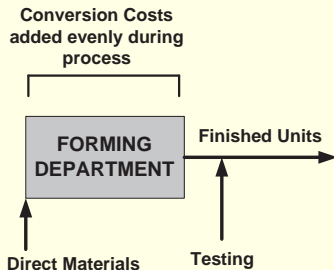


- **Spoilage:** Units of production, either fully or partially completed, that do not meet the specifications required by customers for good units and that are discarded or sold for reduced prices
- **Rework:** Units of production that do not meet the specifications required by customers but which are subsequently repaired and sold as good finished goods
- **Scrap:** residual material that results from manufacturing a product. Scrap has low total sales value compared with the total sales value of the product

- **Normal Spoilage:** Spoilage inherent in a particular production process that arises under efficient operating conditions
 - Management determines the normal spoilage rate
 - Costs of normal spoilage are typically included as a component of the **costs of good units manufactured**
- **Abnormal Spoilage:** Spoilage that is not inherent in a particular production process and would not arise under normal operating conditions
 - Abnormal spoilage is considered avoidable and controllable
 - Units of abnormal spoilage are calculated and recorded in the **Loss from Abnormal Spoilage** account, which appears as a separate line item on the income statement

Anzio Company manufactures a wooden recycling container in its Forming Department. Direct materials are added at the beginning of the production cycle. Conversion costs are added during production. Some units are spoiled as a result of defects, which are detectable only upon inspection of finished units. Normally, spoiled units are 10% of the finished output of good units.



 Physical Units for July

Work in process, beginning inventory (July 1)	1,500 units
Direct materials 100%, conversion costs 60% complete	
Started during July	8,500 units
Completed and transferred out during July	7000 good units
Work in process, ending inventory, (July 31)	2,000 units
Direct materials 100%, conversion costs 50% complete	

 Total Costs for July

Work in process beginning inventory		
Direct materials (1,500 equivalent units × \$8)	12,000	
Conversion costs (900 equivalent units × \$10)	9,000	21,000
	<hr/>	
Direct material costs added during July		\$76,500
Conversion costs added during July		89,100
Total costs to account for		<hr/> \$186,600 <hr/>

- Total spoilage = beginning units + units started - good units completed - ending units
Total spoilage = $(1,500 + 8,500) - (7,000 + 2,000) = 1,000$ units
- Normal spoilage = 10% of good units = $7,000 \times 10\% = 700$ units
- Abnormal spoilage = Total spoilage - Normal spoilage = $1,000 - 700 = 300$ units

Flow of Production	Step 1	Step 2	
	Physical Units	Direct Materials	Conversion Costs
Work in process, beginning	1,500		
Started during current period	8,500		
To account for	10,000		
Good units completed during current period	7,000	7,000	7,000
Normal spoilage	700	700	700
Abnormal spoilage	300	300	300
Work in process, ending (2,000 × 100%; 2,000 × 50%)	2,000	2,000	1,000
Accounted for	10,000		
Work done to date		10,000	9,000

- Step 3

	Total Costs	Direct Materials	Conversion Costs
Work in process, beginning	21,000	12,000	9,000
Costs added in current period	165,600	76,500	89,100
Costs incurred to date		88,500	98,100

Direct Material cost per equivalent unit of work done to date:

$$88,500 / 10,000 = \$8.85$$

Conversion cost per equivalent unit of work done to date:

$$98,100 / 9000 = \$10.9$$

- Step 4: Total costs to account for = \$186,600

- Step 5

Good units completed	
Costs before adding normal spoilage ($7,000 \times (\$8.85 + \$10.9)$)	\$138,250
Normal spoilage ($700 \times (\$8.85 + \$10.9)$)	\$13,825
Total cost of good units	<u>152,075</u>
Abnormal spoilage ($300 \times (\$8.85 + \$10.9)$)	5,925
Work in process, ending (2,000 units)	
Direct materials ($2,000 \times \$8.85$)	17,700
Conversion Costs ($1,000 \times \$10.9$)	10,900
Total work in process	<u>28,600</u>
Total costs accounted for	<u>186,600</u>

Flow of Production	Physical Units	Equivalent Units	
		Direct Materials	Conversion Costs
Work in process, beginning	1,500		
Started during current period	8,500		
To account for	10,000		
Completed during current period			
From beginning work in process	1,500		
[$1,500 \times (100\% - 100\%)$; $1,500 \times (100\% - 60\%)$]		0	600
Started and completed	5,500	5,500	5,500
Normal spoilage	700	700	700
Abnormal spoilage	300	300	300
Work in process, ending	2,000		
($2,000 \times 100\%$; $2,000 \times 50\%$)		2000	1000
Accounted for	10,000		
Work done in current period only		8,500	8,100

- Step 3

Direct material cost per equivalent unit of work done in current period:

$$76,500 / 8,500 = \$9$$

Conversion cost per equivalent unit of work done in current period:

$$89,100 / 8,100 = \$11$$

- Step 4

Total costs to account for: \$186,600

● Step 5

Good units completed (7,000 units)	
Work in process, beginning (1,500 units)	\$21,000
Direct materials added in current period	0
Conversion costs added in current period (600 × \$11)	6,600
Total from beginning inventory before normal spoilage	<u>27,600</u>
Started and completed before normal spoilage (5,500 × (\$9 + \$11))	110,000
Normal spoilage (700 × (\$9 + \$11))	14,000
Total costs of good units completed	<u>151,600</u>
Abnormal spoilage (300 × (\$9 + \$11))	6,000
Work in process, ending (2,000 units)	
Direct materials (2,000 × \$9)	18,000
Conversion costs (1,000 × \$11)	11,000
Total work in process, ending	<u>29,000</u>
Total costs accounted for	<u>\$186,600</u>

Weighted Average Method:

Finished Goods	152,075	
Work in Process - Forming		152,075

Loss from Abnormal Spoilage	5,925	
Work in Process - Forming		5,925

For FIFO Method:

Finished Goods	151,600	
Work in Process - Forming		151,600

Loss from Abnormal Spoilage	6,000	
Work in Process - Forming		6,000

- Costs of normal spoilage are inventoriable costs
- Cost of abnormal spoilage are not considered to be inventoriable and are written of as costs of the period during which abnormal spoilage is detected
- Example Setting: In the Hull Machine Shop, 5 aircraft parts out of a job lot of 50 aircraft parts are spoiled. Costs assigned prior to the inspection point are \$2,000 per part. Our focus is on how the \$2,000 cost per part is accounted for. When the spoilage is detected, the spoiled goods are inventoried at \$600 per part, the net disposal value

- Normal spoilage attributable to a specific job
 - When normal spoilage occurs because of the specifications of a particular job, that job bears the cost of the spoilage reduced by the disposal value.

Materials Control	3,000
Work-in-Process Control	3,000

- Note that WIP Control has already been debited \$100,000; \$10,000 for the spoiled parts. The \$3,000 credit makes the net cost of normal spoilage \$7,000. The total cost of the 45 good units is \$97,000; \$90,000 for producing good units and \$7,000 net cost of normal spoilage. The cost per good unit is $(97,000 / 45) = \$2,155.56$

- Normal Spoilage common to all jobs

- Spoilage inherent in production: Not charged to the specific job. Instead, costed as a manufacturing overhead

Materials Control	3,000	
Manufacturing Overhead Control	7,000	
Work-in-Process Control		10,000

- Assume that 140 good units were produced across all jobs. Then, the overhead allocation rate would be $(\$7,000 / 140) = \50 per good unit. Normal spoilage overhead costs allocated to the 45 good units would be \$2,250. The total cost of 45 good units is then \$92,250.

- Abnormal Spoilage

- The net loss is charged to an abnormal loss account: not included as a part of the cost of good units produced

Materials Control	3,000	
Loss from Abnormal Spoilage	7,000	
Work-in-Process Control		10,000

- Consider the previous example. Assume that the spoiled parts are reworked. Assume further that the journal entry for the \$10,000 of total costs assigned to the spoiled units before considering rework costs is:

Work-in-Process Control	10,000	
Materials Control		4,000
Wages Payable Control		4,000
Manufacturing Overhead Allocated		2,000

- Assume the rework costs equal \$3,800 (\$800 direct materials, \$2,000 direct manufacturing labor, and \$1,000 manufacturing overhead)

- Normal rework attributable to a specific job

Work-in-Process Control	3,800	
Materials Control		800
Wages Payable Control		2,000
Manufacturing Overhead Allocated		1,000

- Normal rework common to all jobs

Manufacturing Overhead Control	3,800	
Materials Control		800
Wages Payable Control		2,000
Manufacturing Overhead Allocated		1,000

- Abnormal Rework: charged to a loss account

Loss from Abnormal Rework	3,800	
Materials Control		800
Wages Payable Control		2,000
Manufacturing Overhead Allocated		1,000

Recognizing scrap at the time of its sale

- When the dollar amount is immaterial

Cash or Accounts Receivable	900	
Scrap Revenues		900

- When the dollar amount is material, and the scrap is sold just after its production
 - Scrap attributable to a specific job

Cash or Accounts Receivable	900	
Work-in-Process Control		900

- Scrap common to all jobs

Cash or Accounts Receivable	900	
Manufacturing Overhead Control		900

Recognizing scrap at the time of its production

- When the dollar amount is material, and the time between storing the scrap and selling/reusing it is long
 - Scrap attributable to a specific job

Materials Control	900	
Work-in-Process Control		900

- Scrap common to all jobs

Materials Control	900	
Manufacturing Overhead Control		900

Recognizing scrap at the time of its production

- If scrap is then sold

Cash or Accounts Receivable	900	
Materials Control		900

- If scrap is reused as direct materials:

Work-in-Process Control	900	
Materials Control		900
