CHEMICALS

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November 2020
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## Executive Summary

**Global position**
- Globally, India is the third-largest consumer of polymers, fourth-largest producer of agrochemicals and sixth-largest producer of chemicals
- In 2019, the Indian chemicals market stood at US$ 178 billion and is forecast to reach US$ 304 billion by 2025

**Highly diversified**
- As of 2019, the Indian chemicals industry accounted for 7% of the GDP and contributed 9% to the total FDI equity inflows and >10% to the country’s exports. The industry is highly diversified, covering >80,000 products and employing >2 million people

**Strong growth in specialty chemicals**
- The specialty chemicals sector witnessed a significant growth of ~14% since 2015, and is expected to reach US$ 70 billion by end-2020, followed by a CAGR of ~12-13% over the next five years
- The key segments of specialty chemicals—including personal care and paints & coatings—are likely to witness CAGR of ~13% and ~10%, respectively
- Also, ICRA’s ratings indicate improved exports and a positive outlook for agrochemicals and surfactants.

**Global dye supplier**
- India is the second-largest manufacturer and exporter of dyes and accounts for ~16% of the world production

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**Notes:** GDP: Gross Domestic Product, FDI: Foreign Direct Investment, CAGR: Compounded Annual Growth Rate  
**Source:** Department of Chemicals and Petrochemicals, Invest India  

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ADVANTAGE INDIA
Rise in demand from end-user industries such as food processing, personal care and home care is driving development of different segments in India’s specialty chemicals market.

Rising middle-class population is likely to support strong demand for specialty chemicals in the automotive, personal products, water treatment and construction segments.

‘Make in India’ initiative is likely to grow in the Indian chemical industry over the next decade, focusing on developing and promoting Petroleum, Chemicals, Petrochemicals and Investment Regions (PCPIRs).

India’s specialty chemicals companies are expanding their capacities to cater to rising demand from domestic and overseas. Companies such as Aarti Industries, Fine Organic Industries, Himandri Specialty Chemicals and Bodal Chemicals have diversified their portfolios to meet demands from customers.

Domestic specialty chemicals sector, especially custom producers, are witnessing opportunities to build relationships with international companies and expand supply contracts.

With global companies seeking to de-risk their supply chains, which are dependent on China, the chemical sector in India has the opportunity for a significant growth.

The government plans to introduce production-linked incentive (PLI) scheme to promote domestic manufacturing of agrochemicals.

100% FDI chemical industry in India is allowed under the automatic route (except in the case of certain hazardous chemicals).

Total FDI inflow in the chemicals (other than fertilisers) sector reached US$ 17.77 billion between April 2000 and June 2020.

Source: Department of Chemicals and Petrochemicals, Invest India
MARKET OVERVIEW
Chemicals industry in India covers >80,000 commercial products and its overall market size valued at US$ 178 billion in 2018-19.

The industry is expected to reach US$ 304 billion by 2025 at a CAGR of 9.3%, driven by rising demand in the end-user segments for specialty chemicals and petrochemicals segment.

Alkali chemicals had the largest share in the chemical industry, with ~69% share in the total production, while production of polymers accounts for ~59% of the total production of basic key petrochemicals.

Specialty chemicals constitute for 22% of the total chemicals and petrochemicals market in India. Demand for specialty chemicals is expected to register 12% CAGR in 2019-22. Specialty chemical companies are seeking at import substitutions while exploring export opportunities to accelerate their business.

The petrochemical demand is expected to record a 7.5% CAGR between 2019 and 2023, with the demand for polymers growing at 8%.

The agrochemicals market in India is expected to register 8% CAGR to reach US$ 3.7 billion by FY22 and US$ 4.7 billion by FY25.

In October 2020, organic and inorganic chemicals witnessed a 1.19% increase (on y-o-y basis) in exports.
## The Chemicals Market is Split into Five Key Segments

<table>
<thead>
<tr>
<th>Segment</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Bulk chemicals</strong></td>
<td>These are groups of chemicals, which are manufactured on a large scale and further divided into organic, inorganic and alkali chemicals.</td>
</tr>
<tr>
<td><strong>Petrochemicals &amp; polymers</strong></td>
<td>These chemicals are derivatives of several chemical compounds such as hydrocarbons, which are derived from crude oil or natural gas.</td>
</tr>
<tr>
<td><strong>Fertilisers</strong></td>
<td>These provide nutrients for plant growth; are divided into organic/inorganic and natural/synthetic. Further, these can be broadly classified into phosphate, potassium and nitrogenous.</td>
</tr>
<tr>
<td><strong>Specialty chemicals</strong></td>
<td>These are derivatives of basic chemicals that are manufactured for specific end-use solutions. The characteristics of these chemicals include high-value, high R&amp;D and low volume.</td>
</tr>
<tr>
<td><strong>Agrochemicals</strong></td>
<td>These chemicals are used to protect crops against insects and pests and include fungicides, herbicides, and insecticides, among others. These chemicals can be applied in water irrigation, seeds, soils and crops.</td>
</tr>
</tbody>
</table>
The Indian chemical industry is valued at US$ 178 billion and contributes ~3% to the total global chemical industry.

India contributes 9% to the total FDI equity inflows and >10% to the country's exports.

Investments in petrochemicals are driven by growth in end-user segments.

Alliances and partnerships helped expand portfolio, strengthen technology and build access to new markets.

Investments in plants and equipment helped achieve economies of scale.

Indian players and MNCs collaborated for key investments.

Lower tariff barriers exposed the domestic industry to competitors (from imports).

Expansion of the petrochemical industry.

Development of integrated naphtha and gas crackers, along with related downstream plants for polymers, synthetic fibers, aromatics and other chemicals.

Indian government established five public-sector companies.

Established Hindustan Antibiotics Ltd. (HAL) in 1954 and Indian Drugs and Pharmaceuticals Ltd. (IDPL) in 1961.

Foreign drug supplies were decreased, and several Indian pharmaceutical companies were established.

Companies included Unichem, Chemo Pharmaceuticals, Zandu Pharmaceutical Works, Chemical Industrial and Pharmaceutical Laboratories (CIPLA) and East India Pharmaceutical Works.

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Source: KPMG report, Invest India, News Articles
### KEY PLAYERS IN THE CHEMICAL SECTOR

#### Indian Companies
- Pidilite
- TATA CHEMICALS LIMITED
- UPL
- Gujarat Fluorochemicals Ltd.
- AARTI INDUSTRIES LIMITED
- GAJAL
- Gujarat Alkalies and Chemicals Ltd.
- Reliance Industries Limited

#### International Companies
- BASF
- DUPONT
- SABIC
- Sinopec
- INEOS
- Formosa Plastics
- ExxonMobil

**Source:** News Articles

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RECENT TRENDS AND STRATEGIES
In September 2020, the production of key chemicals was 8,36,435 MT and petrochemicals was 17,26,502 MT.

In September 2020, the production of selected chemicals increased by 3% compared with August 2020, while the production of petrochemicals increased by 4%.

The manufacturing sector witnessed a shift from conventional material-based products to synthetic products because of their usefulness, adaptability and flexibility of usage.

**Notes:** MT: metric tonnes  
**Source:** Department of Chemicals and Petrochemicals
In October 2020, exports of organic chemicals and inorganic chemicals increased by 2% on a y-o-y basis to reach US$ 1,812.22 million.

For petrochemicals, imports of petroleum and crude products decreased by 39% on a y-o-y basis to reach US$ 3,444.1 million in October 2020.

Source: Department of Chemicals and Petrochemicals, Invest India
• India is a net exporter of agrochemicals and the thirteenth-largest exporter of pesticides and disinfectants. The country’s exports have increased on the account of low-cost manufacturing, availability of technically trained manpower, seasonal domestic demand, overcapacity, competitive pricing and strong presence in generic pesticide manufacturing

• Rise in demand in the agricultural segment is driving growth of agrochemicals in India

• In October 2020, the government urged players in the agrochemicals industry to come out with new molecules of global standards for the farmers’ benefit, while CropLife India, the industry body, pitched for stable policies and regulatory regimes to boost growth in the sector
Alkali chemicals accounted for ~69% of the total chemical production in 2019 and 71% from April to September in the same year.

Soda ash registered a CAGR of 5.54% from 2013 to 2019; its demand is expected to rise with applications in dyes, colouring agents, synthetic detergents and fertilisers in India.

Government initiatives such as promotion of small and midsized ‘Sodium Bicarbonate’ and ‘Ammonia’ processing industries in proximity to soda ash manufacturing units is likely to boost demand for soda ash in the country.

Dyes market is estimated to generate revenue of Rs. 480 billion by 2022.

Source: Ministry of Chemical & Petrochemical Statistics
To promote investments and development in this sector, Indian government approved four PCPIRs:

- **Location/Region**: Dahej  
  **Date of Approval**: Feb. 2009  
  **Total Area**: 453 Sq. Kms  
  **Processing Area**: 248 Sq. Kms  
  **Anchor Tenant**: ONGC Petro-additional Ltd.

- **Location/Region**: Paradeep  
  **Date of Approval**: Dec. 2010  
  **Total Area**: 284.15 Sq. Kms  
  **Processing Area**: 123 Sq. Kms  
  **Anchor Tenant**: Indian Oil Corporation Ltd.

- **Location/Region**: Cuddalore  
  **Date of Approval**: July 2012  
  **Total Area**: 257 Sq. Kms  
  **Processing Area**: 104 Sq. Kms  
  **Anchor Tenant**: Nagarjuna Oil Corporation Ltd.

- **Location/Region**: Vishakhapatnam  
  **Date of Approval**: Feb. 2009  
  **Total Area**: 604 Sq. Kms  
  **Processing Area**: 270 Sq. Kms  
  **Anchor Tenant**: Hindustan Petroleum Corporation Ltd.

- PCPIR in Dahej, Gujarat attracted more investments-compared with the other three cities-wherein various Indian and multinational companies such as ONGC, GACL, OPAL, BASF and LANXESS have opened facilities.

- The region attracted projects involving investments worth US$ 3.4 billion in 2017-18 from multiple companies.

- In October 2020, Grasim Industries signed a definitive agreement with Lubrizol Advanced Materials (specialty chemical company) to manufacture and supply chlorinated polyvinyl chloride (CPVC) resin in Gujarat. The initial production is expected to begin in end-2022.

*Source: Federation of Indian Chambers of Commerce and Industry*
Indian chemical companies are investing in innovative solutions, focusing on issues such as water, environmental impact, raw materials, safety over lifecycle and energy use.

<table>
<thead>
<tr>
<th>Company Name</th>
<th>Description</th>
</tr>
</thead>
</table>
| Tata Chemicals                                    | Tata Chemicals commissioned a solar photo-voltaic plant to save energy  
With an aim to control greenhouse gas emissions, it proposed to establish a 150 kWp grid-connected solar photovoltaic power plant on the rooftop terrace of the electrical sub-station |
| Kanoria Chemicals & Industries Limited           | The company’s AlcoChem Ankleshwar Division runs ‘waste to wealth’ programme, which involves treatment of effluent and recycling water by a ‘Reverse Osmosis’ process developed by the company                                                                                                      |
| Arulpuram Common Effluent Treatment Co. Pvt. Ltd. | The company adopted technology to recycle >98% of water and reuse >90% of salt  
The process consisted of a pre-treatment system, followed by water recovery system using reverse osmosis                                                                                                                |
GROWTH DRIVERS
STRONG DEMAND AND POLICY SUPPORT DRIVING INVESTMENTS

Growing demand

- Higher real disposable incomes
- Shift in production and consumption towards Asian and Southeast Asian countries
- Shift in consumer preference towards environment-friendly products

Policy support

- BIS certification for imported chemicals to prevent dumping
- 100% FDI under the automatic route in the chemical sector, except for hazardous chemicals
- MSIHC Rules to be merged with CAEPPR to safely handle hazardous chemicals
- Indian government’s ‘National Chemical Policy’ with a vision to increase the chemical sector’s share to 6% GDP within 10 years

Increasing investments

- Establishing PCPIR(s) (investment regions for petroleum, chemicals and petrochemicals)
- Domestic and overseas companies investing in greenfield or brownfield projects
- Increase in FDI investments

Notes: MSIHC: Manufacture Storage and Import of Hazardous Chemicals, CAEPPR: Chemical Accidents Emergency Planning, Preparedness and Response
Source: News Articles

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**KEY GROWTH DRIVERS**

**Rise in domestic demand**
- By 2030, India is likely to have ~80% of the households in the middle-income group
- The growing middle-class and increasing urbanization is driving the demand for personal care, agrochemicals, food, paints & coatings resulting into higher consumption of chemicals per capita

**Government aims to boost manufacturing share in GDP to 20% by 2025**
- Government considers the manufacturing sector to be a key focus area and has contracted ~1,450 companies worldwide to manufacture in India
- The plan includes 2-3 autonomous zones which does not have labor and land laws
- ~300 companies are actively pursuing production plans in mobiles, electronics, medical devices and textiles

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**Middle-class Growth in India (million)**

<table>
<thead>
<tr>
<th>Year</th>
<th>Value</th>
<th>CAGR 7.4%</th>
</tr>
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<tbody>
<tr>
<td>FY18</td>
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</tr>
<tr>
<td>FY30</td>
<td>148</td>
<td></td>
</tr>
</tbody>
</table>

**Manufacturing as % of GDP**

<table>
<thead>
<tr>
<th>Year</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>2019</td>
<td>14</td>
</tr>
<tr>
<td>2025E</td>
<td>20</td>
</tr>
</tbody>
</table>

*Source: National Council of Applied Research, World Economic Forum*
KEY INDUSTRIES DRIVING GROWTH

- Disruption in automotive sector with the emergence of autonomous driving, connected cars, electric vehicles and shared mobility will affect the value chain of Indian chemical companies supplying chemicals to automotive applications
- New value chain is likely to be apparent in the electric vehicles segment, especially in the battery market
- Specialty chemical companies are partnering with OEMs to work on concept cars, such as the BASF-Daimler Smart Forvision project

- ‘Smart City’ projects by the Indian government are driving growth of chemical companies in India. Availability of essential raw materials at low cost is anticipated to increase demand for construction chemicals
  - Further, repairs and maintenances of long-standing infrastructure is likely to increase demand for paints & coatings, cement and other construction related chemicals
  - For example, Pidilite is promoting its waterproofing chemical products for preventive maintenance purposes

- Investment opportunities in the water sector is expected to reach US$ 13 billion by 2030
- Increasing urbanisation and population is driving the demand for safe drinking water. Moreover, rising awareness of hygiene among the people is leading to excessive water consumption
- Increase in demand for water due to population growth, agricultural use, environmental degradation and economic development is driving the demand for wastewater treatment plants; this leads to demand in water treatment chemicals

- India’s textiles and apparel export stood at US$ 23 billion in 2020 and is likely to reach US$ 82 billion by 2021. Demand from domestic and export market is driving the need for chemicals such as dyes and pigments
  - India has witnessed increasing demand for wide range of cosmetic chemicals, health care products and hygiene products that use specialty chemicals, polymers and oleo chemicals. This segment is likely to outperform other segments

**Source:** Invest India, News Articles
### November 06, 2020

**Rise in production**

HIL (Hindustan Insecticides Limited) signed a memorandum of understanding with the Department of Chemicals & Petro Chemicals to achieve revenue target of Rs. 451 crore (US$ 60.86 million).

### November 04, 2020

**M&As**

Pidilite Industries acquired Huntsman Group's Indian subsidiary for Rs. 2,100 crore (US$ 283.38 million) to strengthen adhesives and sealants portfolio that will complement the company's retail portfolio.

### September 15, 2020

**Self-reliant in fertilisers**

By 2023, India will be self-reliant in fertiliser production and reduce import dependency, by establishing new units covering an investment of Rs.400 billion. At present, Indian fertiliser production stands at 42-45 million tonnes and imports at 18 million tonnes.

### September 11, 2020

**Methanol plant set up**

The Rashtriya Chemicals and Fertilisers (RCF), a PSU under the Ministry of Chemicals and Fertilisers, started its methanol plant at Trombay unit in Mumbai, Maharashtra. RCF has the capacity to produce 242 tonnes of methanol per day.

***Source: Company Websites, News Sources, Invest India***
### Skills and technical support

**September 08, 2020**  
Central Institute of Petrochemicals Engineering & Technology (CIPET), under the Ministry of Chemicals and Fertilisers, will establish two new ‘Centres for Skilling and Technical Support’ (CSTS) at Bhagalpur, Bihar and Varanasi, Uttar Pradesh. This will act as a catalyst for development and growth of new and existing industries in the region.

### International collaboration

**August 7, 2020**  
Prince Pipes and Fittings (PPFL) entered into a technical collaboration with Tooling Holland, an international plastic injection moulding industry, based in The Netherlands.

**January 31, 2020**  
Germany headquartered SCHOTT AG, an international specialty glass and technical ceramic materials manufacturer, increases sales in India and plans record investments.

*Source: Company Websites, News Sources, Invest India*
OPPORTUNITIES
Specialty chemical companies in India have started accelerating their capex plan on the back of strong growth visibility and emerging opportunities

- Due to growing environmental concerns, chemical companies in China ceased activities in 2018; this led to an increase in manufacturing of specialty chemicals in the Indian market to ensure uninterrupted supply

- Capex of specialty chemicals stood at US$ 1.1 billion in fiscals 2017-2018 and is expected to grow 70% to ~1.8 billion combined in fiscals from 2018 to 2020

**Key growth drivers in the end-user industry for specialty chemicals include the following:**

1. **Paints & coatings:** Increase in urbanisation, increase in middle-income households, high replacement demand and increase in per capita income
2. **Textile:** Increase in Indian export, increase in urbanisation and higher disposal income
3. **Construction:** Low expenditure on admixtures compared with China and the US
4. **Home care:** Increased consumption

### Indian Specialty Chemical Industry Subsegments

<table>
<thead>
<tr>
<th>Subsegments</th>
<th>User Industries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paints &amp; Coatings</td>
<td>Construction, Automotive</td>
</tr>
<tr>
<td>Special Polymers</td>
<td>Packaging Automotive</td>
</tr>
<tr>
<td>Construction Chemicals</td>
<td>Infrastructure, Real Estate</td>
</tr>
<tr>
<td>Paper Chemicals</td>
<td>Printing, Packaging</td>
</tr>
<tr>
<td>Textile Chemicals</td>
<td>Apparel, Technical Textile</td>
</tr>
<tr>
<td>Water Chemicals</td>
<td>Industrial Water, Municipal Water</td>
</tr>
<tr>
<td>Cosmetic Chemical</td>
<td>Bath, Shower, Haircare</td>
</tr>
<tr>
<td>Flavours &amp; Fragrances</td>
<td>Food Processing, Personal Care</td>
</tr>
<tr>
<td>Agro Chemicals</td>
<td>Agriculture, Exports</td>
</tr>
<tr>
<td>Home Care Surfactants</td>
<td>Laundry Care, Dishwashing</td>
</tr>
<tr>
<td>Colourants</td>
<td>Textile, Exports</td>
</tr>
</tbody>
</table>

*Source: Department of Chemicals and Petrochemicals*
FAVOURABLE INITIATIVES BY GOVERNMENT

- 100% FDI is allowed in the chemical sector under automatic route with exception to few hazardous chemicals
- Industrial licensing is approved in most sectors, except for few hazardous chemicals
- The Indian Government supports the industry in research & development, reduced the basic customs duty on several products and offers support through the 'Make in India' campaign
- Four Petroleum, Chemicals and Petrochemical Investment Regions (PCPIRs) have been set up as the investment regions for petroleum, chemicals and petrochemicals along with associated services
- A 2034 vision for the chemicals and petrochemicals sector has been set up by the government to explore opportunities to improve domestic production, reduce imports and attract investments in the sector. The government plans to implement production-link incentive system with 10-20% output incentives for the agrochemical sector; to create an end-to-end manufacturing ecosystem through the growth of clusters.

Source: Department of Chemicals and Petrochemicals, Invest India
Many Indian chemical companies are focusing on attaining scale to build their margins and enhance environmental sustainability.

- In November 2020, NextChem, and Indian Oil Corp. Ltd. (IndianOil) signed a memorandum of understanding (MOU) to use NextChem technologies to build industrial projects to support industrialisation of India’s sustainable development.
- The projects would emphasis on recycling of plastics, production of biofuels from renewable feedstock and circular fuels and non-recyclable waste chemicals.

- **Camlin Fine Sciences** acquired Borregaard Italia Spa54, a raw-material catechol manufacture, and Ningbo Wanglong, an end-product vanillin flavour manufacturer.
- The vertical integration made CFS the third-largest vanillin producer worldwide.

- **Aarti Industries** generates >40% revenue from the global markets.
- **UPL** has presence in multiple markets with >30% of its revenue generated from Latin America.
- **SH Kelkar**, a niche Indian company, has completed several strategic acquisitions, including China-based Anhui Ruibang Aroma and Italy’s Creative Flavours and Fragrances; this helped expand its portfolio, improve technological platforms and gain access to new markets.

- **Atul Chemicals**, partnered with Akzo Nobel to access state-of-the-art eco-friendly hydrogenation technology for monochloroacetic acid (MCA) production in India.
- The partnership will produce MCA, which is an important ingredient in agrochemicals, adhesives and pharmaceuticals.

Source: McKinsey & Company
KEY INDUSTRY ORGANISATIONS
# KEY INDUSTRY ORGANISATIONS

<table>
<thead>
<tr>
<th>Agency</th>
<th>Contact Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Department of Chemicals &amp; Petrochemicals</td>
<td>Dept. of Chemicals &amp; Petrochemicals, Ministry of Chemicals &amp; Fertilisers, 341-(C), A-wing, 3rd floor, Shastri Bhawan, New Delhi-110001 Phone: +91 11 23383428 Fax: +91 11 23073682(F) Email: <a href="mailto:samir.biswas@gov.in">samir.biswas@gov.in</a> Website: <a href="https://chemicals.nic.in">https://chemicals.nic.in</a></td>
</tr>
<tr>
<td>Indian Chemical Council</td>
<td>Sir Vithaldas Chambers, 6th Floor 16 Mumbai Samachar Marg, MUMBAI - 400 001 Phone: +91 22 61144000 / 22048043 Email: <a href="mailto:iccmumbai@iccmail.in">iccmumbai@iccmail.in</a>, <a href="mailto:events@iccmail.in">events@iccmail.in</a> Website: <a href="http://www.icmaindia.com">www.icmaindia.com</a></td>
</tr>
<tr>
<td>Dye Manufacturers Association of India</td>
<td>A-317, 3rd Floor, Antop Hill Warehousing Complex, Vidyalankar College Road, Near Barkat Ali Naka, Wadala (East), Mumbai - 400 037. India Phone: +91 22 24158156, 24158157 Fax: +91 22 24157374 Email: <a href="mailto:info@dmai.org">info@dmai.org</a> Website: <a href="http://dmai.org/">http://dmai.org/</a></td>
</tr>
<tr>
<td>Alkali Manufacturers Association of India</td>
<td>Alkali Manufacturers Association of India,3rd Floor, Pankaj Chambers, Commercial Complex Preet Vihar, Vikas Marg, Delhi 110092 Phone: +91 11 22432003, 22410150 Fax: +91 11 22468249 Email: <a href="mailto:hkanand@ama-india.org">hkanand@ama-india.org</a>, <a href="mailto:info@ama-india.org">info@ama-india.org</a> Website: <a href="http://www.ama-india.org">www.ama-india.org</a></td>
</tr>
<tr>
<td>Indian Specialty Chemical Manufacturers’ Association</td>
<td>1156, Bole Smruti, Suryavanshi Kshatriya Sabhagiha Marg, Off. Veer Savarkar Marg, Dadar (West), Mumbai - 400 028 Phone: +91 22 2446 5003 Email: <a href="mailto:info@iscma.in">info@iscma.in</a>, <a href="mailto:iscma@email.com">iscma@email.com</a> Website: <a href="http://www.iscma.in">www.iscma.in</a></td>
</tr>
<tr>
<td>Chemicals &amp; Petrochemicals Manufacturers Association</td>
<td>708, 7th floor, Kailash Building, 26 Kasturba Gandhi Marg, New Delhi - 110 001 Phone: +91 11 43612198 Mobile: 9910495818 Email: <a href="mailto:cpmai@airtelmail.in">cpmai@airtelmail.in</a> Website: <a href="http://cpmaindia.com">http://cpmaindia.com</a></td>
</tr>
</tbody>
</table>
USEFUL INFORMATION
GLOSSARY

- CAGR: Compound Annual Growth Rate
- Capex: Capital Expenditure
- MMTPA: Million metric tons per annum
- CENVAT: Central Value Added Tax
- EHTP: Electronic Hardware Technology Park
- EPCG: Export Promotion Capital Goods Scheme
- FDI: Foreign Direct Investment
- FY: Indian Financial Year (April to March); So, FY10 implies April 2009 to March 2010
- LCD: Liquid Crystal Display
- R&D: Research and Development
- US$: US Dollar
- Wherever applicable, numbers have been rounded off to the nearest whole number
### Exchange Rates (Fiscal Year)

<table>
<thead>
<tr>
<th>Year</th>
<th>Rs. Equivalent of one US$</th>
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<td>2018-19</td>
<td>69.89</td>
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<tr>
<td>2019-20</td>
<td>70.49</td>
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### Exchange Rates (Calendar Year)

<table>
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<th>Year</th>
<th>Rs. Equivalent of one US$</th>
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</thead>
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<td>2005</td>
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<td>46.67</td>
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<td>53.49</td>
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<td>2013</td>
<td>58.63</td>
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<td>2014</td>
<td>61.03</td>
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<td>2016</td>
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<td>2018</td>
<td>68.36</td>
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<tr>
<td>2019</td>
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*Source: Reserve Bank of India, Average for the year*
India Brand Equity Foundation (IBEF) engaged Sutherland Global Services private Limited to prepare/update this presentation.

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