

Factory Overhead

Factory overhead, also called "manufacturing overhead" or "factory burden," comprises the indirect expenses associated with the operations of a manufacturing plant; these costs cannot be directly charged to a specific product or project.

All expenses that fall under factory overhead are divided into three different subcategories: indirect material, indirect labor and other indirect costs.

Direct vs. Indirect Expenses

- every factory or production plant requires employees to undertake the production. As these employees are associated directly with the production process, the wages paid to them are considered direct expenses.
- Indirect expenses, on the other hand, are incurred indirectly during the production process and do not result in actual production. Such expenses often facilitate production and make it more efficient.

Components of factory overhead

Indirect material + Indirect labor + other indirect costs = factory overhead

- **Indirect Material**

- Indirect materials are those not directly used as raw materials for the production of goods and services. The use of indirect material makes the production process possible, more efficient and safer. Indirect materials include lubricants, fuels, cleaning chemicals and protective gear.

Indirect labor

- Indirect labor refers to the cost of those employees who are associated with the production process, but not on specific units or products; they indirectly produce goods and services by supporting the production facility. Indirect labor costs include the cost of factory supervision, inspection teams, superintendents, factory managers and clerks.

Other Indirect Costs

- Other indirect costs include rent, property tax on the factory premises, fire insurance, depreciation of the plant and machinery, repairs and maintenance of machinery, utilities, and taxes. These costs are further classified as either fixed or variable factory overhead.

Fixed & Variable Factory Overhead

- Expenses that do not change with changes in production are called fixed expenses, or fixed factory overhead, and include property insurance, depreciation, property taxes and salaries for non-production employees.
- Variable expenses change in direct proportion to the production of goods and services; these include heating, electricity, water, indirect labor and indirect materials

Examples

- overhead expenses include:
- **Indirect material** - Welding rods, glues, and product wrappers.
- **Indirect labor** – Salary for the maintenance staff, technical support staff, etc.
- **Machine depreciation** – This includes the depreciation cost of manufacturing equipment.
- **Rent** – This would include rent that is paid for the manufacturing or assembly facilities.
- **Property taxes** – This is the tax that is paid for the land on which the factory sits, or the proportion of which is directly attributable to the manufacturing process.
- **Factory maintenance supplies** – Any supplies or expenses that are incurred to keep the factory running. This may include items such as grease for the machines and replacement parts.
- **Heating and lighting** – Heating, lighting, and other utility charges.

How to Calculate factory overhead

It is a number that represents the overhead costs of producing the product in your factory.

- List every business expense that you've incurred during the period
- Separate the listed expenses into two smaller lists -- one covering direct costs and the other indirect costs.
- Add together the list of indirect costs and list of direct costs to calculate the overhead costs and the total direct costs for your factory and for your factory.
- Divide the overhead costs for the factory by the direct costs to calculate the overall overhead rate for the factory

How to Calculate Applied Overhead Costs

- applied overhead costs = budgeted annual rate x budgeted annual hours.
- Determine the budgeted annual rate
- Determine the budgeted annual activity hours which are also a management estimate
- Multiply the budgeted overhead rate by the budgeted annual activity hours.

How to Calculate Actual Overhead

- Determine payroll costs. Average the past 12 payroll cycles to determine your average monthly costs.
- Gather your business credit cards from the past year in which money is still owed. Calculate the total you have paid each month for all cards. Divide by 12 to get your company's average credit card expense.
- Calculate all indirect monthly expenses, such as rent payments, company car expenses, mileage, vendor bills, utility costs, entertainment costs, business lunches and supply purchases.

- Calculate all your direct monthly expenses for labor or manufacturing that goes towards producing services or products for your company
- Add together your average monthly payroll cost, your monthly credit card expense and your indirect and direct monthly expenses. The total is your company's actual overhead. This total needs to be accounted for in the budget for your business each month

Over-applied or Under-applied Overhead Rate

- Overhead is the amount of indirect costs attributed to units of production that is not directly incurred during the production process. The over-application or under-application of overhead is due to differences between the estimated and actual overhead amounts.
- When actual overhead is greater than estimated overhead, the amount assigned to inventory costs was under-applied.
- If the actual overhead is less than the estimated overhead, the amount assigned to inventory costs was over-applied.

How to calculate over/under applied overhead

- Determine the estimated cost driver. it can be estimated direct labor hours or machine hours.
- Calculate the overhead rate. The amount of budgeted overhead costs can include items such as indirect labor, indirect materials and other indirect costs. The total budgeted overhead costs are divided by the estimated cost driver to arrive at the overhead rate.

- Determine the actual cost driver. The actual cost driver is based on actual production activity; it can be actual direct labor hours worked or actual machine hours used in production.
- Apply and calculate the overhead by multiplying the actual cost driver by the overhead rate. The applied overhead is compared to actual overhead costs to determine if the amount is over-applied or under-applied.

How to Calculate Overhead Cost Per Unit

- Define overhead costs and expenses. These are all costs associated with direct labor and materials.
- Determine average hourly wage. Each employee's contribution should be classified as either direct or indirect labor. Direct labor works directly with product, whereas indirect labor supports direct labor
- Estimate the number of workdays available in a given calendar year. Subtract the average number of days labor will not be working (holidays, weekends, vacations, sick leave, etc.) from 365.

- Multiply the number of workdays available for labor by eight (for an eight-hour work day). This gives you an estimate for the total number of labor hours worked.
- Multiply number of total labor hours by average labor wage determined in Step 2.
- Add all overhead expenses, as defined in Step 1, to the dollar amount in Step 5. This is your total overhead cost.
- Look up the average number of units sold per month and multiply by 12.
- Divide total overhead costs by average number of units. This is your overhead cost per unit.

Variance analysis

- For the purpose of over or applied factory overhead analysis two separate variance are computed as follows:
 - Budget or spending variance
 - Volume or capacity variance

Budget or spending variance

- **Factory Overhead spending variance** is the difference between actual expenses incurred and the budgeted allowance based on actual hours worked.
- The spending variance is the responsibility of the department manager, who is expected to keep actual expenses within the budget.
- **Formula of Spending Variance:**
[Actual factory overhead – Budgeted allowance based on actual hours worked*]
*[Fixed expenses budgeted + Variable expenses (actual hours worked × variable overhead rate)]

Volume or capacity variance

- It is the difference between the budgeted overhead estimated for the capacity attained and factory overhead during the period
- Responsibility of this overhead is rest on the top management because of the policy decisions about the utilization of the plant and equipment.

- **Formula of Idle Capacity Variance:**

[Budgeted allowance based on actual hours worked* –
(Actual hours worked × Standard overhead rate)]

*Fixed expenses budgeted + Variable expenses (actual hours worked × variable overhead rate)

Example of variance analysis

Fixed factory overhead	Rs. 40,000
Variable factory overhead	<u>60,000</u>
Total factory overhead	1,00,000

- Variable overhead rate = $\frac{60,000}{20,000} = \text{Rs. 3 per D. L Hr.}$

- **Budget variance**

Actual factory overhead		Rs. 80,000
(Factory overhead budgeted for the capacity attained)		
Fixed overhead	40,000	
Variable overhead	<u>51,000</u>	
(Rs. 3 x 17000)		<u>91,000</u>
Budget variance		Rs.11,000
(cr. Or unfavorable)		

- **Volume variance**

Budgeted overhead allowance	Rs. 91,000
for the capacity attained	
applied factory overhead	<u>85,000</u>
volume variance(dr. unfavorable)	Rs. 6,000