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MALLEABLE IRON
RESEARCH INSTITUTE

Union Trust Building
CLEVELAND, OHIO

COST ACCOUNTING
METHODS



Adopted at Meetings of Cost Accountants
February 5, and April 28, 1927.
Approved by Institute, May 11, 1927

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Standard Classification of Cost Accounts

METAL:

- 10-1 Pig Iron
- 10-2 Steel Scrap
- 10-3 Malleable Scrap—Purchased

MELTING DEPARTMENT:

- 22 Indirect Labor
- 23 Fuel
- 24 Supplies and Tools
- 25 Repair Labor and Materials (a)

MOLDING DEPARTMENT:

- 31 Direct Labor
- 32 Indirect Labor
- 34 Supplies and Tools
- 35 Repair Labor and Materials (a)

COREMAKING DEPARTMENT:

- 41 Direct Labor
- 42 Indirect Labor
- 43 Fuel
- 44 Supplies and Tools
- 45 Repair Labor and Materials (a)

HARD IRON CLEANING DEPARTMENT:

- 52 Indirect Labor
- 54 Supplies and Tools
- 55 Repair Labor and Materials (a)

HARD IRON TRIMMING AND INSPECTION DEPARTMENT:

- 62 Direct and Indirect Labor
- 64 Supplies and Tools
- 65 Repair Labor and Materials (a)

ANNEALING DEPARTMENT:

- 72 Indirect Labor
- 73 Fuel
- 74 Supplies and Tools
- 75 Repair Labor and Materials (a)
- 77 Pots and Bottoms

SOFT IRON CLEANING DEPARTMENT:

- 82 Indirect Labor
- 84 Supplies and Tools
- 85 Repair Labor and Materials (a)

FINISHING DEPARTMENT:

- 91 Direct Labor
- 92 Indirect Labor
- 94 Supplies and Tools
- 95 Repair Labor and Materials (a)

ASSORTING AND SHIPPING DEPARTMENT:

- 102 Indirect Labor
- 104 Supplies and Tools
- 105 Repair Labor and Materials (a)

-
- 180 Pattern Expense
 - 190 Drayage
 - 200 Returned Castings and Allowances
-

FIXED PLANT CHARGES:

- 116 Power, Heat and Light
- 126 Insurance
- 146 Taxes
- 156 Depreciation
- 162 Supt., Foremen and Plant Clerks
- 172 Yard Labor, Watchmen and Janitors
- 174 General Supplies and Tools
- 175 General Repairs (Optional with the Departmental Repair Accounts)
- 176 Misc. Plant Expense

ADMINISTRATIVE AND SELLING EXPENSE:

- 270 Office Salaries
- 280 Office Expense
- 290 Traveling Expense
- 300 General Expense
- (a) Optional account, No. 175, General Repairs.

Standard Definition of Cost Accounts

METAL

10-1 PIG IRON:

To include the cost of all pig iron used, including freight, and labor in unloading.

10-2 STEEL SCRAP:

To include the cost of all steel scrap used, including freight, and labor in unloading.

10-3 MALLEABLE SCRAP—PURCHASED:

To include the cost of all purchased malleable scrap used, including freight, and labor in unloading. Defective castings returned by customers should be included in this account at scrap value.

MELTING DEPARTMENT

22 INDIRECT LABOR:

To include all labor identified with the melting of the iron, namely:

Delivering melting stocks and charging furnaces;

Furnacemen, firemen and coal wheelers;

Cleaning out ash pits and hauling out slag;

Cleaning sprue and gates;

Slag Mill operations;

Taking chunks from furnace to drop hammer;

Blacksmith labor in making and repairing pokers, grate bars, etc.;

Repairing and mudding bungs;

Relining furnaces and stacks, including new side walls, bottoms, tap holes and spouts.

23 FUEL:

To include the cost of all melting fuel used, including freight, and labor in unloading.

24 SUPPLIES AND TOOLS:

To include the cost of all supplies and small

tools used at the melting furnace, such as fire brick, fire clay, fire sand, pokers, rakes, bars, miscellaneous supplies and tools.

25 REPAIR LABOR AND MATERIALS:

(Optional Account No. 175, General Repairs).

To include the cost of all labor and materials used in connection with the upkeep and maintenance of the melting furnaces and their equipment, exclusive of labor and materials for relining furnaces, tap holes and spouts which are chargeable to accounts Nos. 22 and 24.

MOLDING DEPARTMENT

31 DIRECT LABOR:

To include all labor of molders, in putting up molds, operating molding machines, green sand coremaking, core setting, pouring, when done by molders or helpers, lifting and carrying out molds.

32 INDIRECT LABOR:

To include all labor in the foundry other than that of putting up molds, namely:

Pouring, when not done by molders or helpers;
Delivering metal to molders' floors;
Shifting mold weights, jackets or cases;
Dumping molds;
Breaking castings from gates;
Wetting sand;
Cutting and tempering sand;
Mixing sand and facing;
Wheeling flasks and sand;
Attending sand cellars, bins, and conveyors;
Wheeling out sprue and scrap castings to Cleaning Department and running magnetic separators and ash hoppers;
Assorting and oiling chills;
Mixing chill oil;
Stock-keepers of chills and flasks;

Cleaning floors for molders;
Removing shot;
Cleaning and sweeping gangways;
Wheeling boards, boxes and barrels;
Firing stoves;
Returning patterns to safe;
Operating monorail system when it applies to foundry labor operations;
Ordinary moving of molding machines about foundry and elsewhere;
Relining foundry ladles;
Carpenter labor in making and repairing flasks, jackets, bottom boards, etc.;
Conveying castings to cooling ovens;
Attending cooling furnaces;
Conveying castings to Hard Iron Cleaning Department.

34 SUPPLIES AND TOOLS:

To include the cost of all supplies and small tools used in the foundry, such as molding sand, facing, parting, chaplets, molders' tools, chills, flask lumber and supplies.

35 REPAIR LABOR AND MATERIALS:

(Optional Account No. 175, General Repairs).

To include the cost of all labor and materials used in connection with the upkeep and maintenance of the foundry equipment, such as repairs to molding machines, molding benches, etc.

COREMAKING DEPARTMENT

41 DIRECT LABOR:

To include all labor of coremakers and helpers in making and assembling cores, both piece and day work, including green sand coremaking when made in the core room, and pasting when chargeable directly to the job.

42 INDIRECT LABOR:

To include all core room labor other than that of actually making cores, namely:

Sand wheelers;
Sand weighers;
Sand mixers and rosin grinders;
Pasters, when not chargeable directly to the job;
Painters;
Hook pasters, when not done by coremakers;
Loaders;
Coke wheelers;
Oven lighters;
Oven tenders;
Carriers and board collectors;
Inspectors;
Counter and tally boys;
Cleaners;
Sweepers;
Pulverizing old cores;
Scrap assorters;
Errand boys;
Storeroom helpers;
Shortage reporters;
Core plate collectors;
Dispatchers;
Assorters;
Wire cutters and straighteners;
Delivering cores to Molding Department;
Cleaning up department refuse and disposing of same.

43 FUEL:

To include the cost of all core fuel used, including freight, and labor in unloading.

44 SUPPLIES AND TOOLS:

To include the cost of all supplies and small tools used in the core room, such as core sand, core oil, rosin and pitch, compounds, wire, rods, core plates, core makers' and laborers' tools, etc.

45 REPAIR LABOR AND MATERIALS:

(Optional Account No. 175, General Repairs).

To include the cost of all labor and materials

used in connection with the upkeep and maintenance of the core room equipment, such as repairs to ovens, racks, trays, etc.

HARD IRON CLEANING DEPARTMENT

52 INDIRECT LABOR:

To include all labor in the Hard Iron Cleaning Department, namely:

Loading and unloading tumblers and sand-blast mills;

Pickling castings;

Brushing and cleaning castings which are neither tumbled or pickled;

Delivering castings to Hard Iron Trimming and Inspection Department;

Cleaning up department refuse and disposing of same.

54 SUPPLIES AND TOOLS:

To include the cost of all supplies and small tools used in the Hard Iron Cleaning Department, such as stars, jacks, hose, sand-blast sand, small tools, etc.

55 REPAIR LABOR AND MATERIALS:

(Optional Account No. 175, General Repairs).

To include the cost of all labor and materials used in connection with the upkeep and maintenance of all Hard Iron Cleaning Department equipment, such as repairs to mills, sand-blast apparatus, dust arresters, etc.

HARD IRON TRIMMING AND INSPECTION DEPARTMENT

62 DIRECT AND INDIRECT LABOR:

To include all labor in the Trimming and Inspection Department, namely:

Trimming;

Inspecting;

Sorting;

Gauging and weighing castings;

Delivering good castings to the Annealing Department;

Assorting chills, stars, core wire, balls, gaggers, and returning same to respective departments when work is done by Trimming Department. (Note: If done elsewhere to be charged to the labor of the department doing the work.)

Moving defective castings from Trimming Room to designated delivery point.

Cleaning up department refuse and disposing of same.

64 SUPPLIES AND TOOLS:

To include the cost of all supplies and small tools used in the Trimming and Inspection Department, such as chipping hammers, chisels, gauges, etc.

65 REPAIR LABOR AND MATERIAL:

(Optional Account No. 175, General Repairs).

To include the cost of all labor and materials used in connection with the upkeep and maintenance of the Trimming and Inspection Department equipment.

ANNEALING DEPARTMENT

72 INDIRECT LABOR:

To include all labor in the Annealing Department, namely:

Packing castings in pots;

Mudding pots;

Dumping pots;

Emptying and filling ovens;

Building up oven doors;

Charging truck operators and crane operators;

Mixing, tempering and screening packing;

Firing ovens and wheeling coal to ovens;

Removing ashes;

Disposing of old pots and bottoms;

Standard Definition of Cost Accounts

Ordinary running repairs to ovens and stacks when made by masons and helpers;
Sorting and delivering castings to Soft Iron Cleaning Department;
Cleaning up department refuse and disposing of same.

73 FUEL

To include the cost of all annealing fuel, including freight, and labor in unloading.

74 SUPPLIES AND TOOLS:

To include the cost of all supplies and small tools used in the Annealing Department, such as fire brick, fire clay, fire sand, packing materials, department and oven tools, etc.

75 REPAIR LABOR AND MATERIALS:

(Optional Account No. 175, General Repairs).

To include the cost of all labor and materials used in connection with the upkeep and maintenance of the annealing ovens and their equipment, exclusive of labor and materials for the ordinary running repairs to ovens and stacks which are chargeable to accounts Nos. 72 and 74.

77 POTS AND BOTTOMS:

To include the cost of all purchased pots and bottoms used and the cost of producing pots and bottoms. This account should be credited with the receipts from the sale of scrap pots and bottoms.

SOFT IRON CLEANING DEPARTMENT

82 INDIRECT LABOR:

To include all labor in the Soft Iron Cleaning Department, namely:

Loading and unloading tumblers and sand-blast mills, and delivering castings to Finishing Department;
Pickling castings;

Cleaning up department refuse and disposing of same.

84 SUPPLIES AND TOOLS:

To include the cost of all supplies and small tools used in the Soft Iron Cleaning Department, such as stars, jacks, hose, sand-blast sand, small tools, etc.

85 REPAIR LABOR AND MATERIALS:

(Optional Account No. 175, General Repairs).

To include all labor and materials used in connection with the upkeep and maintenance of the Soft Iron Cleaning Department equipment, such as repairs to mills, sand-blast apparatus, dust arresters, etc.

FINISHING DEPARTMENT

91 DIRECT LABOR:

To include all direct labor in the Finishing Department which is chargeable to a pattern number, namely; grinding, straightening, drifting, drilling, reaming, and any other finishing operation, the cost of which can be charged directly to the job.

92 INDIRECT LABOR:

To include all indirect labor in the Finishing Department, namely:

Inspecting, when done by specialists;

Gauging;

Welding;

Cleaning up department refuse and disposing of same.

94 SUPPLIES AND TOOLS:

To include the cost of all supplies and small tools used in the Finishing Department, such as emery wheels, press and drop hammer supplies, tapping and threading machine supplies, chisels and hammers, gauges, oil and waste, etc.

95 REPAIR LABOR AND MATERIALS:

(Optional Account No. 175, General Repairs).

To include the cost of all labor and materials used in connection with the upkeep and maintenance of the Finishing Department equipment.

ASSORTING AND SHIPPING DEPARTMENT

102 INDIRECT LABOR:

To include all indirect labor in the Assorting and Shipping Department, namely:

Assorting;

Packing;

Weighing;

Trucking;

Loading Castings;

Inspecting, when work is performed with sorting operation;

Unloading and assorting defective castings returned;

Transferring castings to and from storage for shipment;

Loading castings on delivery trucks;

Moving defective castings to designated delivery point;

Cleaning up department refuse and disposing of same.

104 SUPPLIES AND TOOLS:

To include the cost of all supplies and small tools used in the Assorting and Shipping Department, such as sacks, or other containers, twine, needles, etc.

105 REPAIR LABOR AND MATERIALS:

(Optional Account No. 175, General Repairs).

To include the cost of all labor and materials used in connection with the upkeep and maintenance of the Assorting and Shipping Department equipment.

180 PATTERN EXPENSE:

To include all direct labor and material in making, altering or repairing patterns which is chargeable to individual pattern numbers; all pattern shop indirect labor, fuel supplies and tools and pattern shop repair labor and materials.

This account will be credited with the labor, materials and expense which is chargeable to customers. The remainder will be a direct charge to the individual jobs involved, so far as it is practicable to apply the expense. Any unabsorbed balance should be regarded as a molding department indirect expense and distributed to jobs on the basis of molding direct labor.

190 DRAYAGE:

To include the cost of delivering castings to depots or to city customers, also switching of cars loaded for city customers, and incidental drayage on miscellaneous small items which cannot conveniently be charged to the cost of the commodity.

200 RETURNED CASTINGS AND ALLOWANCES:

To include the invoice price less scrap value of defective castings returned by customers and allowances to customers because of defective castings. Defective castings are those which cannot be reclaimed.

FIXED PLANT CHARGES

116 POWER, HEAT AND LIGHT:

To include the cost of all purchased current; all costs of labor, fuel, supplies and expense in producing power; labor and materials in repairing boiler and engine room equipment, including air compressors, accumulators, pumps, generators, transformers, etc., located in engine room; etc.

126 INSURANCE:

To include all premiums for insurance—fire, liability, boiler, tornado, etc.

Charge the account monthly and credit “Pre-paid Insurance” account, the entry being one-twelfth of the annual expense.

146 TAXES:

To include all tax payments and assessments on both real and personal property.

Charge the account monthly and credit “Accrued Taxes” account, the entry being one-twelfth of the annual expense.

156 DEPRECIATION:

To include charges to cover the deterioration in the value of buildings and equipment due to wear and tear and obsolescence.

Charge the account monthly and credit “Plant and Equipment Depreciation Reserve” accounts, the basis being one-twelfth of the annual expense.

162 SUPT., FOREMEN AND PLANT CLERKS:

To include the salary of the superintendent, general foreman, all departmental foremen, plant clerks and chemists.

172 YARD LABOR, WATCHMEN AND JANITORS:

To include all miscellaneous yard labor, excepting unloading; watchmen and janitors.

174 GENERAL SUPPLIES AND TOOLS:

To include the cost of all miscellaneous supplies and tools which cannot be charged to any specific department.

175 GENERAL REPAIRS:

(Optional with the departmental repair accounts).

To include the cost of all labor and materials used in connection with the upkeep and main-

tenance of all buildings and plant equipment, other than power plant and pattern shop.

176 MISC. PLANT EXPENSE: .

To include all forms of miscellaneous plant expense of a general nature not included elsewhere, such as water rent, employees' welfare, medical and hospital, etc.

ADMINISTRATIVE AND SELLING EXPENSE

270 OFFICE SALARIES:

To include the salaries of office clerks, salesmen and of all general officers.

280 OFFICE EXPENSE:

To include all expense incidental to the office, including selling expense other than traveling.

290 TRAVELING EXPENSE:

To include traveling expense of all officers and employees.

300 GENERAL EXPENSE:

To include all forms of expense of a general nature which cannot be included elsewhere, such as membership dues, donations, etc., not including Federal Income and Profits Taxes which are not cost items.

Procedure to Ascertain the Costs of Metal and of Melting and to Distribute Indirect Costs to Particular Jobs

1. To ascertain the metal and melting costs per ton of good finished castings produced, for any pattern of casting of a given yield, prepare a table of metal and melting costs at different yields, using the procedure illustrated on pages 19 and 20.

Note: Good finished castings produced shall be the shipping weight or the trimming room weight less soft iron scrap and less a finishing loss of 3%; unless, however, definite experience shows a lower percentage of loss, in which case the known percentage should be used.

2. Distribute the indirect costs of the Molding Department (Accounts 32, 34, 35) on the basis of the molding direct labor.

3. Distribute the indirect costs of the Coremaking Department (Accounts 42, 43, 44, 45) on the basis of the coremaking direct labor.

4. Distribute the costs of the Hard Iron Cleaning Department (Accounts 52, 54, 55) on the basis of good finished castings produced, applying where practicable the cost of tumbling against the tonnage tumbled and the cost of sand-blasting against the tonnage sand-blasted.

5. Distribute the costs of the Hard Iron Trimming and Inspection Department (Accounts 62, 64, 65) on the basis of the molding direct labor when such costs are not determined by pattern numbers, or by a weight classification

6. Distribute the costs of the Annealing Department (Accounts 72, 73, 74, 75, 77) on the basis of good finished castings produced.

7. Distribute the costs of the Soft Iron Cleaning Department (Accounts 82, 84, 85) on the basis of good

finished castings produced, applying where practicable the cost of tumbling against the tonnage tumbled and the cost of sand-blasting against the tonnage sand-blasted.

8. Distribute the indirect costs of the Finishing Department (Accounts 92, 94, 95) on the basis of the finishing direct labor.

9. Distribute the costs of the Assorting and Shipping Department (Accounts 102, 104, 105) on the basis of good finished castings produced.

10. Distribute the cost of drayage (Account 190) on the basis of good finished castings produced.

11. Distribute the account "Returned Castings and Allowances" (Account 200) on the basis of good finished castings produced. Where it is practicable, however, to treat returns as a direct charge that practice is recommended.

12. Distribute Fixed Plant Charges (Accounts 116, 126, 146, 156, 162, 172, 174, 175, 176), when not departmentalized, by applying 10% on the basis of the pounds of metal charged (melting department expense), 40% on the basis of molding direct labor, 10% on the basis of coremaking direct labor, 10% on the basis of finishing direct labor, and 30% on the basis of good finished castings produced.

Note: These percentages are not arbitrarily chosen but are approximately the proportions obtained by those who make a careful departmental distribution of each of the several Fixed Plant Charges.

13. Distribute Administrative and Selling Expense (Accounts 270, 280, 290, 300) by applying 10% on the basis of the pounds of metal charged (melting department expense), 40% on the basis of molding direct labor, 10% on the basis of coremaking direct labor, 10% on the basis of finishing direct labor, and 30% on the basis of good finished castings produced.

Procedure to Ascertain the Costs of Metal

STATEMENT OF METAL COSTS

Month of 192.....

Per Cent of Mixture	Net Tons	Price	Amount
100.0	909.09	\$18.45	\$16,770.00
8.0	72.72
<u>92.0</u>	<u>836.37</u>	<u>20.05</u>	<u>16,770.00</u>
42.5	386.50	18.45	7,130.00
<u>49.5</u>	<u>449.87</u>	<u>21.43</u>	<u>9,640.00</u>
4.1	36.83	18.45	680.00
<u>1.4</u>	<u>13.04</u>
44.0	400.00	22.40	8,960.00

Oxidation and Metal Loss, including finishing loss, per ton of Metal Charged (85.76 tons @ 18.45 ÷ 909.09).....\$1,740

Melting Department Costs, per ton of Metal Charged (\$5,447.60, see page 24, ÷ 909.09 tons)\$5,992

**COMPUTATION OF METAL AND MELTING COSTS
AT DIFFERENT YIELDS**

Yield (% of Metal Charged)	Oxidation and Metal Loss (a)	Cost of Metal Charged Per Net Ton	Metal Cost per ton of good finished castings produced	Melting Cost per ton of good finished castings produced (b)
25	\$6.96	\$18.45	\$25.41	\$23.97
26	6.69	18.45	25.14	23.05
27	6.44	18.45	24.89	22.19
28	6.21	18.45	24.66	21.40
29	6.00	18.45	24.45	20.66
30	5.80	18.45	24.25	19.97
31	5.61	18.45	24.06	19.32
32	5.43	18.45	23.88	18.73
33	5.27	18.45	23.72	18.16
34	5.12	18.45	23.57	17.62
35	4.97	18.45	23.42	17.12
36	4.83	18.45	23.28	16.64
37	4.70	18.45	23.15	16.19
38	4.57	18.45	23.02	15.77
39	4.46	18.45	22.91	15.36
40	4.35	18.45	22.80	14.98
41	4.24	18.45	22.69	14.61
42	4.14	18.45	22.59	14.27
43	4.04	18.45	22.49	13.93
44	3.95	18.45	22.40	13.62
45	3.86	18.45	22.31	13.32
46	3.78	18.45	22.23	13.03
47	3.70	18.45	22.15	12.75
48	3.62	18.45	22.07	12.48
49	3.55	18.45	22.00	12.23
50	3.48	18.45	21.93	11.98
51	3.41	18.45	21.86	11.75
52	3.34	18.45	21.79	11.52
53	3.28	18.45	21.73	11.31
54	3.22	18.45	21.67	11.10
55	3.16	18.45	21.61	10.89
56	3.10	18.45	21.55	10.70
57	3.05	18.45	21.50	10.51
58	3.00	18.45	21.45	10.33
59	2.95	18.45	21.40	10.16
60	2.90	18.45	21.35	9.99
61	2.85	18.45	21.30	9.82
62	2.80	18.45	21.25	9.66
63	2.76	18.45	21.21	9.51
64	2.72	18.45	21.17	9.36
65	2.67	18.45	21.12	9.22

Yield of any given job, in percentage of metal charged, is obtained by dividing the pounds of good production by the pounds of metal poured, increased by the average oxidation and metal loss, including finishing loss. Example—18,000 lbs. metal poured, 9,000 lbs. good finished castings produced:

$$18,000 \div 90.6 (100 - 9.4) = 19,868$$

$$9,000 \div 19,868 = 45\% \text{ yield}$$

(a) Obtained by dividing the cost of the oxidation and metal loss per net ton of metal charged (\$1.740) by the given yield.

(b) Obtained by dividing the melting cost per net ton of metal charged (\$5.992) by the given yield.

FORMS OF COST RECORDS

The accounting methods recommended in this pamphlet do not require that records for gathering cost data be similar in form or arrangement. The forms of records, however, should be such as to gather and exhibit the results with a minimum amount of clerical labor and with proof of the accuracy of the work.

Suggested forms of statements and records illustrating the methods described in this pamphlet consist of the following:

Monthly Cost Statement

Molder's Weekly Production Record

Coremaker's Weekly Production Record

Summary Cost Record

Cost Card

Cost Estimate Card

The accounting principles involved can be readily understood by studying the figures and the relationship of one record to another.

MONTHLY COST STATEMENT

Good Finished Castings Produced—400 Tons.

Month of.....192..

	Actual Cost		Normal Basis (a)	
	Amount	Per Ton	Amount	Per Ton
METAL COST	\$8,960.00	22.40	\$8,960.00	22.40
MELTING DEPARTMENT:				
Indirect Labor	\$1,600.00	4.00	\$1,600.00	4.00
Fuel	2,800.00	7.00	2,800.00	7.00
Supplies and Tools	360.00	.90	360.00	.90
Total	\$4,760.00	11.90	\$4,760.00	11.90
MOLDING DEPARTMENT:				
Direct Labor	\$8,000.00	20.00	\$8,000.00	20.00
Indirect Labor	4,500.00	11.25	4,500.00	11.25
Supplies and Tools	400.00	1.00	400.00	1.00
Total	\$12,900.00	32.25	\$12,900.00	32.25
COREMAKING DEPARTMENT:				
Direct Labor	\$1,600.00	4.00	\$1,600.00	4.00
Indirect Labor	960.00	2.40	960.00	2.40
Fuel	200.00	.50	200.00	.50
Supplies and Tools	600.00	1.50	600.00	1.50
Total	\$3,360.00	8.40	\$3,360.00	8.40
HARD IRON CLEANING DEPARTMENT:				
Indirect Labor	\$560.00	1.40	\$560.00	1.40
Supplies and Tools	20.00	.05	20.00	.05
Total	\$580.00	1.45	\$580.00	1.45
HARD IRON TRIMMING AND INSPECTION DEPARTMENT:				
Direct and Indirect Labor	\$920.00	2.30	\$920.00	2.30
Supplies and Tools	20.00	.05	20.00	.05
Total	\$940.00	2.35	\$940.00	2.35
ANNEALING DEPARTMENT:				
Indirect Labor	\$2,200.00	5.50	\$2,200.00	5.50
Fuel	1,400.00	3.50	1,400.00	3.50
Supplies and Tools	400.00	1.00	400.00	1.00
Pots and Bottoms	1,600.00	4.00	1,600.00	4.00
Total	\$5,600.00	14.00	\$5,600.00	14.00

SOFT IRON CLEANING DEPARTMENT:			
Indirect Labor.....	\$640.00	1.60	\$640.00
Supplies and Tools.....	100.00	.25	100.00
Total.....	\$740.00	1.85	\$740.00
FINISHING DEPARTMENT:			
Direct Labor.....	\$1,500.00	3.75	\$1,500.00
Indirect Labor.....	360.00	.90	360.00
Supplies and Tools.....	320.00	.80	320.00
Total.....	\$2,180.00	5.45	\$2,180.00
ASSORTING AND SHIPPING DEPARTMENT:			
Indirect Labor.....	\$960.00	2.40	\$960.00
Supplies and Tools.....	160.00	.40	160.00
Total.....	\$1,120.00	2.80	\$1,120.00
Pattern Expense.....	\$200.00	.50	\$200.00
Drayage.....	180.00	.45	180.00
Returned Castings and Allowances.....	720.00	1.80	720.00
FIXED PLANT CHARGES:			
Power, Heat and Light.....	\$1,200.00	3.00	\$720.00
Fire Insurance.....	480.00	1.20	288.00
Liability Insurance.....	440.00	1.10	264.00
Taxes.....	520.00	1.30	312.00
Depreciation.....	1,600.00	4.00	960.00
Supt., Foremen and Plant Clerks.....	1,880.00	4.70	1,128.00
Yard Labor, Watchmen and Janitors.....	140.00	.35	84.00
General Supplies and Tools.....	100.00	.25	60.00
General Repairs.....	680.00	1.70	408.00
Misc. Plant Expense.....	80.00	.20	48.00
Total.....	\$7,120.00	17.80	\$4,272.00
ADMINISTRATIVE AND SELLING EXPENSE:			
Office Salaries.....	\$2,400.00	6.00	\$1,440.00
Office Expense.....	500.00	1.25	300.00
Traveling Expense.....	840.00	2.10	504.00
General Expense.....	600.00	1.50	360.00
Total.....	\$4,340.00	10.85	\$2,604.00
Total Cost of Good Finished Castings.....	\$63,700.00	134.25	\$49,116.00
Normal Production per month.....			667 Tons
Production during month.....			400 Tons
Percentage of Normal.....			60

(a) Actual Cost, adjusting Fixed Plant Charges and Administrative and Selling Expense to basis of Normal Production.

It is recommended that the average monthly production for the five preceding calendar years be taken as a normal monthly production modified by the effect of any substantial change in productive facilities or class of work.

Cost Accounting Methods

OVERHEAD RATES

Metal Cost.....		\$8,960.00
Melting Department Costs.....	\$4,760.00	
10% Fixed Plant Charges and Adm. and Selling.....	687.60	5,447.60
<hr/>		
Molding Direct Labor.....		8,000.00
Molding Department Indirect Costs.....	4,900.00	
Trimming and Inspection Department Costs.....	940.00	
Pattern Expense.....	200.00	
40% Fixed Plant Charges and Adm. and Selling.....	2,750.40	8,790.40
<hr/>		
(\$8,790.40 ÷ \$8,000.00 = 110% overhead on molding direct labor.)		
Coremaking Direct Labor.....		1,600.00
Core Department Indirect Costs.....	1,760.00	
10% Fixed Plant Charges and Adm. and Selling.....	687.60	2,447.60
<hr/>		
(\$2,447.60 ÷ \$1,600.00 = 153% overhead on coremaking direct labor.)		
Hard Iron Cleaning Department Costs..	580.00	
Annealing Department Costs.....	5,600.00	
Soft Iron Cleaning Department Costs..	740.00	
Assorting and Shipping Department Costs	1,120.00	
Drayage.....	180.00	
Returned Castings and Allowances.....	720.00	
30% Fixed Plant Charges and Adm. and Selling.....	2,062.80	11,002.80
<hr/>		
(\$11,002.80 ÷ 400.0 tons good finished casting produced = \$27.51 per ton, uniform tonnage costs on all work).		
Finishing Direct Labor.....		1,500.00
Finishing Department Indirect Costs....	680.00	
10% Fixed Plant Charges and Adm. and Selling.....	687.60	1,367.60
<hr/>		
(\$1,367.60 ÷ \$1,500.00 = 92% overhead on finishing direct labor.)		
Total Cost.....		<hr/> \$49,116.00

MOLDERS WEEKLY PRODUCTION RECORD

Amount \$ 37.01
May 7

Week ending May 7

Molder J. Smith No. 2.0

A. B. Machine Co.

CUSTOMER	PCS. ORDERED															
	TOTAL MOLDING HOURS		MOLDS POURED		PIECES		POUNDS		MOLDING HOURS							
PATTERN NO.	P. W.	D. W.	GOOD	ALLOW	BAD	GOOD	ALLOW	BAD	GOOD	BAD						
			102	380	8	20	760		8							
			110	408	2	30	816		8							
			117	416	6	46	832		8							
			115	412	4	44	824		8							
			116	420	2	42	840		8							
TOTAL			560	2036	22	182	4072		40							
RATE											110	408	8	24	816	6
AMOUNT											104 molds @ 6¢ 624					

CUSTOMER	PCS. ORDERED									
	TOTAL MOLDING HOURS		MOLDS POURED		PIECES		POUNDS		MOLDING HOURS	
PATTERN NO.	P. W.	D. W.	GOOD	ALLOW	BAD	GOOD	ALLOW	BAD	GOOD	BAD
			400							
			72							
TOTAL			472							

CUSTOMER	PCS. ORDERED									
	TOTAL MOLDING HOURS		MOLDS POURED		PIECES		POUNDS		MOLDING HOURS	
PATTERN NO.	P. W.	D. W.	GOOD	ALLOW	BAD	GOOD	ALLOW	BAD	GOOD	BAD
TOTAL										

CUSTOMER	PCS. ORDERED									
	TOTAL MOLDING HOURS		MOLDS POURED		PIECES		POUNDS		MOLDING HOURS	
PATTERN NO.	P. W.	D. W.	GOOD	ALLOW	BAD	GOOD	ALLOW	BAD	GOOD	BAD
TOTAL										

COREMAKER'S WEEKLY PRODUCTION RECORD

Amount \$ 3520
 May 7, 192...

Coremaker Bon Polak No. 64 Week ending

CUSTOMER		PATTERN NO.		CORE LETTER		CORES ORDERED		TOTAL CORE HOURS		CORES MADE		HOURS		CORES MADE		HOURS	
	<u>Ross Co</u>	<u>B.M.C.</u>	<u>U.F. 90</u>	<u>C. J. Wood</u>	<u>R.S. 910</u>												
	<u>OR 2346</u>	<u>9680</u>	<u>2.90</u>														
DATE	P. W.	D. W.	CORES MADE	HOURS	CORES MADE	HOURS	CORES MADE	HOURS	CORES MADE	HOURS	CORES MADE	HOURS	CORES MADE	HOURS	CORES MADE	HOURS	
<u>May 3</u>	<u>8</u>		<u>1000</u>	<u>1200</u>													
	<u>4</u>		<u>880</u>	<u>1500</u>			<u>80</u>										
	<u>5</u>		<u>760</u>				<u>410</u>										
	<u>6</u>		<u>560</u>				<u>390</u>					<u>100</u>					
	<u>7</u>											<u>1100</u>					
	<u>76</u>		<u>4400</u>	<u>3600</u>			<u>880</u>					<u>1200</u>					
RATE			<u>304</u>	<u>254</u>			<u>100</u>					<u>354</u>					
AMOUNT			<u>1320</u>	<u>900</u>			<u>880</u>					<u>420</u>					

CUSTOMER	PATTERN NO.	CORE LETTER	CORES ORDERED	TOTAL CORE HOURS	CORES MADE	HOURS	CORES MADE	HOURS	CORES MADE	HOURS	CORES MADE	HOURS	CORES MADE	HOURS	CORES MADE	HOURS
TOTAL																
RATE																
AMOUNT																

SUMMARY COST RECORD

Bench	1
Squeezer	
Plate	
Floor	
Machine	

Pounds Metal Poured Per Mold 141.7
 Pounds Per Casting 2.0
 Pieces Per Mold 4

Customer Roe & Co.
 Pattern No. R-2346
 Class of Work Automotive

WEEK ENDING	MOLDER	MOLDING HOURS	MOLDS POURED	HARD IRON		POUNDS FINISHING LOSS	POUNDS SOFT IRON SCRAP	POUNDS GOOD PRODUCTION	DIRECT COSTS				
				PIECES GOOD	POUNDS GOOD				MOLDING LABOR	COREMAKING LABOR	FINISHING LABOR		
May 7	J. Smith	40	560	2036	4072	81	16	3975	9087	1320	1018		

Customer **Roe + Co.**
 Pattern No. **12-2346**

COST CARD

Class of Work **Automotive.**
 Wt. Per Piece **2.0**

					<i>May</i>									
Lbs Metal Poured					82 32									
Lbs. Good Production					3,975									
Yield (% Good to Metal Charged)					44									
Production per Molder per Hour (Lbs.)					99									
COSTS PER NET TON:														
Metal					22 40									
Melting					13 62									
Molding Direct Labor					15 55									
Molding Overhead					17 11									
Coremaking Direct Labor					6 65									
Core Overhead					10 18									
Finishing Direct Labor					5 13									
Finishing Overhead					4 73									
Uniform Tonnage Costs					27 51									
TOTAL COST PER TON					122 88									
					<i>Cost Per Cwt.</i>					6 14				
					<i>S. P. Per Cwt.</i>					7 00				

COST ESTIMATE

NAME Rox + Co

DATE OF ESTIMATE.....192..

PATTERN NO. R-2346

CLASS OF WORK.....

PIECES	LBS. PER CASTING	PCS. PER MOLD	LBS. PER MOLD	WT. OF SPRUE (LBS.)	COST PER TON
2000	2.0	4	8.0	7.0	
MOLDS					
500	% LOSS	MOLDS TO MAKE	GROSS WT. PER MOLD (LBS.)	LBS. METAL Poured	
	H. I. not pd. for 6	556	15.0	7840	22 40
	H. I. pd. for 2			8340	13 62
	S I. pd. for 2				15 63
Total Good Production 4000 Lbs. 2.00 Tons					
Yield (on Metal Poured) 48 % (on Metal Charged) 44 %					
Molds per Molder per Hour 12 per Day 96					
Good Production per Hour 96 per Day 768					
DAY WORK					
Molding Labor:	Hours	Rate	Total		
Core Labor:	Hours	Rate	Total		
Finishing Labor:	Hours	Rate	Total		
PIECE WORK					
Molding Labor:	Molds	Rate	Total		
Core Labor:	Molds	Rate	Total		
Cores Required	4448	Rate per 100 Cores	30¢ Total		
Core Breakage	130				
Finishing Labor:	Pieces	Rate per 100 Pcs.	50¢ Total		
TOTAL COST PER TON 123 52					
15 % Profit (\$ 7.11 per Floor per Day) 18 53					
Selling Price per Ton 142 05					
per 100 Lbs.					
7 10					

Depreciation

The first step necessary to provide for proper depreciation is to departmentize building and equipment values. The next step is to take each kind of building and equipment and figure its proper depreciation.

It is the experience of members that the following annual rates for depreciation, for the principal kinds of malleable iron foundry buildings and equipment, are necessary to fully maintain plant and equipment values:

BUILDINGS:	Per cent.
Concrete.....	21½
Brick.....	3
Sheet Iron.....	10
MELTING DEPARTMENT EQUIPMENT:	
Melting Furnaces and Apparatus.....	7½
Sprue Mill and Slag Washer.....	15
Laboratory Equipment.....	10
Crane.....	10
MOLDING DEPARTMENT EQUIPMENT:	
Hand Squeezers.....	15
Air Molding Machines.....	20
CORE DEPARTMENT EQUIPMENT:	
Core Ovens and Apparatus.....	7½
Core Machines.....	15
Sand Mixer.....	20
Benches, Racks, Trays, Trucks.....	10
HARD IRON CLEANING DEPARTMENT EQUIPMENT:	
Tumbling Barrels, with motor, shafting and belting..	15
Sand-Blast Barrels and Tables, with motor shafting and belting.....	30
Dust Arrester.....	10
TRIMMING AND INSPECTING DEPARTMENT EQUIPMENT:	
Benches, Scales, Trucks.....	10
Emery Wheel Stands, with motor, shafting and belting	10
ANNEALING DEPARTMENT EQUIPMENT:	
Annealing Ovens and Apparatus.....	10
Annealing Trucks.....	20
Crane.....	10

Depreciation

SOFT IRON CLEANING DEPARTMENT EQUIPMENT:

	Per cent.
Tumbling Barrels, with motor, shafting and belting . .	15
Sand-Blast Barrels and Tables, motor shafting and belting	30
Dust Arrester	10

FINISHING DEPARTMENT EQUIPMENT:

Emery Wheel Stands, Drop Hammers, Lathes, Drill Presses, Air Choppers, Milling Machines, Threading Machines, etc., with motor, shafting and belting . . .	10
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ASSORTING AND SHIPPING DEPARTMENT EQUIPMENT:

Sorting Tables, Trucks, Scales, etc.	10
Automobile Trucks	20

POWER PLANT EQUIPMENT:

Steam Boiler, Generator, Air Compressor, Steam Piping, Electric Wiring, etc.	7½
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Experience has proved these rates to be conservative, and it is very doubtful if the member who is not providing for depreciation at substantially the rates noted above is fully maintaining his plant values.

The amount provided to represent the deterioration in plant and equipment values due to wear and tear and obsolescence should be charged monthly to cost of production and credited to Buildings and Equipment Depreciation Reserve accounts. Against the reserve accounts should be charged all expenditures of the nature of complete renewals and replacements which to that extent restore plant values and reduce the accrued depreciation.

Current repairs and partial renewals of an inextensive nature should be charged directly to cost of production.