

WORK - IN - PROGRESS

NOTE : Process Costing mainly deals with continuous type of production. We can easily find out the final cost of a finished product. But, at the end of the accounting period, there may be some work-in-progress. The cost of such work is determined by calculating equivalent or effective production.

Understand the concept of equivalent production with the following example :

Total cost of material = Rs. 60,000

Units of finished product = 6000 units

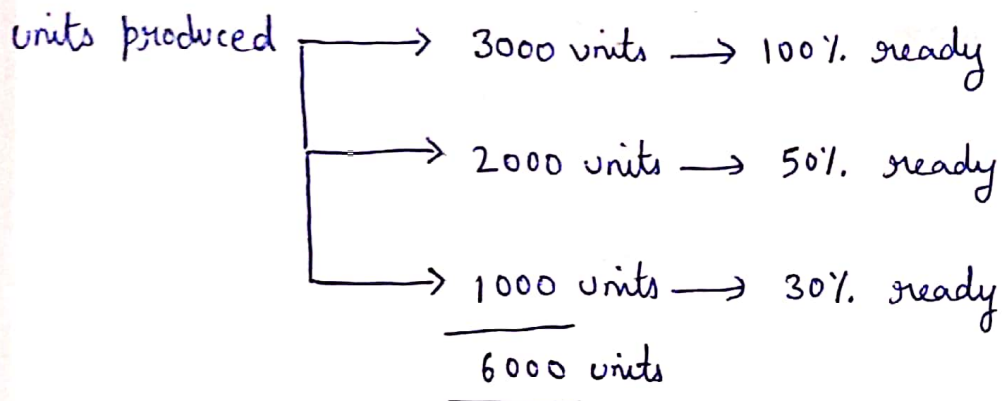
Material cost per unit = $\frac{60000}{6000} = \text{Rs. } 10$

- * To produce a single unit of a product, material of Rs. 10 will be required.
- * If a product completed till 50%, that means only 50% of material has been used i.e. to produce a product till 50%, material of Rs. 5 ($\text{Rs. } 10 * 50\%$) has been used.
- * Similarly, if a product completed till 30%, that means only 30% of material has been used (i.e. of Rs 3)
- * This shows that if we know the cost per unit of 100% finished product, then we can easily find out the cost per unit at different percentages in partially completed product.

* Now, problem arises when units of finished product is not given as a whole, but given in categories.

example

Total cost of material = Rs. 60,000



* 6000 units includes combination of three types of units i.e. Ist type which is 100% completed, IInd type which is 50% completed and IIIrd type which is 30% completed. Therefore, we cannot find out the cost per unit simply by dividing Rs. 60,000 by 6000 units.

* In order to find cost per unit of material, we have to find out the equivalent units of partially completed products.

<u>Inequivalent units</u>		<u>Degree of completion</u>		<u>equivalent units</u>
3000	*	100%	=	3000
2000	*	50%	=	1000
1000	*	30%	=	300
EQUIVALENT PRODUCTION				4300 units

Therefore ;

$$\text{Equivalent production} = \text{Completed unit} + \left[\frac{\text{No. of units of W.I.P.}}{\text{of W.I.P.}} * \left(\frac{\text{Degree of completion}}{\text{in \%}} \right) \right] + \dots$$

Now ;

$$\text{Cost per unit} = \frac{60,000}{4300} = \text{Rs. 14/- approx.}$$

- * Now, we can easily find out the cost per unit of W.I.P.
i.e. for 50% completed units, cost per unit will be 50% of Rs. 14, i.e. Rs. 7/-.
- * In above example, we calculated per unit cost of material.
In similar way, we can find out the cost of labour and overheads.

PRACTICAL QUESTIONS

(When there is opening as well as closing stock of WIP)



Methods of calculating equivalent production



FIFO METHOD

AVERAGE METHOD



WHEN APPLIED



If the output transferred to the next process can be differentiated with the W.I.P and fresh units introduced in the process.

In case such differentiation cannot be made.

For example ;

Given : opening w.I.P 1000 units

Degree of completion & cost :

material (100% complete)	Rs. 10000
labour (60% complete)	Rs. 4000
overhead (60% complete)	Rs. 4000

- ④ where the question specified a method to be followed, then that method must be followed.

TREATMENT OF PROCESS LOSSES & GAIN

⇒ NORMAL LOSS :- Equivalent units of normal loss are taken as nil. However, realizable value of normal scrap is deducted from the cost of material so as to calculate the net material cost.

⇒ Abnormal loss :- It is added to equivalent production with due consideration to its degree of completion. Unless the degree of completion is specified, it may be assumed that abnormal loss units are 100% complete in respect of all element of cost.

⇒ Abnormal Gain :- It is always taken as 100% complete in respect of all elements of cost. Abnormal gain is deducted to obtain equivalent production.

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MANISHA
ASSISTANT PROFESSOR
DEPARTMENT OF COMMERCE

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⇒ For the purpose of computation of equivalent production and its evaluation, the following three statements are generally prepared :

- (a) Statement of equivalent production
- (b) Statement of cost (per unit)
- (c) Statement of evaluation

FORMATS OF ABOVE MENTIONED STATEMENTS ARE AS FOLLOWS :

STATEMENT OF EQUIVALENT PRODUCTION

Input Units	Particulars	Output Units	Equivalent production					
			Material		Labour		Overhead	
			%	units	%	units	%	units
xxx	Opening W.I.P	xxx	xxx (Remaining %)	xxx	xxx (Remaining %)	xxx	xxx (Remaining %)	xxx
xxx	Units Introduced and Completed / transferred to next process	xxx	xxx	xxx	xxx	xxx	xxx	xxx
	Normal loss	xxx	—	—	—	—	—	—
	Abnormal loss	xxx	xxx	xxx	xxx	xxx	xxx	xxx
	Closing W.I.P	xxx	xxx	xxx	xxx	xxx	xxx	xxx
	TOTAL	xxx		xxx		xxx		xxx
	Less : Abnormal Gain	(xxx)	100	(xxx)	100	(xxx)	100	(xxx)
xxx		xxx						
	EQUIVALENT PRODUCTION			xxx		xxx		xxx

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STATEMENT OF COST

Particulars (Elements of cost)	Cost (A)	Equivalent Production (B)	Cost per unit (A ÷ B)
	Rs.	units	Rs.
Materials :			
units introduced @ given rate	xxx		
Direct material	xxx		
	xxx		
	(xxx)		
Less : scrap value of normal loss	xxx	xxx	xxx
Material cost	xxx		
Direct labour	xxx	xxx	xxx
overhead	xxx	xxx	xxx
TOTAL	xxx		xxx

STATEMENT OF EVALUATION

Items	Cost element	Equivalent Production	Cost per unit	Cost of Equivalent unit	Total cost
Opening WIP	Material	xxx	xxx	xxx	
	labour	xxx	xxx	xxx	
	overhead	xxx	xxx	xxx	
units introduced & completed	Material	xxx	xxx	xxx	xxx
	labour	xxx	xxx	xxx	
	overhead	xxx	xxx	xxx	
Abnormal loss	— Same —	—	Same	—	xxx
					xxx
Closing W.I.P	— Same —	Same	—	—	xxx
					xxx
Abnormal Gain	— Same —	Same	—	—	xxx
					xxx

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* Calculation of cost of units transferred to next process (FIFO)

From Statement of equivalent production Units ; value of opening stock of WIP Add: Opening work-in-progress completed Add: units ; Introduced & completed during the period	<u>Rs.</u> xxx xxx (from Statement of evaluation) xxx (from Statement of evaluation)
<u>Total units</u>	<u>Total cost</u>

* Calculation of units introduced & completed

Input units	xxx
Less: Scrap, (units) if any	(xxx)
Less: Closing units of WIP	(xxx)
	<u>xxx</u>

* Calculation of Abnormal loss / Gain

Total Input (units)	Expected output (units)	Actual output (units)
xxx	Total input Less: Normal loss	Transfer to Next process Add: Closing WIP
	<u>xxx</u>	<u>xxx</u>

If ; Expected output > Actual output $\Rightarrow$ Abnormal loss

If ; Expected output < Actual output $\Rightarrow$ Abnormal gain

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STATEMENT OF COST (AVERAGE METHOD)

Particulars (Element of cost)	Cost (A) (RS.)	Equivalent production (B) (units)	Cost per unit (A ÷ B)
<u>Materials</u> :			
opening w.I.P	xxx		
Add: units introduced @ given rate	xxx		
Direct material	xxx		
	xxx		
	(xxx)		
Less: Scrap value of normal loss			
Material cost	xxx	xxx	xxx
<u>Labour</u> :			
opening w.I.P	xxx		
Add: cost incurred	xxx		
Labour cost	xxx	xxx	xxx
<u>Overhead</u> :			
opening w.I.P	xxx		
Add: cost incurred	xxx		
Overhead cost	xxx	xxx	xxx
TOTAL			xxx