

1. EXECUTIVE SUMMARY

1.1. Conclusions

- 1.1.1. A high percentage of fibre glass produced in the world is used for reinforcement of plastics. The main products marketed by the fibre glass plants are Mats, Rovings, Woven Rovings, Yarns etc. The use of end products i.e. fibre glass re-inforced plastics are mostly in pipes and tanks, boats transport sector, furniture, crash helmets etc.
- 1.1.2. The formulation chosen for continuous fibre glass production is generally known as E-glass. This has become standard the world over as it performs well in practice and is used widely. The fibre glass produced in India is E-glass only. The process of manufacture of fibre glass consists of several steps e.g. batch preparation, production of glass melt, glass filament conditioning, winding, drying of glass cakes, conversion to saleable products.
- 1.1.3. In late seventies, the background of the licensing policy was to issue a large number of letters of intent with a capacity of 2000 Tonnes per annum expandable to 4000 tonnes per annum capacity. At that time only one unit Fibre Glass Pilkington (FGP) was working at Thane-Bombay with a licensed capacity of 1290 tonnes per annum. Out of 6 letters of intent issued, only 2 units i.e. Deccan Fibre Glass Ltd., (now known as Glass Fibre Division, CEAT Tyres) and UP Twiga Fibre Glass Limited (now closed since December 1982) were installed in early eighties. The other units did not materialise mainly due to inadequate market demand. The present guideline of licensing is that no new licence is to be issued till 1990, since the installed capacity in the country is around 5000 tonnes per annum against the present demand of 2400 tonnes per annum.
- 1.1.4. FGP Ltd., started production in mid sixties with remelt technology based on imported E-glass marbles. In 1974 they started their own unit melter for manufacture of E-glass with a licensed melting capacity of 1290 tonnes per annum and the installed finishing equipment capacity of 2650 tonnes per annum. The company is functioning with about 70 to 80 per cent of their licensed capacity.
- 1.1.5. UP TWIGA Fibre Glass Ltd., was started in 1980 at Sikandrabad in Uttar Pradesh. The capacity of the plant is 2000 tonnes per annum with electric Pochet Furnace. The unit could not develop proper market for its products. The unit, had to close down in December 1982 and has not re-started as yet.

- 1.1.6. Deccan Fibre Glass Ltd., came into being in 1981 at Mehboobnagar in Andhra Pradesh. In 1983 the unit was merged with CEAT Tyres Ltd., and is presently known as Glass Fibre Division, CEAT Tyres Ltd., The installed capacity is 1770 tonnes per annum with electric Pochet Furnace. The performance of the unit is not satisfactory and the production varies between 40 to 50 per cent of licensed capacity. The main reason for dismal capacity utilization is inadequate market demand.
- 1.1.7. All the three fibre glass units were put up with foreign collaboration. The collaboration agreements were more or less similar, irrespective of the country of collaboration. The major scope of collaboration was :
- a) Provision of technology
 - b) Basic engineering of the plant
 - c) Detailed engineering and design of special equipment and supply of materials
 - d) Procurement and supply of special equipment
 - e) Commissioning and Supervisory services.
 - f) Arrangement of training of personnel in collaborator's place.

The activities of the three manufacturing units from collaboration angle may broadly be tabulated as follows :

COLLABORATION PROFILE OF FIBRE GLASS UNITS

Designation	F.G.P. Ltd.	Glass Fibre Division CEAT Tyres	JIP TWIGA Fibre Glass Ltd.
1. Company Status	Promoted in 1962 as a private sector venture	Promoted in 1978 as a joint sector unit of APIDC and Philips Carbon Ltd., (Duncan Bros)	Promoted in 1978 as a joint sector unit of PICUP and a Nonresident Indian
2. Factory Location	Thane, Maharashtra	Thirarapur in Mehboobnagar Dist. Andhra Pradesh	Sikandrabad, Bulandshahar Distt. Uttar Pradesh
3. Foreign Collaboration	Pilkington Ltd., of U.K. License from Owens Corning Ltd., of USA	Nittoboseki Ltd. of Japan	Ferr-Corporation of USA under Reichold Chemical Co. of USA
4. Nature of glass	E-glass	E-glass	E-glass
5. Products	Roving, Mats, Woven rovings, Yam etc.	Roving, Mats, Woven rovings, Yam etc.	Roving, Mats, Woven rovings, Yam etc.

Designation	F.G.P. Ltd.	Glass Fibre Division CEAT Tyres	GP TWIGA Fibre Glass Ltd.
6. Glass Melting	Unit Melter, oil fired	Pochet Furnance, electric	Pochet Fumance, electric
7. Imported equipment	Chromite refractories, noble metal bushings, finishing equipment	Pochet Furnace noble metal bushings, finishing equipment	Pochet Furnace noble metal bushings, finishing equipment
8. Total Project Cost	Rs. 4.5 crores	Rs. 9.5 crores	Rs. 7.5 crores
9. Imported equipment	Rs. 1.0 crore	Rs. 1.5 crores	Rs. 1.2 crores
10. Associated India Consultant	Power Gas India Ltd.	Engineering Staff of Duncan Brothers	Dalal Consultants
11. Know-how fee in Foreign Exchange	No lumpsum fee. 2.75% royalty on net sales for 10 years	US\$ 6 lakhs lumpsum plus 0.5 per cent royalty for 10 years on net sales	US\$ 4.5 lakhs lumpsum plus 3 per cent royalty on net sales for 5 years
12. Collaboration obligation	Free from 1977 onwards	Still tied	Still tied

1.1.8. The capacities of the Fibre Glass plants abroad vary from 15,000 to 50,000 tonnes per annum. In most of the plants oil/gas fired unit melters with electric boosting are being preferred. Pilkington Brothers, U.K. has perfected the technology for the production of fibre glass compatible for use with cement and they are at present producing at the rate of 1500-2000 tonnes per annum. A considerable development has taken place in the manufacture of sizing compound. Present trends are in usage of a single complex compound designed to provide all the functions of the size e.g. lubrication, base for binding material, Keying agents etc.

1.1.9. The know-how in the case of fibre glass technology, is the manufacturing procedure which basically consists of E-glass technology, filament forming technology emulsion technology, conversion of fibre into saleable products technology. These are the basic technology elements which have to be absorbed for successful operation of the plant. For all the three plants, the technology transferred has been broadly absorbed.

1.1.10. The Indian Fibre Glass industry is not handicapped by way of technological drawback but its progress has been throttled due to the non-development of adequate demand. It has to be highlighted that the use of fibre glass is mostly as reforced element of special plastic products, the demand of

finished products is based on the price of the plastic component which forms the major part of the finished product. However, the cost structure of reinforced plastic or similar item is also dependent on the policy of Government in regard to the excise duty. In plastics excise duty is about thirty per cent which affects the cost of production of fibre glass reinforced plastics. Besides this is finished FRP products carry a 16.5 per cent different tax components. So in the cost structure of finished saleable items substantial part of the price is the tax element, As the FRP products are mainly handled in the small scale sector, this tremendous tax burden puts major hindrance to the development of demand which calls for a reasonable consideration of duty subsidisation.

In R&D section also action may be taken for development of sizing formulation and bushing technology. These may be initiated at Bombay or Hyderabad by well established R&D Centres e.g. BARC, RRL etc. and the manufacturing units like FGP, Glass Fibre Divin. of CEAT Tyres and small scale FRP moulders. The activities of Central Glass and Ceramic Research Institute, Calcutta may also be programmed to add to the R&D sectors of fibre glass technology development

1.2. **RECOMMENDATIONS**

- i) Fibre Glass is a replacement material. The demand of fibre glass, it seems has been hampered by the various duties and levies. There is a prima facie case for a detailed study in the revision of excise duties on fibre glass, allied resins and fillers.
- ii) There exists substantial scope in improvement of technology of fibre glass production in the following fields:
 - a) Bushing Technology
 - b) Sizing Formulation

Necessary support should be extended to research groups to carry out development activities in collaboration with existing glass fibre manufacturers. The major part of R&D should preferably be production oriented and carried out at the production plant itself.

- iii) One of the impediments in the growth of Fibre Glass Industry has been product development. To carry out the product development, necessary financial and technical support and/or incentives to the glass fibre manufacturers and/or agencies producing down stream products should be provided for.

- iv) A detailed study should be initiated to identify actions necessary for introduction and manufacture of fibre glass compatible for use with cement.

A Workshop on "Technology in Fibre Glass Industry" was organised by DSIR in coordination with NIDC on 25th March, 1986 at New Delhi to discuss the report and it was recommended to set up a Steering Committee on Fibre Glass and FRP products with representative of Fibre Glass and Resin manufacturers, FRP moulders, R&D institution, DSIR etc. to initiate actions for implementation of recommendation of the report. A summary of the proceedings of this workshop is given in Annexure I.