

Crimped Wire Connectors

| | |
|-------------------------|--|
| PRODUCT CODE (ASICC) | : 78989 |
| QUALITY AND STANDARDS | : As per customer's specification. |
| PRODUCTION CAPACITY | : Qty. : 75,00,000 Nos. (per annum) Value : Rs. 75,00,000 |
| YEAR OF PREPARATION | : 2002-2003 |
| PREPARED AND UPDATED BY | : Small Industries Service Institute, Bamunimaidan, Guwahati -21 And Office of the Development Commissioner (Small Scale Industries), Electronics and Electrical Division, 7th Floor, Nirman Bhavan, New Delhi-110011 |

INTRODUCTION

Electronic packaging technology has undergone rapid innovation and upgradation during the last decade to meet the complex needs of electronic equipments/systems with modular form of construction. Such construction requires a wide variety of connectors for inter connection of a number of electronic functions in an equipment/system. With the advancement of packaging technology, the connectors have become very vital and an important component in forming or making up a complete electronic system. In today packaging concepts the connectors are not just connecting hardware but are a very important component part of the system.

The majority of connectors being used today employ insertable/

removable crimp type contacts that are assembled to wires, cables of harnesses and are then inserted into the connector dielectric housings. The crimp type contacts permit connector flexibility that has an economical advantage for both manufacturing and maintenance. Some of the advantages of crimp contact are given below:

Damaged contacts can be easily replaced at assembly stage.

Inspection and testing termination of a wire to the contact can be made prior to assembly into the connector and without the space restrictions of a normally wired solder type connectors.

Wiring errors can be easily corrected by removal and reinsertion of contacts.

Electrical and mechanical characteristics of the terminations are uniform and reproducible.

Insulation support at the contact terminal is an aid to reliability.

The contact terminals are captured in the individual cavities of the moulded insulator eliminating the possibility of random contact between bore metallic portions of the terminals/wires and provide a long creepage path between contacts.

MARKET POTENTIAL

The crimp type connectors are widely used in various applications in the field of electronics. They are popular because of various advantages associated with it. They are mainly used for interconnection of printed circuit boards of electronic equipment/systems. The demand for Crimped Connectors has increased because of growth in the field of computers and telecommunication field. There are few units in the country manufacturing Crimped type of Connectors. The crimped type connectors are manufactured for different specifications as per customers requirement and hence cost for the same also varies. There is also good export potential for these types of Connectors. The plant and machinery have to be imported and testing equipment are indigenously available. Raw material is being imported for manufacturers quality connectors. To improve the quality, one has to go in for Accreditation of ISO 9000 Standards and explore possibility for exports. With high quality and competitive price, crimped type connectors has good scope for development.

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 onwards.
- iii) The salaries and wages, cost of raw materials, utilities, rents, etc. are based on the prevailing rates in and around Jaipur. 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 expenses.
- 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) set up by the State Governments and STQC Directorate of the Department of Information Technology, Ministry of Communication and Information Technology, to manufacture products conforming to Bureau of Indian Standards.

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:

| Sl. No. | Name of Activity | Period in Months (Estimated) |
|---------|---|------------------------------|
| 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

- Many of the above activities shall be initiated concurrently.
- Procurement of raw materials commences from the 8th month onwards.
- 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 manufacturing process involves stamping the crimp terminal from the plated sheet of Brass or phosphor bronze with the help of high speed and high accuracy stamping press. Compression crimping does crimping the wire with the terminal. The compressed joint is called the crimp joint. A proper crimp joint is electrically sound and mechanically strong. Hand tools or semi-automatic crimping machines are used to make the crimps. Semi-automatic machines are used for high production rates. The machines are available for either continuous strips of formed contacts on carrier strips, or machine contacts mounted on a continuous carrier. A production rate of 1000 to 4000 crimped terminals per hour can be achieved depending on the size and type of wire and terminal. The crimped terminals are inserted into the moulded housing cavities with the help of contact insertions and removal tools. The completed crimp connectors are tested for quality as per the relevant standards and specifications. The connectors are then packed well before despatch to customers.

Quality Control and Standards

- As per the relevant BIS/ISS or customer specifications.
- General Specification

| | |
|-----------------------|----------------------|
| Contact Spacing | 2.5 mm to 7.5 mm |
| Temperature range | - 25°C to ± 85°C |
| Contact Resistance | 10 to 20 Mili Ohm's |
| Insulation Resistance | 500 Mega Ohm's (Min) |
| Breakdown Voltage | 750 VDC/1500 V DC |

Quality aspects of manufacturing

- (a) All the materials input shall be inspected for quality as per the manufacturing / design requirements.
- (b) The crimping tool and die shall be of requisite accuracy for good joints.
- (c) The crimp shall not be under crimp or over crimped. The under crimping will result in loose connection between the terminal and wire, where as over crimping will cause damage to both the wire and the terminal.

Production Capacity (per annum)

| Quantity | Value (Rs.) |
|----------------|-------------|
| 75,00,000 Nos. | 75,00,000 |

Motive Power 25 KVA (approx.)

Pollution Control

The Govt. 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 Sept. 1992, the production and use of Ozone Depleting Substances (ODS) like Chlorofluoro Carbon (CFC), 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.

The following steps are suggested which may help to control pollution in electronics industry wherever applicable:

- i) In electronic industry fumes and gases are released during hand soldering/wave soldering/Dip soldering, which are harmful to people as well as environment and the end products. Alternate technologies may be used to phase out the existing polluting technologies. Numerous new fluxes have been developed containing 2-10% solids as opposed to the traditional 15-35% solids.
- ii) Electronic industry uses CFC, Carbon Tetrachloride and Methyl Chloroform for cleaning of printed circuit boards after assembly to remove flux residues left after soldering, and various kinds of foams for packaging.

Many alternative solvents could replace CFC-113 and Methyl Chloroform in electronics cleaning. Other Chlorinated solvents such as Trichloroethylene, Perchloroethylene and Methylene Chloride have been used as effective cleaners in electronics industry for many years. Other organic solvents such as Ketones and Alcohols are effective in removing both solder fluxes and many polar contaminants.

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 Govt. 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 desoldering 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 | |
|--------------------------------|--------------|
| Built up Area | 300 sq. mts. |
| Office Stores | 50 sq. mts. |
| Workshop, Assembly and Testing | 250 sq. mts. |
| Rent payable (per annum) | Rs. 48,000 |

(ii) Machinery and Equipments

| Description | Ind/ Imported | Qty. Nos. | Value (Rs.) |
|---|------------------|--------------|----------------|
| 1. Vertical Injection Moulding M/c | Imp | 1 | 5,00,000 |
| 2. Air Wire Stripper | Imp | 1 | 90,000 |
| 3. Wire Twisting Machine | Imp | 1 | 20,000 |
| 4. Wire Stripping Machine | Imp | 1 | 25,000 |
| 5. Soldering Machine (Semi-automatic) | Imp | 1 | 25,000 |
| 6. Applicator | Imp | 1 | 25,000 |
| 7. Air Press | Imp | 1 | 55,000 |
| 8. Terminating Machine | Imp | 1 | 80,000 |
| 9. Precision Punch | Imp | 1 set | 60,000 |
| <i>Testing Equipments</i> | | | |
| 1. Mill Ohm Meter | Ind | 4 | 50,000 |
| 2. Insulation Tester (Megger) | Ind | 1 | 5,000 |
| 3. High Voltage Break down Tester | Ind | 1 | 20,000 |
| 4. Insertions and withdrawal force Tester | Ind | 4 | 48,000 |
| 5. Testing Gauge for Crimp system | Ind | 4 | 32,000 |
| 6. Electrification @ 10% of machinery and equipment | | | 1,03,500 |
| 7. Tools, Jigs, Fixtures, Soldering Iron/Stations | | | 15,000 |
| 8. Office Equipment/furniture | | | 75,000 |
| (iii) Pre-operative Expenses | | | 10,000 |
| Total Fixed Capital | | | 12,38,500 |
| or Say | | | 12,39,000 |

B. Working Capital (per month)

(i) Staff and Labour

| Sl. Description | Qty. | Salary | Total (Rs.) |
|----------------------|------|--------|-------------|
| 1. Manager | 1 | 5,000 | 5,000 |
| 2. Supervisor | 1 | 3,000 | 3,000 |
| 3. Accountant | 1 | 2,500 | 2,500 |
| 4. Clerk/Typist | 1 | 2,000 | 2,000 |
| 5. Peon-cum-Watchman | 1 | 1,000 | 1,000 |

| Sl. Description | Qty. | Salary | Total (Rs.) |
|---------------------------------|--------|--------|-------------|
| 6. Skilled Workers | 4 | 2,000 | 8,000 |
| 7. Semi-skilled workers | 3 | 1,500 | 4,500 |
| 8. Unskilled Workers | 3 | 1,000 | 3,000 |
| | Total | | 29,000 |
| Add Perquisites @ 15% of salary | | | 4,350 |
| | Total | | 33,350 |
| | or Say | | 33,000 |

(ii) Raw Material (per month)

| Sl. Particulars | Ind/Imp. | Cost (Rs.) |
|--|----------|------------|
| 1. Plastic parts | Imp | 2,80,000 |
| 2. Plastic Moulding Powder | Ind | 36,000 |
| 3. Brass/Phosphorus bronze strips | Imp | 46,000 |
| 4. PVC Wires | Ind | 34,000 |
| 5. Consumables and packing material | Ind LS | 25,000 |
| Cost of Raw Material for 6,25,000 Crimp Connectors | | 4,21,000 |

Note: The Crimped Connectors can be manufactured for different specifications as per Customers requirement. Hence, quality and quantity of raw material vary with specifications.

| (iii) Utilities (per month) | (Rs.) |
|-----------------------------|-------|
| Power | 8,000 |
| Water | 500 |
| Total | 8,500 |

| (iv) Other Contingent Expenses (per month) (Rs.) | (Rs.) |
|--|--------|
| 1. Rent | 4,000 |
| 2. Postage and Stationery | 2,000 |
| 3. Repair and Maintenance | 2,000 |
| 4. Telephone/Telex/Fax charges | 3,000 |
| 5. Transport | 5,000 |
| 6. Advertisement/Publicity | 4,000 |
| 7. Insurance | 1,000 |
| 8. Misc. expenses | 2,000 |
| Total | 23,000 |

(v) Total Recurring Expenditure Rs. 4,85,500
(i) + (ii) + (iii) + (iv) =
Say 4,86,000

C. Total Capital Investment

| | |
|------------------------------|---------------|
| Fixed Capital | Rs. 12,39,000 |
| Working Capital for 3 months | Rs. 14,58,000 |
| Total | Rs. 26,97,000 |

FINANCIAL ANALYSIS

| (1) Cost of Production (per annum) | (Rs.) |
|--|-----------|
| Total recurring expenditure | 58,32,000 |
| Depreciation on machinery and equipment @ 10% | 1,03,500 |
| Depreciation on office equipment and furniture @ 20% | 15,000 |
| Depreciation on Jigs/Fixtures @ 20% | 3,000 |
| Interest on total capital investment @ 16% | 4,31,500 |
| Total | 63,85,000 |

(2) Sales Turnover (per annum)

| Item | Qty. | Rate/Unit (Rs.) | Value (Rs.) |
|-------------------------|-----------|-----------------|-------------|
| Crimped Wire Connectors | 75,00,000 | 1.0 | 75,00,000 |

(3) Profit (per annum) (Before Taxes) Rs. 11,15,000

(4) Net Profit Ratio

$$= \frac{\text{Profit (per annum)} \times 100}{\text{Sales (per annum)}}$$

$$= \frac{1115000 \times 100}{7500000}$$

$$= 14.86\%$$

(5) Rate of Return

$$= \frac{\text{Profit (per annum)} \times 100}{\text{Total capital investment}}$$

$$= \frac{1115000 \times 100}{2697000}$$

$$= 41.34\%$$

(6) Break-even Point

| Fixed Cost (per annum) | (Rs.) |
|--|--------|
| Rent | 48000 |
| Depreciation on machinery and equipment @ 10 % | 103500 |
| Depreciation on tools, jigs and fixtures @ 20% | 3000 |

| Fixed Cost (per annum) | (Rs.) |
|--|--------|
| Depreciation on office furniture @ 20% | 15000 |
| Interest on total capital investment @ 16% | 431500 |
| Insurance | 12000 |
| 40% Salaries and wages | 158400 |
| 40% other contingent expenses and utilities (excluding rent and insurance) | 127200 |
| Total | 898600 |

B.E.P.

$$= \frac{\text{Fixed cost} \times 100}{\text{Fixed cost} + \text{Profit}}$$

$$= \frac{898600 \times 100}{898600 + 1115000}$$

$$= 44.63\%$$

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 Electronics 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 Systems 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/Equipment Suppliers

- M/s. Tombow Precision Industrial Co. Ltd.
2-F, No. 11, Lane 530,
Chung-Cheng N. Rd., Sanchung City, Taipei H Sien, Taiwan R.O.C.
(*Vertical Injection moulding Machine.*)
- M/s. Doon Industrial Corporation
79, Rajpur Road,
Dehradun – 248001
(*Vertical Injection Moulding Machine.*)
- M/s. Control Signals
62, Haranagar, Ashram,
Mathura Road, New Delhi – 110014
(*Air Wire Stripper, Twisting Machine, Wire Stripping Machine, Applicator etc.*)
- M/s. Naina Electronics Pvt. Ltd.
Plot No. 18/6, Industrial Area,
Chandigarh – 160002
(*Air Wire Stripper, Twisting Machine, Wire Stripping Machine, Applicator etc.*)
- M/s. Accurate Tools and Guages
Sheshadripuram,
Bangalore–20
(*Air Wire Stripper, Twisting Machine, Wire Stripping Machine, Applicator etc.*)

6. M/s. Aplab
No.6 Vasundhra Road, 6th Floor,
2/7, Sarat Bose Road,
Kolkata -700020
*(Testing and Measuring
Instruments)*

Addresses of Raw Material Suppliers

1. M/s. Novaflex Cable Core Systems
38, Camac Street, Post Box
No.9159,
Kolkata -700016
(Plastic Parts and Accessories.)
2. M/s. B.M. Enterprises Pvt. Ltd.
B01 and B02, Welbel Electronic
Complex, P-1, Taratola Road,
Kolkata -700088
(Plastic Parts and Accessories.)
3. M/s. Elcos Radio Components
Pvt. Ltd.
No.10, Sagar Dutta Lane,
Kolkata -700073
*(Brass, Phosphorus and Bronze
parts)*
4. M/s. Jamnagar Brass Products
"Laxmi Bhawan",
Behind Dr. Bakshi's Bunglow,
Near Pawan Chakki,
Jamnagar - 361005
(Plastic Parts and Accessories.)
5. M/s. Dow Chemical Co. Ltd.
Meadow Bank, Batu Road,
Hounslow,
Taiwan 59Y
(Plastic Parts and Accessories.)
6. Fort Gloster Industries Ltd.
31, Chowringhee Road,
Kolkata - 700016
(PVC Cable.)