EXECUTIVE SUMMARY

1.0 TV glass shell is a glass envelope of the picture tube. It consists of three glass parts namely panel/screen, funnel/cone and neck. Other parts include Steel Pins and Anode Buttons. Special glass is used for this purpose, Pins and Button are made of iron-chromium alloy and iron-nickel-chromium alloy.

2.0 In B/W TV glass shells, barium lead glass is used for both panel and funnel. Neck is made of Potash Soda lead glass. In colour TV glass shells, leaded and not leaded glass is used for panel making and Potash soda lead glass is used for funnel making. Neck glass is same as for B/W glass shells.

3.0 The process of manufacture of B/W TV glass shells includes making of the three parts and sealing them in the same facility to make glass bulbs.

The process of manufacture of Colour TV glass shells includes making of the three parts and sealing is done by its end users (i.e. CPT manufacturers) as they have to insert metallic components before sealing.

4.0 Manufacturing process includes melting, press forming, annealing, finishing and sealing operations. Glass is melted and press forming operation is carried out where glass takes the shape of the mould/die. Annealing is done to remove the strain and thus enhance the quality. For the proper sealing of three parts namely panel, funnel and neck, finishing operation is carried out. Final inspection is done to check various dimensions.

5.0 Raw material required for TV glass shells manufacture is available indigenously except for few.

6.0 Major Capital Goods/Equipments required for manufacture of TV glass shells include Batch Plant, Melting System, Fore Hearths, Forming Systems, Lehrs, Panel Cold Finishing Systems, Pin Sealing, Funnel Hot Finishing, Funnel Cold Finishing System, Quality Control Equipments and Pollution Control Equipments. Except for few semi automatic sealing equipments, all major equipments are presently being imported.

7.0 As on date only one unit i.e.BEL Taloja is manufacturing B/W TV glass shells. Colour TV glass shells are not being manufactured in India. Presently two projects, one for B/W and another for colour TV glass shells

are under implementation and likely to come into operation by 1993. The two units are:

- Gujarat Narmada Electronics Ltd. - Colour Glass Shell.

- Samcor India Ltd. - B/W Glass Shell.

8.0 Technology for BEL Taloja has been obtained from M/s Corning Glass Works, USA. Present installed capacity is 1.0 Million B/W TV Glass Shells and presently plant is operating at 75% capacity.

In the case of GNEL the capacity being installed in the first phase is 11.7 million CTV Glass Shells and technology is being obtained from M/s Owens-Illinois - NEG TV Products, USA.

For Samcor India Ltd the installed capacity would be 4.4 million (20" and 14" sizes) B/W TV Glass Shells and technology is being obtained from Corning Glass Works, USA.

9.0 The existing unit is using old technology i.e spinning operation whereas the world trend is towards press forming operation which is highly productive. Moreover, the quality of shells initially manufactured, were not readily accepted by the indigenous end users, but the problems have been substantially overcome now.

10.0 At the international level the leading TV glass shell manufacturers are NEG and Asahi Glass, Japan; Corning Glass Works and OI-NEG TV products, USA; Schott Glass, Germany; Philips TV Glass, Netherlands; Hankuk & Samsung Co, Korea; Cheng DU, China.

11.0 The world technology for TV Glass Shells manufacturing is aimed towards automation, so as to eliminate the human factor and to enhance the productivity. Computers are used at the key positions to achieve the above goal.

12.0 No standardisation exists in the Colour TV glass shell industry, as the specifications vary not only from manufacturer to manufacturer but also from model to model of the same manufacturer. B/W Shells are almost standardised as inter changeablity is easily possible. In India lack of standardisation has resulted in frangmented market of CPTs. Three CPT manufacturers have acquired technology from different sources (ICT

Electronics - Hitachi, Uptron CPT - Toshiba and Samtel Colour Ltd., Mitsubishi).

These world leaders have their own specifications which even vary from model to model (at present India has 6 types of CPTs). This has left the CTV Glass Shell market fragmented for prospective manufacture thus affecting the economies of the scale of manufacture.

13.0 The operating atmosphere of the TV glass shell manufacturing units is full of heat and smoke. In the advanced countries the trend is towards white collar jobs and most of these countries are phasing out the shell manufacture and relocating suppliers of shells in the developing countries. Hence India has good export potential for TV Glass Shells.

14.0 RECOMMENDATIONS

14.1 The existing unit manufacturing B/W TV glass shells requires modernisation and also requires to increase its capacity so as to cater the domestic demand and also the export market. New unit in the pipe line may go in for product mix for 14" and 20" shells and also they could arrange buy-back facility.

The new unit for colour TV glass shells may acquire technology for the manufacture of glass parts for conventional (Black Stripes) 20" and 21" FST, they can also have inbuilt flexibility to take up the manufacturing of 22" to 29" glass shells.

14.2 As far as possible the technology should be imported from sources having their own running plants. Cost of plant and machinery would be one of the most important criteria for selection of technology. In order to conserve foreign exchange and also for more responsiveness to the market trends, the technology for manufacture of high quality dies and moulds may also be procured. This would also be useful for TV manufacturers who are importing dies for facia etc., except for Texla who have their own plant for plastic dies at Ludhiana.

14.3 Certain in-house R & D capacity be created by the existing/future manufacturers for upgrading their products. New products/projects can be undertaken by Central Glass & Ceramics Research Institute at Calcutta and other R & D organisations. Overall approach for R & D in India in the field of TV picture tubes and glass shells be evolved with the cooperation of manufacturers, R & D organisations, ITMS, ELCINA, STGC.

14.4 Working Groups are required to be formed under the BIS to study the existing specifications and evolve standards for the manufacturing and inspection of glass shells. The adaptation of Japanese standards can be considered.

Government of India had announced a policy in 1983 to establish a self sustained industry of Colour TVs. The same policy may be considered for application towards manufacture of TV glass shell also. The broad framework in implementation of the same may include:

a) The need for ensuring quality and reliability through quality certification and improved technology.

b) The need for a minimum complement of production and test equipment at manufacturers premises, taking into consideration the specifications involved and also the tests that a manufacturer has to conduct at various stages of production.

c) To encourage the need for standardisation of glass shells so as to build up a base for viable manufacture in India.