# Indian Minerals Yearbook 2019

## (Part- II : Metals & Alloys)

## 58th Edition

# FERROALLOYS

### (ADVANCE RELEASE)

**GOVERNMENT OF INDIA**
**MINISTRY OF MINES**
**INDIAN BUREAU OF MINES**

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# 6 Ferroalloys

Ferroalloys are one of the important inputs in the manufacture of alloys and special steel. They are used as deoxidisers and alloy additives in the steel manufacturing process. They impart special properties to steel. The alloys provide increased resistance to corrosion, improve hardness & tensile strength at high temperature, impart wear and abrasion resistance and increases creep strength etc. The growth of Ferroalloys Industry is, thus, linked with the development of the Iron and Steel Industry, Foundry Industry and to some extent Electrode Industry. The principal ferroalloys are chromium, manganese and silicon. The product series consists mainly of ferromanganese, silicomanganese, ferrosilicon and ferrochrome.

Ferroalloys are classified into two main categories, viz, bulk ferroalloys and noble ferro alloys. Bulk ferroalloys is majorly used in stainless steel & carbon steel. Most of the boble ferroalloys are made from rare-earth minerals and are expansive to produce as compared to bulk ferroalloys. Owing to high cost of power, Ferroalloys Industry has not been operating to its full capacity in India. Ferroalloys Industry spends 40 to 70% production cost on power consumption. The power consumption per tonne of ferroalloys production in the country varied from 3,000 to 12,000 kWh.

At present, major portion of the ferroalloys produced is exported. Ferromanganese, silicomanganese, ferrosilicon, high carbon ferrochrome and chargechrome are exported after meeting the domestic requirements.

## INDUSTRY, PRODUCTION, DEVELOPMENT AND CONSUMPTION

As per Indian Ferroalloys Producers' Association (IFAPA), the total installed capacity of bulk Ferroalloys Industry in India is estimated at 5.10 million tonnes per annum and for noble ferroalloys it is 50,000 tonnes per annum. The products covered are Manganese alloys (HC, MC & LC ferro chrome, silicochrome and charge chrome) and Nobel ferroalloys (ferromolybdenum, ferrovanadium, ferrotungsten, ferrosilicon magnesium, ferroboron, ferrotitanium etc.). The details are furnished in Table- 1.

**Table – 1 : Capacity of Ferroalloys Industry in India**

(In tonnes per annum)

| Ferroalloys | Installed capacity |
|---|---|
| **Total** | **5150000** |
| **Bulk Ferroalloys:** | **5100000** |
| Manganesealloys | 3160000 |
| Chromealloys | 1690000 |
| Ferrosilicon | 250000 |
| **Noble Ferroalloys:** | **50000** |

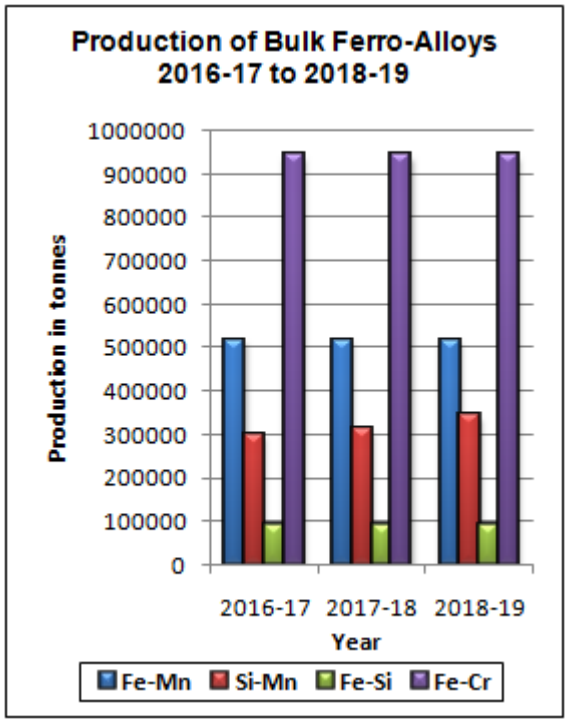
***Source:*** *Indian Ferroalloys Producers' Association (IFAPA), Mumbai.*

The Ferroalloys Industry was established as an ancillary industry to cater to the growing needs of the domestic Steel Industry and is spread all over the country. Most of the ferroalloys units have been set up in Andhra Pradesh, Chhattisgarh, Jharkhand, Karnataka, Madhya Pradesh, Maharashtra, Odisha and West Bengal because of availability of the raw material as well as uninterrupted electricity supply. Recently, the Industry has further spread to the North-Eastern Region of India. In Meghalaya, a number of small units producing ferrosilicon and ferrosilico-manganese have come up. The production of various ferroalloys is detailed in Table-2.

The ferroalloy units have incorporated the latest technology in order to use non-metallurgical grade ores, both lumps and fines, after necessary beneficiation and agglomeration. The units have also incorporated an effective pollution control measures in the form of gas cleaning, deoxidising and waste heat recovery.

## BULK FERROALLOYS

Bulk ferroalloys consist of principal alloys, viz, ferromanganese, silicomanganese, ferrochrome, chargechrome and ferrosilicon. The production of different kinds of ferroalloys was not received from IFAPA as well as from other sources. However, the data received from JPC for some of the ferroalloys and partial coverages on ferroalloys that have been published in IBM's Monthly Statistics of Mineral Production (MSMP) in its March, 2018 & 2019 issues have been reproduced in Table-2. It may be noted that the data coverage in Table-2 is partial and does not reflect the actual production of ferroalloys.




### Ferromanganese/Silicomanganese

Ferromanganese is produced as high carbon ferromanganese with 72-82% Mn, 6-8% C and 1.5% Si; medium-carbon ferromanganese with 74-82% Mn, 1-3% C and 1.5% Si; and low-carbon

**Table – 2 : Production of Ferroalloys, 2016-17 to 2018-19**

(In tonnes)

| Ferroalloys | 2016-17 | 2017-18 | 2018-19 |
|---|---|---|---|
| **A) Bulk Ferroalloys** | | | |
| Ferromanganese | 518000 | 518000 | 518000 |
| Silicomanganese | 300625 | 311326 | 345291 |
| Ferrosilicon | 90000 | 90000 | 90000 |
| Ferrochrome | 944000 | 944000 | 944000 |
| Chargechrome | NA | NA | NA |
| **B) Noble Ferroalloys** | | | |
| Ferromolybdenum | 1603 | 1205 | 1003 |
| Ferrovanadium | 1329 | 1331 | 1013 |
| Ferrotungsten | NA | NA | NA |
| Magnesium-ferro-silicon | 20183 | 15978 | 19180 |
| Ferroaluminium | 4345 | 4423 | 2752 |
| Ferro-silicon-zirconium | NA | NA | NA |
| Ferrotitanium | 291 | 281 | 118 |
| Ferroboron | NA | NA | NA |
| Ferroniobium | NA | NA | NA |

***Source:*** *Monthly Statistics of Mineral Production (MSMP), IBM, March, 2018 & 2019 Issues.*

ferromanganese with 80-85% Mn, 0.1-0.7% C and 1-2% Si. Silicomanganese on the other hand is a combination of 60-70% Mn, 10-20% silica and about 20% carbon. Manganese in the form of ferromanganese is added for hardening and desulphurisation of steel. Nav Bharat Ferro Alloys Ltd, Paloncha, Andhra Pradesh; Chhattisgarh Electricity Co. Ltd, Raipur, Chhattisgarh; Indsil Energy & Electro Chemicals Ltd, Raipur, Chhattisgarh; Ispat Godawari Power & Ispat Ltd (GPIL), Chhattisgarh; Monet Ispat Ltd, Raipur, Chhattisgarh; Union Ferro, Raigarh, Chhattisgarh; Prakash Industries, Raigarh, Chhattisgarh; Tirumala Balaji Alloys Pvt. Ltd, Raigarh, Chhattisgarh; Vandana Global Ltd, Raipur, Chhattisgarh; SAL Steels Ltd, Gandhidham, Gujarat; Anjaneya Ferro Alloys Ltd, Mihijam, Jharkhand; Gautam Ferro Alloys Ltd, Ramgarh, Jharkhand; Shivam Iron & Steel Co. Pvt. Ltd, Giridih, Jharkhand; Sandur Manganese & Iron Ores Ltd, Sandur, Karnataka; Indsil Electrosmelt Ltd, Palakkad, Kerala; Chandrapur Ferro Alloys Plant (formerly Maharashtra Electrosmelt Ltd), Chandrapur, Maharashtra; Nagpur Power Ind. Ltd, Kanhan, Maharashtra; Natural Sugar & Allied Ind. Ltd, Osmanabad, Maharashtra; Adhunik Meghalaya Steels Pvt. Ltd, Bymihat, Meghalaya; Meghalaya Sova Ispat Ltd, Meghalaya; Shyam Century Ltd, Meghalaya; Tata Steel Ltd, Joda, Odisha; Bhaskar Shrachi Alloys Ltd, Durgapur, West Bengal; Cosmic Ferro Alloys Pvt. Ltd, Bankura, West Bengal; Dayal Ferro Alloys Ltd, Ramgarh, West Bengal; Haldia Steels Ltd, Burdwan, West Bengal; Impex Ferro Tech Ltd, Burdwan, West Bengal; Maithan Alloys Ltd, Burdwan, West Bengal; Modern India Con-Cast Ltd, Birhampur, West Bengal; Sharp Ferro Alloys Ltd, Durgapur, West Bengal; Shri Gayatri Minerals Ltd, Bishnupur, West Bengal; Shyam Ferro Alloys Ltd, Burdwan, West Bengal; and Sova Ispat Ltd, Durgapur, West Bengal are the major producers of ferromanganese/silicomanganese.

Silicomanganese, is an alloy that contains 60-70% manganese, 16-28% silicon and 1.5 to 2.5% carbon. It is more preferred as an effective deoxidising agent than high-carbon ferromanganese in the production of various types of steels. It is also used as feedstock to produce refined alloys like medium and low-carbon ferromanganese. Around 4,750 to 5,250 kWh power is consumed to produce one tonne of silicomanganese produced. Silicomanganese has emerged as a more important alloy than ferromanganese. The country, over the year, has emerged as a leading producer of silicomanganese. Silicomanganese was also produced by a number of small-scale ferroalloy producers. The total production of ferromanganese in 2017-18 was about 5,18,000 tonnes which remained same in 2018-19. The estimated consumption of ferromanganese was 50,800 tonnes in 2017-18. The production of silicomanganese (including medium-carbon & low-carbon silicomanganese) which was about 3,11,326 tonnes in 2017-18 increased to 3,45,291 tonnes in 2018-19. In 2017-18, the total consumption of silicomanganese by all industries has been estimated at 1,22,600 tonnes.

## Ferrrochrome/Chargechrome

Ferrochrome when added to steel imparts hardness, strength and augments its stainless characteristics. For every tonnes of stainless steel (depending on the grade), there is 17-23% of chrome content is required. Hence, if the stainless-steel Industry grows, the ferrochrome Industry also grows. Carbon content classifies the ferrochrome alloy into high-carbon (6-8%), medium-carbon (3-4%) and low-carbon (1.5-3%), although chromium content in all the three grades is around 60-70%. Around 2.5 tonnes chrome ore with an estimated power consumption of 4,500 kWh is required to produce one tonne of ferrochrome. Ferrochrome is produced by electric carbothermic reduction of chromite.

FACOR Alloys Ltd, Garividi, Andhra Pradesh; Jindal Steel & Power Ltd, Raigarh, Chhattisgarh; Standard Chrome Ltd, Raigarh, Chhattisgarh; SAL Steel, Kachchh-Bhuj, Gujarat; Balasore Alloys Ltd, Balasore, Odisha; IDCOL Ferro Chrome Plant, Jajpur Road, Odisha; Indian Metals & Ferro Alloys Ltd, Therubali, Odisha; Jindal Stainless Ltd, Duburi, Odisha; Nava Bharat Ferro Alloys Ltd, Dhenkanal, Odisha; Utkal Manufacturing Services Ltd, Choudhwar, Odisha; Rawat Ferro Alloys, Cuttack, Odisha; Rohit Ferro Tech. Pvt. Ltd, Bishnupur, West Bengal and Sri Vasavi Ind. Ltd, Bishnupur, West Bengal are the major ferrochrome

producers. A sizeable quantity is also produced by units in the small-scale sector.

The total production of ferrochrome/charge chrome in 2017-18 was about 9,44,000 tonnes which remained same in 2018-19. The consumption of ferrochrome was estimated at 14,600 tonnes in 2017-18.

### Ferrosilicon

Ferrosilicon contains about 75-90% silicon and minor amounts of iron, carbon, etc. It is produced by using quartzite, iron ore, coke and electrode paste. Around 1.75 to 2 tonnes quartzite is required to produce one tonne of ferrosilicon. A very high consumption of power, i.e., 9,000 to 10,000 kWh is required to produce one tonne of ferrosilicon. It is a powerful deoxidising agent and its major applications are in electrical steel used for transformers and dynamos, alloy steel for tools & automobile valves and in iron casting and mineral dressing. Ferrosilicon is used by the military to quickly produce hydrogen for balloons. For this, chemical reaction of sodium hydroxide, ferrosilicon and water is utilised.

Bharat Alloys & Energy Ltd, Kurnool, Andhra Pradesh; VBC Ferro Alloys, Medak, Andhra Pradesh; SMS Smelters Ltd, Lekhi, Arunachal Pradesh; Visvesvaraya Iron & Steel Plant, Bhadravati, Karnataka; Silical Metallurgic Pvt. Ltd, Palakkad, Kerala; Jayantia Alloys, Meghalaya and Indian Metals & Ferro Alloys Ltd, Therubali, Odisha, are the major producers of ferrosilicon. Small-scale producers of ferrosilicon are also in operation in Kerala and Tamil Nadu. In Meghalaya, three units have sprung up that produce ferrosilicon.

The production of ferrosilicon in 2017-18 was about 90,000 tonnes which remained same in 2018-19. The domestic consumption of ferro-silicon in the Organised Sector was estimated at 23,400 tonnes in 2017-18.

## NOBLE FERROALLOYS

Noble ferroalloys are one of the vital additive inputs required especially in production of alloy and special steel. Noble ferroalloys also refer to alloys used in small quantities and are relatively expensive compared to bulk ferroalloys. These are used in the production of steel as deoxidant and alloying agents.

These high temperature alloys impart strength, resistance and stability within a temperature range from 260 to 1,200 °C. These alloys are used generally in turbine engines, power plants, furnaces and all pollution control equipment. Noble ferroalloys include ferrovanadium, ferrotitanium, ferronickel, ferromolybdenum, ferrotungsten and ferroniobium. In India, noble ferro-alloys are mostly manufactured through alumino-thermic process.

### Ferronickel

The consumption and production of ferronickel were not reported in the Organised Sector.

### Ferromolybdenum

There were five important Units, namely, Mehra Ferroalloys, Electro Ferroalloys Pvt. Ltd, India Thermit Corporation, Bharat Pulverising Mills Ltd and Sunbel Alloys Co. of India Ltd. The all India production decreased considerably by 17% to 1,003 tonnes in 2018-19 as compared 1,205 tonnes in 2017-18.

### Ferrotungsten

The consumption and production of ferrotungsten in 2018-19 were not reported in the Organised Sector.

### Ferrovanadium

Production of ferrovanadium in 2017-18 was 1,331 tonnes which decreased considerably by 24% to 1,013 tonnes in 2018-19.

### Others

Mishra Dhatu Nigam Ltd (MIDHANI) (A Govt. of India Enterprise), Hyderabad, produced chiefly cobalt, molybdenum, titanium and tungsten-based super-alloys.

The production details of various types of Bulk ferroalloys and Noble ferroalloys in 2016-17 to 2018-19 are furnished in Table- 2.

Information on plantwise capacity of principal ferroalloys in India together with general specifications of products is elucidated in Table-3. Consumption of principal alloys by different industries is furnished in Table- 4.

**Table – 3 : Statewise, Plantwise Capacity and Specifications of Principal Ferroalloys Produced in India**

| Name and location of the plant | Product | Specifications | Installed capacity (tpy) |
|---|---|---|---|
| **Andhra Pradesh** | | | |
| Andhra Ferro-alloys Ltd, Srinivasanagar, Distt Vizianagaram | HC ferrochrome | Cr: 60-65% max. Si: 2-4% max. C: 6-8% max. P: 0.040% max. S: 0.040% max. | |
| | Silicomanganese | Mn: 60% min. C: 2.5% max. Si: 14% min. P: 0.3 % max. S: 0.035% max. | 20,000 |
| FACOR Alloys Ltd, Shreeramnagar, Garividi, Distt Vizianagaram | HC ferromanganese | Mn: 70-80%, C:6-8%, Si: 1-5 % max. P: 0.35% max. S: 0.05% max. Size: 25-150 mm +/- 10%, Corresponding ISI specification: IS 1171-2011. | 72,500 (For all ferroalloys) |
| | HC Ferrochrome | Cr: 60-63%, Si: 3-4%, C: 6-8%, P: 0.03-0.05% (max.), S: 0.03-0.05% (max.) | 90,345 |
| | Silicomanganese | Mn: 60-70%, Si: 16-20%, C: 2.0% max. S: 0.03%, P: 0.3 %, Size: 10 - 150 mm +/- 10%, Corresponding ISI specification: IS 1470-1990. | |
| | Ferrosilicon | Si: 60-80%, C: 0.15% max. P: 0.05%, S: 0.05% max. Al : 1-15% max. Size: 25-150 mm +/- 10%, Corresponding ISI specification: IS 1110-2011. | |
| | Ferrosilicon-magnesium | Mg: 4-30%, Si: 44-55 %, Al: 1.00%, Ca: 1.0-4.0%, | |
| | Silico-chrome | NA | |
| Deccan Ferro Alloys (P) Ltd, Chintalapalem (PO), Pendurthi (SO), Vizianagaram | Silicomanganese | NA | 30,000 |
| Jindal Stainless Ltd, (Ferro Alloys Division) Jindal Nagar, Kothavalasa, Distt Vizianagaram. | HC ferrochrome | Cr: 62%, Si: 2.5%, C: 7-8%, P: 0.040%, | 40,000 |
| Sree Sarda Alloys Ltd, Ravivalsa, Tekkali Mandal, Distt Srikakulam. | Ferrochrome | NA | 6,000 |
| Metkore Alloys and Industries Ltd, Srikakulam. | H C ferrochrome | NA | 25000 |
| Siri Smetters & Energy Pvt. Ltd, Distt Vizianagaram. | Silicomanganese | NA | 8,500 |

(Contd)

Table- 3 (Contd)

| Name and location of the plant | Product | Specifications | Installed capacity (tpy) |
|---|---|---|---|
| Maithan Alloys Ltd, Visakhapatnam. | Ferroalloy | NA | 1,20,000 (Total) |
| MDA Mineral Dhatu AP Pvt. Ltd, Distt Vizianagaram. | Ferro Mn<br>Silico Mn | NA<br>NA | 9,000<br>11,000 |
| Rhodium Ferro-alloys Pvt. Ltd, Gollapuram, Distt Anantapur | Ferrosilicon | NA | 8,000 |
| Ushodaya Electrodes Pvt. Ltd, Visakhapatnam | Ferromanganese | NA | 4 |
| Srinivasa Ferro Alloys Ltd, Visakhapatnam | Silicomanganese | NA | 26000 |
| Sri Raghvendra Ferro Alloys Pvt. Ltd,Nalgonda | Silicomanganese | NA | 18000 |
| Sri Balaji Electro Smelters Ltd, Hyderabad | Silicomanganese | NA | 4650 |
| Sri Mahalakshmi Smelters Pvt. Ltd, Vizianagaram | Ferrosilicon | NA | 7,200 |
| Nav Bharat Ventures Ltd, Distt Khammam | Silico Mn | NA | 1,25,000 |
| Anjaney Alloys Ltd, Atchutapuram, Distt Visakhapatnam | Ferroalloys | NA | 120,000 |
| M.B.SMELTERS Pvt. Ltd, Hindupur, Distt Anantapur | MC ferromanganese<br>HC ferromanganese | NA<br>NA | 7,500<br>50,000 |
| **Chhattisgarh** | | | |
| (i) Hira Ferro Alloys Ltd, Urla, Distt Raipur. | HC ferromanganese | Mn: 70-75%, Si: 1.50% max.<br>C: 6-8 %, P: 0.30% max.<br>S: 0.05% max. | 61,500 |
| | Silicomanganese | Mn: 60-65%, Si: 14-17%,<br>C: 2.0% max. P: 0.35% max.<br>S: 0.05% max. | |
| (ii) Alok Ferro-Alloys Ltd, Raipur. | Ferroalloys | NA | 18,000 |
| INDSIL Energy & Electrochemical Ltd, Raipur, Chhattisgarh | Silicomanganese | NA | 19,200 |
| Sarda Energy & Minerals Ltd | Ferromanganese | Mn: 70% (min.), Si: 1.5% (max.), C: 6-8%, P: 0.35% (max.), S-0.050(max.) | 45 MVA (Total) |
| | Silicomanganese | Mn: 60% (min.), Si: 15-20%,<br>C: 2.50% (max.), P: 0.35% (max.),<br>S-0.050(max.) | |
| Chhattisgarh Electricity Co. Ltd, Siltara, Raipur. | HC ferromanganese | Mn: 70-75%,<br>Si: 1.5-2.0%,<br>C: 6.0-8.0%,<br>P: 0.35-0.40%,<br>S: 0.05 (max.) | 36,000 |
| | Silicomanganese | Mn: 60-65% ,<br>Si: 15-20%, C: 2.0-2.5%,<br>P : 0.3-0.35 %, S: 0.05% (max.) | NA |
| Nav-chrome Ltd, Urla Industrial Area, Distt Raipur. | HC ferromanganese<br>Silicomanganese<br>HC ferrochrome | NA<br>NA<br>NA | 21,560<br><br>14,700 |

(Contd)

Table- 3 (Contd)

| Name and location of the plant | Product | Specifications | Installed capacity (tpy) |
|---|---|---|---|
| Deepak Ferro Alloys Ltd | Ferromanganese | | 5,000 |
| VA Power & Steel Pvt. Ltd, Distt Raigarh | Ferrosilicon<br>Silicomanganese | NA<br>NA | 8,100<br>14,400 |
| Orion Ferro alloys, Gharghoda, Raigarh | Silicomanganese<br>Silico-slag (as by-product) | NA<br>NA | 8,000<br>12,000 |
| Vandana Global Ltd, Raipur | Silicomanganese | NA | 36,000 |
| Jindal Steel & Power Ltd, Kharsia, Distt Raigarh. | HC Ferrochrome | Cr: 60-66%,<br>C: 6 to 8%,<br>Si: 4% (max.),<br>P: 0.050 (max.),<br>S: 0.050 (max.), | 36,000 |
| | Silicomanganese | Mn: 60%, Si: 15%, P: 0.3% max. | |
| Sai Chemical Pvt Ltd, Tadesara, Distt Rajnandgaon | Silicomanganese | NA | 10,200 |
| MSP Spong Iron Ltd, Manuapali, Jamgaon, Raigarh (Chhattisgarh) | Silicomanganese | NA | 42057 |
| **Goa** | | | |
| Karthik Alloys Ltd, Cuncolim, Distt South Goa. | HC Silicomanganese | Mn:60-65%<br>$Sio_2$:14-15% (min.)<br>C:2.5-0.20% (max.)<br>P:0.03-0.2% (max.)<br>S:0.05% (max.) | 25,500 |
| **Gujarat** | | | |
| Essel Mining & Industries Ltd, Vapi, Distt Valsad. | Ferrovanadium | V: 50%, C: 0.1% (max.),<br>S and P: 0.05% each,<br>Al: 1.5% | 400 |
| | Ferromolybdenum | Mo: 60%, C: 0.1%,<br>S: 0.08%, P: 0.06%,<br>Al: 0.5% | 1,200 |
| | Ferrotitanium | NA | 600 |
| Electro Ferro-Alloys (Pvt.) Ltd, Ahmedabad, Gujarat. | Ferromolybdenum<br>Ferrosilico-zirconium | NA | 300 |
| Baroda Ferro-Alloys, Distt Panchmahals. | HC ferrochrome | NA | 3500 |
| Sal Steel Ltd, Gandhidham, Distt Kachchh | Silicomangenese | NA | 61890 |
| Sahjanand Ferro Alloys, Distt Vadodara. | NA | NA | 3,000 |
| **Haryana** | | | |
| Haryana Ferro-Alloys Ltd, Gohana Road, Distt Rohtak. | – | – | 2,500 |
| **Jammu and Kashmir** | | | |
| Shree Sitaram Industries Pvt. Ltd, Phase II, SIDCO Complex, Bari Brahmana. | Ferrochrome | NA | 3,325 |
| **Jharkhand** | | | |
| Anjaneya Ferro Alloys Ltd, Mihijam, Distt Jamtara | Ferroalloys | NA | 41,850 |

(Contd)

Table- 3 (Contd)

| Name and location of the plant | Product | Specifications | Installed capacity (tpy) |
|---|---|---|---|
| Bihar Foundry & Casting Ltd (Unit Gautam Ferro Alloys) | Silico-manganese | Si: 14%, Mn : 60% | 34,000 |
| Castron Technologies Ltd, Bokaro Industrial Area, | Ferromanganese<br>Silicomanganese | NA<br>NA | 14,400 |
| Shivam Iron & Steel Co. Ltd, Ferro Alloys Division, Jambad, Udnabad, Giridih | Ferromanganese<br>Silicomanganese | NA | 37,400 |
| Dayal Ferro Alloys, Ramgarh Cantt.,Hazaribagh | Silicomanganese | NA | 10,000 |
| Jamshedpur Mineral & Chemicals, Distt Saraikela-Kharaswan. | Ferromanganese | NA | 4,800 |
| **Karnataka** | | | |
| Sandur Manganese & Iron Ores Ltd, Vyasanakere, Distt Ballari | HC ferromanganese<br>Silicomanganese<br>Ferrosilicon | NA | 29,100<br>36,000<br>24,000 |
| Dandeli Steel & Ferro Alloys Ltd, Dandeli, Distt Uttar Kannada. | Ferromanganese | Mn: 70-75%, C: 0.1%, Si: 2.4%, P : 0.15%, S: 0.05%, Size: 37 mm | 6,000 |
| | MC ferromanganese | Mn: 70-75%, C: 1.5%, P: 0.25%, Si: 2%, S: 0.05% | |
| S.R. Chemicals & Ferro-Alloys, KIADB Honaga, Distt Belagavi. | LC Ferromanganese | Mn: 70%, C: 0.1%, P: 0.12% | 25 |
| Thermit Alloys (Pvt.) Ltd, N-7, Industrial Estate, Distt Shivamogga | Ferromanganese<br>Silicomanganese<br>Ferrochrome<br>Ferrosilicon<br>Silicochrome | NA<br>NA<br>NA<br>NA<br>NA | 1,200 |
| Padmavati Ferrous Ltd, Distt Ballari | Ferromanganese<br>Silicomanganese | Mn: 24 to 48%<br>Fe:4 to 30% | 5,000<br>5,000 |
| | Ferrosilicon | | 2,000 |
| **Kerala** | | | |
| The Silical Metallurgic Ltd, Wayalur, Distt Palakkad. | Silicomanganese | Mn: 70-75% | 3,600 |
| INDSIL Electrosmelts Ltd, Pallatheri, Distt Palakkad. | Silicomanganese<br>Ferrosilicon | NA<br>NA | NA<br>NA |
| INDSIL Hydro Power & Manganese Ltd, Distt Palakkad, Kerala | Silicomanganese | Mn: 55% (min.), Si: 23-27%, C: 0.1 % (max.)/0.2% (max.)/0.5% (max.), S: 0.02% (max.), P: 0.15% (max.) | 14,400 |
| Shri Laxmi Electro Smelters (Pvt.) Ltd, Industrial Development Area Erumathala, P.O. Aluva- 683 105. | Ferrosilicon | NA | NA |
| **Madhya Pradesh** | | | |
| MOIL Ltd, (formerly Manganese Ore India Ltd) Ferro-manganese Plant, Bharweli (Manjhara), Distt Balaghat. | HC ferromanganese | Mn:78±1%, P: 0.35% (max.), C: 6.8% | 10,000 |

(Contd )

Table- 3 (Contd)

| Name and location of the plant | Product | Specifications | Installed capacity (tpy) |
|---|---|---|---|
| Jalan Ispat Castings Ltd,<br>Industrial Area,<br>Meghnagar, Distt Jhabua. | Silicomanganese | Mn: 60-65%, Si: 15-20%,<br>C: 2% (max), P: 0.35% | 12,000 |
| Crescent Alloys Pvt. Ltd,<br>Seoni. | Ferrosilicon<br>Ferromanganese | N.A.<br>N.A. | 4,500<br>(Total) |
| S.R Ferro Alloys, Jhabua | Silicomanganese | NA | 8,639 |
| **Maharashtra** | | | |
| Chandrapur Ferro Alloy<br>Plant (Erstwhile Maharashtra<br>Electrosmelt Ltd),<br>Distt Chandrapur- 442 401. | HC ferromanganese | Mn: 70-74 % and 74-78% ,<br>Si: 1.5% (max.),<br>C: 6.8%, P: 0.43%. (max.) | 190,000 |
| | MC ferromanganese | Mn : 70-74% and 74-78% ,<br>Si: 2% max.,<br>C: 1 - 3% , P: 0.4% max. | 1,800 |
| | LC ferromanganese | Mn: 70-74% and 74-78% ,<br>Si: 2% (max.), C: 1.5% max.,<br>P: 0.4% max. | NA |
| | Silicomanganese | Mn: 60-65% and 65% min.,<br>Si: 15-20%, C: 2 % max.,<br>P: 0.35% max | 130,000 |
| Nagpur Power & Industries Ltd,<br>P.O. Khandelwal Nagar,<br>Distt Nagpur. | Silicomanganese<br>HC ferromanganese | Mn: 60-65%, P: 0.35%<br>Mn: 70-75%, P: 0.4% | NA<br>NA |
| Bharat Pulverising Mills Ltd,<br>Andheri, Mumbai. | Ferromolybdenum<br>Ferrotungsten<br>Ferrovanadium | NA<br>NA<br>NA | 200<br>(Total) |
| Sunbel Alloys Co. of India Ltd,<br>Thane-Belapur, Mumbai. | Ferromolybdenum<br>Ferrosilicon<br>Ferrotungsten<br>Ferrovanadium | NA<br>NA<br>NA<br>NA | 300<br>(Total) |
| Natural Sugar and Allied<br>Ind. Ltd,<br>Sainagar, Ranjani,<br>Distt Osmanabad. | HC Ferromanganese | Mn: 70-75%,<br>Si: 2-2.5%,<br>P: 0.4%,<br>C: 6-8% | 16,500 |
| | Silicomanganese | Mn: 60-65%,<br>Si: 13-15%,<br>P: 0.3%,C: 2-2.5% | 16,500 |
| Mahavir Ferro Alloys,<br>Paonakhari, Distt Bhandara | Ferroalloys | NA | 100 |
| Minex Metallurgical<br>Co. Ltd, Distt Nagpur | Ferrotitanium | NA | 250 |
| **Meghalaya**<br>Maithan Alloys Ltd,<br>Distt Rio Bhoi. | Ferromanganese | NA | 28,000 |
| **Odisha** | | | |
| Ferro Alloys Corporation Ltd,<br>(Ferro Chrome Plant Randia),<br>D.P. Nagar, Randia, Distt Bhadrak. | HC ferrochrome/<br>Chargechrome | Cr: 60-64%, Si: 3-4%,<br>C: 6-8%, P: 0.03-0.05% (max.),<br>S: 0.03-0.05% (max.) | 75,000 |
| Tata Steel Ltd, Ferro Manganese<br>Plant, Joda,<br>Distt Keonjhar | HC ferromanganese<br><br>Silicomanganese | Mn: + 70%, C: 6-8 %,<br>Si :0.3-2%, P: 0.2-0.4%,<br>Mn: 46-48%, | 50,400<br>-<br>65,000 |

(Contd)

Table- 3 (Contd)

| Name and location of the plant | Product | Specifications | Installed capacity (tpy) |
|---|---|---|---|
| Tata Steel Ltd, | Ferrochrome | NA | 65,000 |
| (Charge-chrome Plant), | Chargechrome | Cr: 60% (min.), Si: 4% (max.) , C: 8% (max.), P: 0.03% (max.), S: 0.03% (max.) | 55,000 |
| Bamnipal, Distt Keonjhar. | Ferromanganese | Mn: 46 to 49% | 50,400 |
| Balasore Alloys Ltd, | HC ferrochrome | Cr: 60-63% ,Si: 3.5% (max.) Grade I | 150,000 |
| Balgopalpur, Distt Balasore. | | C: 8.0% (max.), Cr: 57-60% | |
| (Formerly Ispat Alloys Ltd) | | S: 4.0% (max.) Grade II, C: 8.0% (max.) | |
| Jeypore Sugar Co. Ltd, | HC ferrochrome | Cr: 60-65%, | 22,000 |
| (Ferro-manganese Plant) | | P: 0.055%, | |
| Distt Rayagada. | | C: 2%, | |
| | | S: 0.05%, | |
| | | Si: 4%, | |
| | | Fe: Balance | |
| | Silicomanganese | Mn: 60-65%, | 22,000 |
| | | Si: 15-18%, | |
| | | C: 2% max. | |
| J.B. Ferro Alloys, At Tanto, | LC ferromanganese | NA | 200 |
| P.O. Bhadrashahi, Keonjhar. | | | |
| IDCOL Ferro Chrome & Alloys Ltd, | HC ferrochrome | Cr: 62-65%, | 18,000 |
| Jajpur Road, Distt Jajpur. | | Si: 1.5 to 8%, | |
| | | C: 8% (max.) | |
| Indian Metals & Ferro Alloys Ltd, | HC ferrochrome/ | Cr: 60% | 62,500 |
| (IMFA) | Chargchrome | | |
| Indian Metals & Ferro Alloys Ltd, | Ferrosilicon | Si: 70-75%, | 61,000 |
| (IMFA), Therubali, Distt Rayagada. | HC ferrochrome | Cr: 60% | 116,400 |
| Superb-Metal Alloys (Pvt.) Ltd, | Ferrocolumbium | NA | 300 |
| Rairangpur, Distt Sundergarh. | Ferromolybdenum | | (Total) |
| | Ferrotungsten | | |
| | Ferrovanadium | | |
| Jabamayee Ferro Alloys Ltd, | HC Ferrochrome | NA | 15660 |
| Sukinda, Distt Jajpur | | | |
| M M Minerals & Alloys Pvt Ltd, | HC Ferrochrome | NA | 25000 |
| Jamirdiha, Distt Mayurbhanj. | | | |
| T S Alloys Ltd, Anantapur, Cuttack. | Ferrochrome | NA | 59400 |
| Stork Ferro and Mineral | Silicomanganese | NA | 25,000 |
| Industries Pvt. Ltd, | Ferromanganese | NA | 29,700 |
| Somnathpur, Distt Balasore | Ferrochrome | NA | 25,000 |
| Aarti Steel Ltd, | Ferrochrome | NA | 25,000 |
| Ghantikhal, Distt Cuttack. | | | |
| Kalinga Ferro Ispat Pvt. Ltd, | HC Ferrochrome | NA | 8052 |
| Mandia, Distt Jajpur | | | |
| **Puducherry** | | | |
| The Silical Metallurgic Ltd | Ferrosilicon | – | 10,560 |
| | Ferrosilicon-magnesium | – | 1,800 |
| VSK Ferro Alloys Ltd, | Ferrosilicon | Si: 72.3%, C: 0.15%, | 3,000 |
| Thuthipet. | | S: 0.051%, Mn: 0.55%, | |
| | | P: 0.042%, Fe: 26.13% | |
| Snam Alloys (Pvt.) Ltd, | Ferrosilicon | NA | 12,000 |
| Kariamanikam, | Ferrosiliconmagnesium | | |
| Distt, Puducherry. | Ferrochrome | Si: 14.56%, P: 0.197% | |

(Contd)

Table- 3 (Contd)

| Name and location of the plant | Product | Specifications | Installed capacity (tpy) |
|---|---|---|---|
| Tata Steel Alloys Ltd,<br>Ferro Alloy Plant,<br>Cuttack. | Ferrochrome | | 50,000 |
| **Punjab** | | | |
| Mehra Ferro-Alloys,<br>Verka, Amritsar. | Ferromolybdenum<br>Ferrovanadium<br>Ferrotitanium<br>Ferrotungsten<br>Ferroboron | NA | 300<br>(Total) |
| **Sikkim** | | | |
| Akshay Ispat & Ferro Alloys Ltd,<br>Mamring, Namchi,<br>Distt South Sikkim. | Ferrosilicon | NA | 6,000 |
| **Telangana** | | | |
| VBC Ferro Alloys Ltd,<br>Village Rudraram,<br>Patancheru Mandal<br>Distt Medak. | Ferrosilicon<br>Ferrochrome<br>Silicomanganese/<br>Ferromanganese | –<br><br>– | 10,000<br>27,000<br>31,500 |
| Shree Raghvendra Ferro Alloys<br>Pvt. Ltd, Nalgonda | Silicomanganese | NA | 15000 |
| Nava Bharat Ventures Limited,<br>Paloncha, Distt Khammam, | HC Silicomanganese<br>HC ferromanganese | NA | 1,25,000 |
| **Uttar Pradesh** | | | |
| The India Thermit Corp. Ltd,<br>Fazalganj, Distt Kanpur. | Ferromolybdenum<br>Ferrotitanium<br>Ferrochrome<br>Ferroboron<br>Chromium metal<br>LC ferromanganese<br>Ferrovanadium | NA | 300<br>(Total) |
| Hindustan Ferro-Alloys,<br>Hamirpur. | FerrosiIicon | NA | 3,200 |
| **West Bengal** | | | |
| Bhaskar Shrachi Alloys Ltd,<br>Durgapur | Silicomanganese | Si: 15% | 24,000 |
| Cosmic Ferro Tech. Ltd,<br>Bishnupur,<br>Distt Bankura. | HC ferromanganese | Mn: 66-71%, Si: 1.4%<br>C: 6.5-7%, P: 0.3% | 45,375 |
| | Silicomanganese | Mn: 61-65%, Si: 15.5%<br>C: 1.9%, P: 0.28% | |
| Sri Gayatri Minerals Pvt. Ltd,<br>WBIIDC Growth Centre,<br>Bishnupur, Bankura. | HC silicomanganese | Mn: 60-65% & 65% min.,<br>Si: 15% min. & 16% min.,<br>C: 2% max.,<br>P: 0.3 max., S: 0.03 max. | 24,000 |
| Industrial Metals & Ferro Alloys,<br>Jamuria, Burdwan. | LC ferrotitanium<br>LC ferrochrome | NA<br>NA | 20<br>20 |
| Hira Concast Ltd, Salanpur,<br>Burdwan. | Silicomanganese<br>Ferromanganese | NA<br>NA | 11,455<br>15,225 |
| Karthik Alloys Ltd (I & II),<br>Durgapur. | MC silicomanganese | Mn: 54-56%, C: 0.2-0.5% Si: 22-25%<br>P: 0.15-0.2, S: 0.05% | 19,000 |

(Contd)

Table- 3 (Concld)

| Name and location of the plant | Product | Specifications | Installed capacity (tpy) |
|---|---|---|---|
| | LC silicomanganese | Mn: 53-55%, C: 0.15-0.2% Si: 25-28% P: 0.15-0.2%, S: 0.05% | NA |
| Maithan Alloys Ltd, Burdwan. | Ferromanganese Silicomanganese Ferrochrome | NA | 94,600 (Total) |
| Monnet Ferro Alloys Ltd, Burdwan. | Silicomanganese | NA | 12,500 |
| Shyam Ferro Alloys Ltd, Palitpur Road, Burdwan, Dewandighi (Katwa Road) | HC silicomanganese HC ferromanganese HC ferrochrome | NA | 104,957 (Total) |
| Srinivasa Ferro Alloys Ltd, Durgapur, Burdwan. | HC ferromanganese | Mn: 70-74%, 74-76% Si: 1.5% max., C: 6-8%,, P: 0.25, 0.30 and 0.40 max., S: 0.03 max. | 10,800 |
| | HC silicomanganese | Mn: 60-65% & 65% min. Si: 15% min. & 16% min. C: 2% max., P: 0.3% max., S: 0.03% max. | 23,400 |
| | LC silicomanganese | NA | 5,400 |
| Shri Vasavi Industries Ltd, WBIIDC Industrial Growth Centre, Bishnupur, Distt Bankura. | HC ferrochrome | Cr: 58-60%, Si: 2-4%, C: 8% max., P: 0.05% max. S: 0.05% max. | 45,000 (16MVA 1No. & 12MVA 1 No.) |
| Modern India Con-Cast Ltd, | Bulk ferroalloys | – | 22,000 |
| WBIIDC Industrial Growth Centre, Bishnupur, Distt Bankura. | | | |
| Rohit Ferro Tech. Ltd, Bishnupur, Distt Bankura | HC ferrochrome | Cr: 60% (min.), C: 8% (max.) Si: 3.5% (max.), P: 0.03% (max.) S: 0.04% (max.) | 45,375 |
| Sharp Ferro Alloys, Durgapur | HC silicomanganese | NA | 42,500 |
| Nilkantha Ferro Ltd, Bankura | HC silicomanganese | NA | 39,960 |
| | Silicomanganese Slag | NA | 40,200 |
| Lalwani Ferro Alloysa Ltd, Kolkata | Silicomanganese | NA | 48,780 |
| | HC ferromangenese | NA | 69,285 |
| Ispat Damodar Pvt. Ltd, (Sponge Iron Plant), Nabagram, PS-Neturia, Digha, Purulia. | Ferroalloys | NA | 40,000 |
| Sonic Thermal Pvt. Ltd, (Ferro Alloys Plant), Namobandh, Sitarampur, Bankura. | Silicomanganese | NA | 39,500 |
| Shree Ambry Ispat Pvt. Ltd, Basdebpur, Distt Bankura. | Ferromanganese | NA | 22,600 |
| | Silicomanganese | NA | 17,400 |
| | Ferrosilicon | NA | 7,600 |

***Note:*** *HC : High carbon. MC: Medium carbon. LC: Low carbon*
***Source:*** *Information collected by IBM*

**Table – 4 : Consumption* of Principal Ferroalloys, 2017-18 (P)**

(In tonnes)

| | Consumption |
|---|---|
| Ferrochrome | 14600 |
| Ferromanganese | 50800 |
| Ferrosilicon | 23400 |
| Silicomanganese | 122600 |

*Note: 1) *Includes actual reported consumption and/or estimates made whereaver required, and paucity of data, hence consumption may not be complete*

# ENVIRONMENT

Studies reveal that depending on the ferroalloy manufactured, waste generation per day in 35 tpd and 50 tpd ferrosilicon and ferrochrome plants may be in the following range:

Silica fines: 7 to 8 tonnes/day

Fe-Cr slag (fined boulder): 40 tonnes/day

Charcoal & coke fines: 7 to 8 tonnes/day

To utilise the waste from ferroalloys industries, a typical Fe-Si or Fe-Cr manufacturing unit can provide material for 10 small-scale units for manufacturing bricks and each unit can produce 2,400 bricks per day. Other units which can be set up are board-and-briquette-making units. The utilisation of waste materials for converting them into building materials will result in bringing down the building material cost, and therefore, lead to conservation of natural resources like clay and sand.

Domestic vanadium sludge is used for producing ferrovanadium by Essel Mining & Industries Ltd, Gujarat.

The implementation of the Kyoto Protocol by the European Union provides significant opportunities for Ferroalloys Industry in India to implement $CO_2$ reduction technologies, which could be traded in terms of carbon credits. Installation of an electricity generation facility driven by CO-rich furnace gas is an obvious means by which $CO_2$ saving could be achieved.

# WORLD REVIEW

The major ferroalloys producing countries were China, South Africa, India, Russia and Kazakhstan. The production of ferroalloys in China during 2018 was 31,234 thousand tonnes, while production of ferrochrome in South Africa during 2018 was 3,700 thousand tonnes. The markets for the bulk alloys like high-carbon ferromanganese, silicomanganese, ferrosilicon and high-carbon ferrochrome showed varied responses to the fluctuations in steel and stainless steel production which seem to have influence as per the different circumstances that prevailed in different markets.

World production of various ferroalloys in principal producing countries is furnished in Table- 5.

**Table – 5 : World Production of Ferroalloys, 2016 to 2018 (By Principal Countries)**

(In tonnes)

| Country | Ferroalloys | 2016 | 2017 | 2018 |
|---|---|---|---|---|
| China | Fe-Alloys | 35588000 | 32887000 | 31234000 |
| | Si-Metal | 2101000 | 1800000* | 1800000* |
| South Africa | FeCr | 3700000* | 3700000* | 3700000* |
| | FeMn | 600000* | 600000* | 600000* |
| | FeSiMn | 210000* | 210000* | 210000* |
| | FeSi | 90000* | 90000* | 90000* |
| | FeV | 16000* | 16000* | 16000* |
| | Si-Metal | 60000* | 60000* | 60000* |
| Kazakhstan[e] | FeCr | 1525222 | 1640299 | 1640300* |
| | FeSiMn | 135885 | 123977 | 137710 |

(Contd)

(Table-5 Contd)

| Country | Ferroalloys | 2016 | 2017 | 2018 |
|---|---|---|---|---|
| | FeSiCr | 94467 | 110497 | 110500* |
| | FeSi | 68779 | 60001 | 65405 |
| | Other Fe-Alloys | - | - | - |
| India[b] | FeCr | 944000 | 944000 | 944000* |
| | FeMn | 518000 | 518000 | 515000* |
| | FeSiMn | 300625 | 311326 | 343900* |
| | FeSi | 90000 | 90000 | 90000* |
| | FeSiMg | 20183 | 15978 | 19700* |
| | FeAl | 4345 | 4423 | 2700* |
| | FeV | 1329 | 1331 | 1100* |
| | FeMo | 1603 | 1205 | 1000* |
| | FeTi | 291 | 281 | 130* |
| Russia | FeSi | 935912 | 840352 | 928797 |
| | FeCr | 268439 | 434452 | 332261 |
| | FeMn | 124200 | 253000 | 281000 |
| | Si-Metal | 48000* | 48000* | 48000* |
| | FeSiMn | 203216 | 44917 | 43334 |
| | Other Fe-Alloys | 34000* | 34000* | 34000* |
| | FeNi | 20000* | 20000* | 20000* |
| | FeV | 12392 | 12588 | 11383 |
| | Spiegeleisen | 7000* | 7000* | 7000* |
| | FeMo | 4881 | 4726 | 4700* |
| | FeSiCr | 4200* | 4200* | 4200* |
| Ukraine | FeSiMn | 876756 | 875031 | 912300 |
| | FeMn | 184310 | 211124 | 155869 |
| | Other Fe-Alloys | 106244 | 87094 | 100764 |
| | FeSi | 126297 | 118371 | 97084 |
| | FeNi | 84025 | 74459 | 79537 |
| Finland | FeCr | 469000 | 415000 | 497000 |
| Japan | FeMn | 473740 | 456460 | 456518 |
| | FeNi | 333448 | 312324 | 339844 |
| | Other Fe-Alloys | 77453 | 79809 | 73094 |
| USA | Fe-Alloys (FeSi & Si-Metal) | 384000 | 415000 | 430000* |
| Korea, Rep. of | FeMn | 355000* | 355000* | 355000* |
| | FeSiMn | 196000* | 196000* | 196000* |
| | Other Fe-Alloys | 4200* | 4200* | 4200* |
| Norway | FeSiMn | 310000* | 269000* | 328000* |
| | FeMn | 380000* | 380000* | 380000* |
| | FeSi[(x)] | 249475 | 240813 | 265964 |
| | Si-Metal | 150000* | 150000* | 150000* |

(Contd)

(Table-5 Concld)

| Country | Ferroalloys | 2016 | 2017 | 2018 |
|---|---|---|---|---|
| Georgia | FeSiMn | 244228 | 289765 | 332893 |
| | FeMn | 4500* | 4500* | 4500* |
| Australia[g] | FeMn & FeSiMn | 222000 | 245000 | 275000 |
| | Si-Metal | 51000* | 49000* | 42000* |
| New Caledonia | FeNi | 261420 | 269961 | 260206 |
| Brazil | Si-Metal | 110000 | 110000 | 190000 |
| | FeCr[(d)] | 150240 | 171531 | 175061 |
| | FeMn[(f)] | 124000 | 133074 | 168000 |
| | FeSi | 100000* | 100000* | 100000* |
| | FeNb | 44390 | 58690 | 60000* |
| | FeNi[(y)] | 44538 | 43800 | 42300 |
| | Other Fe-Alloys | 40000* | 40000* | 40000* |
| | FeSiMg | 20000* | 20000* | 20000* |
| Mexico | FeSiMn | 134251 | 148142 | 151991 |
| | FeMn | 84529 | 90010 | 95349 |
| Spain | FeSiMn | 134000 | 140000* | 140000* |
| | FeMn | 126000 | 130000* | 126000* |
| | FeSi | 80000* | 95000* | 90000* |
| | Si-Metal | 30000* | 7500* | 8000* |
| France | FeMn | 126000 | 126000* | 126000* |
| | Si-Metal | 80000 | 105000* | 100000* |
| | FeSiMn | 82000 | 65000* | 60000* |
| | Other Fe-Alloys | 70000* | 80000* | 60000* |
| | FeSi | 45000* | 35000* | 35000* |
| Indonesia | FeNi | 101465 | 108810 | 124340 |
| | FeSiMn | 8000* | 6000* | 5000* |
| Bhutan | FeSi | 106000* | 109000* | 120900* |
| Other countries | All types rounded | 1662762 | 1874053 | 1534122 |

***Source:*** *BGS, World Mineral Production, 2014-2018 BGS*

***Note:*** *FeAl : Ferroaluminium; FeCr : Ferrochrome; FeSiCr : Ferrosilico-chrome; FeSiMg : Ferrosilico-magnesium; FeMn : Ferromanganese; FeSiMn : Ferrosilico-manganese; FeMo : Ferromolybdenum; FeNi : Ferronickel; FeNb : Ferroniobium; FeSi : Ferrosilicon; FeTi : Ferrotitanium; FeV : Ferrovanadium*

**Estimate*

*(b) Years ended 31st March following that stated*

*(d) Including ferro-silico-chrome*

*(f) Including ferro-silico-manganese*

*(g) Years ended 30th June of that stated*

*(x) Sales*

*(y) Nickel Content*

# FOREIGN TRADE

## Exports

In 2018-19, exports of ferroalloys (total) decreased slightly to 19,42,134 tonnes in 2018-19 from 19,55,751 tonnes in the previous year. In terms of value, the ferro-alloys exports increased to ₹ 14,962 crore in 2018-19 from ₹ 14,328 crore in 2017-18.

Out of total export, in terms of quantity, majority were exports of ferrochrome (44%) followed by ferrosilico-manganese (39%), ferromanganese (14%) and ferrosilicon (1%). The other ferroalloys together accounted for remaining 2% of exports in 2018-19. Exports were mainly to Republic of Korea & China (15% each), UAE (11%), Japan (10%), Taiwan (7%), Italy (4%), Thailand & Malaysia (3% each) and USA & Netherlands (2% each) (Tables-6 to 26).

**Table – 6 : Exports of Ferroalloys : Total (By Countries)**

| Country | 2017-18 (R) | | 2018-19 (P) | |
|---|---|---|---|---|
| | Qty (t) | Value (₹'000) | Qty (t) | Value (₹'000) |
| **All Countries** | **1955751** | **143284847** | **1942134** | **149622740** |
| Korea, Rep. of | 213833 | 16061464 | 292555 | 22518888 |
| China | 260427 | 19273609 | 283739 | 20881513 |
| UAE | 170032 | 12939421 | 204353 | 16099834 |
| Japan | 206701 | 15333603 | 190276 | 14856701 |
| Taiwan | 207530 | 15013870 | 136245 | 10194388 |
| Italy | 100712 | 6464670 | 82740 | 5344752 |
| USA | 55758 | 4534246 | 42513 | 3873207 |
| Thailand | 67679 | 4715386 | 52324 | 3800798 |
| Malaysia | 26691 | 1903104 | 49193 | 3636918 |
| Netherlands | 54131 | 4076030 | 42027 | 3326402 |
| Other countries | 592257 | 42969444 | 566168 | 45089339 |

*Figures rounded off*

**Table – 7 : Exports of Ferroboron (By Countries)**

| Country | 2017-18 (R) | | 2018-19 (P) | |
|---|---|---|---|---|
| | Qty (t) | Value (₹'000) | Qty (t) | Value (₹'000) |
| **All Countries** | **102** | **14677** | **47** | **9921** |
| South Africa | 78 | 11459 | 38 | 7986 |
| Oman | - | - | 8 | 1608 |
| Turkey | 1 | 198 | 1 | 135 |
| Malaysia | - | - | ++ | 99 |
| Brazil | 1 | 110 | ++ | 75 |
| Pakistan | - | - | ++ | 15 |
| Spain | - | - | ++ | 5 |
| Slovenia | 23 | 2910 | - | - |
| Thailand | ++ | ++ | - | - |

*Figures rounded off*

**Table – 8 : Exports of Ferrochrome (By Countries)**

| Country | 2017-18 (R) | | 2018-19 (P) | |
|---|---|---|---|---|
| | Qty (t) | Value (₹'000) | Qty (t) | Value (₹'000) |
| **All Countries** | **791862** | **60038253** | **860183** | **66563284** |
| China | 259855 | 19236998 | 280293 | 20528577 |
| Korea, Rep. of | 183321 | 13667043 | 256081 | 19533000 |
| Japan | 72820 | 5998342 | 81313 | 6904567 |
| Taiwan | 116111 | 8919092 | 77657 | 6151261 |
| USA | 39679 | 3092628 | 37074 | 3080543 |
| Netherlands | 23481 | 1549020 | 26656 | 2080344 |
| Italy | 22734 | 1858059 | 20265 | 1696276 |
| Indonesia | 17568 | 1185310 | 13670 | 985439 |
| Mexico | 14505 | 1121254 | 10867 | 869877 |
| Thailand | 9080 | 735682 | 9727 | 767348 |
| Other countries | 32708 | 2674825 | 46580 | 3966052 |

*Figures rounded off*

## Table – 9 : Exports of Chargechrome (By Countries)

| Country | 2017-18 (R) | | 2018-19 (P) | |
|---|---|---|---|---|
| | Qty (t) | Value (₹'000) | Qty (t) | Value (₹'000) |
| **All Countries** | **1** | **136** | **++** | **64** |
| Saudi Arabia | - | - | ++ | 51 |
| Singapore | - | - | ++ | 12 |
| Nepal | 1 | 136 | - | - |

*Figures rounded off*

## Table – 10 : Exports of Ferromanganese (By Countries)

| Country | 2017-18 (R) | | 2018-19 (P) | |
|---|---|---|---|---|
| | Qty (t) | Value (₹'000) | Qty (t) | Value (₹'000) |
| **All Countries** | **307107** | **24302483** | **271433** | **22752482** |
| UAE | 98823 | 8156712 | 120296 | 10165512 |
| Korea, Rep. of | 9485 | 763090 | 18649 | 1525638 |
| Iran | 37235 | 2953206 | 9309 | 934182 |
| Taiwan | 12060 | 839598 | 10854 | 775605 |
| Canada | 3166 | 232106 | 8706 | 669828 |
| Oman | 782 | 56279 | 8316 | 656591 |
| Egypt | 8374 | 571490 | 8592 | 645851 |
| Thailand | 3776 | 293682 | 7966 | 611246 |
| Indonesia | 24779 | 1881373 | 6523 | 591504 |
| Libya | 4509 | 349369 | 5697 | 529322 |
| Other countries | 104119 | 8205577 | 66524 | 5647203 |

*Figures rounded off*

## Table – 11 : Exports of Ferromolybdenum (By Countries)

| Country | 2017-18 (R) | | 2018-19 (P) | |
|---|---|---|---|---|
| | Qty (t) | Value (₹'000) | Qty (t) | Value (₹'000) |
| **All Countries** | **505** | **440840** | **330** | **444660** |
| Oman | 303 | 268926 | 212 | 273801 |
| Saudi Arabia | 1 | 717 | 40 | 54911 |
| Pakistan | 7 | 6443 | 22 | 31530 |
| Netherlands | 90 | 90134 | 20 | 26699 |
| Korea, Rep. of | - | - | 12 | 24169 |
| Thailand | 14 | 16006 | 12 | 15269 |
| Indonesia | 4 | 2299 | 3 | 7167 |
| Philippines | 3 | 3406 | 4 | 4453 |
| Bahrain | - | - | 1 | 1504 |
| Ghana | ++ | 384 | 1 | 1317 |
| Other countries | 84 | 52525 | 2 | 3839 |

*Figures rounded off*

### Table – 12 : Exports of Ferronickel (By Countries)

| Country | 2017-18 (R) | | 2018-19 (P) | |
|---|---|---|---|---|
| | Qty (t) | Value (₹'000) | Qty (t) | Value (₹'000) |
| **All Countries** | **++** | **2** | **++** | **55** |
| Kenya | - | - | ++ | 55 |
| USA | ++ | 2 | - | - |

*Figures rounded off*

### Table – 13 : Exports of Ferroniobium (By Countries)

| Country | 2017-18 (R) | | 2018-19 (P) | |
|---|---|---|---|---|
| | Qty (t) | Value (₹'000) | Qty (t) | Value (₹'000) |
| **All Countries** | **3** | **4679** | **46** | **99697** |
| UAE | - | - | 23 | 47176 |
| Saudi Arabia | - | - | 13 | 25777 |
| Taiwan | - | - | 6 | 18578 |
| Malaysia | 2 | 2750 | 4 | 6967 |
| Pakistan | 1 | 1426 | ++ | 877 |
| Indonesia | ++ | 503 | ++ | 281 |
| Singapore | - | - | ++ | 41 |
| Spain | - | - | ++ | 2 |
| Turkey | - | - | ++ | ++ |

*Figures rounded off*

### Table – 14 : Exports of Ferrophosphorus (By Countries)

| Country | 2017-18 (R) | | 2018-19 (P) | |
|---|---|---|---|---|
| | Qty (t) | Value (₹'000) | Qty (t) | Value (₹'000) |
| **All Countries** | **162** | **16559** | **149** | **17076** |
| Sweden | 120 | 14843 | 120 | 16028 |
| Oman | 40 | 1642 | 20 | 683 |
| Saudi Arabia | 2 | 74 | 9 | 349 |
| Brazil | - | - | ++ | 16 |

*Figures rounded off*

### Table – 15 : Exports of Ferrosilicochrome (By Countries)

| Country | 2017-18 (R) | | 2018-19 (P) | |
|---|---|---|---|---|
| | Qty (t) | Value (₹'000) | Qty (t) | Value (₹'000) |
| **All Countries** | **-** | **-** | **++** | **31** |
| Tanzania | - | - | ++ | 31 |

*Figures rounded off*

### Table – 16 : Exports of Ferrosilicomagnesium (By Countries)

| Country | 2017-18 (R) | | 2018-19 (P) | |
|---|---|---|---|---|
| | Qty (t) | Value (₹'000) | Qty (t) | Value (₹'000) |
| **All Countries** | **10078** | **951909** | **8610** | **951637** |
| USA | 2264 | 192977 | 2104 | 209831 |
| Mexico | 892 | 85846 | 1668 | 189109 |
| Turkey | 2192 | 214601 | 965 | 103091 |
| Saudi Arabia | 608 | 55127 | 807 | 87298 |
| Iran | 675 | 71459 | 438 | 45765 |
| South Africa | 496 | 48568 | 358 | 41757 |
| Sri Lanka | 219 | 23744 | 237 | 35047 |
| Brazil | 417 | 37614 | 278 | 32244 |
| Oman | 335 | 32429 | 259 | 29581 |
| Slovenia | 162 | 15277 | 193 | 22657 |
| Other countries | 1818 | 174269 | 1303 | 155257 |

*Figures rounded off*

### Table – 17 : Exports of Ferrosilico-Manganese (By Countries)

| Country | 2017-18 (R) | | 2018-19 (P) | |
|---|---|---|---|---|
| | Qty (t) | Value (₹'000) | Qty (t) | Value (₹'000) |
| **All Countries** | **818012** | **54608448** | **766932** | **53296562** |
| Japan | 122585 | 8516704 | 102167 | 7444263 |
| UAE | 69025 | 4588643 | 80729 | 5479497 |
| Malaysia | 26073 | 1840932 | 47962 | 3517294 |
| Taiwan | 78995 | 5218662 | 47318 | 3205752 |
| Italy | 63422 | 3506746 | 54720 | 3019431 |
| Bangladesh | 35171 | 2244665 | 40545 | 2714947 |
| Pakistan | 47844 | 3089507 | 37309 | 2513058 |
| Qatar | 17489 | 1176199 | 31366 | 2405206 |
| Thailand | 54371 | 3630865 | 34455 | 2358413 |
| Nigeria | 17832 | 1162318 | 23053 | 1600330 |
| Other countries | 285206 | 19633207 | 267308 | 19038370 |

*Figures rounded off*

### Table – 18 : Exports of Ferrosilicon (By Countries)

| Country | 2017-18 (R) | | 2018-19 (P) | |
|---|---|---|---|---|
| | Qty (t) | Value (₹'000) | Qty (t) | Value (₹'000) |
| **All Countries** | **20650** | **1815141** | **25752** | **2580250** |
| Italy | 399 | 43687 | 3920 | 345110 |
| Brazil | 1807 | 163948 | 2063 | 239223 |
| Bangladesh | 1767 | 153576 | 2283 | 210695 |
| Oman | 1644 | 140540 | 1688 | 154882 |
| Korea, Rep. of | 965 | 92792 | 1222 | 133745 |
| Pakistan | 733 | 66962 | 1262 | 121803 |
| Netherlands | 664 | 62431 | 1246 | 116533 |
| USA | 1143 | 119977 | 842 | 107851 |
| Slovenia | 845 | 82861 | 864 | 100777 |
| UAE | 1083 | 91718 | 1026 | 98360 |
| Other countries | 9599 | 796648 | 9337 | 951270 |

*Figures rounded off*

### Table – 19 : Exports of Ferrotitanium (By Countries)

| Country | 2017-18 (R) | | 2018-19 (P) | |
|---|---|---|---|---|
| | Qty (t) | Value (₹'000) | Qty (t) | Value (₹'000) |
| **All Countries** | **564** | **110740** | **1199** | **284737** |
| China | - | - | 500 | 115663 |
| Saudi Arabia | - | - | 189 | 49518 |
| Korea, Rep. of | 60 | 13041 | 115 | 27155 |
| UK | 182 | 34589 | 80 | 17641 |
| Belgium | 75 | 13579 | 75 | 12470 |
| UAE | 2 | 478 | 44 | 11092 |
| Netherlands | 55 | 8529 | 45 | 11084 |
| Japan | - | - | 45 | 9879 |
| Oman | 38 | 7746 | 37 | 8701 |
| Spain | - | - | 25 | 5781 |
| Other countries | 152 | 32778 | 44 | 15753 |

*Figures rounded off*

### Table – 20 : Exports of Ferrotungsten (By Countries)

| Country | 2017-18 (R) | | 2018-19 (P) | |
|---|---|---|---|---|
| | Qty (t) | Value (₹'000) | Qty (t) | Value (₹'000) |
| **All Countries** | **7** | **5845** | **2** | **6443** |
| Pakistan | 5 | 2450 | 1 | 3237 |
| Finland | 1 | 1884 | 1 | 2755 |
| Turkey | - | - | ++ | 288 |
| Philippines | - | - | ++ | 164 |
| Ireland | ++ | 803 | - | - |
| Thailand | ++ | 523 | - | - |
| UAE | ++ | 185 | - | - |

*Figures rounded off*

### Table – 21 : Exports of Ferrovanadium (By Countries)

| Country | 2017-18 (R) | | 2018-19 (P) | |
|---|---|---|---|---|
| | Qty (t) | Value (₹'000) | Qty (t) | Value (₹'000) |
| **All Countries** | **214** | **410525** | **474** | **1832964** |
| Belgium | 50 | 88803 | 230 | 975012 |
| Oman | 42 | 64473 | 80 | 352978 |
| USA | 20 | 41069 | 80 | 279103 |
| Netherlands | 80 | 189130 | 30 | 130078 |
| UAE | 15 | 18264 | 39 | 50510 |
| Thailand | ++ | 1 | 6 | 29845 |
| Turkey | 2 | 3253 | 1 | 3345 |
| Philippines | - | - | 1 | 2365 |
| Pakistan | 1 | 1296 | ++ | 2184 |
| Bangladesh | 1 | 1094 | 1 | 1839 |
| Other countries | 2 | 3142 | 6 | 5705 |

*Figures rounded off*

### Table – 22 : Exports of Ferrocolumbium (By Countries)

| Country | 2017-18 (R) | | 2018-19 (P) | |
|---|---|---|---|---|
| | Qty (t) | Value (₹'000) | Qty (t) | Value (₹'000) |
| **All Countries** | **5** | **9965** | **1** | **1089** |
| Pakistan | ++ | 516 | 1 | 1032 |
| UK | - | - | ++ | 56 |
| Peru | 4 | 8248 | - | - |
| Malaysia | 1 | 1201 | - | - |

*Figures rounded off*

### Table – 23 : Exports of Ferrozirconium (By Countries)

| Country | 2017-18 (R) | | 2018-19 (P) | |
|---|---|---|---|---|
| | Qty (t) | Value (₹'000) | Qty (t) | Value (₹'000) |
| **All Countries** | **++** | **24** | **3** | **1546** |
| Brazil | - | - | 2 | 1260 |
| Turkey | - | - | 1 | 266 |
| Bahrain | - | - | ++ | 20 |
| Iran | ++ | 24 | - | - |

*Figures rounded off*

### Table – 24 : Exports of Ferroselenium (By Countries)

| Country | 2017-18 (R) | | 2018-19 (P) | |
|---|---|---|---|---|
| | Qty (t) | Value (₹'000) | Qty (t) | Value (₹'000) |
| **All Countries** | **++** | **1333** | **++** | **917** |
| Malaysia | ++ | 1333 | ++ | 917 |

*Figures rounded off*

**Table – 25 : Exports of Ferroalloys (Others) (By Countries)**

| Country | 2017-18 (R) | | 2018-19 (P) | |
|---|---|---|---|---|
| | Qty (t) | Value (₹'000) | Qty (t) | Value (₹'000) |
| **All Countries** | **6479** | **553043** | **6973** | **778927** |
| UAE | 188 | 10252 | 1957 | 214139 |
| Saudi Arabia | 286 | 39064 | 883 | 145105 |
| South Africa | 650 | 82987 | 574 | 100705 |
| Turkey | 140 | 14993 | 827 | 99383 |
| Italy | 913 | 60291 | 1367 | 98871 |
| Bangladesh | 234 | 25203 | 223 | 27891 |
| Bahrain | 101 | 14025 | 148 | 24320 |
| Japan | 315 | 11519 | 533 | 23193 |
| Algeria | - | - | 101 | 11620 |
| Brazil | 118 | 23212 | 39 | 8008 |
| Other countries | 3535 | 271497 | 322 | 25692 |

*Figures rounded off*

**Table – 27 : Imports of Ferroalloys : Total (By Countries)**

| Country | 2017-18 (R) | | 2018-19 (P) | |
|---|---|---|---|---|
| | Qty (t) | Value (₹'000) | Qty (t) | Value (₹'000) |
| **All Countries** | **544264** | **66167627** | **508008** | **75734226** |
| Indonesia | 56400 | 8365100 | 44088 | 11913893 |
| Bhutan | 94133 | 7654426 | 107226 | 9260646 |
| China | 45280 | 4042988 | 71606 | 8470144 |
| Malaysia | 91235 | 6105545 | 84628 | 6209192 |
| Singapore | 589 | 163095 | 13607 | 5373716 |
| Korea, Rep. of | 14039 | 3288382 | 16671 | 4463478 |
| Japan | 22566 | 3064065 | 18369 | 4309616 |
| Brazil | 23609 | 7661583 | 11609 | 4034060 |
| South Africa | 45148 | 3632976 | 44771 | 3419082 |
| Russia | 28364 | 3821613 | 15099 | 2135125 |
| Other countries | 122901 | 18367854 | 80334 | 16145274 |

*Figures rounded off*

**Table – 26 : Exports of Ferrocobalt (By Countries)**

| Country | 2017-18 (R) | | 2018-19 (P)# | |
|---|---|---|---|---|
| | Qty (t) | Value (₹'000) | Qty (t) | Value (₹'000) |
| **All Countries** | **++** | **243** | **++** | **398** |
| Japan | ++ | 243 | ++ | 398 |

*Figures rounded off*

## Imports

Imports of ferroalloys (total) decreased marginally by 7% to 5,08,008 tonnes in 2018-19 from 5,44,264 tonnes in the previous year. In terms of value, the ferroalloys imports increased to ₹ 7,573 crore in 2018-19 from ₹ 6,617 crore in 2017-18. Out of total imports in terms of quantity, imports of ferrosilicon accounted for about 44% followed by ferromanganese (24%), ferronickel (17%), ferrochrome (6%) and chargechrome (4%). Other ferroalloys together accounted for the remaining 5% of the imports in 2018-19. Imports were mainly from Bhutan (21%) followed by Malaysia (17%), China (14%), Indonesia & South Africa (9% each), Japan (4%) Korea Republic of, Russia & Singapore (3% each) and Brazil (2%) (Tables-27 to 44).

**Table – 28 : Imports of Ferroboron (By Countries)**

| Country | 2017-18 (R) | | 2018-19 (P) | |
|---|---|---|---|---|
| | Qty (t) | Value (₹'000) | Qty (t) | Value (₹'000) |
| **All Countries** | **1223** | **165544** | **1025** | **181136** |
| China | 1219 | 164977 | 923 | 165083 |
| Hong Kong | 4 | 567 | 96 | 15247 |
| Russia | - | - | 6 | 713 |
| UK | - | - | ++ | 53 |
| USA | - | - | ++ | 40 |

*Figures rounded off*

**Table – 29 : Imports of Ferrochrome (By Countries)**

| Country | 2017-18 (R) | | 2018-19 (P) | |
|---|---|---|---|---|
| | Qty (t) | Value (₹'000) | Qty (t) | Value (₹'000) |
| **All Countries** | **38792** | **5772151** | **30816** | **5594083** |
| China | 1046 | 238383 | 8199 | 1724289 |
| Russia | 15664 | 2707917 | 7584 | 1401223 |
| Turkey | 4163 | 584174 | 6463 | 1086896 |
| Albania | 1394 | 157373 | 2087 | 336074 |
| Hong Kong | - | - | 886 | 160275 |
| Netherlands | - | - | 781 | 159785 |
| Oman | 5956 | 528619 | 1703 | 131469 |
| Belgium | 51 | 15958 | 276 | 95837 |
| Kazakhstan | 6096 | 842317 | 537 | 87502 |
| Germany | 256 | 61948 | 308 | 72626 |
| Other countries | 4166 | 635462 | 1992 | 338107 |

*Figures rounded off*

**Table – 30 : Imports of Chargechrome (By Countries)**

| Country | 2017-18 (R) | | 2018-19 (P) | |
|---|---|---|---|---|
| | Qty (t) | Value (₹'000) | Qty (t) | Value (₹'000) |
| **All Countries** | **15468** | **997214** | **22081** | **1446124** |
| South Africa | 14968 | 960190 | 22054 | 1441690 |
| Malta | - | - | 27 | 4434 |
| Oman | 500 | 37024 | - | - |

*Figures rounded off*

**Table – 31 : Imports of Ferromanganese (By Countries)**

| Country | 2017-18 (R) | | 2018-19 (P) | |
|---|---|---|---|---|
| | Qty (t) | Value (₹'000) | Qty (t) | Value (₹'000) |
| **All Countries** | **123910** | **9085573** | **123110** | **9695115** |
| Malaysia | 67386 | 4405367 | 63670 | 4354039 |
| Korea, Rep. of | 12598 | 1402344 | 14757 | 1751558 |
| South Africa | 25164 | 2003296 | 18578 | 1387302 |
| France | 4912 | 221845 | 10621 | 658722 |
| Japan | 1980 | 237685 | 3388 | 419894 |
| Norway | 2519 | 158713 | 2520 | 308968 |
| Australia | 2792 | 139918 | 3087 | 224802 |
| China | 1923 | 201476 | 1608 | 217531 |
| Netherlands | 900 | 45707 | 819 | 99739 |
| UAE | - | - | 1516 | 96179 |
| Other countries | 3736 | 269222 | 2555 | 176381 |

*Figures rounded off*

**Table – 32 : Imports of Ferromolybdenum (By Countries)**

| Country | 2017-18 (R) | | 2018-19 (P) | |
|---|---|---|---|---|
| | Qty (t) | Value (₹'000) | Qty (t) | Value (₹'000) |
| **All Countries** | **1753** | **1607055** | **2371** | **3109993** |
| Korea, Rep. of | 1147 | 1389007 | 1420 | 2362971 |
| UAE | - | - | 160 | 203910 |
| Hong Kong | - | - | 140 | 171613 |
| Austria | 471 | 137564 | 331 | 142320 |
| USA | 72 | 28364 | 94 | 70791 |
| Slovenia | - | - | 136 | 60517 |
| Japan | - | - | 40 | 25452 |
| China | 63 | 52120 | 13 | 23912 |
| Singapore | - | - | 20 | 23251 |
| Germany | - | - | 9 | 17720 |
| Other countries | - | - | 8 | 7536 |

*Figures rounded off*

**Table – 33 : Imports of Ferronickel (By Countries)**

| Country | 2017-18 (R) | | 2018-19 (P) | |
|---|---|---|---|---|
| | Qty (t) | Value (₹'000) | Qty (t) | Value (₹'000) |
| **All Countries** | **155318** | **24901795** | **88320** | **24319791** |
| Indonesia | 56400 | 8365100 | 44088 | 11913893 |
| Japan | 20441 | 2582321 | 14818 | 3838494 |
| Singapore | 579 | 149879 | 11309 | 2410929 |
| Macedonia | 20658 | 2913488 | 1840 | 1592170 |
| Brazil | 13134 | 2668988 | 4911 | 1186766 |
| Albania | 18868 | 2265985 | 7210 | 1145161 |
| Dominican Rep. | 8070 | 2619764 | 812 | 777633 |
| Myanmar | 3380 | 861646 | 539 | 555780 |
| Switzerland | 664 | 76334 | 2122 | 437535 |
| Colombia | 5425 | 1318431 | 298 | 303870 |
| Other countries | 7699 | 1079859 | 373 | 157560 |

*Figures rounded off*

**Table – 34 : Imports of Ferroniobium (By Countries)**

| Country | 2017-18 (R) | | 2018-19 (P) | |
|---|---|---|---|---|
| | Qty (t) | Value (₹'000) | Qty (t) | Value (₹'000) |
| **All Countries** | **2815** | **5165317** | **3177** | **6022084** |
| Singapore | 10 | 13215 | 1571 | 2883101 |
| Brazil | 2271 | 4078753 | 1200 | 2169493 |
| Canada | 475 | 962308 | 249 | 608094 |
| Netherlands | 10 | 13850 | 68 | 180061 |
| UAE | 18 | 27614 | 78 | 159968 |
| Germany | - | - | 3 | 9060 |
| USA | - | - | 5 | 7932 |
| Belgium | - | - | 2 | 2585 |
| Malaysia | - | - | 1 | 871 |
| China | 26 | 57886 | ++ | 827 |
| Other countries | 5 | 111691 | ++ | 92 |

*Figures rounded off*

## Table – 35 : Imports of Ferrophosphorus (By Countries)

| Country | 2017-18 (R) | | 2018-19 (P) | |
|---|---|---|---|---|
| | Qty (t) | Value (₹'000) | Qty (t) | Value (₹'000) |
| **All Countries** | **3899** | **92568** | **3589** | **102217** |
| China | 2563 | 54210 | 2074 | 64918 |
| Vietnam | 1148 | 17493 | 1311 | 25689 |
| Bhutan | 177 | 18367 | 50 | 5811 |
| Germany | - | - | 70 | 3304 |
| Hong Kong | - | - | 54 | 1411 |
| UK | 2 | 262 | 30 | 1072 |
| USA | - | - | ++ | 12 |
| Sweden | 9 | 2236 | - | - |

*Figures rounded off*

## Table – 36 : Imports of Ferrosilico-Chrome (By Countries)

| Country | 2017-18 (R) | | 2018-19 (P) | |
|---|---|---|---|---|
| | Qty (t) | Value (₹'000) | Qty (t) | Value (₹'000) |
| **All Countries** | **-** | **-** | **29** | **5221** |
| Zimbabwe | - | - | 27 | 3309 |
| Norway | - | - | 2 | 1816 |
| USA | - | - | ++ | 84 |
| UK | - | - | ++ | 12 |

*Figures rounded off*

## Table – 37 : Imports of Ferrosilico-Manganese (By Countries)

| Country | 2017-18 (R) | | 2018-19 (P) | |
|---|---|---|---|---|
| | Qty (t) | Value (₹'000) | Qty (t) | Value (₹'000) |
| **All Countries** | **2913** | **179334** | **3135** | **204718** |
| Malaysia | 2350 | 146682 | 2098 | 131577 |
| Hong Kong | - | - | 500 | 36809 |
| Saudi Arabia | 150 | 9930 | 350 | 24452 |
| China | - | - | 40 | 4319 |
| Singapore | - | - | 100 | 3801 |
| France | 10 | 1124 | 20 | 2305 |
| Zambia | - | - | 18 | 1072 |
| Switzerland | 4 | 189 | ++ | 185 |
| UK | - | - | 9 | 122 |
| USA | 3 | 505 | ++ | 71 |
| Other countries | 396 | 20904 | ++ | 5 |

*Figures rounded off*

## Table – 38 : Imports of Ferro-Silico-Magnesium (By Countries)

| Country | 2017-18 (R) | | 2018-19 (P) | |
|---|---|---|---|---|
| | Qty (t) | Value (₹'000) | Qty (t) | Value (₹'000) |
| **All Countries** | **1177** | **110154** | **2271** | **243875** |
| Bhutan | 574 | 53314 | 1142 | 122397 |
| China | 463 | 41821 | 980 | 103133 |
| Hong Kong | - | - | 42 | 4705 |
| Belgium | 11 | 1444 | 36 | 4703 |
| Bulgaria | - | - | 25 | 3270 |
| Thailand | - | - | 25 | 2942 |
| Norway | 105 | 10938 | 21 | 2702 |
| USA | - | - | ++ | 23 |
| Other countries | 24 | 2637 | - | - |

*Figures rounded off*

## Table – 39 : Imports of Ferro-Silicon (By Countries)

| Country | 2017-18 (R) | | 2018-19 (P) | |
|---|---|---|---|---|
| | Qty (t) | Value (₹'000) | Qty (t) | Value (₹'000) |
| **All Countries** | **190552** | **15700335** | **221509** | **20909222** |
| Bhutan | 93338 | 7580549 | 105854 | 9116808 |
| China | 34469 | 2642195 | 53610 | 4932343 |
| Malaysia | 21489 | 1552362 | 18759 | 1713414 |
| Norway | 9696 | 1147494 | 5239 | 738259 |
| Russia | 12542 | 969149 | 7477 | 722940 |
| Brazil | 3398 | 316954 | 5325 | 638500 |
| France | 5688 | 556482 | 4351 | 596909 |
| South Africa | 3539 | 488765 | 4024 | 583793 |
| Netherlands | - | - | 4337 | 525032 |
| Iceland | 552 | 47015 | 2644 | 386567 |
| Other countries | 5841 | 399370 | 9889 | 954657 |

*Figures rounded off*

## Table – 40 : Imports of Ferrotitanium (By Countries)

| Country | 2017-18 (R) | | 2018-19 (P) | |
|---|---|---|---|---|
| | Qty (t) | Value (₹'000) | Qty (t) | Value (₹'000) |
| **All Countries** | **1963** | **509721** | **1378** | **408958** |
| UK | 1000 | 260774 | 754 | 237106 |
| Canada | 781 | 215498 | 301 | 90164 |
| Netherlands | - | - | 221 | 50930 |
| Estonia | 81 | 17511 | 49 | 16387 |
| Russia | 50 | 10973 | 32 | 9523 |
| USA | - | - | 20 | 4621 |
| UAE | 2 | 240 | 1 | 227 |
| China | 49 | 4725 | - | - |

*Figures rounded off*

**Table – 41 : Imports of Ferrovanadium (By Countries)**

| Country | 2017-18 (R) | | 2018-19 (P) | |
|---|---|---|---|---|
| | Qty (t) | Value (₹'000) | Qty (t) | Value (₹'000) |
| **All Countries** | **718** | **1489369** | **713** | **2881355** |
| Germany | - | - | 361 | 1332287 |
| China | 113 | 251126 | 120 | 719556 |
| Netherlands | 20 | 56525 | 95 | 331054 |
| Korea, Rep. of | 194 | 484485 | 60 | 278688 |
| USA | 36 | 22757 | 50 | 123484 |
| Latvia | 58 | 99121 | 27 | 96191 |
| UK | - | - | ++ | 95 |
| Japan | 132 | 239479 | - | - |
| Russia | 88 | 127134 | - | - |
| South Africa | 32 | 87014 | - | - |
| Other countries | 45 | 121728 | - | - |

*Figures rounded off*

**Table – 42 : Imports of Ferrotungsten (By Countries)**

| Country | 2017-18 (R) | | 2018-19 (P) | |
|---|---|---|---|---|
| | Qty (t) | Value (₹'000) | Qty (t) | Value (₹'000) |
| **All Countries** | **3** | **4746** | **27** | **65195** |
| China | - | - | 19 | 43855 |
| Netherlands | - | - | 4 | 9489 |
| USA | ++ | 234 | 2 | 6094 |
| Hong Kong | - | - | 2 | 5744 |
| UK | - | - | ++ | 13 |
| Brazil | 3 | 4512 | - | - |

*Figures rounded off*

**Table – 43 : Imports of Ferrozirconium (By Countries)**

| Country | 2017-18 (R) | | 2018-19 (P) | |
|---|---|---|---|---|
| | Qty (t) | Value (₹'000) | Qty (t) | Value (₹'000) |
| **All Countries** | **461** | **57211** | **297** | **39969** |
| China | 461 | 57211 | 295 | 39672 |
| UAE | - | - | 2 | 297 |

*Figures rounded off*

**Table – 44 : Imports of Ferroalloys (Others)**
**(By Countries)**

| Country | 2017-18 (R) | | 2018-19 (P) | |
|---|---|---|---|---|
| | Qty (t) | Value (₹'000) | Qty (t) | Value (₹'000) |
| **All Countries** | **3301** | **329537** | **4158** | **505175** |
| China | 2880 | 276013 | 3725 | 430706 |
| Argentina | 240 | 22127 | 192 | 25918 |
| Slovenia | - | - | 40 | 17025 |
| Hong Kong | - | - | 123 | 14936 |
| Bhutan | - | - | 53 | 5844 |
| USA | 3 | 188 | 17 | 5101 |
| Japan | 8 | 2074 | 3 | 2316 |
| Canada | 2 | 1128 | 2 | 1080 |
| Germany | 4 | 644 | ++ | 925 |
| Russia | ++ | 56 | 1 | 714 |
| Other countries | 164 | 27307 | 2 | 610 |

*Figures rounded off*

# FUTURE OUTLOOK

Depending on the process of steel making and the type of steel being manufactured, the requirement of different ferroalloys varies widely.

Indian Ferroalloys Industry has immense potential and capability to compete in the international market. On the positive side, India produces some of the finest ferroalloys in the world. Indian ferroalloys are extensively preferred in Europe. India exports potential is indeed bright with very high growth prospects.

As per the steelworld report, ferroalloys Industry is estimated to grow at a CAGR of 5.9% between 2017 to 2025 and is expected to reach a valuation of US$ 188.7 Bn by 2025.

India is expected to show strong growth in usage of steel in the coming years because of its robust economy, massive infrastructure needs and expansion of industrial production. India is expected to become one of the leading steel consuming nations in the next decade. In this scenario, the Ferro-alloys Industry estimates that the consumption of ferroalloys will increase domestically and internationally in the coming years. Some of the Ferroalloy Producers have already gone for expansion and some new units are coming up.

As per the National Steel Policy, 2017, Ferro-alloy is a power intensive industry. Hence, captive power generation in the ferroalloys plants will be extensively supported. Since the demand for ferro-alloys is likely to grow along with steel production in the country, the Industry would have to be encouraged to set up larger units to achieve adequate economies of scale. Efforts in the direction of providing necessary raw materials linkages and stable supply of power to the Ferroalloy units must be rendered priority.