calculate the missing unit production data.
B. Prepare a cost of production report for each of the shaping and finishing processing centres for the month of June 2002.

## Solution

A.

FANTASTIC FIGURINES PTY LTD

**Missing unit production data:**

Finishing - Units started = units transferred out from Shaping Department

| | |
|---|---|
| Shaping - | |
| Units started | 52 000 |
| Beginning WIP | 10 000 |
| Units to be accounted for | 62 000 |
| Ending WIP | 12 000 |
| Transferred out | 50 000 |
| Finishing - | |
| Units started | 50 000 |
| Beginning WIP | 4 000 |
| Units to be accounted for | 54 000 |
| Ending WIP | 10 000 |
| Transferred out | 44 000 |
| Packaging - | |
| Units started | 44 000 |
| Beginning WIP | 3 000 |
| Units to be accounted for | 47 000 |
| Ending WIP | 7 000 |
| Transferred out | 40 000 |

B.

FANTASTIC FIGURINES PTY LTD
Shaping Department
Cost of Production Report
for the month ending 30 June, 2002

Physical flow schedule:

| | |
|---|---|
| Work in process, 1 June | 10 000 units (0.50) |
| Units started | 52 000 units |
| Units finished | 50 000 units |
| Work in process, 30 June | 12 000 units (0.60) |

Costs to be accounted for:

| Cost element | Beginning | Current | Total | Equivalent units+ | Unit cost |
|---|---|---|---|---|---|
| Raw materials | $106 400 | $389 600 | $496 000 | 62 000 | $8.000000 |
| Conversion costs | 13 800 | 153 600 | 167 400 | 57 200 | 2.926573 |
| | $120 200 | $543 200 | $663 400 | | $10.926573 |

Costs accounted for:

| | | |
|---|---|---|
| Units completed (50 000 × $10.926573) | | $546 329 |
| Work in process, 30 June: | | |
| Raw materials, 12 000 × $8.00 | $96 000 | |
| Conversion cost, 2 520 × $0.203933 | 21 071 | 117 071 |
| | | $663 400 |

+Equivalent units of production (weighted average)

| | Materials | Conv.Cost |
|---|---|---|
| Units completed | 50 000 | 50 000 |
| Equivalent units in ending inventory | 12 000 * | 7 200 ** |
| | 62 000 | 57 200 |

* (1.0) 12 000 ** (0.60) 12 000

FANTASTIC FIGURINES PTY LTD
Finishing Department
Cost of Production Report
for the month ending 30 June, 2002

Physical flow schedule:

| | |
|---|---|
| Work in process, 1 June | 4 000 units (0.60) |
| Units started | 50 000 units |
| Units finished | 44 000 units |
| Work in process, 30 June | 10 000 units (0.80) |

Costs to be accounted for:

| Cost element | Beginning | Current | Total | Equivalent units+ | Unit cost |
|---|---|---|---|---|---|
| Raw materials | $0 | $0 | $0 | 44 000 | $0.00000 |
| Conversion costs | 2 680 | 69 320 | 72 000 | 52 000 | 1.384615 |
| Transferred in | 44 400 | 546 329 | 590 729 | 54 000 | |
| | $47 080 | $615 649 | $662 729 | | $12.324041 |

Costs accounted for:

| | | |
|---|---|---|
| Units completed (44 000 × $12.324041) | | $542 258 |
| Work in process, 30 June: | | |
| Conversion cost, 8 000 × $1.384615 | 11 077 | |
| Previous dept. costs, 10 000 × $10.939426 | 109 394 | 120 471 |
| | | $662 729 |

+Equivalent units of production (weighted average)

| | Materials | Conv. Cost | Prev Dept |
|---|---|---|---|
| Units completed | 44 000 | 44 000 | 44 000 |
| Equivalent units in ending inventory | 0 | 8 000 ** | 10 000 |
| | 44 000 | 52 000 | 54 000 |

** (0.80) 10 000

## Problem 9.5 Cost of production reports for two departments

Production and inventory data for the Cooking and Packaging Departments of Goody Goody Breakfasts Ltd are as follows. The data refer to the production of Goody Bars, a breakfast bar 'for those on the run at breakfast'. All materials are entered at the beginning of each process:

| Department | Inventory, 1 July | | Inventory, 31 July | | Units transferred out |
|---|---|---|---|---|---|
| | Units | % complete | Units | % complete | |
| Cooking | 5 000 | 50 | – | – | 255 000 |
| Packaging | 10 000 | 40 | 7 500 | 70 | 257 500 |

The work in process accounts that relate to the making of Goody Bars during the month of July are presented below:

**Work in Process—Mixing**

| | | | | | |
|---|---|---|---|---|---|
| July 31 | Materials | 78 750 | July 31 | WIP—Cooking | 125 000 |
| | Labour | 21 250 | | | |
| | Factory Overhead | 29 750 | | | |

**Work in Process—Cooking**

| | | | | | |
|---|---|---|---|---|---|
| July 1 | Balance | 2 750 * | July 31 | WIP—Packaging | 153 000 |
| 31 | Labour | 5 000 | | | |
| | Factory Overhead | 20 250 | | | |
| | WIP—Mixing | 125 000 | | | |

* Transferred in $2282, conversion $468

**Work in Process—Packaging**

| | | | | | |
|---|---|---|---|---|---|
| July 1 | Balance | 8 800 ** | July 31 | Finished Goods | ? |
| 31 | Materials | 51 000 | | | |
| | Labour | 17 500 | | | |
| | Factory Overhead | 34 250 | | | |
| | WIP—Cooking | 153 000 | | | |

** Transferred in $5280, materials $1760, conversion $1760

***Required:***

Prepare a cost of production report for the Cooking Department and the Packaging Department for the production of Goody Bars for July.

## Solution

(**Note:** The breakdown of beginning inventories in cost components has been omitted from this question. These are – Cooking, Transferred in $2 282, conversion costs $468; Packaging, Transferred in $5 280, materials $1 760, and conversion costs $1 760. Units transferred out of the Packaging dept. should be 257 500. The solution below incorporates these figures.)

GOODIE GOODIE BREAKFASTS LTD
Cooking Department
Cost of Production Report
for the month ending 31 July

Physical flow schedule:

| | |
|---|---|
| Work in process, 1 July | 5 000 units (0.50) |
| Units started | 250 000 units |
| Units finished | 255 000 units |
| Work in process, 31 July | 0 units |

Costs to be accounted for:

| Cost element | Beginning | Current | Total | Equivalent units+ | Unit cost |
|---|---|---|---|---|---|
| Transferred in | $468 | $125 000 | $125 468 | 255 000 | $0.492031 |
| Conversion costs | 2 282 | 25 250 | 27 532 | 255 200 | 0.107969 |
| | $2 750 | $150 250 | $153 000 | | $0.600000 |

Costs accounted for:

| | |
|---|---|
| Units completed (255 000 × $0.600000) | $153 000 |

+Equivalent units of production (weighted average)

| | Materials | Conv. Cost |
|---|---|---|
| Units completed | 255 000 | 255 000 |
| | 255 000 | 255 000 |

GOODIE GOODIE BREAKFASTS LTD
Packaging Department
Cost of Production Report
for the month ending 31 July

Physical flow schedule:

| | |
|---|---|
| Work in process, 1 July | 10 000 units (0.40) |
| Units started | 255 000 units |
| Units finished | 257 500 units |
| Work in process, 31 July | 7 500 units (0.70 ) |

Costs to be accounted for:

| Cost element | Beginning | Current | Total | Equivalent units+ | Unit cost |
|---|---|---|---|---|---|
| Raw materials | $1 760 | $51 000 | $52 760 | 265 000 | $0.199094 |
| Conversion costs | 1 760 | 51 750 | 53 510 | 262 750 | 0.203654 |
| Transferred in | 5 280 | 153 000 | 158 280 | 265 000 | 0.597283 |
| | $8 800 | $255 750 | $264 550 | | $1.000031 |

Costs accounted for:

| | | |
|---|---|---|
| Units completed (257 500 × $1.000031) | | $257 508 |
| Work in process, 30 June: | | |
| Raw materials, 7 500x $0. 199094 | $1 493 | |
| Conversion cost, 2 520 × $0.203654 | 1 069 | |
| Previous dept. costs, 4 200 × $0.597283 | 4 480 | 7 042 |
| | | $264 550 |

+Equivalent units of production (weighted average)

| | Materials | Conv. Cost | Prev Dept |
|---|---|---|---|
| Units completed | 257 500 | 257 500 | 257 500 |
| Equivalent units in ending inventory | 7 500 * | 5 250 ** | 7 500 |
| | 265 000 | 252 750 | 265 000 |

* (1.0) 7 500 ** (0.70) 7 500