

EXECUTIVE SUMMARY

1. Carbon black is used mainly as a reinforcing material in the rubber industry. Other user areas include inks, paints, plastic and paper.
2. At present, there are seven units manufacturing rubber grade oil furnace carbon black, in India. They are Phillips Carbon Black Ltd., Durgapur, United Carbon India Ltd., Thane, Oriental Carbon Ltd., Ghaziabad, Consolidated Petrotech Industries Ltd. (formerly Gujarat Carbon Ltd.), Baroda, Carbon & Chemicals Ltd., Cochin, Ralson Carbon Ltd., Ludhiana and Hi-Tech Carbon Ltd., Renukoot, which is the most recent and modern.
3. The present production (1988-89) of Carbon Black is about 1,28,600 MTA against an installed capacity (based on indigenous carbon black feed-stock) of 2,13,200 MTA. It is reported that the industry's modernization programme will increase the total installed capacity to nearly 3,10,000 MTA by 1994-95.
4. The Planning Commission has estimated the demand, of carbon black, to be 1,59,000 MTA by 1989-90 rising to 2,51,000 MTA by 1994-95 and 4,12,000 MTA by 1999-2000. However, the All India Rubber Industries Association (AIRIA), assuming a compound growth rate of 8% estimates the demand by 1994-95 to be only about 1,74,000 MTA which is likely to increase to around 2,44,000 MTA by the year 2000. The Association of Carbon Black Manufacturers, on the other hand, estimates the demand to be 1,90,000 MTA by 1994-95 and 2,67,000 MTA by the year 2000 (assuming a compound growth rate of 7%)
5. The yield, of carbon black, depends on the aromaticity of the feed-stock. This is measured by the BMCI value (**Bureau of Mines Correlation Index**), after making adjustments for the sulfur, oxygen and nitrogen content. The higher the BMCI value, the higher is the yield, of carbon black. The BMCI of indigenous feed-stock, averages 85. Carbon black feed-stock (CBFS), available abroad, averages 122 and if this is made available, to existing indigenous units, carbon black production could be increased to over 2,64,500 MTA (as against the present 1,28,600 MTA)
6. There are, however, some impediments to imports e.g.:
 - High import duty surcharge and counter veiling duty.
 - Ocean freight is high on small tanker loads.
 - Lack of facilities for port handling and storage of CBFS.

7. There is variation in the BMCI value of indigenously available CBFS. These vary from 112-122 (IPCL and NOCIL) to 93 (Barauni) to 80 (H.P. and others). This is in contrast to the higher values abroad, of 120-128 BMCI. Cost of CBFS is around US\$100 per ton (Rs.1,670/-), at US port of shipment. Indigenous price has no correlation to BMCI value and varies from Rs.6,481/- per ton (IPCL), Rs.3,513/- per ton (Barauni) to Rs.2,887/- per ton (Halida). There is also no freight equalization. The problem is further aggravated by erratic supplies.
8. Indigenously manufactured carbon black prices range between Rs.15,840 per ton (GPF grades) to Rs.22,700/- per ton (for ISAF ones), excluding taxes and 15.75% excise duty. Imported CIF prices are US\$ 570-660 per ton (Rs.9,500-11,000/- per ton). Despite an import duty of 115% (which makes the landed price of the imported product higher than the indigenous one), Carbon Black continues to be imported.
9. Carbon black produced in India, by and large, confirms to Indian and American standards specifications. The range of grades manufactured is, however, narrower than that available abroad. Contemporary technology overseas, enables economic manufacture of a wider range, main features being:

Carbon black units are of larger capacity (1,30,000 MTA in contrast to 6,000-36,000 MTA Indian ones) which gives them the **advantage** of economies of scale.

Larger throughput furnaces are employed together with improved reactor and burner design which enable more rapid and uniform feed-stock atomization, faster mixing and shorter residence times. Computer /microprocessor controls ensure consistent quality, lower surface areas, higher tinting strengths and narrower aggregate size of carbon black which result in enhanced surface polymer interactions and lead to higher tensile strength, modulus, hysteresis and tread-wear in tyres and other rubber products.
10. There is also better energy utilization in plants abroad. Air is pre-heated, by tail gas, to 600-815°C. Burnt tail gases are utilized for steam and power generation and for drying carbon black pellets. The above factors lead to nearly 93% heat utilization which translates to lower production costs and maximization of capacities.
11. M/s Hi-Tech Carbon Ltd. is the only plant in India to incorporate the above features. The others normally pre-heat air to only 300-450°C. some units,

however, eg M/s Phillips Carbon Black Ltd., Oriental Carbon & Chemicals Ltd., and Consolidated Petro-Tech Ltd., have recently put up captive power plants based on burnt tail gas and steam generation. Some new Carbon Black grades have also been introduced by the Indian units, eg., N-339, N-347 and N-375.

12. To bring the Indian Carbon Black Industry at par with international ones, better and higher BMCI value CBFS must be provided, at an internationally competitive price. Existing units can, thus, nearly double their present production and lower production costs.
13. Existing units should be provided with necessary incentives, to modernize production techniques (in terms of furnace size, design, improved heat-exchangers, better waste heat utilization and self-sufficient power generation etc) and, thereby, come at par with international units.
14. Possibilities of setting up a coal based carbon unit, based on the work done by RRL, Jorhat, as a joint venture involving RRL, Jorhat, CFRI and the Carbon Black manufacturer may be explored.
15. R&D must be intensified, to gain better control on carbon deposit formation mechanisms, broaden the CBFS spectrum, and also cover the area of desulphurisation of feed-stock and use of coal tar and coal tar pitch for carbon black manufacture and rice husk for white carbon manufacture.
16. R&D work should also be undertaken on utilization of carbon obtained during gasification of fuel oil in the fertilizer industry.