

Rubber and Plastics

MARKET & OPPORTUNITIES



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CONTENTS

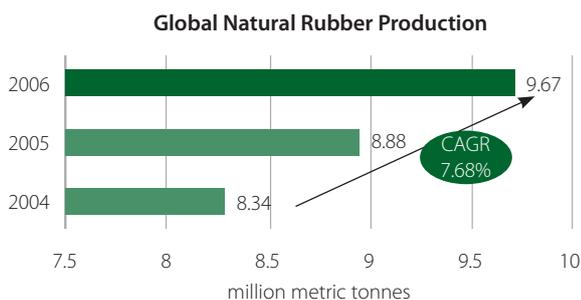
Rubber	2
Plastics	7
Conclusion	11
Appendix	12

Rubber

Three major categories of rubber are in use today, namely: natural rubber, synthetic rubber and reclaimed rubber. Natural rubber is produced from the sap of rubber tree, which grows primarily in South East Asian countries. Synthetic rubber is artificial rubber, made from raw materials such as butadiene, styrene, isoprene, chloroprene, isobutylene, acrylonitrile, ethylene and propylene. Reclaimed rubber is made by the treatment of ground vulcanised scrap of rubber tyres, tubes and miscellaneous waste rubber articles, through the application of heat and chemical agents. This is followed by intense mechanical working, which gives regenerated rubber almost original plasticity. Natural rubber accounts for about 42 per cent of the overall global production of rubber.

THE GLOBAL RUBBER INDUSTRY

Global natural rubber production stood at 9.67 million metric tonnes in 2006 and grew at a CAGR of 7.68 per cent during 2004-06. Asia is the largest source of natural rubber, accounting for around 94 per cent of the total world output. The three largest rubber producing countries are Indonesia, Malaysia and Thailand, which together account for around 72 per cent of all natural rubber production.



Source: International Rubber Study Group

Natural rubber has qualities that make it a preferred material in many engineering applications. Its long fatigue life and high strength make it an ideal material for tyres, tubes, mountings and hoses.

The global consumption of natural rubber is mainly determined by two factors:

- Economic growth in major natural rubber consuming countries
- The prices of natural rubber relative to synthetic rubber

INDIAN RUBBER INDUSTRY

The Rubber Industry is a key sector in the Indian economy. India is the third largest producer and fourth largest consumer of natural rubber in the world and also the fifth largest consumer of natural rubber and synthetic rubber put together.

Classification of Rubber Estates by Size	
<40 hectares	34%
40-200 hectares	42%
200-400 hectares	8%
400-600 hectares	7%
600-800 hectares	6%
>800 hectares	3%

Source: Rubber Board of India, www.rubberboard.org.in

Commercialisation of the Indian rubber plantation industry started in 1902, when progressive Indian farmers started recognising the advantages of rubber as a commercially viable crop. The industry structure was initially characterised by dominance of large estates, which later broke into a number of small holdings. Currently, nearly 76 per cent of rubber estates are less than 200 hectares in area and nearly 34 per cent are less than 40 hectares.

The rubber manufacturing industry is fragmented in structure with around 6000 manufacturing units, comprising of 30 large-scale, 300 medium-scale and around 5600 small and tiny units. With an estimated turnover of US\$ 5.6 billion, the industry employs 400,000 people.

Rubber Production and Consumption Growth

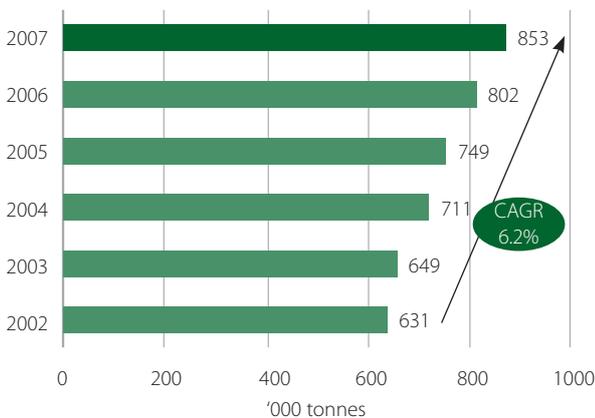
India’s natural rubber production has increased, at a CAGR of 6.2 per cent during 2002-07, while the consumption has increased at 5.1 per cent CAGR during the same period. Natural rubber production in India has been about 0.853 million tonnes in FY 2006-07 and over 90 per cent of this came from the state of Kerala. Consumption of natural rubber during the year stood at 0.820 million tonnes.

India has evolved as an exporter of natural rubber

Exports and imports of natural rubber have been fluctuating, over the last four years. The level of exports and imports depends on a number of factors such as production, domestic consumption, stocks held and variance between international and domestic prices of rubber. Manufacturers target exports mainly to leverage from difference in prices between domestic and international markets and to reduce built up stocks when the domestic market is dull.

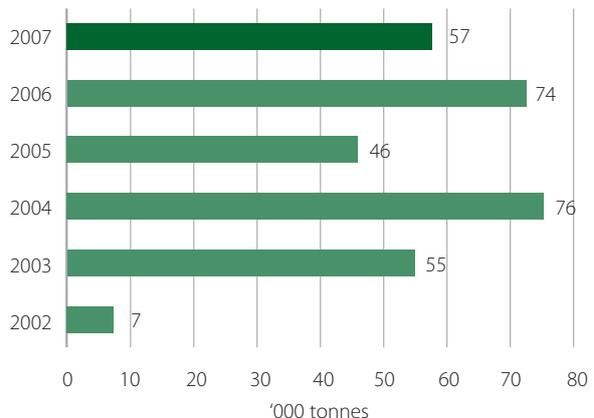
Government policies with regard to the rubber industry were drafted largely to support the domestic market and enable it to grow in view of the uncertainties in the international market. Rubber was earlier placed in the ‘negative list’ of imports. The lifting of Quantitative Restrictions (QRs) on import of natural rubber in 2001, resulted in the integration of the domestic industry with global markets. While, this also brought huge challenges

Indian Rubber Production

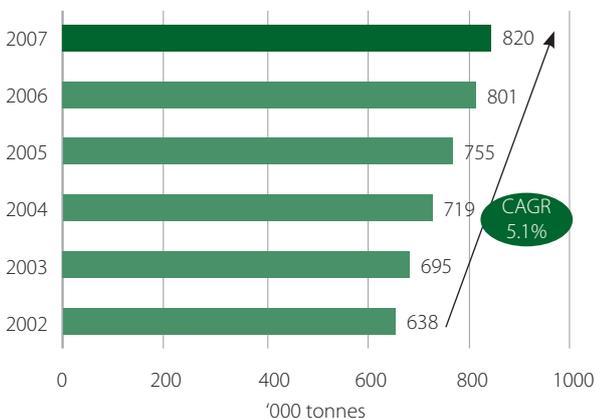


Source: KPMG Research

Indian Rubber Exports

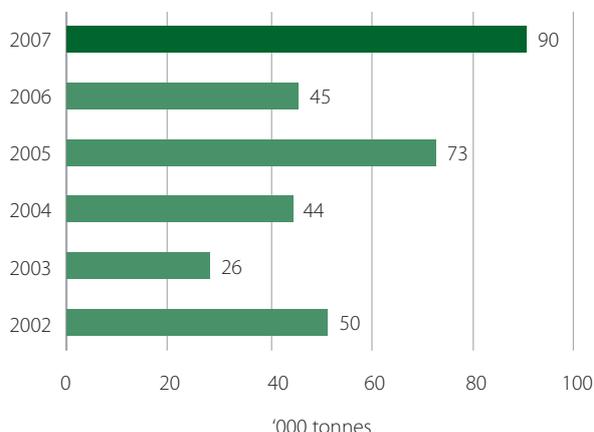


Indian Rubber Consumption



Source: KPMG Research

Indian Rubber Imports



for the domestic industry in the form of stiff competition from international players, the Indian rubber industry has been able to meet the challenges successfully and record substantial increment in production, productivity and exports. In 2006, India overtook Thailand, as the global leader in rubber productivity, recording a productivity of 1879 kilograms per hectare.

The growth in domestic consumption has been driven by strong demand from user segments. Rubber finds application in a range of industrial and consumer products, which are detailed below.

Automobile industry is the largest consumer of natural rubber

Based on consumption patterns, rubber industry in India can be categorised into two sectors - the tyre sector and non-tyre sector.

The tyre sector, comprises all types of automobile tyres, conventional as well as radial tyres - and tyre exports. Globally, automobile tyres constitute the single-largest consumer segment, for natural rubber. For instance, Japan's Bridgestone Corporation, the third-largest producer of tyres globally, consumes nearly 300,000 tonnes of natural rubber annually, which is nearly 3 per cent of the global output. Italy's Pirelli SpA, consumes 120,000 tonnes of natural rubber, annually.

The non-tyre sector comprises the medium-scale, small-scale and tiny units, which produce high technology and sophisticated industrial products. The small-scale units account for over 50 per cent of rubber goods production in the non-tyre sector.

The automobile industry is a key consumer, for both tyre and non-tyre sectors and has emerged as the single-largest consumer of natural rubber, in the form of auto tyres, tubes and other parts and accessories.

Automobile tyres account for nearly 50 per cent of the consumption of all types of rubber globally, followed by bicycle tyres and tubes at 15 per cent, rubber footwear at

12 per cent and industrial belts and hoses at 6 per cent.

Rubber finds use in a wide variety of products, due to which rubber consumption is driven by industrial growth as well as demand for consumer goods. Hence, per capita consumption of rubber is a relevant measure for assessing comparative markets for rubber.

The per capita consumption of rubber in India is only 800 gms, against 12 to 14 kg in Japan, the USA and Europe. This presents attractive growth prospectst for the rubber industry

KEY FACTORS INFLUENCING RUBBER INDUSTRY IN INDIA

A few key segments determine the demand for rubber, due to which any factor/trend affecting these could have a major influence, on the rubber industry. Also, rubber being a commodity, its price plays a critical role in influencing demand and production. Key factors that can have a bearing on rubber demand and production, are discussed below.

AUTOMOTIVE INDUSTRY GROWTH

The automobile industry in India is growing at a healthy rate of nearly 15 per cent annually and this trend is expected to continue, over the next few years. The sale of passenger vehicles has crossed the 'one and a half million units a year' mark and that of two wheelers is close to 8 million units a year. While, these numbers are large, they still indicate a relatively small penetration level, for example, passenger vehicle penetration in India is only about 7 per 100 people, which is far less than other developed and developing countries. These indicate, immense potential for growth in India's automobile industry.

Rubber finds use not only in tyres but also in a variety of auto components such as fan belts, mountings, hoses, etc. These are items that need to be replaced as part of regular maintenance. Therefore, the ever increasing population of vehicles on the road, as well as the rapidly expanding auto components space, indicate a captive and growing market for rubber products in India.

Growth in income levels and standard of living

There has been a steady increase in income levels and

Key Consumption Segment for Rubber

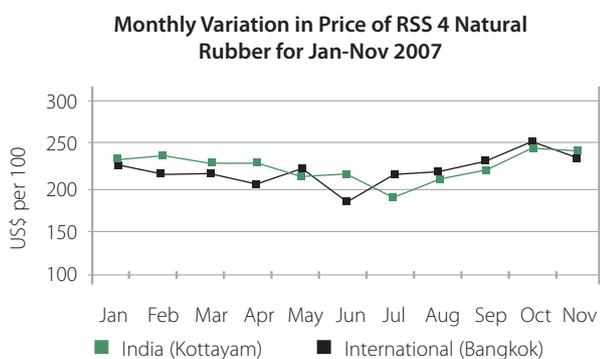
Automobile Tyres	50%
Tubes	15%
Footwear	12%
Latex	7%
Belts and Hoses	6%
Others	10%

consumer spending in India, over the past several years. The consuming section of the population (with annual income exceeding US\$ 980) is projected to constitute nearly 80 per cent of the population by 2010. Household disposable income levels are expected to grow, at a CAGR of 5.3 per cent over the next 20 years.

These trends point towards a long-term sustainable growth in demand for consumer durables, many of which contain rubber components. Demand for consumer durables, in turn will lead to growth in manufacturing, again leading to demand for rubber, for industrial use. Thus, any increase in overall consumption of goods will have an indirect impact on the demand for rubber.

International rubber prices vis-à-vis domestic market

Variation between international and domestic rubber prices is a key factor that impacts domestic production, exports and imports. The adjacent chart indicates the monthly variance in price for the period from January to November 2007, with prices fluctuating widely and irregularly. Industry players track rubber prices and review their strategy for domestic sales and exports accordingly.



Source: Rubber Board statistics

Government regulations

The Government's policies to promote investment and exports, improve quality and R&D etc. have a major influence on rubber prices and profitability of players. These policies include subsidies, restrictions on ports, tax incentives, customs duty etc. The Indian Government has been proactive, in devising a sound regulatory framework for the rubber industry and has provided strong support for its growth.

- Export promotion of natural rubber had been identified as a thrust area in the Tenth Plan.

- The Rubber Board, is also pursuing its agenda to bring rubber plantation under the ambit of carbon trading and under the Kyoto protocol. This would also need international cooperation.
- Efforts and activities to find new uses, improve properties of natural rubber through blending and evolving composites, are also being encouraged.

KEY SUCCESS FACTORS FOR INDUSTRY PLAYERS

The drivers and trends impacting the rubber industry in India and the increasing integration of the industry with global markets are reflective of certain key areas that rubber manufacturers in India need to address towards maintaining their competitiveness.

Accessibility to plantations

Rubber plantations in India are predominantly spread over the states of Kerala, Tamil Nadu, Karnataka and the North East. Proximity to plantations and easy access to raw material will be an advantage for players, as this will cut down on their logistics, costs and time. In a price sensitive market, this can provide a competitive edge.

Share of rubber plantation (Region-wise) - 2005-06	
Kerala	82%
North East	10%
Karnataka	4%
Tamil Nadu	3%
Others	1%

Source: Rubber Board

Quick response to market fluctuations

The rubber market is cyclic in nature and production fluctuates between months and production is low during the rainy season. Demand fluctuates, based on trends in the user industries and movement of rubber prices. The ability to monitor the market, anticipate changes and respond quickly is a key capability for firms to succeed in the industry.

Improved R&D

Development of the natural rubber industry has been based on well-targeted research and development efforts towards improved breeding to raise productivity and development of new applications as well as improvement of quality. Further, research is aimed at increasing economic viability of plantations through faster growing clones with better yield, usage of biotechnology etc. Continuous investment in R&D is necessary for the Indian industry to remain competitive globally.

Plastics

Plastics are organic high polymers, consisting of large chain-like molecules containing carbon. They are formed when the short-chain molecules of chemicals and monomers are blended together by the process of polymerisation to form large chain-like molecules. Plastics are known for their light weight, anti-rust and good insulation properties and are increasingly becoming substitutes for major commodities such as metals, stones, wood, glass and cotton.

Plastics can exhibit a wide variety of properties from being flexible and soft, to rugged and hard. This is mainly due to the different types of polymers used in the manufacturing process. Polymers are categorised into thermoset, thermoplastics and elastomers.

Thermosets become permanently hard and rigid when heated or cured. Thermoplastics become soft when heated and harden when cooled and hence, thermoplastic scraps can be reused and reprocessed through repeated melting and solidification by heating and cooling. Elastomers, also called synthetic rubber are polymers that have the elastic properties of natural rubber. Depending on the type of polymer used in the manufacturing of plastic, the characteristics of the end product vary.

This report attempts to discuss the following key segments that form the main constituents of the plastics industry:

- Polymers
- Performance plastics

INDIAN PLASTICS INDUSTRY - HIGHLY FRAGMENTED

The Indian plastics industry comprises around 55,000 plastic processing units, spread over both the organised and unorganised sectors, employing an estimated 0.4

million people. About 75 per cent of plastic processing units are in the small-scale sector and these account for about 25 per cent of the total production. There are about 2000 fibre processors, of which 80 per cent are in the small-scale sector. Globally the degree of fragmentation is large and despite the small size of operations of the players, they are able to operate profitably.

More than 95 per cent of firms in the Indian plastics industry operate in the form of partnership, proprietorship or as private limited companies. The key organised sector players include VIP Industries, Nilkamal Plastics Limited and Supreme Industries Limited.

MOST PLASTIC PRODUCTS IN INDIA ARE FORMED THROUGH EXTRUSION

Polymers are processed in a number of ways, to arrive at the end products. The different types of processing include:

- Extrusion – Typical extruded products include films, sheets, piles and filaments
- Injection moulding – This is largely used for industrial applications and making moulded luggage
- Blow moulding – Bottles, containers, toys, etc, are manufactured using the blow moulding process
- Rotomoulding – Large circular containers such as water tanks are made using this process

Plastics: Break-up by Manufacturing processes	
Extrusion	76%
Injection moulding	18%
Blow moulding	5%
Rotomoulding	1%

Plastics - Break-up by Product/Application	
Flexible Packaging	42%
Rigid Packaging	14%
Construction	12%
Household	9%
Appliances	7%
Cables	6%
Others	10%

Nearly 76 per cent of plastic products in India are made through extrusion.

In terms of product segments, plastics find application in packaging, construction, household appliances and cables. Packaging is by far the most widespread use, that plastics are put to.

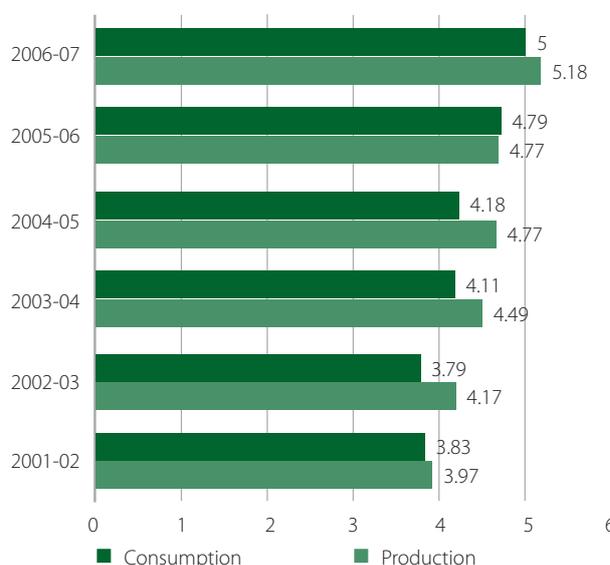
THE PLASTICS INDUSTRY - STEADY GROWTH ACROSS SECTORS

Polymers production in India has been growing at a CAGR of 5.4 per cent between 2001-02 and 2006-07 from 3.9 million tonnes to 5.2 million tonnes, respectively. Performance plastics have been growing, at a CAGR of 8 per cent during the same period. Consumption of polymers in India closely matches production, however in performance the consumption of plastics exceeds domestic production the gap being addressed through imports.

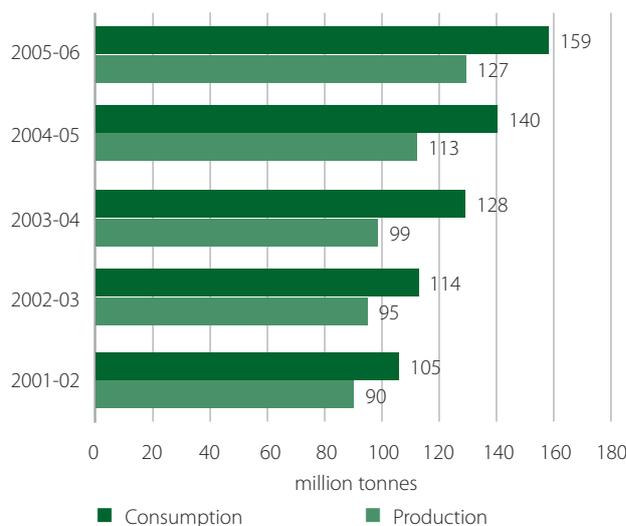
Exports of polymers from India form a small percentage of overall consumption. However, polymer exports have been growing from 5,67,900 tonnes in 2001-02 to 6,94,700 tonnes in 2005-06, CAGR of 5 per cent. Exports of performance plastics have grown more rapidly from just 944 tonnes in 2001-02 to 4,550 tonnes in 2005-06, at a CAGR of close to 50 per cent.

The per capita consumption of plastics in India is very low, at about 4 kilograms per year. The USA and China have an average consumption at 120 kilograms and 17 kilograms, respectively. The world average in per capita consumption of plastics is 25 kilograms per year. Hence, there is significant potential for growth in plastics consumption in India. It is expected that the consumption will nearly double, to about 12 million tonnes by 2010.

Polymer Production and Consumption in India



Production and Consumption of Plastics in India



Factors impacting industry growth

Plastics find application in a wide range of products, in industrial and agricultural applications and consumer use. Hence, the demand for plastics depends largely on growth in user segments and overall macro-economic growth. It has been seen that the consumption of polymers is closely linked to the economic development of a country. In this respect, plastics are similar to rubber and driven by the same factors.

Some key drivers for the plastics industry, include:

1. Growth in industrial production/manufacturing, especially in consumer durables and automotive sectors, which are key consumers of plastics;
2. Growth in income levels and demographic shifts, leading to increased consumption of plastic products.

Regulatory environment

The Government of India has been playing a proactive role in supporting the plastics industry. The Task Force on Petrochemicals has envisioned the following:

- Development of value-added, quality petrochemical products at globally competitive prices using eco-friendly processes and technologies.
- Innovation of newer applications and products with focus on sustainable development.

Thrust areas for the plastics industry include, modern farming through plasticulture, packaging for processed foods and consumer non-durables, better performing plastics for automobiles and consumer durables, infrastructure development through cost effective plastics and innovative products for telecommunications and information technology services sector.

Reservation under SSI

The Indian government has reserved certain categories of plastic products for Small-Scale Industries (SSI). The small-scale sector accounts for more than 50 per cent of the plastic industry turnover. Some of the key products reserved include soap cases, buckets, cups, water jugs, plastic cane, mugs, flexible PUF products, PS foam products upto 110 mm diameter, PVC pipes, rain coats, polyester sheets, thermo welded plastic products, monofilaments and tubular PP films. Typically these are relatively low-technology, low-cost items. Most high-end plastic products are not reserved.

KEY SUCCESS FACTORS FOR MANUFACTURERS

Product Mix

Plastics find application in a very wide range of user segments, each with its own characteristics and dynamics. Plastics manufacturers need to identify segments and products that align with their own strategy and capabilities.

For example, if the manufacturer has invested significantly in capital equipment, say moulding machines, the product mix needs to ensure there is consistent high volume demand so that the machines are fully utilised.

Branding

This is a key requirement for organised players to address consumer markets. Given the high number of units producing similar products in the industry, it is important to have a strong brand that will differentiate the product and influence customer mind-set. For example, VIP in moulded luggage and Nilkamal in moulded furniture are well-known brands and are therefore able to attract customers through their brand strength.

Productivity improvement

Nearly 63 per cent of costs for plastics processing go towards raw materials. Hence, it is important for manufacturers to continuously improve productivity and reduce waste, so as to safeguard margins amid increasing competition.

Economies of scale need to be leveraged to reduce costs of production

More than 85 per cent of the conversion cost (difference between the value of finished good sales and the raw material costs) is fixed in nature. This implies that a larger scale of operations would yield economies of scale. For manufacturers not covered under the SSI policy, it is important to look for avenues to grow operations and scale up and at the same time control costs

Market sensitivity

The consumption patterns change with time and new end uses keep evolving. For instance, the Kerala Government, has enforced a ban on plastic items such as, carry bags, glasses and cups, in view of harm to the environment and public health. The players need to keep themselves abreast of such changes, as these would directly affect demand in particular geographies. At the same time players also need to upgrade their processes to reduce harm to the environment and public health.

Opportunities for investment

The plastics industry offers several opportunities for growth, as most of the user segments such as auto components, consumer durables and telecom are growing rapidly. Growth in food and beverage and FMCG segments offer significant opportunities in packaging.

Another avenue for potential investors could be plastics processing machinery. As the industry grows further and aims at improving productivity and adopting new technology, there will be an increase in the demand for modern processing machinery. It has been estimated that the industry will need nearly 30,000 new machines over the next three years.

Conclusion

Rubber and plastics are key materials that find application in a wide range of products and applications. These industries, play a key supporting role in India's overall economic development.

Both sectors are fragmented in structure, but for a few large players in the organised sector. However, both sectors are getting increasingly aligned with global market developments. These are focus sectors and the Government is actively involved in devising plans to support growth. Significant progress has been made post the Tenth Five-Year Plan since more thrust was provided on processing and marketing.

Demand for rubber appears set for sustained growth, due to the strong growth projected in the automobile and consumer durables sectors. Given the seasonal nature of production and irregular fluctuations in prices, rubber manufacturers have a challenging task ahead in assessing the market and responding fast to its needs.

With India poised to emerge as the third largest consumer of plastics by 2010 and the industry growing at a rapid pace, the players need to gear up along with Government support, to take advantage of the new opportunities offered by the sector.

Appendix

PROFILE OF KEY PLAYERS

Major manufacturers in rubber industry

MRF Limited

- Started in 1946 as a small balloon making unit, MRF has grown to become one of India's largest tyre manufacturers, with a turnover close to US\$ 1 billion.
- It manufactures a full range of tyres for vehicles ranging from two wheelers to four wheelers and commercial vehicles.
- The company's main plant is in Tiruvottriyur, Chennai and it has another plant in Pondicherry to manufacture radial tyres.
- It has diversified into toys and games through Funskool India Ltd, a joint venture with Hasbro International, USA. The company also has a collaboration with Pirelli to make conveyor and elevator belts

Apollo Tyres

- Established in 1975, Apollo Tyres is one of India's leading manufacturers of tyres for heavy vehicles and off-road applications.
- The company manufactures tyres for passenger cars, light trucks, commercial vehicles, farm equipment and off-road applications.
- The company has its main plant in Kerala and seven other manufacturing plants across India and Africa, three in India and two each in South Africa and Zimbabwe.

JK Tyres

- Part of the 70-year old JG Group, the company's first tyre manufacturing plant was set up in 1976 at Kankroli,

in Rajasthan

- JK Tyres manufactures tyres for passenger cars, commercial vehicles and tractors. In 1997, it acquired Vikrant Tyres.
- Its products are exported to nearly 55 countries, JK Tyres accounts for nearly 26 per cent of all tyre exports from India.
- Along with Vikrant Tyres it has four manufacturing locations in India and has a turnover of over US\$ 700 million.

Ceat Limited

- Part of the RPG Group (a large diversified business group in India) Ceat Tyres, was established in 1958.
- With a turnover of close to US\$ 450 million, the company manufactures a full range of tyres, for two wheelers, three wheelers, cars, commercial vehicles, off-roaders and fork lifts.
- It also markets tubes and flaps, sourced from other manufacturers
- It manufactures over 6 million tyres annually from its plants in Mumbai and Nasik

Bata India

- Bata India, was established in 1931 and is India's leading footwear manufacturer
- The Bata Group has 40 production facilities across 26 countries and a retail presence in over 50 countries globally.
- Through its 4600 retail stores, the group employs over 40,000 people and serves nearly 1 million customers every day
- With a turnover of US\$ 200 million, the company has 1250 outlets and sells nearly 45 million pairs of footwear each year

MAJOR MANUFACTURERS IN PLASTICS INDUSTRY

VIP Industries

- VIP Industries Limited, is the flagship company of the US\$ 200 million DG PIRAMAL Group with a 2,000-strong workforce.
- It has two manufacturing units in India and multiple subcontract operations in China and Indonesia.
- The product portfolio of VIP Industries includes a diverse range of hard-sided and soft-sided luggage.

Nilkamal

- Nilkamal Group of Companies, is the world leader in plastic molded furniture and has a turnover of over US\$ 125 million.

- The company has diversified into the lifestyle furniture business by launching @home, which is a complete home solution store offering contemporary readymade wooden furniture.
- The company has eight manufacturing stores in India, where besides furniture and accessories, services like design solutions, professional guidance and interest free loans are also provided.
- Nilkamal, also has joint ventures in Bangladesh and Sri Lanka.
- Major strengths of the Group are, a 350-member strong wide direct sales network, a strong 350-plus dealer network, 33 regional offices located in all major industrial cities and 24 warehouses situated across India. The group also has a presence in the UAE, through a warehousing facility and a marketing office.

Industry Associations

Apex Contact Agency	Address
International Rubber Study Group	1st Floor, Heron House 109/115 Wembley Hill Road Wembley, Middlesex HA9 8DA, UK http://www.rubberstudy.com/
Rubber Board of India	P.B. No: 1122 Kottayam - 686 002 Kerala, India http://www.rubberboard.org.in
Indian Rubber Manufacturers Research Association	Director or Public Information Officer Plot No. B-88, Road No. 24 / U-2, Wagle Industrial Estate, Thane - 400604, Maharashtra http://www.irmra.org
Plastic Manufacturers Association in India	AIPMA House, A-52, Street No. 1, M.I.D.C., Marol, Andheri (E), Mumbai - 400093, India http://www.aipma.net/
All India Plastic Industries Association	203, Hansa Tower, 25, Central Market, 11nd Floor Ashok Vihar, New Delhi -110052 http://www.aipia.org

Exchange Rate Used

Year	Exchange Rate (INR/US\$)
2000-01	45.75
2001-02	47.73
2002-03	48.42
2003-04	45.95
2004-05	44.87
2005-06	44.09
2006-07	45.11

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