

Depreciation for Light Machining , Heavy Machining, and Other Machinery was directly assigned.
Tooling Expenses for Light Machining , Heavy Machining, and Other Machinery was directly assigned.
Space (in square footage) for Light Machining , Heavy Machining, and Other Machinery was directly assigned.
Horsepower hours for Light Machining , Heavy Machining, and Other Machinery was directly assigned.
Direct labor hours for Light Machining , Heavy Machining, and Other Machinery was directly assigned.
Direct labor wage rate for Light Machining , Heavy Machining, and Other Machinery was directly assigned.
Budgeted hours for Light Machining , Heavy Machining, and Other Machinery was directly assigned.
% machine utilization for Light Machining , Heavy Machining, and Other Machinery was directly assigned.
Gross hourly wage for Light Machining , Heavy Machining, and Other Machinery is the same as the direct labor wage rate for each area since no fringe benefits are paid to any direct labor employees.

Space cost for each area was determined by multiplying the total space cost by the quantity space (in square footage) of each area divided by the total space (in square footage) of all the areas.

Light machining
 $\$255,000 \times (3500 / 28000) = \$31,875.00$

Heavy machining
 $\$255,000 \times (5500 / 28000) = \$50,089.29$

Other machinery
 $\$255,000 \times (19000 / 28000) = \$173,035.31$

Utilities for each area was determined by multiplying the total utilities cost by the quantity horsepower hours of each area divided by the total horsepower hours of all the areas.

Light machining
 $\$285,000 \times (370500 / 1595500) = \$66,181.45$

Heavy machining
 $\$285,000 \times (950000 / 1595500) = \$169,696.02$

Other machinery
 $\$285,000 \times (275000 / 1595500) = \$49,122.53$

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Direct labor cost for each area was determined by multiplying the wage rate of each area times the direct labor hours for each area.

Light machining

$$\$17.50 \times 35000 = \$612,500.00$$

Heavy machining

$$\$45.70 \times 10500 = \$479,850.00$$

Other machinery

$$\$33.00 \times 45000 = \$1,485,000.00$$

Indirect labor cost for each area was determined by multiplying the total indirect labor cost by the quantity direct labor hours of each area divided by the total direct labor hours of all the areas.

Light machining

$$\$275,000 \times (35000 / 90500) = \$106,353.59$$

Heavy machining

$$\$275,000 \times (10500 / 90500) = \$31,906.08$$

Other machinery

$$\$275,000 \times (45000 / 90500) = \$136,740.33$$

Tooling services cost for each area was determined by multiplying the total tooling services cost by the quantity horsepower hours of each area divided by the total horsepower hours of all the areas.

Light machining

$$\$550,000 \times (370500 / 1595500) = \$127,718.58$$

Heavy machining

$$\$550,000 \times (950000 / 1595500) = \$327,483.55$$

Other machinery

$$\$550,000 \times (275000 / 1595500) = \$94,797.87$$

Engineering cost for each area was determined by multiplying the total engineering cost by the quantity direct labor hours of each area divided by the total direct labor hours of all the areas.

Light machining

$$\$450,000 \times (35000 / 90500) = \$174,033.15$$

Heavy machining

$$\$450,000 \times (10500 / 90500) = \$52,209.94$$

Other machinery

$$\$450,000 \times (45000 / 90500) = \$223,756.91$$

Management cost for each area was determined by multiplying the total management cost by the quantity direct labor cost of each area divided by the total direct labor cost of all the areas.

Light machining

$$\$850,000 \times (\$612,500 / \$2,577,350) = \$202,000.12$$

Heavy machining

$$\$850,000 \times (\$479,850 / \$2,577,350) = \$158,252.66$$

Other machinery

$$\$850,000 \times (\$148,500 / \$2,577,350) = \$489,747.22$$

Total overhead for each area was determined by taking the sum of depreciation, tooling expenses, space (cost), utilities, direct labor cost, indirect labor cost, tooling services cost, engineering cost, and management cost for each area.

Light machining

$$\begin{aligned} &\$39,000 + \$195,000 + \$31,875 + \$66,181.45 + \$612,500 + \$106,353.60 + \$127,718.60 + \\ &\$174,033.10 + \$202,000.10 = \$1,417,605.44 \end{aligned}$$

Heavy machining

$$\begin{aligned} &\$72,000 + \$105,000 + \$50,089.29 + \$169,696.00 + \$479,850.00 + \$31,906.08 + \\ &\$327,483.50 + \$52,209.94 + \$158,252.70 = \$1,154,702.23 \end{aligned}$$

Other machinery

$$\begin{aligned} &\$35,000 + \$39,000 + \$173,035.70 + \$49,122.53 + \$1,485,000 + \$136,740.30 + \$94,797.87 + \\ &\$223,756.90 + 489,747.20 = \$2,469,042.33 \end{aligned}$$

Total overhead was determined by taking the sum of each area's total overhead.

$$\$1,417,605.44 + \$1,154,702.33 + \$2,469,042.33 = \$5,041,350.00$$

Machine hour cost for each area was determined by dividing the total overhead of each area by the quantity of the budgeted hours for each area multiplied by the % machine utilization for each area.

Light machining

$$\$1,554,662 / (35,000 \times 90\%) = \$49.35$$

Heavy machining

$$\$1,446,488 / (10,500 \times 80\%) = \$172.20$$

Other machinery

$$\$272,620 / (45,000 \times 95\%) = \$63.77$$

Productive hour cost for each area was determined by taking the sum of the gross hourly wage and the machine hour cost.

Light machining

$$\$17.50 + \$49.35 = \$66.85$$

Heavy machining

$$\$45.70 + \$172.20 = \$217.90$$

Other machinery

$$\$63.77 + \$33.00 = \$96.77$$