

# Nickel Alloy Wires

PRODUCT CODE	: 339931000
QUALITY AND STANDARDS	: BS 115 :1954
MONTH AND YEAR OF PREPARATION	: August, 2002
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## INTRODUCTION

Nickel alloyed with copper at the ratio of 45:55 is suitable for use where low temperature co-efficient is required. In wire form (also known as Eureka Wire) it is widely used for the manufacture of precision components in Electronics and Electrical Industries being mainly used as instrument coils, shunts etc.

## MARKET POTENTIAL

Nickel alloyed wire is required by Electronics and Electrical Industries for the manufacture of precision components. In view of the increasing demand day by day and existence of very few units manufacturing this product, there is a good market potential for this product.

With the stress on quality particularly for electrical goods, the demand for the product shall be ever increasing wherever specific properties of low temperature co-efficient are required. At

present the demand of this product is partly fulfilled by its import. Hence it has good market prospects and it is actually an import substitution item.

## BASIS AND PRESUMPTIONS

1. For capacity utilisation, it is considered that 60% efficiency and 6 working hours per day are required.
2. Four years required for achieving full capacity utilisation.
3. Labour and wages required as per present circumstances.
4. Interest rates for Fixed and Working Capital is 14%.
5. Margin Money from the proprietor is 25% and 75% from financial institutions.
6. Land and Building is on Rent.
7. Cost of Machinery and Equipments is Rs. 9,09,300.

## IMPLEMENTATION SCHEDULE

Sl No.	Name of Activity	Period
1.	Preparation of the Project Report:	
	a. Calling quotations	1 month
	b. Preparation of Report	2 weeks
2.	Provisional registration as SSI Unit	1 day
3.	Financial Arrangements	3 months
4.	Purchase and Procurement of Machinery and Equipment	1 month
5.	Installation of machines and equipment	1 month
6.	Electrification	1 month
7.	Recruitment of Staff and workers	1 month
8.	Commencement of production	9 months onwards

## TECHNICAL ASPECTS

### Process of Manufacture

Virgin Nickel and Copper are weighed in the ratio as per composition plus provision for melting loss to form a charge and the charge is then melted in crucible furnace. The molten metal is heated to optimum pouring temperature so as to have good fluidity. Molten metal is poured in moulds and rods of 1" dia are cast. After fettling, the rods are passed through rolling machine to make rods of smaller diameter. The rods are then passed through a number of wire drawing machines to gradually reduce the dia to the required gauge. The wires are annealed in annealing furnace intermittently as and when the material gets hardened due to drawing operations. The wires are finally tested to check resistivity, temperature resistant co-efficient etc. as stipulated for wire in the specification.

### Quality Control and Standards

Nickel alloy wire drawn to the final

required size should have bright finish without any surface defects. The physical properties of quality wires are as follows:

1. Melting Point	1250°C
2. Resistance compared with copper	28.45
3. Coefficient of linear expansion, 20°C-100°C, per °C × 10 <sup>-6</sup>	14.9
4. Tensile Strength (Annealed), Tons per sq. inch (approx).	26
5. Specific heat	0.098
6. Specific Gravity, gms/cc.	8.88

The material can be tested as per BS: 115-1954.

### Production Capacity

This scheme has been prepared with estimated production capacity of 60 kg. of wire per day on single shift basis. It comes to 1.5 MT per month.

### Pollution Control

This unit will not create any pollution hazards.

### Energy Conservation

Coke in the pit Furnace and electrical power for the blower and annealing furnaces are the sources of energy. The Furnace pit recess used for lighting up and removing ashes should be sealed with a steel plate and mud. For the blower pipe entry appropriate hole should be there by the side of the steel plate. The coke pit should be properly designed as to restrict wastage of coke. The top end of the crucible should be well inside the coke and should always be covered with broken crucible pieces except for the time of charging and pressing.

## FINANCIAL ASPECTS

### A. Fixed Capital

(i) Land and Building	Amount (In Rs.)
Rented Land, 2500 sq.ft. with covered Area	12,500
<b>Total</b>	<b>12,500</b>

(ii) Machinery and Equipments	Qty.	Amount (In Rs.)
1. Coke fired Pit furnace (self fabricated) suitable for No. 16 crucible with 1/2 H.P. Motor and blower	1	25,000
2. Electrically heated Pot type bright annealing furnace with closed type stainless steel pot, cap. 100 kg with temperature indicator and control panel board, max. cap. 1100°C., 10 KW rating	1	1,50,000
3. Wire rolling machine, heavy duty grooved rollers size 6" x 10" fitted with 7.5 HP electric motor and starter	1	70,000
4. Vertical type wire drawing machine, 600mm drum dia. With 15 HP motor and starter suitable for drawing from 6 SWG to 12 SWG	1	80,000
5. Vertical type wire drawing machine suitable for drawing from 12 SWG to 16 SWG	2	90,000
6. Horizontal type wire drawing machine suitable for wire drawing from 16 SWG to 24 SWG-8 stages with 7.5 HP motor and starter	1	1,10,000
7. Horizontal type wire drawing machine suitable for wire drawing from 24 SWG to 32 SWG into drafts with 5 HP motor and starter	1	75,000
8. Horizontal type wire drawing machine suitable for wire drawing from 24 SWG to 32 SWG in 15 drafts with 3 HP motor and starter	1	60,000
9. Pointing machine with 1 HP motor and starter	1	15,000
10. Die polishing machine complete with 1/2 HP motor	1	8,000
11. Wire Butt Welder, 10 KVA	1	12,000
12. Bobbin Winding machine with 1/2 HP motor	1	8,000

Testing Equipments	Qty.	Amount (In Rs.)
1. Resistance and Current measuring instruments Thermocouple tester, micrometer, wire gauge etc. and Chemical laboratory equipments	L.S.	30000
2. Cost of Moulds and fixtures	L.S.	30000
<b>Total</b>		<b>7,63,000</b>

Office/Lab. Furniture/ equipments	L.S.	30,000
Pre-operative expenses	L.S.	40,000
<b>Total</b>		<b>8,33,3000</b>

Electrical and mechanical installation @ 10% of Plant and Machinery Equipment		76300
<b>Total</b>		<b>90,9300</b>

### B. Working Capital (per month)

(i) Raw Materials		(Rs.)
1. Copper Ingots @ Rs. 160 kg	865 kg.	138,400
2. Nickel Ingots @ Rs. 400Kg	680Kg.	2,72,000
3. Fluxing Chemicals	L.S.	5,000
4. Moulding materials, sand additives, lubricants etc.	L.S.	4,000
5. Crucible No. 16 @ Rs. 250 piece	20 Nos.	5,000
6. Hard Coke @ Rs. 7000 MT	2.5 MT	17,500
<b>Total</b>		<b>4,41,900</b>

(ii) Utilities		(Rs.)
1. Power and Electricity @ Rs. 3 unit	2000	6,000
2. Water @ Rs. 10 KL	100	1,000
<b>Total</b>		<b>7,000</b>

### (iii) Salary and Wages (per month)

Designation	No.	Salary (In Rs.)	Amount (In Rs.)
1. Works Manager	1	4,000	4,000
2. Sales Executive	1	2,000	2,000
3. Supervisor	2	25,00	5,000
4. Store Keeper	1	1,500	1,500
5. Chemist	1	2,000	2,000
6. Steno-Typist	1	1,500	1,500

7. Skilled Workers	3	2,000	6,000
8. Semi-skilled Workers	5	1875	9,375
9. Unskilled workers	8	1350	10,800
10. Watchman/Peon	3	1350	4,050
11. Maintenance Fitter	1	1,875	1875
<b>Total</b>			<b>48,100</b>
<i>Perquisite @ 15% of Salary and Wages</i>			7,215
<b>Total</b>			<b>55,315</b>

**(iv) Other Contingent Expenses (per month) (Rs.)**

1. Rent	12,500
2. Insurance	3,000
3. Office stationery and postage	1,000
4. Publicity and advertisement	5,000
5. Travelling and conveyance	4,000
6. Packing charges	1,000
7. Legal and other expenses	2,000
8. Repair and maintenance	2,000
9. Consumable stores	3,000
10. Sales Expenses	4,000
11. Miscellaneous expenses	4,000
<b>Total</b>	<b>41,500</b>

**(v) Total Recurring Expenses (per month) (Rs.)**

1. Salary and wages	55,315
2. Raw Materials	4,41,900
3. Utilities	7,000
4. Other Expenses	41,500
<b>Total</b>	<b>5,45,715</b>

**(vi) Working Capital (for 3 Months) Rs.16,37,145****C. Total Capital Investment**

1. Fixed Capital	9,09,300
2. Working Capital (for 3 Months)	16,37,145
<b>Total</b>	<b>25,46,445</b>

**FINANCIAL ANALYSIS****(1) Cost of Production (per year) (Rs.)**

1. Total Recurring Cost per year	65,48,580
2. Depreciation on Machinery and Equipment @ 10%	76,300

3. Depreciation on Furnaces @ 20%	35,000
4. Depreciation on Office Equipments @ 25%	7,500
5. Interest on Total Capital Investment @ 14%	3,56,502
<b>Total</b>	<b>70,23,882</b>
<b>Say</b>	<b>70,24,000</b>

**(2) Turnover (per year) (Rs.)**

By Sale of Nickel Alloyed Wire of different gauges 18 MT @ Rs. 425000 per MT

**(3) Profit per year**

Total Turnover – Total Cost of Production  
**Rs. 6,26,000**

**(4) Rate of Return on Investment % 24.59%****(5) Rate of Return on Sales % 8.18%****(6) Break-even Point****(i) Fixed Cost (per annum) (Rs.)**

1. Interest on Total Investment @ 14%	36,56,502
2. Depreciation on Furnaces @ 20%	35,000
3. Depreciation on Machinery and Equipments @ 10%	76,300
4. Insurance	36,000
5. 40% of Salary and Wages	2,65,512
6. 40% of Other Expenses (excluding Rent and Insurance)	1,24,800
<b>Total</b>	<b>8,94,114</b>

**(ii) Net Profit (per year) Rs. 626000**

= F.C. / (F.C. + Profit) × 100 **58.81%**

**Addresses of Machinery, Equipment and Raw Material Suppliers**

- M/s. Mahavir Engineering Corporation  
1, Ambika Estate, Behind Agarwal Indl. Estate, Off. S.V. Road, Jogeshwari (W),  
Mumbai - 400002

2. M/s. Nisha Engineers and Consultants  
Nisha Enclave, Plot No. 95,  
Sec - 23, Codco Indl. Area  
Turbhe - 400613
3. M/s. Electroll Super Thermal Engineers  
151, Small Factory Area,  
Lakadganj,  
Nagpur - 440008.
4. M/s. Mechachem Industries  
D-55, M.I.D.C.,  
Nagpur - 440028.
5. M/s. R.R. Khandelwal Steel and Allied Industries Pvt. Ltd.  
Ghat Road,  
Nagpur - 440018.
6. M/s. Engineering and Industrial Foundry Company  
Ramnagar, Coimbatore - 641009
7. M/s. Krystal Elmec  
Ichalkaranji Indl. Co-op. Estate Ltd.  
Common Hall No. 5,  
Block No. 8/9,  
Ichalkaranji - 416115.
8. M/s. AIMIL Ltd.  
Malhotra House, Opp. G.P.O.,  
Walchand Hirachand Marg,  
Mumbai - 1
9. M/s. Foundry Accessories  
7, Home Prakash, 90,  
Kazisyed Street,  
Mumbai - 3
10. M/s. Khurana Enterprises  
Near Subhash Putla,  
Sataranjipura,  
Nagpur - 8.
11. M/s. AARPEE Enterprises (Jaya Group)  
4950, 4th Floor,  
Bussi Plaza,  
Central Bazar Road,  
Ramdaspath,  
Nagpur - 10
12. M/s. Fuel Instruments and Engineers Pvt. Ltd.  
68 to 69, Parvati Co-op. Indl. Estate, Yadrav, Tah. Shirol,  
Kolhapur - 416145.