

SOLUTIONS TO END-OF-CHAPTER QUESTIONS

CHAPTER 15

► RECALL AND REVIEW

► Question 15.1

- Normal losses: Normal losses are caused by evaporation, chemical reactions or other natural spoilage during the production process. Normal losses are allowed for in the budget for each process and they are always valued at £Nil. The cost of normal losses is rolled up into the costs of each process and is therefore included in the cost of finished production.
- Abnormal losses: Abnormal losses are unexpected losses that exceed the normal losses from a process. Unlike normal losses, abnormal losses are valued and accounted for separately. They are valued at the unit cost of the expected finished output from the process. The cost of abnormal losses is not included in the cost of finished production and is charged instead as an expense in the costing statement of profit or loss.
- Abnormal gains: Abnormal gains arise when the actual losses from a process are lower than the expected normal losses. Abnormal gains are valued and accounted for separately. Abnormal gains are not deducted from the production cost of finished products but are instead recognized as an additional source of income in the costing statement of profit or loss.
- Disposal costs of normal losses: Normal losses may take the form of actual waste products which have to be disposed of. The disposal cost of normal losses is part of the regular operation of the process and so is added to the cost of finished production.
- Disposal costs of abnormal losses: Abnormal losses may also take the form of actual waste products from a process. These abnormal losses must also be disposed of. The disposal cost of abnormal losses is not part of the regular operation of the process and so is added to the costs in the abnormal loss account. As in the case of abnormal losses, any disposal costs associated with abnormal losses will not be included in the cost of finished production.
- Proceeds from the sale of normal losses: Waste products from normal losses may be sold to other entities. Proceeds from the sale of normal losses will be credited to the process account and thereby reduce the costs of the production process. Thus, proceeds from the sale of normal losses are deducted from and so included in the cost of finished production.
- Proceeds from the sale of abnormal losses: Proceeds from the sale of abnormal losses will be credited to the abnormal loss account to reduce the cost of abnormal losses. As such, they will not be deducted from and so are not included in the cost of finished production.

Question 15.2**Production process 5 account**

	Kg	£		Kg	£
Materials	15,000	60,000	Transfer to process 6 (2)	13,500	81,000
Labour		20,000	Normal loss	1,000	—
Overhead		3,000	Abnormal loss (3)	500	3,000
Normal loss disposal (1)		1,000			
	<u>15,000</u>	<u>84,000</u>		<u>15,000</u>	<u>84,000</u>

Notes
 (1) Disposal cost of normal loss: 1,000 kg x £1 = £1,000.
 Per kg cost of finished production: £84,000 production costs ÷ (15,000 kg input material – 1,000 kg normal loss) = £6.
 (2) Total cost of finished production transferred to Process 6: £6 per kg of finished production x 13,500 kgs = £81,000.
 (3) Abnormal losses: £6 per kg of finished production x 500kg = £3,000.

DEVELOP YOUR UNDERSTANDING**Question 15.3**

The process account for Aloo Brew for March

Iron Bar Limited: Aloo Brew process account for March

	Litres	£		Litres	£
Materials	30,000	7,425	To bottling section	30,000	15,000
Labour		4,950			
Overhead		2,625			
	<u>30,000</u>	<u>15,000</u>		<u>30,000</u>	<u>15,000</u>

There are no normal losses in the Aloo Brew process as normal losses are estimated to be 0% of input of materials to the process. Therefore, all materials input should result in material output. As 30,000 litres were input to the process and 30,000 litres of finished production were transferred to the bottling section, there is no abnormal loss or abnormal gain to account for.

Per litre cost of production: £15,000 ÷ 30,000 litres = **£0.50**.

Question 15.4

The expected normal loss is 12,000 kilograms of input material × 10% = **1,200 kilograms**. Expected finished product from 12,000 kilograms is thus 12,000 kilograms – 1,200 kilograms = 10,800 kilograms.

As only 10,600 kilograms of finished goods were produced in the month, this means that there was an abnormal loss of 10,800 kilograms – 10,600 kilograms = **200 kilograms**.

Total process costs: £51,000 + £27,000 + £19,200 = **£97,200**. Expected production: 10,800 kilograms.

Therefore, the per kilogram cost for production and abnormal losses for the month (remember normal losses are not valued) = $\pounds 97,200 \div 10,800$ kilograms = **$\pounds 9$ per kilogram**.

Value of production transferred to finished goods: 10,600 kilograms $\times \pounds 9 = \pounds 95,400$. Abnormal loss transferred to the abnormal loss account: 200 kilograms $\times \pounds 9 = \pounds 1,800$.

The Big Bang Chemical Company: Whimper process account for October

	Kilos	£		Kilos	£
Materials	12,000	51,000	Finished goods	10,600	95,400
Labour		27,000	Normal loss	1,200	—
Overhead		19,200	Abnormal loss	200	1,800
	<u>12,000</u>	<u>97,200</u>		<u>12,000</u>	<u>97,200</u>

» Question 15.5

The expected normal loss is 25,000 litres of input material $\times 6\% = 1,500$ litres.

Expected finished product from 25,000 litres is thus 25,000 litres – 1,500 litres = 23,500 litres.

As 24,000 litres of engine oil were produced in the month, this means that there was an abnormal gain of 24,000 litres – 23,500 litres = **500 litres**.

Total process costs: $\pounds 52,875 + \pounds 22,325 + \pounds 28,200 = \pounds 103,400$. Expected production: 23,500 litres.

Therefore, the per litre cost for production and abnormal gains for the month (remember normal losses are not valued) = $\pounds 103,400 \div 23,500$ litres = **$\pounds 4.40$ per litre**.

Value of production transferred to finished goods: 24,000 litres $\times \pounds 4.40 = \pounds 105,600$. Abnormal gain transferred to the abnormal gain account: 500 litres $\times \pounds 4.40 = \pounds 2,200$.

Inedible Oils plc: Engine oil process account for June

	Litres	£		Litres	£
Materials	25,000	52,875	Finished goods	24,000	105,600
Labour		22,325	Normal loss	1,500	—
Overhead		28,200			
Abnormal gain	500	2,200			
	<u>25,500</u>	<u>105,600</u>		<u>25,500</u>	<u>105,600</u>

» Question 15.6

The expected normal loss is 7,500 litres of input material $\times 12\% = 900$ litres.

Expected finished product from 7,500 litres of input material is thus 7,500 litres – 900 litres normal loss = 6,600 litres.

As 6,450 litres of moisturising cream were produced in the month, this means that there was an abnormal loss of 6,600 litres expected production – 6,450 litres actual production = **150 litres**.

The scrap value of normal loss: 900 litres $\times \pounds 0.80 = \pounds 720$. The scrap value of abnormal loss: 150 litres $\times \pounds 0.80 = \pounds 120$.

Total process costs: $\pounds 26,500 + \pounds 11,880 + \pounds 8,540 - \pounds 720 = \pounds 46,200$. Expected production: 6,600 litres.

Therefore, the per litre cost for production and abnormal loss for the month (remember normal losses are not valued) = $\text{£}46,200 \div 6,600 \text{ litres} = \text{£}7.00 \text{ per litre}$.

Value of production transferred to finished goods: $6,450 \text{ litres} \times \text{£}7.00 = \text{£}45,150$. Abnormal loss transferred to the abnormal loss account: $150 \text{ litres} \times \text{£}7.00 = \text{£}1,050$.

SCT Limited: Moisturising cream process account for August

	Litres	£		Litres	£
Materials	7,500	26,500	Finished goods	6,450	45,150
Labour		11,880	Normal loss scrap value	900	720
Overhead		8,540	Abnormal loss	150	1,050
	<u>7,500</u>	<u>46,920</u>		<u>7,500</u>	<u>46,920</u>

SCT Limited: Abnormal loss account: August

	£		£
Moisturising cream process	1,050	Scrap account	120
	<u>1,050</u>	Costing statement of profit or loss	930
	<u>1,050</u>		<u>1,050</u>

SCT Limited: Scrap account: August

	£		£
Normal loss scrap value	720	Bank	840
Abnormal loss	120		<u>840</u>
	<u>840</u>		<u>840</u>

» Question 15.7

The expected normal loss is $30,000 \text{ litres of input material} \times 20\% = 6,000 \text{ litres}$.

Expected finished product from 30,000 litres is thus $30,000 \text{ litres} - 6,000 \text{ litres} = 24,000 \text{ litres}$. As 23,750 litres of luxury ice cream were produced in the month, this means that there was an abnormal loss of $24,000 \text{ litres} - 23,750 \text{ litres} = 250 \text{ litres}$.

Disposal costs of normal losses: $6,000 \text{ litres} \times \text{£}0.20 = \text{£}1,200$.

Total process costs: $30,000 \text{ litres} \times \text{£}0.66 \text{ (materials)} + 1,000 \text{ hours} \times \text{£}10 \text{ per hour (labour)} + 1,000 \text{ hours} \times \text{£}5 \text{ per hour (overhead)} + \text{£}1,200 \text{ (disposal costs of normal losses)} = \text{£}36,000$.

Expected production: 24,000 litres.

Therefore, the per litre cost for production and abnormal losses for the month (remember normal losses are not valued) = $\text{£}36,000 \div 24,000 \text{ litres} = \text{£}1.50 \text{ per litre}$.

Value of production transferred to finished goods: $23,750 \text{ litres} \times \text{£}1.50 = \text{£}35,625$. Abnormal loss transferred to the abnormal loss account: $250 \text{ litres} \times \text{£}1.50 = \text{£}375$.

Disposal costs of abnormal losses: $250 \times \text{£}0.20 = \text{£}50$. £50 is debited to the abnormal loss account and credited to the disposal costs account.

Mr Threshy Limited: Ice cream process account for April

	Litres	£		Litres	£
Materials	30,000	19,800	Finished goods	23,750	35,625
Labour		10,000	Normal loss	6,000	—
Overhead		5,000	Abnormal loss	250	375
Normal loss disposal		1,200			
	<u>30,000</u>	<u>36,000</u>		<u>30,000</u>	<u>36,000</u>

Mr Threshy Limited: Abnormal loss account for April

	£		£
Process account	375	Costing statement of profit or loss	425
Disposals account	50		
	<u>425</u>		<u>425</u>

Mr Threshy Limited: Disposal cost account April

	£		£
Bank	1,250	Process account (normal loss)	1,200
		Abnormal loss	50
	<u>1,250</u>		<u>1,250</u>

»» TAKE IT FURTHER**»» Question 15.8****Mobo Chemicals Limited**

Value of output and closing work in progress when finished production and closing work in progress are valued using the first in first out method

Step 1: Calculate equivalent units of production

	Total units	Materials		Labour and overhead		
		% to complete	Equivalent units	Total units	% to complete	Equivalent units
Finished output						
Opening WIP completed	10,000	× 20%	2,000	10,000	× 50%	5,000
Other units started and finished in December	<u>30,000</u>	× 100%	<u>30,000</u>	<u>30,000</u>	× 100%	<u>30,000</u>
Total production in period	40,000		32,000	40,000		35,000
Closing WIP	5,000	× 60%	3,000	5,000	× 20%	1,000
	<u>45,000</u>		<u>35,000</u>	<u>45,000</u>		<u>36,000</u>

Step 2: Calculate the cost per equivalent unit of output and work in progress

Remember that under the first in first out method of valuing finished production and closing work in progress, the costs of opening work in progress are ignored in the cost per equivalent unit calculations. Only the costs incurred in the period are used to determine the cost per equivalent unit of materials and labour and overhead under this method.

Materials

- Cost of material incurred in December: £105,350.
- The cost per equivalent unit of completed output and closing work in progress for 35,000 equivalent units of material is therefore $£105,350 \div 35,000 = £3.01$.
- The materials in completed production and closing work in progress will therefore be valued at
- £3.01 per equivalent unit of material input.

Labour and overhead

- Cost of labour and overhead incurred in December: £147,600.
- The cost per equivalent unit of completed output and closing work in progress for 36,000 equivalent units of labour and overhead is therefore $£147,600 \div 36,000 = £4.10$.
- The labour and overhead in completed production and closing work in progress will therefore be valued at £4.10 per unit of labour and overhead input.

Step 3: Calculate the total cost of output and work in progress.

Cost of output of completed production:

	£
Opening work in progress cost brought forward at 1 December	44,637
Completion of work in progress:	
2,000 equivalent units of material: $2,000 \times £3.01$	6,020
5,000 equivalent units of labour and overhead: $5,000 \times £4.10$	20,500
Production started and finished in December	
30,000 equivalent units of material: $30,000 \times £3.01$	90,300
30,000 equivalent units of labour and overhead: $30,000 \times £4.10$	123,000
Total cost of completed output during December	<u>284,457</u>

Closing work in progress valuation:

	£
3,000 equivalent units of material: $3,000 \times £3.01$	9,030
1,000 equivalent units of labour and overhead: $1,000 \times £4.10$	4,100
Total cost of work in progress at the end of December	<u>13,130</u>

Step 4: Complete the process account

Mobo Chemicals Limited: process account for December

	Litres	£		Litres	£
WIP b/f	10,000	44,637	Completed in month	40,000	284,457
Materials	35,000	105,350	WIP c/f	5,000	13,130
Labour and overhead		147,600			
	<u>45,000</u>	<u>297,587</u>		<u>45,000</u>	<u>297,587</u>

Mobo Chemicals Limited

Value of output and closing work in progress when finished production and closing work in progress are valued using the weighted average cost method

Step 1: Calculate the equivalent units of production

	Materials			Labour and overhead		
	Total units	% complete	Equivalent units	Total units	% complete	Equivalent units
Output completed	40,000	× 100%	40,000	40,000	× 100%	40,000
Work in progress	5,000	× 60%	3,000	5,000	× 20%	1,000
Total units	<u>45,000</u>		<u>43,000</u>	<u>45,000</u>		<u>41,000</u>

Step 2: Calculate the cost per equivalent unit of output and work in progress

Remember that under the weighted average cost method of valuing finished production and closing work in progress, the costs of opening work in progress are *not* ignored in the cost per equivalent unit calculations but are added to the material and conversion costs incurred in the period. Both the costs of opening work in progress and the costs incurred in the period are used to determine the cost per equivalent unit of materials and of labour and overhead.

Materials

- Cost of materials in opening work in progress: £26,187.
- Cost of materials in December: £105,350.
- Combined material cost for December: £26,187 + £105,350 = £131,537.
- Cost per equivalent unit of completed output and closing work in progress for 43,000 equivalent units of material: £131,537 ÷ 43,000 = £3.059.
- The materials in completed production and closing work in progress will therefore be valued at £3.059 per equivalent unit of material input.

Labour and overhead

- Cost of labour and overhead in opening work in progress: £18,450.
- Cost of labour and overhead in December: £147,600.
- Combined labour and overhead cost for the month: £18,450 + £147,600 = £166,050.
- Cost per equivalent unit of completed output and closing work in progress for 41,000 equivalent units of labour and overhead: £166,050 ÷ 41,000 = £4.05.

- The labour and overhead in completed production and closing work in progress will therefore be valued at £4.05 per unit of labour and overhead input.

Step 3: Calculate the total cost of output and work in progress

	£
Completed production in December	
40,000 equivalent units of material: $40,000 \times \text{£}3.059$	122,360
40,000 equivalent units of labour and overhead: $40,000 \times \text{£}4.05$	162,000
Total cost of completed output during December	<u>284,360</u>

The closing work in progress is valued as follows:

	£
3,000 equivalent units of material: $3,000 \times \text{£}3.059$	9,177
1,000 equivalent units of labour and overhead: $1,000 \times \text{£}4.05$	4,050
Total cost of work in progress at the end of December	<u>13,227</u>

Step 4: Complete the process account

Mobo Chemicals Limited: process account for December

	Litres	£		Litres	£
WIP b/f	10,000	44,637	Output	40,000	284,360
Materials	35,000	105,350	WIP c/f	5,000	13,227
Labour and overhead		147,600			
	<u>45,000</u>	<u>297,587</u>		<u>45,000</u>	<u>297,587</u>

»» Question 15.9

Giant Plant Fertilisers Limited

Value of output and closing work in progress when finished production and closing work in progress are valued using the first in first out method

Step 1: Calculate equivalent units of production

	Materials			Labour and overhead		
	Total units	% to complete	Equivalent units	Total units	% to complete	Equivalent units
Finished output						
Opening WIP completed	12,000	$\times 30\%$	3,600	12,000	$\times 65\%$	7,800
Other units started and finished in May	<u>72,800</u>	$\times 100\%$	<u>72,800</u>	<u>72,800</u>	$\times 100\%$	<u>72,800</u>
Total production in period	84,800		76,400	84,800		80,600
Closing WIP	20,000	$\times 68\%$	13,600	20,000	$\times 37\%$	7,400
	<u>104,800</u>		<u>90,000</u>	<u>104,800</u>		<u>88,000</u>

Step 2: Calculate the cost per equivalent unit of output and work in progress

Remember that under the first in first out method of valuing finished production and closing work in progress, the costs of opening work in progress are ignored in the cost per equivalent unit calculations. Only the costs incurred in the period are used to determine the cost per equivalent unit of materials and labour and overhead under this method.

Materials

- Cost of material incurred in May: £442,800.
- The cost per equivalent unit of completed output and closing work in progress for 90,000 equivalent units of material is therefore $£442,800 \div 90,000 = £4.92$.
- The materials in completed production and closing work in progress will therefore be valued at £4.92 per equivalent unit of material input.

Labour and overhead

- Cost of labour and overhead incurred in May: £304,260.
- The cost per equivalent unit of completed output and closing work in progress for 88,000 equivalent units of labour and overhead is therefore $£304,260 \div 88,000 = £3.4575$.
- The labour and overhead in completed production and closing work in progress will therefore be valued at £3.4575 per unit of labour and overhead input.

Step 3: Calculate the total cost of output and work in progress.

Cost of output of completed production:

	£
Opening work in progress cost brought forward at 1 May	66,873
Completion of work in progress:	
3,600 equivalent units of material: $3,600 \times £4.92$	17,712
7,800 equivalent units of labour and overhead: $7,800 \times £3.4575$ (rounded)	26,969
Production started and finished in May	
72,800 equivalent units of material: $72,800 \times £4.92$	358,176
72,800 equivalent units of labour and overhead: $72,800 \times £3.4575$	251,706
Total cost of completed output during May	<u>721,436</u>

Closing work in progress valuation:

	£
13,600 equivalent units of material: $13,600 \times £4.92$	66,912
7,400 equivalent units of labour and overhead: $7,400 \times £3.4575$ (rounded)	25,585
Total cost of work in progress at the end of May	<u>92,497</u>

Step 4: Complete the process account**Giant Plant Fertilisers Limited: process account for May**

	Litres	£		Litres	£
WIP b/f	12,000	66,873	Completed in month	84,800	721,436
Materials	92,800	442,800	WIP c/f	20,000	92,497
Labour and overhead		304,260			
	104,800	813,933		104,800	813,933

Giant Plant Fertilisers Limited

Value of output and closing work in progress when finished production and closing work in progress are valued using the weighted average cost method

Step 1: Calculate the equivalent units of production

	Materials			Labour and overhead		
	Total units	% complete	Equivalent units	Total units	% complete	Equivalent units
Output completed	84,800	× 100%	84,800	84,800	× 100%	84,800
Work in progress	20,000	× 68%	13,600	20,000	× 37%	7,400
Total units	104,800		98,400	104,800		92,200

Step 2: Calculate the cost per equivalent unit of output and work in progress

Remember that under the weighted average cost method of valuing finished production and closing work in progress, the costs of opening work in progress are *not* ignored in the cost per equivalent unit calculations but are added to the material and conversion costs incurred in the period. Both the costs of opening work in progress and the costs incurred in the period are used to determine the cost per equivalent unit of materials and of labour and overhead.

Materials

- Cost of materials in opening work in progress: £51,660.
- Cost of materials in May: £442,800.
- Combined material cost for May: £51,660 + £442,800 = £494,460.
- Cost per equivalent unit of completed output and closing work in progress for 98,400 equivalent units of material: £494,460 ÷ 98,400 = £5.025.
- The materials in completed production and closing work in progress will therefore be valued at
- £5.025 per equivalent unit of material input.

Labour and overhead

- Cost of labour and overhead in opening work in progress: £15,213.
- Cost of labour and overhead in May: £304,260.
- Combined labour and overhead cost for the month: £15,213 + £304,260 = £319,473.

- Cost per equivalent unit of completed output and closing work in progress for 92,200 equivalent units of labour and overhead: $\text{£}319,473 \div 92,200 = \text{£}3.465$.
- The labour and overhead in completed production and closing work in progress will therefore be valued at $\text{£}3.465$ per unit of labour and overhead input.

Step 3: Calculate the total cost of output and work in progress

	£
Completed production in May	
84,800 equivalent units of material: $84,800 \times \text{£}5.025$	426,120
84,800 equivalent units of labour and overhead: $84,800 \times \text{£}3.465$	293,832
Total cost of completed output during May	<u>719,952</u>

The closing work in progress is valued as follows:

	£
13,600 equivalent units of material: $13,600 \times \text{£}5.025$	68,340
7,400 equivalent units of labour and overhead: $7,400 \times \text{£}3.465$	25,641
Total cost of work in progress at the end of May	<u>93,981</u>

Step 4: Complete the process account

Giant Plant Fertilisers Limited: process account for May

	Litres	£		Litres	£
WIP b/f	12,000	66,873	Output	84,800	719,952
Materials	92,800	442,800	WIP c/f	20,000	93,981
Labour and overhead		304,260			
	<u>104,800</u>	<u>813,933</u>		<u>104,800</u>	<u>813,933</u>

»» Question 15.10

Acetic Industries Limited

Process 1

The expected normal loss is 47,000 litres of input material $\times 5\% = 2,350$ litres.

Expected finished product from 47,000 litres of input: 47,000 litres – 2,350 litres normal loss = 44,650 litres.

As Process 1 produced 44,000 litres in the month, this means that there was an abnormal loss of 44,650 litres – 44,000 litres = 650 litres.

Sale proceeds from normal loss: 2,350 litres $\times \text{£}1.20 = \text{£}2,820$.

Total process costs: $\text{£}129,250 + \text{£}31,300 + \text{£}20,870 - \text{£}2,820 = \text{£}178,600$. Expected production: 44,650 litres.

Therefore, the per litre cost for production and abnormal loss for the month (remember normal losses are not valued) = $\text{£}178,600 \div 44,650$ litres = $\text{£}4.00$ per litre.

Value of production transferred to Process 2: 44,000 litres \times £4.00 = £176,000. Abnormal loss transferred to the abnormal loss account: 650 litres \times £4.00 = £2,600.

Acetic Industries Limited: Process 1 account for July

	Litres	£		Litres	£
Materials	47,000	129,250	Output to Process 2	44,000	176,000
Labour		31,300	Normal loss scrap value	2,350	2,820
Overhead		20,870	Abnormal loss	650	2,600
	<u>47,000</u>	<u>181,420</u>		<u>47,000</u>	<u>181,420</u>

Sale proceeds from sale of abnormal loss: 650 litres \times £1.20 = £780

Acetic Industries Limited: Abnormal loss account for July

	£		£
Process 1 account	2,600	Scrap account	780
	<u>2,600</u>	Costing statement of profit or loss	1,820
			<u>2,600</u>

Acetic Industries Limited: Scrap account July

	£		£
Process 1 (normal loss)	2,820	Balance c/f	3,600
Abnormal loss	780		
	<u>3,600</u>		<u>3,600</u>

Process 2

Acetic Industries Limited: Value of output and closing work in progress when finished production and closing work in progress are valued using the first in first out method

Step 1: Calculate equivalent units of production

	Materials			Labour and overhead		
	Total Units	% to complete	Equivalent units	Total units	% to complete	Equivalent units
Finished output						
Opening WIP completed	6,000	\times 0%	—	6,000	\times 50%	3,000
Other units started and finished in July	<u>40,000</u>	\times 100%	<u>40,000</u>	<u>40,000</u>	\times 100%	<u>40,000</u>
Total production in period	46,000		40,000	46,000		43,000
Closing WIP	4,000	\times 100%	4,000	4,000	\times 50%	2,000
	<u>50,000</u>		<u>44,000</u>	<u>50,000</u>		<u>45,000</u>

Step 2: Calculate the cost per equivalent unit of output and work in progress

Remember that under the first in first out method of valuing finished production and closing work in progress, the costs of opening work in progress are ignored in the cost per equivalent unit calculations. Only the costs incurred in the period are used to determine the cost per equivalent unit of materials and labour and overhead under this method.

Materials

- Cost of material transferred from Process 1 in July: £176,000.
- The cost per equivalent unit of completed output and closing work in progress for 44,000 equivalent units of material is therefore $£176,000 \div 44,000 = £4.00$.
- The materials in completed production and closing work in progress will therefore be valued at £4.00 per equivalent unit of material input.

Labour and overhead

- Cost of labour and overhead incurred in July: £207,360.
- The cost per equivalent unit of completed output and closing work in progress for 45,000 equivalent units of labour and overhead is therefore $£207,360 \div 45,000 = £4.608$.
- The labour and overhead in completed production and closing work in progress will therefore be valued at £4.608 per unit of labour and overhead input.

Step 3: Calculate the total cost of output and work in progress.

Cost of output of completed production:

	£
Opening work in progress cost brought forward at 1 July	35,760
Completion of work in progress:	
0 equivalent units of material: $0 \times £4.00$	—
3,000 equivalent units of labour and overhead: $3,000 \times £4.608$	13,824
Production started and finished in July	
40,000 equivalent units of material: $40,000 \times £4.00$	160,000
40,000 equivalent units of labour and overhead: $40,000 \times £4.608$	184,320
Total cost of completed output during July	<u>393,904</u>

Closing work in progress valuation:

	£
4,000 equivalent units of material: $4,000 \times £4.00$	16,000
2,000 equivalent units of labour and overhead: $2,000 \times £4.608$	9,216
Total cost of work in progress at the end of July	<u>25,216</u>

Step 4: Complete the process account

Acetic Industries Limited: process account for July

	Litres	£		Litres	£
WIP b/f	6,000	35,760	Finished goods	46,000	393,904
Materials	44,000	176,000	WIP c/f	4,000	25,216
Labour and overhead		207,360			
	<u>50,000</u>	<u>419,120</u>		<u>50,000</u>	<u>419,120</u>

Acetic Industries Limited: Value of output and closing work in progress when finished production and closing work in progress are valued using the weighted average cost method

Step 1: Calculate the equivalent units of production

T	Materials			Labour and overhead		
	Total units	% complete	Equivalent units	Total units	% complete	Equivalent units
Output completed	46,000	× 100%	46,000	46,000	× 100%	46,000
Work in progress	4,000	× 100%	4,000	4,000	× 50%	2,000
Total units	<u>50,000</u>		<u>50,000</u>	<u>50,000</u>		<u>48,000</u>

Step 2: Calculate the cost per equivalent unit of output and work in progress

Remember that under the weighted average cost method of valuing finished production and closing work in progress, the costs of opening work in progress are *not* ignored in the cost per equivalent unit calculations but are added to the material and conversion costs incurred in the period. Both the costs of opening work in progress and the costs incurred in the period are used to determine the cost per equivalent unit of materials and of labour and overhead.

Materials

- Cost of materials in opening work in progress: £22,800.
- Cost of materials in July: £176,000.
- Combined material cost for July: £22,800 + £176,000 = £198,800.
- Cost per equivalent unit of completed output and closing work in progress for 50,000 equivalent units of material: £198,800 ÷ 50,000 = £3.976.
- The materials in completed production and closing work in progress will therefore be valued at £3.976 per equivalent unit of material input.

Labour and overhead

- Cost of labour and overhead in opening work in progress: £12,960.
- Cost of labour and overhead in July: £207,360.
- Combined labour and overhead cost for the month: £12,960 + £207,360 = £220,320.
- Cost per equivalent unit of completed output and closing work in progress for 48,000 equivalent units of labour and overhead: £220,320 ÷ 48,000 = £4.59.

- The labour and overhead in completed production and closing work in progress will therefore be valued at £4.59 per unit of labour and overhead input.

Step 3: Calculate the total cost of output and work in progress

	£
Completed production in July:	
46,000 equivalent units of material: $46,000 \times \text{£}3.976$	182,896
46,000 equivalent units of labour and overhead: $46,000 \times \text{£}4.59$	211,140
Total cost of completed output during July	<u>394,036</u>

The closing work in progress is valued as follows:

	£
4,000 equivalent units of material: $4,000 \times \text{£}3.976$	15,904
2,000 equivalent units of labour and overhead: $2,000 \times \text{£}4.59$	9,180
Total cost of work in progress at the end of July	<u>25,084</u>

Step 4: Complete the process account

Acetic Industries Limited: process account for July

	Litres	£		Litres	£
WIP b/f	6,000	35,760	Finished goods	46,000	394,036
Materials	44,000	176,000	WIP c/f	4,000	25,084
Labour and overhead		207,360			
	<u>50,000</u>	<u>419,120</u>		<u>50,000</u>	<u>419,120</u>