

Computation of Machine Hour Rate

➤ **Example:** A machine was purchased on 1st January 2018 for Rs. 5 lakhs. The total cost of all machinery inclusive of the new machine was Rs. 75 lakhs. The following further particulars are available:

- ✓ Expected life of the machine 10 years.
- ✓ Scrap value at the end of 10 years Rs. 5,000.
- ✓ Repairs and Maintenance for the machine during the year Rs. 20,000.
- ✓ Expected number of working hours of the machine per year 4,000 hours.
- ✓ Insurance premium annually for all machine Rs.4,5000.
- ✓ Power consumption for the machine per hour @ Rs.7.50 per unit-25 units

- ✓ Area occupied by the machine 100 sq.ft.
- ✓ Area occupied by other machines 1,500 sq.ft.
- ✓ Rent per month of the department Rs. 8000.
- ✓ Lighting charges for 20 points for the whole department out of which three points are for the new machine-Rs. 1200 per month.
- ✓ Compute the machine hour rate for the new machine.

Solution: Computation of Machine Hour Rate

Standing Charges	Rs. per annum	Re per hour
Insurance#	3000	
Repairs & Maintenance	20,000	
Rent ##	6000	
Light charges	2160	
	<u>3,1160</u>	
Hourly Rate of Standing Charges	3,1160/4,000 hrs	Rs.7.79
Machine Expenses		
Depreciation####		12.375
Electricity Consumption: 25 units per hour @ Rs. 7.5 per unit		187.50
Machine Hour Rate		207.66

*Depreciation may also be taken as a standing charge.

#. Insurance for the Machine

Total cost of all Machine Rs. 75,00,000

Total insurance premium paid for all machines Rs. 45,000

Total annual insurance premium of the new machine

$$\frac{45,000 * 75,00,000}{75,00,000} = \text{Rs. } 3000$$

##. Rent for the Machine

Rent paid for annum Rs.96,000

Total area occupied 1600 sq.ft.

Rent for the area occupied by the machine (100 sq.ft.)

$$\frac{96,000 * 100}{1,600} = \text{Rs. } 6000$$

###. Depreciation of machine	Rs.
Cost of New machine	5,00,000
<i>Less:</i> Scrap Value	<u>5,000</u>
Net Cost of the Machine	<u>4,95,000</u>
Life of the Machine	10 years

$$\text{Depreciation per hour: } \frac{4,95,000}{10 \text{ Year} * 4,000} = \text{Rs.}12.375$$

####. *Lighting Charges for the Machine*

Total annual lighting charges of 20 points for the whole department Rs. 14,400

Lighting charges of the machine p.a.:

$$\frac{\text{Rs. } 14,400 * 3 \text{ points}}{20 \text{ points}} = \text{Rs. } 2160$$

➤ **Example:** In a factory there are five machine of exactly similar type. One operator is employed on each machine at Rs.20 per hour. The factory works a 40 hour week which includes four hour for setup time for each machine. The operators are paid fully for 40 hours. Cost are reported for the machine shop on the basis of thirteen four-weekly periods.

The following details applicable to the cost centre/machine are available.

1. Set up time is unproductive and no power is consumed during the set up time.
2. Original cost of machine is Rs. 1,30,000.
3. Depreciation on machine is to be provided at 10% per annum on original cost.
4. Maintenance & repair per work per machine amount to Rs.25.

5. Consumable stores per week per machine amount to Rs. 27.
6. Power consumed is 10 units per hour per machine at 80 paise per unit.
7. Wages paid to the operators are considered as indirect.
8. Overheads apportioned to the cost centre are

Rent	Rs. 3,000 p.a.
Heat and light	Rs. 4,000 p.a.
Misc. Expenses	Rs. 6,000 p.a.

You are required to calculate:

1. Cost of running one machine for a four-week period; and
2. The machine hour rate.

Solution:

Calculation of cost of running one machine for a four week period.

Standing Charges:	Rs.
1. Rent	3,000
2. Heat and Light	4,000
3. Sundry Exp.	<u>6,000</u>
Total Exp. Of 5 Machines	<u>13,000</u>
Total Exp. for one machine for 4 week period	
$= \frac{13,000 * 4}{5 * 13}$	800
4. Wages of operator (40*4*Rs. 20)	<u>3,200</u>
1. Total Standing charges (i)	<u>4,000</u>

(ii) Machine Expanses:

1. Depreciation	$\left\{ \frac{1,30,000 * 10}{100} \right\} * \frac{4}{13}$	4,000
2. Repair and Maintenance	$(25 * 4)$	100
3. Power	$(36 * 10 * 0.80)$	288
Total Machine Expenses (ii)		<u>4,496</u>
Total Machine Exp. (i + ii)		<u>8,496</u>

2. Machine Hour Rate:

= Total cost / Total Productive time

= Rs. 8,496 / 36 hrs * 4

= Rs. 59 per effective productive hour

➤ **Example:** From the following data of factory machine room, calculate an hourly machine rate, assuming that the machine room will work on 90% capacity throughout the year and that a breakdown of 10% is reasonable. There are Seven days holiday in a year exclusive of Sundays. The factory work 8 hour a day and 4 hours on Saturday. Number of machines (each of the same type)-40.

Expenses per annum:

	Rs.
Power	3,12,000
Light	64,000
Salaries to foreman	1,20,000
Lubricating oil	6,600
Repair to Machine	1,44,600
Depreciation	78,560

Solution: Computation of Machine Hour Rate

<i>Standing Charges</i>	<i>Rs.</i>	<i>Rs. Per Hour</i>
Light	64,000	
Salaries to forman	1,20,000	
Lubrication oil (Assumed fixed)	<u>6,600</u>	
	1,90,600	
Hourly standing charges =	1,90,600/ 80640	2.364
<i>Running Charges</i>		
Power	(3,12,000/80640)	3.869
Repair	(144600/80640)	1.793
Depreciation	(78,560/80,640)	<u>0.974</u>
Machine Hour Rate		<u>9.000</u>

Workings:

Calculation of Effective Machine Hours (Hrs)

Total Hours $365 * 8 = 2920$

Less: Saturday only 4 hours works $(52 * 4) 208$

Sunday Holiday $(52 * 8) 416$

Holiday in a year

$7 \text{ days} * 8 \text{ hours per day} \quad \underline{56} \quad \underline{680}$

Machine Hours worked 2,240

Less: 10% Break Down (Normal) 224

Effective Machine Hour per machine 2,016

Total Machine Hours = Effective machine Hours per
machine * Number of machines

= $2,016 * 40 = 80,640$ Hrs.

➤ **Example:** Calculate the comprehensive Machine Hour Rate of a machine from the following:

- (i) Cost of the machine Rs. 25 lakhs, having a scrap value of Rs. 1 lakhs after 10 years.
- (ii) The machine will be operated for three shifts of 7 hrs. each for 300 working days in a year of which 300 hrs. will be utilized for minor repairs and maintenance.
- (iii) Wages payable: Rs. 8,000 p.m. for an operator and Rs. 3,000 for a helper for every shift. Rs. 16,000 per month to one supervisor per shift for the department accommodating four machines including the above machine.
- (iv) Other details
Power consumption : 25 units (kWh @ Rs.4.80 per unit
Repair and maintenance : Rs. 30,000 per annum

General lighting and heating : Rs.4,000 p.m. for the whole
department having the 4 machines

Insurance : Rs. 18,000 per machine per annum

Rent, Rates and Taxes : Rs. 3,000 p.m. for the department

Factory overheads : Rs. 36,000 per annum for the department

Solution:

Computation of Comprehensive Machine Hour Rate

	Annual Working Hours	6,300
	(300*7*3)	
Cost: Rs. 25,00,000	Less: for minor repair and maintenance	<u>300</u>
Life: 10 years	Net working hours	6,000
scrap value: Rs. 1,00,000		
Depreciation: Rs. 2,40,000 p.a.		

(i) Running Expenses:

	Per annum	Per hour (based on 6000 hours)
	(Rs.)	(Rs.)
Wages to operators: $3*8000*12$	2,88,000	48
Wages to helper: $3*3000*12$	1,08,000	18
Power: $6000*25*4.80$	7,20,000	120
Repair & maintenance	30,000	5
	<u>11,46,000</u>	<u>191</u>

(ii) Fixed Expenses:

Supervisor's Salary: Rs. $\frac{16,000 \times 12 \times 3}{4}$	1,44,400	24
General lighting & heating Rs. $\frac{4000 \times 12}{4}$	12,000	2
Insurance	18,000	3
Rent, Rates & Taxes Rs. $\frac{3000 \times 12}{4}$	9,000	1.50
Factory overhead Rs. $\frac{36000}{4}$	9,000	1.50
Depreciation	<u>2,40,000</u>	<u>40</u>
	<u>4,32,000</u>	<u>72</u>

<i>Running Expenses:</i>	11,46,000	191
<i>Fixed Expenses:</i>	4,32,000	72
Total	<u>15,78,000</u>	<u>263</u>

Comprehensive Machine Hour Rate: Rs. 263

Thank You