

HRC Fuse Links, 1000 VAC

PRODUCT CODE (ASICC)	77434
QUALITY AND STANDARDS	IS 13703 :1993
PRODUCTION CAPACITY	Quantity: 3,00,000 Nos. (per annum) Value : Rs. 60,00,000
YEAR OF PREPARATION	2002 _ 2003
PREPARED BY	Small Industries Service Institute Opp. Okhla Industrial Estate New Delhi - 110020 and Office of the Development Commissioner Small Scale Industries Electrical and Electronics Division, 7th Floor, Nirman Bhavan, New Delhi - 110 011.

Introduction

HRC fuse link is a very common, simple and effective electrical protection device against over load and short circuit current. It is so simple device that even an un-skilled person can handle it.

Market Potential

Every electrical establishment, factory, shops, offices etc. need electrical protection devices for smooth running. Therefore, all electrical equipments need over load protection. HRC Fuses are the reliable and cheap option. Because of massive rural and urban electrification programme of Government, there is a good demand for this product. This product is available in a wide range of rated capacity as per customer's requirement. Though, newly developed MCB is also available in the market but in view of simple technology involved to manufacture this product and for replacement, the present demand and future prospect of this product is reasonably good.

Basis and Presumptions

- i) The basis for calculation of production capacity has been taken on single shift basis on 75% efficiency.
- ii) The maximum capacity utilization on single shift basis for 300 days a year. During first year and second year of operations the capacity utilization is 60% and 80% respectively. The unit is expected to achieve full capacity utilization from the third year onward.
- iii) The salaries and wages, cost of raw materials, utilities, rents, etc. are based on the prevailing rates in and around Delhi. These cost factors are likely to vary with time and location.

iv) Interest on term loan and working capital loan has been taken at the rate of 16% on an average. This rate may vary depending upon the policy of the financial institutions/agencies from time to time.

v) The cost of machinery and equipments refer to a particular make/model and prices are approximate.

vi) The break-even point percentage indicated is of full capacity utilization.

vii) The project preparation cost etc. whenever required could be considered under pre-operative expense.

viii) The essential production machinery and test equipment required for the project have been indicated. The unit may also utilize common test facilities available at Electronics Test and Development Centres (ETDCs) and Electronic Regional Test Laboratories (ERTLs) and Regional Testing Centres (RTCs).

Implementation Schedule

The major activities in the implementation of the project has been

listed and the average time for implementation of the project is estimated at 12 months:

<i>Sl. Activity No.</i>	<i>Period (In Months)</i>
1. Preparation of project report	1
2. Registration and other formalities	1
3. Sanction of loan by financial institutions	3
4. Plant and Machinery:	
a) Placement of orders	1
b) Procurement	2
c) Power connection/ Electrification	2
d) Installation/Erection of machinery/Test Equipment	2
5. Procurement of raw materials	2
6. Recruitment of Technical Personnel etc.	2
7. Trial production	11
8. Commercial production	12

Notes

1. Many of the above activities shall be initiated concurrently.

2. Procurement of raw materials commences from the 8th month onwards.

3. When imported plant and machinery are required, the implementation period of project may vary from 12 months to 15 months.

Technical Aspects

Process of Manufacture

The final product HRC Fuses link is basically assembly of electrical conducting and insulating components. The design of HRC Fuses link depends upon rating of current and voltage to

be handled. The components like Fuse element to be designed in accordance to customer's requirement. Other components like Blades, Ceramic barrel, Ceramic base plate, Silica jel, End cover, Blown up indicating and striking device and brass hard ware etc. are bought out components.

All these components are fixed at ceramic housing called barrel and contact blade for connection to be made on it. Complete assembly put on testing bench for final testing to set accuracy of the HRC Fuses link. The routine test to be carried out at every stage of assembly. Final product to be tested as per relevant IS Specification.

Quality Control and Standards

Low Voltage Fuses For Voltages not exceeding 1000 V A C or 1500 V D C. (HRC FUSE LINKS), IS 13703:1993.

Production Capacity (per annum)

Description	Quantity (Nos.)	Value (Rs.)
Low Voltage Fuses For Voltages not exceeding 1000 V A C or 1500 V D C. (Hrc Fuse Links) 16 Amp.	300,000	60,00,000

Motive Power 30 kVA.

Pollution Control

The Government accords utmost importance to control environmental pollution. The small-scale entrepreneurs should have an environmental friendly attitude and adopt pollution control measures by process modification and technology substitution.

India having acceded to the Montreal Protocol in September 1992, the

production and use of Ozone Depleting Substances (ODS) like Chlorofluore Carbon (CFCs), Carbon Tetrachloride, Halons and methyl Chloroform etc. need to be phased out immediately with alternative chemicals/solvents. A notification for detailed Rules to regulate ODS phase out under the Environment Protection Act, 1986 have been put in place with effect from 19th July 2000.

Energy Conservation

With the growing energy needs and shortage coupled with rising energy cost, a greater thrust in energy efficiency in industrial sector has been given by the Government of India since 1980s. The Energy Conservation Act, 2001 has been enacted on 18th August 2001, which provides for efficient use of energy, its conservation and capacity building of Bureau of Energy Efficiency created under the Act.

The following steps may help for conservation of electrical energy:

- i) Adoption of energy conserving technologies, production aids and testing facilities.
- ii) Efficient management of process/manufacturing machineries and systems, QC and testing equipments for yielding maximum Energy Conservation.
- iii) Optimum use of electrical energy for heating during soldering process can be obtained by using efficient temperature controlled soldering and de-soldering stations.
- iv) Periodical maintenance of motors, compressors etc.
- v) Use of power factor correction capacitors. Proper selection and layout of lighting system; timely switching on-off of the lights; use of compact fluorescent lamps wherever possible etc.

Financial Aspects

A. Fixed Capital

(i) Land and Building

Sl. Description No.	Qty. (Sq. Ft.)	Price (Per Sq.Ft.)(Rs.)	Cost (Rs.)
1 Work Shed	4500		
2 Office Block	500		
Total Built up area on Rent (per month)	5,00	3	15,000
Total			15,000

(ii) Machinery and Equipments

(a) Production Unit

Sl. Description No.	Qty./ Nos.	Rate (Rs.)	Total Price (Rs.)
1. Pneumatic power press 10 Tonne	1	75,000	75,000

2. Pneumatic power press 5 Tonne	2	40,000	80,000
3. Spot welding Machine	1	10,000	10,000
4. Brazing Arrangement	1	5,000	5,000
5. Baking oven	1	15,000	15,000
6. Drill machine single/three phase	2	10,000	20,000
7. Taping machine, single/three phase	3	5,000	15,000
8. Grinding machine 4" wheel dia	1	7,000	7,000
9. Air compressor 150 lb/cm ²	1	25,000	25,000
10. Printing Machine	1	20,000	20,000
11. Soldering Station	2	2,000	4,000
12. Bench vice	4	1,000	4,000
13. Hand Press	2	10,000	20,000
Total			300,000

(b) Testing Equipments

Sl. Description/Range No.	Qty.	Rate (Rs.)	Total Price (Rs.)
1. Test Bench consisting with Ampere meter, wattmeter, voltmeter, frequency meter, variac Single phase/three phase	1	10,000	10,000
2. Megar 0-100 M Ohm	1	2,000	2,000
3. Stop Watch 0-60 minutes	1	1,500	1,500
4. H.V. Break down tester 0-3 KV	1	5,000	5,000
5. Shock Tester	1	1,000	1,000
6. Current injection set.	1	5,000	5,000
7. Temperature. rise test set	1	2,000	2,000
8. Tong tester (Clamp Meter)	1	1,000	1,000
9. Multimeter	3	1,000	3,000
10. Double Kelvin Bridge	1	10,000	10,000

11. Fuse link Test rig	4	1,000	4,000
12. Loading Arrangement	1	2,000	2,000
13. Spring Balance	1	500	500
14. Vernier callipers/ Micrometer	1	3,000	3,000
Total			50,000

(c) Other Misc. Expenses on Fixed Assets

Sl. Description No.	Qty.	Value (Rs.)
1. Dies, moulds	LS	10,000
2. Tools/Jigs/Fixture	LS	8,000
3. Installation and electrification charges @ 10%	LS	35,000
4. Office equipments, furniture	LS	10,000
5. Pre-operative expenses	LS	2,000
Total		65,000

Total Fixed Capital (a+b+c)
4,15,000

B. Working Capital (per month)**(i) Raw Materials Including Packing Requirement (per month)**

Sl. Description No.	Qty. (Set/No.)	Rate	Value (Rs.)
1. Electroplated Copper Blade	50,000	2	1,00,000
2. Porcelain Brown Glaze Base Plate	50,000	0.50	25,000
3. Electroplated Copper End Cover	50,000	2	1,00,000
4. Fuse Element	25,000	2	50,000
5. Ceramic Barrel	25,000	1	25,000
6. Silica jel Powder	25,000	0.50	12,500
7. Blown up indicating device	25,000	0.50	12,500
8. Copper/Brass Hardware	25,000	0.50	12,500
9. Misc.	25,000	0.20	5,000
Total			3,42,500

(ii) Salary and Wages (per month)	(Rs.)		
Sl. Description	Qty.	Rate	Value
No.	(Set/No.)		(Rs.)
1. Manager	1	5,000	5,000
2. Q.C. Supervisor	1	5,000	5,000
3. Clerk cum typist	1	3,000	3,000
4. Skilled Workers	3	4,000	12,000
5. Semi-skilled workers	2	3,000	6,000
6. Un-skilled Worker	1	2,500	2,500
7. Peon/Chowkidar	1	2500	2,500
Total			36,000
<i>Perquisite @ 15% of salary</i>			5,400
Total			41,400
(iii) Utilities (per month)			(Rs.)
1. Power			5,000
2. Water			500
Total			5,500
(iv) Other Contingent Expenses (per month)			(Rs.)
1. Rent			15,000
2. Postage and Stationery			1,000
3. Telephone			2,000
4. Advertisement			3,000
5. Repair and Maintenance			2,000
6. Transportation Expenses			5,000
7. Insurance			1,000
8. Other Misc. Expenses			1,000
Total			30,000

(v) Total Recurring Expenditure (per month)

(i)+(ii)+(iii)+(v)
419,400

(vi) Total Working Capital
1,258,200

(for 3 Months Basis)

C. Total Capital Investment

(i) Fixed Capital	Rs. 4,15,000
(ii) Working Capital (for 3 Months Basis)	Rs.1,258,200
Total	Rs. 16,73,200
Say	Rs. 16,73,000

Financial Analysis

(1) Cost of Production (per year)	(Rs.)
(i) Total recurring cost	5,032,800
(ii) Depreciation on machinery and equipment @10%	35,000
(iii) Depreciation on jigs, fixtures, tools, moulds etc. @25%	4,500
(iv) Depreciation on office equipment, furniture @20%	2,000
(v) Interest on total capital investment @16%	2,67,680
Total	53,41,980
Say	53,42,000

(2) Turnover (per year)

Item (Nos.)	Qty.	Rate (Rs.)	Value (Rs.)
Low Voltage Fuses For Voltages not exceeding 1000 V A C or 1500 V D C. (HRC Fuse Links) 16 Amp	300,000	20	6,000,000
(3) Net Profit (per year) (Before Taxes)			6,58,000

(4) Net Profit Ratio

$$= \frac{\text{Net Profit} \times 100}{\text{Total Turn over}}$$

$$= \frac{658000 \times 100}{60,00,000} = 10.97\%$$

(5) Return on Investment

$$= \frac{\text{Net Profit} \times 100}{\text{Total Investment}}$$

$$= \frac{658000 \times 100}{1673000} = 39.33\%$$

(6) Break-even Point

Fixed Cost (per annum)	(Rs.)
(i) Depreciation on plant and machinery @ 10%	35,000
(ii) Depreciation on Jigs and Fixtures tools, moulds etc.@ 25%	4,500

(iii) Depreciation on office equipment @ 20%	2,000
(iv) Interest on total capital investment @ 16%	2,67,680
(v) 40% of salary and wages	1,98,720
(vi) 40% of Other Contingent Expenses and utilities (excluding rent and insurance)	93600
(vii) Rent + Insurance	1,92,000
Total	7,93,500

B.E.P.

$$\begin{aligned} &= \frac{\text{fixed cost} \times 100}{\text{fixed cost} + \text{Profit}} \\ &= \frac{793500 \times 100}{793500 + 658000} \\ &= \frac{793500 \times 100}{1451500} = 54.67\% \end{aligned}$$

Additional Information

- The Project Profile may be modified/tailored to suit the individual entrepreneurship qualities/capacity, production Programme and also to suit the locational characteristics, wherever applicable.
- The Electrical Technology is undergoing rapid strides of change and there is need for regular monitoring of the national and international technology scenario. The unit may, therefore, keep abreast with the new technologies in order to keep them in pace with the developments for global competition.
- Quality today is not only confined to the product or service alone. It also extends to the process and environment in which they are generated. The ISO 9000 defines standards for Quality Management System and ISO 14001 defines standards for Environmental Management System for acceptability at international level. The unit may therefore adopt these standards for global competition.
- The margin money recommended is 25% of the working capital requirement at an average. However, the percentage of margin money may vary as per bank's discretion.

Addresses of Machinery and Equipment Suppliers

- M/s. Aum Techno Ceramics Plot No.704/3 G.I.D.C. Estate
V.U. Nagar-388121
Dist. Anand Gujarat.
(HRC Fuse Barrel and Porcelain Brown Glaze Base Plate/Silica jel Powder)
- M/s. Ravikiran Ceramics Pvt. Ltd.
Station Road, Kanjari-387325.

(HRC Fuse Barrel and Porcelain Brown Glaze Base Plate/Silica jel Powder)

3. M/s. Metal India

4953, Sadar Bazar, Bara Tooti Chowk, Delhi-110006.

(Copper Sheet for Fuse Element)

4. M/s. Wilson Engineering Industry

Basai Road, Gurgon

(All Kinds of Copper and Brass Hardware)

5. M/s. India Metal

3633 Chawari Bazar, Delhi-110006

(Copper/Brass components)

6. M/s. Goyal Traders

3877/1, Charkhewalan Chawari Bazar, Delhi-110006

(Copper/Brass components)

Testing Facilities Available

Regional Testing Centre

New Delhi- 110020.