India's International Trade of Four Specific Commodities in the Recent Past
Some Insights
Preface

The study uses trade indicators to analyse merchandise export and import data in a way that should be useful for the purpose of policy. The indicators provide a glimpse of the trade patterns of the world and the performance of India in comparison to various other countries. They have been used in the case of India's exports of **Dried Vegetables & Structures of Iron and Steel** and imports of **Esters of Phosphoric Acids & their Salts and Paints & Varnishes** to indicate the possible directions policy may take.

The data used in this study has been sourced from the Export Import Data Bank of the DGCI&S, Department of Commerce, and Government of India and from the United Nations Comtrade Database. Introduction notes of each commodities has been sourced from the various sights –viz Wikipedia, Britannica, The Economic Times etc.

Computations are based on data at ITC-HS four-digit level (ITC-HS Code-0712 & 7308 for export and 2919 & 3208 for import) and the latest finalized data available on the UN Comtrade Database up to year 2021 and on the DGCI&S Database up to December'2022. So, trends from 2018 to 2021 have been shown when we extract the data from UN Comtrade and from 2018 to 2021 have been shown when we extract the data from DGCIS Data base.

In this report, we will see various analysis and aspects of India's Precious as well as International export trade of Dried Vegetables & Structures of Iron and Steel and imports of Esters of Phosphoric Acids & their Salts and Paints & Varnishes**.** We will use both the 4 digit Commodity codes.

Trends in India's as well as International Trade i.e. Exports and Imports of above four Commodities are given below in different tables :

- Table 1 :India's top 10 Export destination of Dried Vegetables with their shares in percentage.
- Table 2 : World's top 10 Exporters of Dried Vegetables with their shares in percentage.
- Table 3 : World's top 10 Importers of Dried Vegetables with their shares in percentage.
- Annex- I : Top 3 sources of Dried Vegetables of World's top 3 Importers.
- Table 4 : India's top 10 destination of Structures of Iron and Steel with their shares in percentage.
- Table 5 : World's top 10 Exporters of Structures of Iron and Steel with their shares in percentage.
- Table 6 : World's top 10 Importers of Structures of Iron and Steel with their shares in percentage.
- Annex-II : Top 3 sources of Structures of Iron and Steel of World's top 3 Importers.
- Table 7 : India's top10 Sources of Esters of Phosphoric Acids & their Salts with their shares in percentage.
- Table 8 : World's top 10 Importers of Esters of Phosphoric Acids & their Salts with their shares in percentage.
- Table 9 : India's top 10 Sources of Paints & Varnishes with their shares in percentage.
- Table 10 : World's top 10 Importers of Paints & Varnishes with their shares in percentage.

EXPORT

Dried Vegetables

Vegetables can be preserved by drying. The longer the drying time, the less flavourful and the less tender the product. The drying time can be hastened by drying small, uniformly cut pieces. Because they contain less acid than fruits, vegetables are dried until they are brittle. At this stage, only 10 percent moisture remains and no microorganisms can grow.

Only fresh vegetables in prime condition can produce a good-quality dried product. Wilted ones should not be used — deterioration has already begun. One moldy bean may give a bad flavour to an entire lot. If possible, gather the vegetables early in the morning, and start the drying process as soon as possible. Carefully sort, discarding any bruised or undesirable product. Wash carefully and thoroughly in cool water

Trim, peel, cut, slice or shred vegetables according to the directions for each vegetable (see Table 2. "Drying Vegetables at Home") Remove any fibrous or woody portions and core when necessary, removing all decayed and bruised areas. Keep pieces uniform in size so they will dry at the same rate. A food slicer or food processor can be used. Prepare only as many vegetables as can be dried at one time. Holding vegetables, even in the refrigerator, after washing and preparation for drying will result in loss of quality and nutrients.

Blanching is a necessary step in preparing vegetables for drying. Blanching is the process of heating vegetables to a temperature high enough to destroy enzymes present in the tissue. It stops the enzyme action that causes loss of colour and flavour during drying and storage. It also sets the color and shortens the drying and rehydration time by relaxing the tissue walls so moisture can escape or re-enter more rapidly. In water blanching, the vegetables are submerged in boiling water. In steam blanching, the vegetables are suspended above the boiling water and heated only by the steam. Water blanching usually results in a greater loss of nutrients, but it takes less time than steam blanching. Not all vegetables require blanching. Onions, green peppers and mushrooms can be dried without blanching.

After blanching, dip the vegetables briefly in cold water, only long enough to stop the cooking action. Do not cool them to room temperature. When they feel only slightly hot to the touch, they will be cooled to about 120 °F. Drain the vegetables by pouring them directly onto the drying tray held over the sink. Wipe the excess water from underneath the tray and arrange the vegetables in a single layer. Then place the tray immediately in the dehydrator or oven. The heat left in the vegetables from blanching will cause the drying process to begin more quickly. Watch the vegetables closely at the end of the drying period. They dry much more quickly at the end and could scorch.

Most vegetables are soaked or rehydrated in cold water prior to use. However, there are two other acceptable rehydration methods: adding the dried product to boiling water or adding the dried vegetable to a product with lots of liquid, such as soup. Whichever rehydration method is chosen, the vegetables return to their original shape.

Dried foods should be stored in cool, dry, dark areas. Recommended storage times for dried foods range from four months to one year. Because food quality is affected by heat, the storage temperature helps determine the length of storage; the higher the temperature, the shorter the storage time. Vegetables have about half the shelf-life of fruits, and can generally be stored for six months at 60 °F or three months at 80 °F.

Foods that are packaged seemingly bone-dry can spoil if moisture is reabsorbed during storage. Check dried foods frequently during storage to see if they are still dry. Glass containers are excellent for storage because any moisture that collects on the inside can be seen easily. Foods affected by moisture, but not spoiled, should be used immediately or redried and repackaged. Moldy foods should be discarded.

These are broadly classified under **H.S. Code-0712.**

Table - 1

India's Top 10 destination of Dried Vegetables (H.S Code-0712)

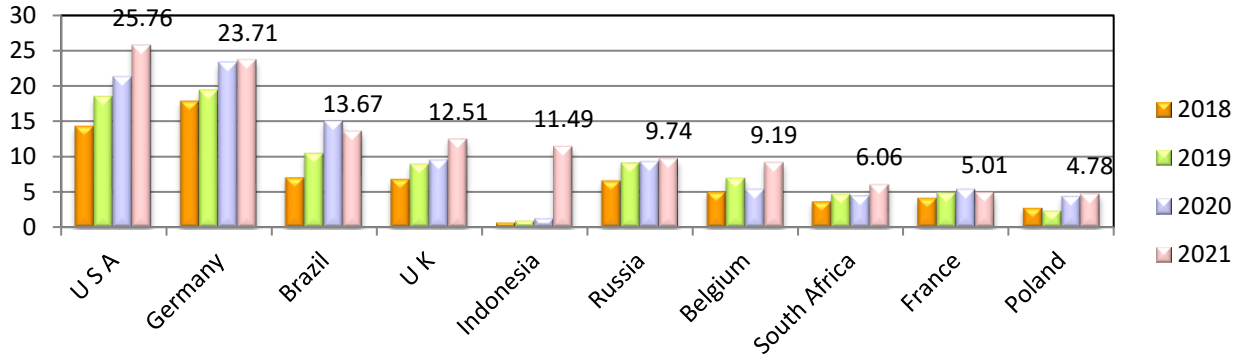
Rank	Countries	2018		2019		2020		2021	
		Value (million$)	Share (%)	Value (million$)	Share (%)	Value (million$)	Share (%)	Value (million$)	Share (%)
1.	U S A	14.36	11.07	18.53	12.13	21.23	11.98	25.76	12.65
2.	Germany	17.86	13.76	19.38	12.68	23.27	13.13	23.71	11.65
3.	Brazil	7.06	5.44	10.50	6.87	15.02	8.47	13.67	6.71
4.	U K	6.87	5.29	8.94	5.85	9.51	5.37	12.51	6.14
5.	Indonesia	0.68	0.52	0.97	0.64	1.26	0.71	11.49	5.64
6.	Russia	6.62	5.10	9.10	5.95	9.29	5.24	9.74	4.78
7.	Belgium	5.02	3.87	6.99	4.57	5.41	3.05	9.19	4.51
8.	South Africa	3.67	2.82	4.73	3.10	4.50	2.54	6.06	2.98
9.	France	4.19	3.23	4.90	3.20	5.38	3.04	5.01	2.46
10.	Poland	2.76	2.13	2.38	1.56	4.38	2.47	4.78	2.35
	Others	60.69	46.77	66.43	43.46	77.98	44.00	81.65	40.11
	Total	129.77	100	152.85	100	177.23	100	203.56	100

Source: DGCI&S.

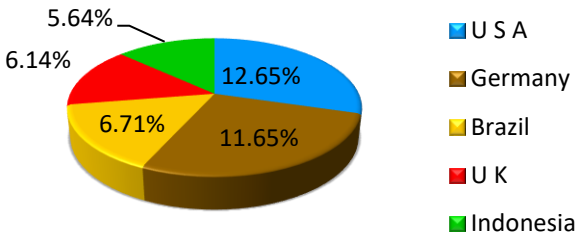
Note : India's Export including re-export

Leading importers of Dried Vegetables from India from 2018-2021**(Values in million $)**

Data label given on the basis of 2021



India's top 5 destinations of Dried Vegetables by percentage India in 2021:



Under the review period the data shows the year wise trends of Dried Vegetables export from India, In the 4 years, Dried Vegetables export from India has shown significant growth. In the year 2018 the total value of Dried Vegetables export from India was US $ 129.77 million. Whereas the data of 2021 states the export value of US $ 203.56 million. India's Dried Vegetables export value to USA is around US $ 25.76 million, which holds the top position with the share of 12.65% of the total value. With 11.65% and 6.71% share of India's total export of Dried Vegetables Germany and Brazil takes 1st and 2nd runner up position respectively in 2021.

Table-2

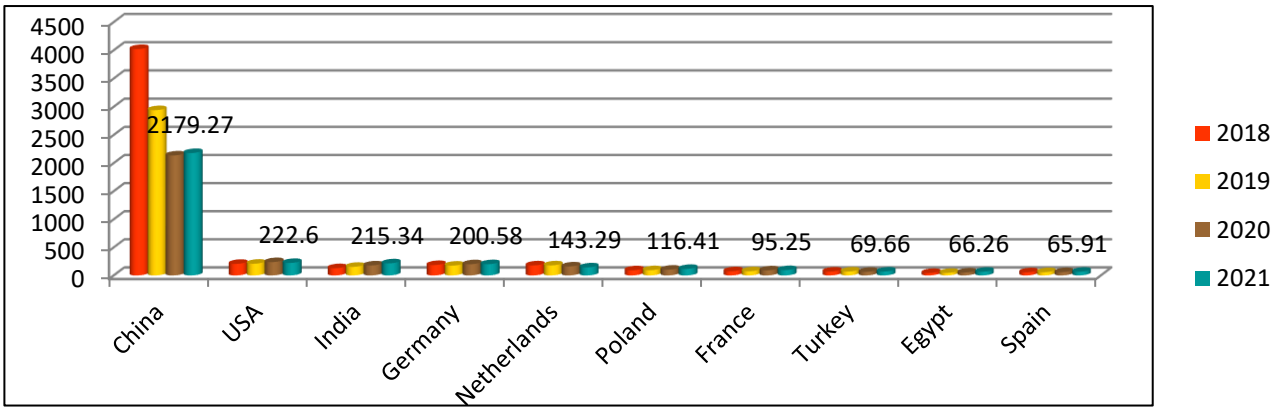
World's Top 10 exporter of Dried Vegetables (H.S Code-0712)

Rank	Countries	2018		2019		2020		2021	
		Value (million $)	Share (%)	Value (million$)	Share (%)	Value (million$)	Share (%)	Value (million$)	Share (%)
1.	China	4021.90	68.38	2939.37	63.91	2136.07	55.69	2179.27	54.49
2.	USA	206.21	3.51	208.88	4.54	237.21	6.18	222.60	5.57
3.	**India**	**129.51**	**2.20**	**152.96**	**3.33**	**178.08**	**4.64**	**215.34**	**5.38**
4.	Germany	185.13	3.15	174.57	3.80	199.57	5.20	200.58	5.02
5.	Netherlands	178.59	3.04	178.87	3.89	160.14	4.17	143.29	3.58
6.	Poland	92.10	1.57	93.41	2.03	102.70	2.68	116.41	2.91
7.	France	74.54	1.27	74.47	1.62	91.12	2.38	95.25	2.38
8.	Turkey	68.78	1.17	69.66	1.51	64.09	1.67	69.66	1.74
9.	Egypt	44.17	0.75	45.58	0.99	52.70	1.37	66.26	1.66
10.	Spain	56.34	0.96	58.31	1.27	59.42	1.55	65.91	1.65
	Others	824.41	14.02	603.25	13.12	554.62	14.46	624.50	15.62
	Total	5881.68	100	4599.33	100	3835.72	100	3999.07	100

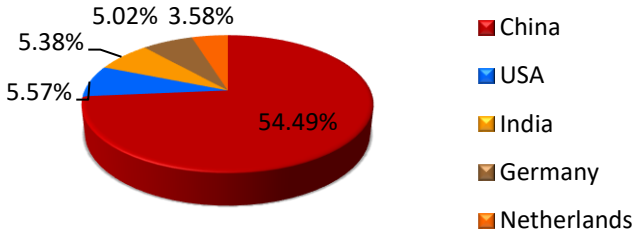
Source: UN Comtrade

Leading Exporters of Dried Vegetables of world from 2018 to 2021 **(Values in million $)**

Data label given on the basis of 2021



Country wise world's leading exporter of Dried Vegetables by percentage in 2021 :



In value terms, Dry vegetable exports rose rapidly to US $ 4 Billion in 2021. The trend pattern indicated some noticeable fluctuations being recorded in certain years. Over the period under review, the global exports hit record highs at US $ X in 2018. In 2021 China (US $ 2.18 B) remains the largest dry vegetable exporter worldwide, comprising 54.49% of global exports. The second position in the ranking was held by the USA (US $ 222.60), with a 5.57% share of global exports. **India** remains the third largest exporter of Dry Vegetables world wide, comprising 5.38% share of global export of Dry vegetables.

Table-3

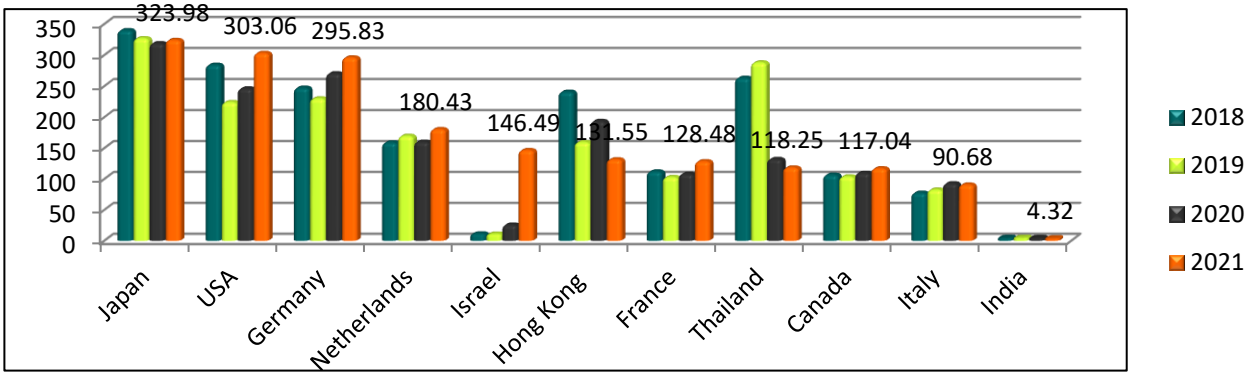
World's top 10 Importers of Dried Vegetables (H.S Code-0712)

Rank	Countries	2018		2019		2020		2021	
		Value (million$)	Share (%)	Value (million$)	Share (%)	Value (million$)	Share (%)	Value (million$)	Share (%)
1.	Japan	339.81	10.57	326.84	10.73	318.80	10.82	323.98	10.06
2.	USA	284.09	8.84	223.99	7.35	245.97	8.35	303.06	9.41
3.	Germany	247.23	7.69	229.97	7.55	270.34	9.17	295.83	9.19
4.	Netherlands	158.91	4.94	169.53	5.56	160.06	5.43	180.43	5.60
5.	Israel	11.46	0.36	11.04	0.36	25.89	0.88	146.49	4.55
6.	Hong Kong	240.68	7.49	159.49	5.23	193.61	6.57	131.55	4.08
7.	France	111.96	3.48	102.92	3.38	108.12	3.67	128.48	3.99
8.	Thailand	263.05	8.18	287.85	9.45	132.12	4.48	118.25	3.67
9.	Canada	106.66	3.32	103.86	3.41	109.77	3.73	117.04	3.63
10.	Italy	77.50	2.41	82.48	2.71	92.78	3.15	90.68	2.82
62.	**India**	**5.12**	**0.16**	**5.24**	**0.17**	**4.88**	**0.17**	**4.32**	**0.13**
	Others	1368.56	42.57	1343.64	44.10	1284.26	43.58	1380.27	42.86
	Total	3215.05	100	3046.85	100	2946.60	100	3220.39	100

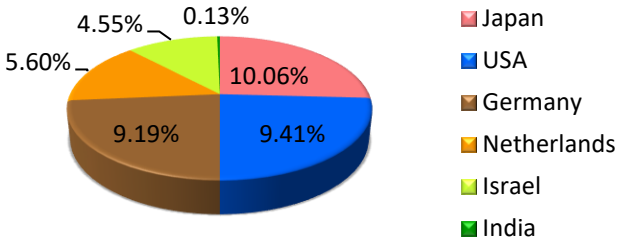
Source : UN Comtrade

Leading Dried Vegetables importers of world from 2018 to 2021 **(Values in million $)**

Data label given on the basis of 2021



Country wise world's leading importers of Dried Vegetables by percentage in 2021

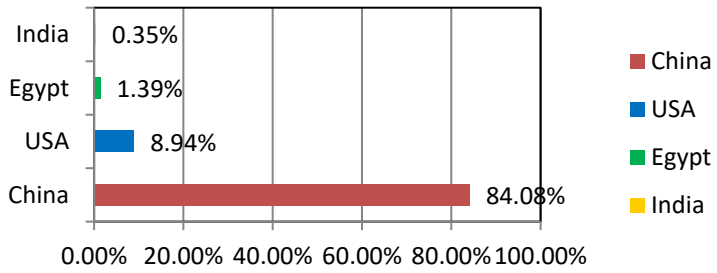


The total global import value of dry vegetable imports was US $ 3.22 Billion in 2021, which has increased at rate of +9.52% over the year from 2020. Global imports of dry vegetables peaked in the year 2021. The largest dry vegetable importing markets worldwide were Japan (US $ 324 M, USA (US $ 303 M) and Germany (US $ 295.83M), with a combined 26.66% share of global imports in 2021. In the same year India imported only US $ 4.32 million worth of Dry vegetables from world which was only 0.13% share of total global import.

Annexure-1

Sources of world's top 3 importers of Dried Vegetables (H.S Code-0712)

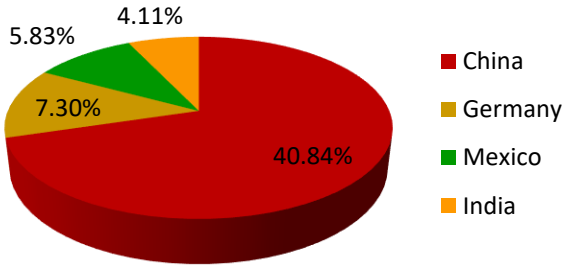
Top 3 Sources of Dried Vegetables to Japan in 2021 by percentage:



Japan totally depended on China for Dried Vegetables, imported 84.08 % share of Japan's total import value of it came from China in 2021 followed by USA (8.94%) and Egypt (1.39%). India' contribution was only 0.35% to Japan.

(Source : UN Comtrade).

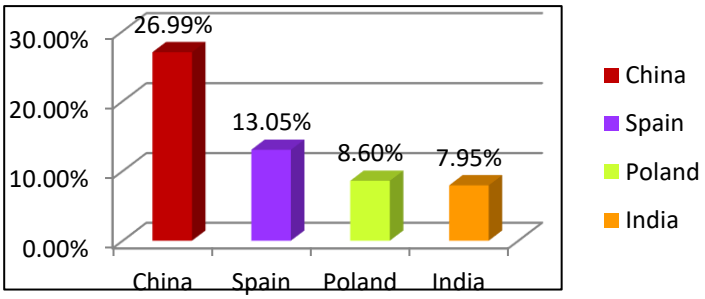
ii) Top 3 Sources of Dried Vegetables to USA in 2021 by percentage*:*



China was the primary source of Dried Vegetables to USA. USA imported 40.84% of Dried Vegetables from China in 2021, followed by Germany (7.30%) & Mexico (5.83%). In that year India exported 4.11% share of USA's total import of Dried Vegetables .

(Source : UN Comtrade)

iii) Top 3 Sources of Dried Vegetables to Germany in 2021 by percentage*:*



Germany's 3 major source countries of Dried Vegetables in 2021 were China (26.99%), Spain (13.05%) and Poland (8.60 %) in 2021. In the same year **India** has exported 7.95% share of Dried Vegetables to Germany. **(Source: UN Comtrade)**

Structures of Iron and Steel

The development of construction methods in iron and steel was the most important innovation in architecture since ancient times. These methods provide far stronger and taller structures with less expenditure of material than stone, brick, or wood and can produce greater unsupported spans over openings and interior or exterior spaces. The evolution of steel frame construction in the 20th century entirely changed the concept of the wall and the support.

In architecture before 1800, metals played an auxiliary role. They were used for bonding masonry (dowels and clamps), for tension members (chains strengthening domes, tie rods across arches to reinforce the vaults), and for roofing, doors, windows, and decoration. Cast iron, the first metal that could be substituted for traditional structural materials, was used in bridge building as early as 1779. Its ability to bear loads and to be produced in an endless variety of forms, in addition to its resistance to fire and corrosion, quickly encouraged architectural adaptations, first as columns and arches and afterward in skeletal structures. Cast iron, the first metal that could be substituted for traditional structural materials, was used in bridge building as early as 1779. Its ability to bear loads and to be produced in an endless variety of forms, in addition to its resistance to fire and corrosion, quickly encouraged architectural adaptations, first as columns and arches and afterward in skeletal structures. Because cast iron has much more compressive than tensile strength (for example, it works better as a small column than as a beam), it was largely replaced in the late 19th century by steel, which is more uniformly strong, elastic, and workable, and its high resistance in all stresses can be closely calculated.

Steel structural members are rolled in a variety of shapes, the commonest of which are plates, angles, I beams, and U-shaped channels. These members may be joined by steel bolts or rivets, and the development of welding in the 20th century made it possible to produce fused joints with less labour and materials. The result is a rigid, continuous structure in which the joint is as firm as the member and which distributes stresses between beams and columns. This is a fundamental change in architectural technique, the effect of which cannot yet be estimated.

The tallest structures today (commonly called "skyscrapers" or high-rise) are constructed using structural steel due to its constructability, as well as its high strength-to-weight ratio. In comparison, concrete, while being less dense than steel, has a much lower strength-to-weight ratio. This is due to the much larger volume required for a structural concrete member to support the same load; steel, though denser, does not require as much material to carry a load. However, this advantage becomes insignificant for low-rise buildings, or those with several stories or less. Low-rise buildings distribute much smaller loads than high-rise structures, making concrete the economical choice. This is especially true for simple structures, such as parking garages, or any building that is a simple, rectilinear shape.

Structural steel has several applications in today's society, but the building is the one most closely linked with it. Steel is one of the most important building materials, chosen for various reasons, the most important are its adaptability, higher strength, more economical, rapid construction, easy repair or modification, high quality, and reliability. Structural steel is unaffected to external forces such as wind and earthquakes. This one is a flexible metal, so in the event of a storm or an earthquake, the steel component in the construction will not break but bend. The added benefit of structural steel is that it budget-friendly. With the handiness of ready-made steel sections, structural frameworks can be raised in no time. Besides, a lot of work can be pre-done in the Steel has got a high strength to weight ratio, which depicts, steel is a tensile metal. It is tough and can withstand the weight of a fleet of cars and people. These abilities enable engineers, designers, and fabricators to construct large, colossal bridges that can stand the test of time.

These are broadly classified under **H.S. Code - 7308.**

Table - 4

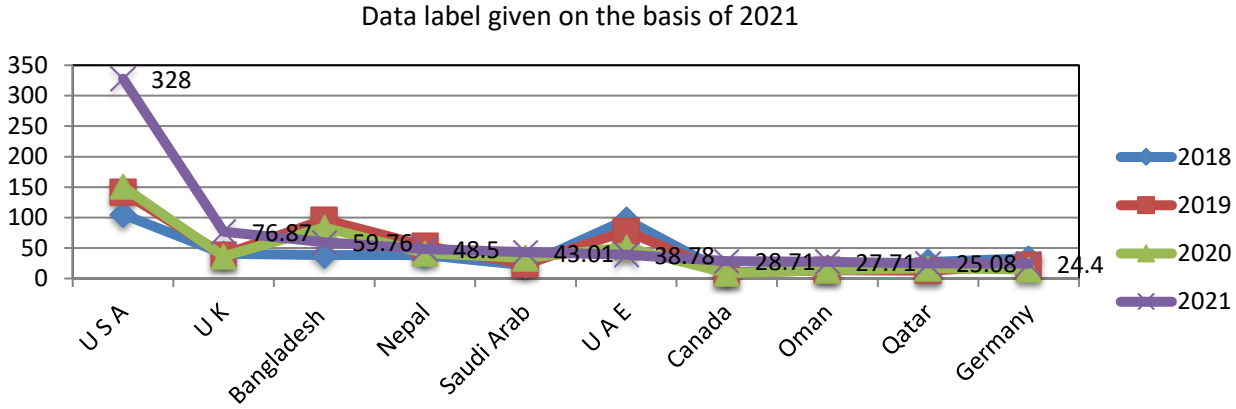
India's Top 10 destination of Structures of Iron & Steel HS Code – 7308)

Rank	Countries	2018		2019		2020		2021	
		Value (million$)	Share (%)	Value (million$)	Share (%)	Value (million$)	Share (%)	Value (million$)	Share (%)
1.	U S A	105.20	10.82	141.89	13.43	150.47	15.10	328.00	26.00
2.	U K	40.79	4.20	39.28	3.72	36.22	3.64	76.87	6.09
3.	Bangladesh	38.43	3.95	96.96	9.18	83.81	8.41	59.76	4.74
4.	Nepal	38.53	3.96	53.90	5.10	41.86	4.20	48.50	3.84
5.	Saudi Arab	21.50	2.21	23.40	2.21	33.88	3.40	43.01	3.41
6.	U A E	96.25	9.90	77.65	7.35	50.87	5.11	38.78	3.07
7.	Canada	9.01	0.93	8.73	0.83	8.73	0.88	28.71	2.28
8.	Oman	17.35	1.79	14.00	1.32	13.58	1.36	27.71	2.20
9.	Qatar	26.98	2.78	12.95	1.23	16.75	1.68	25.08	1.99
10.	Germany	33.09	3.41	22.14	2.10	15.07	1.51	24.40	1.93
	Others	544.74	56.05	565.81	53.54	544.93	54.70	560.62	44.44
	Total	971.88	100	1056.71	100	996.17	100	1261.44	100

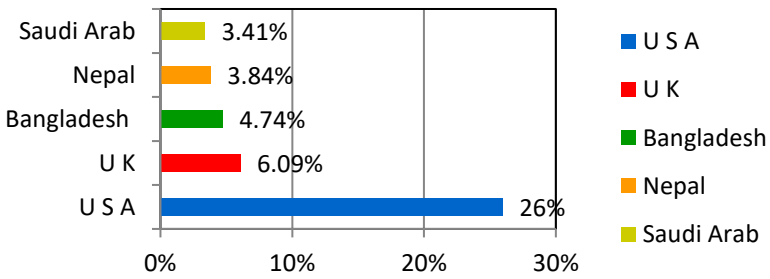
Source: DGCI&S

Note : India's Export including re-export

India's major destination of Structures of Iron & Steel from 2018-2021 **(Value in Million $)**



India's top 5 major destinations of Structures of Iron & Steel by percentage in 2021:



During the year 2021 Indian exporters nearly exported US $ 1.26 Billion of Structures of Iron & Steel to the top global markets. Between 2020 and 2021 the exports of Structures of Iron & Steel increased by 26.62%, from US $ 996.17 Million to US $ 1.26 Billion. The export reached an all time high of US $ 1.26 Billion during the year 2021. India's Structures of Iron & Steel export value to USA is around US $ 328 Million, which holds the top position with the share of 26% of the total export value of India. With 6.09 % and 4.74%, UK and Bangladesh took 1st and 2nd runner up position in the importers of Structures of Iron & Steel from India in 2021.

Table - 5

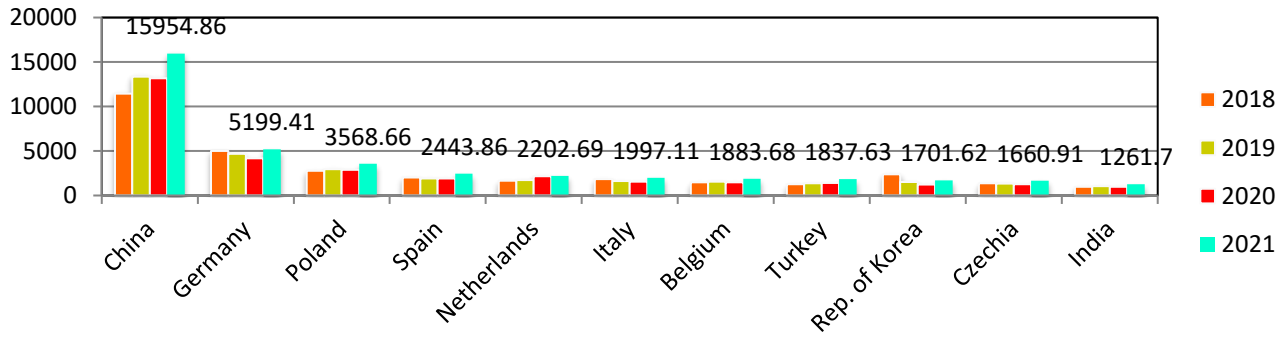
World's Top 10 exporters of Structures of Iron & Steel HS Code – 7308)

Rank	Countries	2018		2019		2020		2021	
		Value (million$)	Share (%)	Value (million$)	Share (%)	Value (million$)	Share (%)	Value (million$)	Share (%)
1.	China	11429.90	22.77	13343.69	25.98	13183.53	26.74	15954.86	26.02
2.	Germany	4995.81	9.95	4667.06	9.09	4173.43	8.46	5199.41	8.48
3.	Poland	2781.95	5.54	2939.31	5.72	2874.94	5.83	3568.66	5.82
4.	Spain	2034.11	4.05	1910.24	3.72	1919.25	3.89	2443.86	3.99
5.	Netherlands	1661.36	3.31	1730.71	3.37	2148.46	4.36	2202.69	3.59
6.	Italy	1833.52	3.65	1635.80	3.18	1562.21	3.17	1997.11	3.26
7.	Belgium	1483.80	2.96	1547.78	3.01	1471.14	2.98	1883.68	3.07
8.	Turkey	1248.66	2.49	1377.22	2.68	1406.21	2.85	1837.63	3.00
9.	Rep. of Korea	2373.33	4.73	1531.78	2.98	1241.49	2.52	1701.62	2.77
10.	Czechia	1371.34	2.73	1328.04	2.59	1256.14	2.55	1660.91	2.71
15.	**India**	**972.70**	**1.94**	**1056.35**	**2.06**	**990.98**	**2.01**	**1261.70**	**2.06**
	Others	18004.00	35.87	18302.72	35.63	17079.98	34.64	21610.67	35.24
	Total	50190.47	100	51370.71	100	49307.75	100	61322.80	100

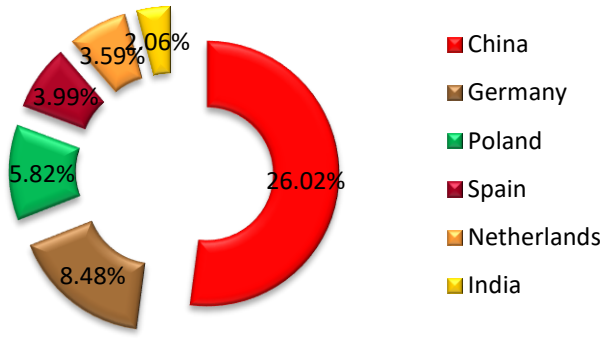
Source: UN Comtrade

Leading Structures of Iron & Steel exporters of world from 2018 to 2021 **(in million $)**

Data label given on the basis of 2021



World's leading Structures of Iron & Steel exporters by percentage in 2021:



In 2021, the world exports of Structures of Iron & Steel exceeded US $ 61.32 billion. China is the largest Structures of Iron & Steel Exporter country in the world. It has recorded the iron and steel export worth of US $ 15.95 Billion during the year 2021, represent 26.02% of world exports of Structure of Iron and Steel. Germany stood as second largest Structures of Iron & Steel exporter country which exported 8.48% share of world total export of Structures of Iron & Steel, which was followed by Poland with 5.82% share of world export. India stood as 15th larges Structures of Iron and Steel exporter country with 2.06 % share of world export in that year.

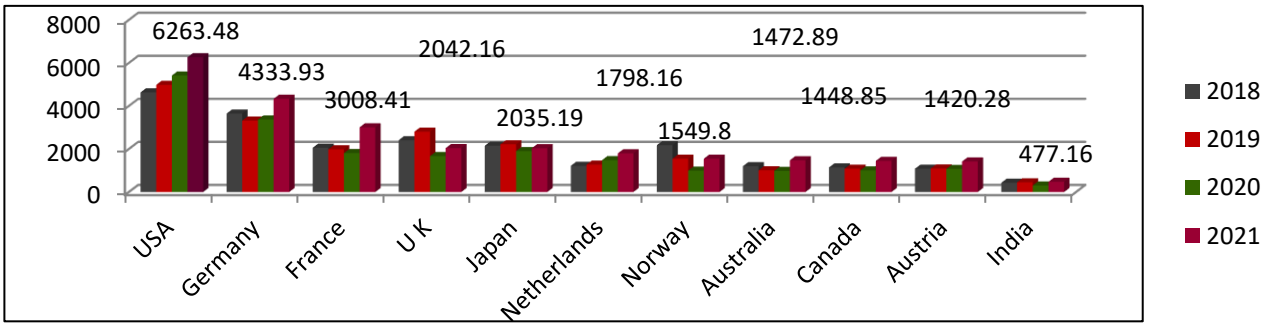
Table - 6

World's Top 10 Importers of Structures of Iron & Steel HS Code – 7308)

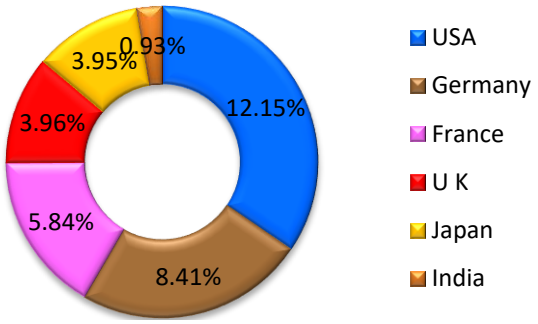
Rank	Countries	2018		2019		2020		2021	
		Value (million $)	Share (%)	Value (million$)	Share (%)	Value (million$)	Share (%)	Value (million$)	Share (%)
1.	USA	4633.53	9.90	4981.01	10.59	5415.31	12.86	6263.48	12.15
2.	Germany	3646.61	7.79	3321.88	7.06	3369.48	8.00	4333.93	8.41
3.	France	2058.20	4.40	1983.55	4.22	1810.22	4.30	3008.41	5.84
4.	U K	2408.75	5.15	2803.58	5.96	1671.03	3.97	2042.16	3.96
5.	Japan	2152.07	4.60	2218.56	4.72	1901.23	4.51	2035.19	3.95
6.	Netherlands	1219.79	2.61	1274.44	2.71	1482.87	3.52	1798.16	3.49
7.	Norway	2177.09	4.65	1546.64	3.29	992.77	2.36	1549.80	3.01
8.	Australia	1200.02	2.56	1011.11	2.15	981.46	2.33	1472.89	2.86
9.	Canada	1143.20	2.44	1085.80	2.31	1005.10	2.39	1448.85	2.81
10.	Austria	1083.05	2.31	1095.39	2.33	1074.26	2.55	1420.28	2.76
29.	**India**	**431.95**	**0.92**	**451.68**	**0.96**	**302.38**	**0.72**	**477.16**	**0.93**
	Others	24645.97	52.66	25250.58	53.70	22109.00	52.50	25700.09	49.85
	Total	46800.23	100	47024.22	100	42115.12	100	51550.39	100

Source :UNComtrade

Leading Structures of Iron & Steel importers of world from 2018 to 2021 **(in million USD)**
Data label given on the basis of 2021



Country wise world's top Importer of Structures of Iron & Steel import by % in 2021 :

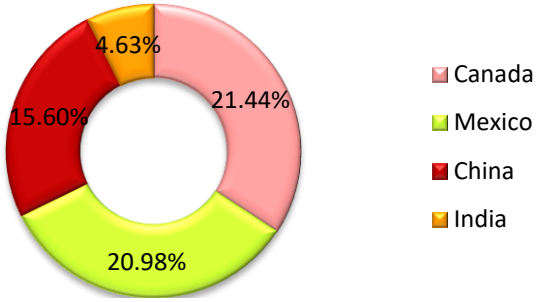


Global purchases of imported Structures of Iron & Steel cost a total US $ 51.55 billion in 2021. In that year, imported Structures of Iron & Steel appreciated by an 22.41% from US $ 42.11 billion during 2020. In 2021 USA stood as largest Structures of iron and steel importer country in the world. USA's imports represent 12.15% of world imports for Structure of iron and steel. Germany and France got the 2nd and 3rd rank in the list of top iron and steel importing countries across the world in 2021 with 8.41% and 5.84% share of world import of Structure of Iron and Steel respectively. In the same year India has imported 0.93% of Structure of Iron and Steel and stood at 29th rank in the world.

Annexure-II

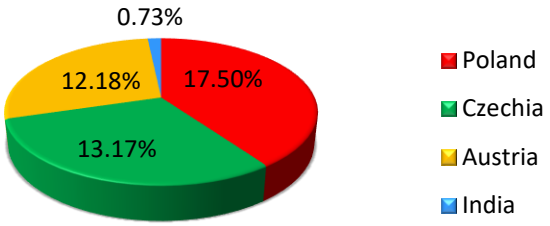
Sources of world's top three importers of Structures of Iron & Steel HS Code – 7308)

i) Top 3 Sources of Structures of Iron & Steel to USA in 2021 by percentage :



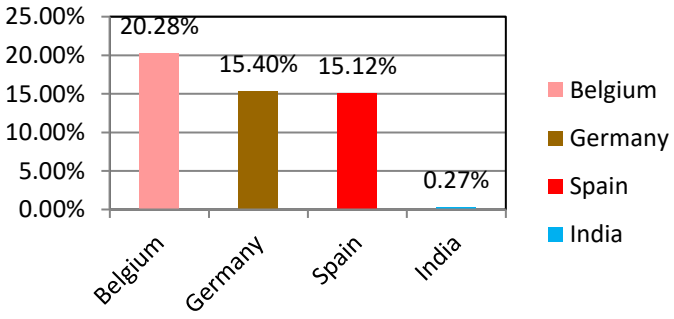
USA's most of its Structures of Iron & Steel came from Canada with 21.44% share of its import of the commodity in 2021. It was followed by Mexico and China, were found to be the 2nd and 3rd largest exporters of Structures of Iron & Steel to USA by 20.98 % and 15.60 % shares of USA's total import respectively in 2021. In the same **India's** contribution was 4.63% share of USA's total import. **(Source: UN Comtrade)**

ii) Top 3 Sources Structures of Iron & Steel. to Germany in 2021 by %



Poland was the top source of Structures of Iron & Steel to Germany. In the 2021more than 17.50% share of Germany's total import of Structures of Iron & Steel came from Poland. It was followed by Czechi (13.17 %) and Austria(12.18%). In that year Germany imports only 0.73% share of Structures of Iron & Steel from **India**. **(Source: UN Comtrade)**

iii) Top 3 Sources of Structures of Iron & Steel to France in 2021 by % **:**



With 20.28% share of France's total import of Structures of Iron & Steel Belgium became the largest source of it to France in 2021. Germany (15.40%) and Spain (15.12%) were other major sources of Structures of Iron & Steel to Portugal in that year. In the same India has only 0.27% share to Portugal. **(Source : UN Comtrade)**

IMPORT

Esters of Phosphoric Acids and their salts

An **ester** is a compound derived from an acid (organic or inorganic) in which at least one acidic hydrogen atom (−H) of that acid is replaced by an organyl group (−R).[1][2] An example of an ester formation is the substitution reaction of a carboxylic acid (RC(=O)−O−H) and an alcohol (R'OH), forming an ester (RC(=O)−O−R'), where R and R′ denote organyl groups, or H in the case of R. Glycerides are fatty acid esters of glycerol; they are important in biology, being one of the main classes of lipids and comprising the bulk of animal fats and vegetable oils. Esters can be formed from oxoacids (e.g. esters of acetic acid, carbonic acid, sulfuric acid, phosphoric acid, nitric acid, xanthic acid), but also from acids that do not contain oxygen (e.g. esters of thiocyanic acid, trithiocarbonic acid, tricyanomethane).

Esters of organic oxoacids typically have a pleasant smell; those of low molecular weight are commonly used as fragrances and are found in essential oils and pheromones. They perform as high-grade solvents for a broad array of plastics, plasticizers, resins, and lacquers, and are one of the largest classes of synthetic lubricants on the commercial market. Polyesters are important plastics, with monomers linked by ester moieties. Esters of phosphoric acid form the backbone of DNA molecules. Esters of nitric acid, such as nitroglycerin, are known for their explosive properties.

In organic chemistry, **organophosphates** (also known as **phosphate esters**, or **OPEs**) are a class of organophosphorus compounds with the general structure $O=P(OR)_3$, a central phosphate molecule with alkyl or aromatic substituents. They can be considered as esters of phosphoric acid.
Like most functional groups, organophosphates occur in a diverse range of forms, with important examples including key biomolecules such as DNA, RNA and ATP, as well as many insecticides, herbicides, nerve agents and flame retardants. OPEs have been widely used in various products as flame retardants, plasticizers, and performance additives to engine oil. The popularity of OPEs as flame retardants came as a substitution for the highly regulated brominated flame retardants. The low cost of production and compatibility to diverse polymers made OPEs to be widely used in industry including textile, furniture, electronics as plasticizers and flame retardants. These compounds are added to the final product physically rather than by chemical bond. Due to this, OPEs leak into the environment more readily through volatilization, leaching, and abrasion. OPEs have been detected in diverse environmental compartments such as air, dust, water, sediment, soil and biota samples at higher frequency and concentration.

The phosphate esters bearing OH groups are acidic and partially deprotonated in aqueous solution. For example, DNA and RNA are polymers of the type $[PO_2(OR)(OR')^-]_n$. Polyphosphates also form esters; an important example of an ester of a polyphosphate is ATP, which is the monoester of triphosphoric acid ($H_5P_3O_{10}$).

The detection of OPEs in the air as far away as Antarctica at concentrations around 1 ng/m^3 suggests their persistence in air, and their potential for long-range transport. OPEs were measured in high frequency in air and water and widely distributed in northern hemisphere. The chlorinated OPEs (TCEP, TCIPP, TDCIPP) in urban sampling sites and non-halogenated like TBOEP in rural areas respectively were frequently measured in the environment across multiple sites. In the Laurentian Great Lakes total OPEs concentrations were found to be 2–3 orders of magnitude higher than concentrations of brominated flame retardants measured in similar air. Waters from rivers in Germany, Austria, and Spain have been consistently recorded for TBOEP and TCIPP at highest concentrations. From these studies, it is clear that OPE concentrations in both air and water samples are often orders of magnitude higher than other flame retardants, and that concentrations are largely dependent on sampling location, with higher concentrations in more urban, polluted locations.

Today, organophosphates make up about 50% of the killing agents in chemical pesticides.

These are broadly classified under **H. S. Code 2919**

Table - 7

India's Top 10 Sources of Esters of Phosphoric Acids and their salts (H.S. Code - 2919)

Rank	Countries	2018		2019		2020		2021	
		Value (million $)	Share (%)	Value (million$)	Share (%)	Value (million$)	Share (%)	Value (million$)	Share (%)
1.	China	13.80	64.91	13.33	66.71	12.90	63.70	15.62	60.60
2.	Singapore	0.07	0.31	0.09	0.46	1.69	8.32	3.46	13.43
3.	U S A	3.78	17.76	3.51	17.56	2.32	11.44	1.81	7.02
4.	Belgium	0.48	2.24	0.71	3.54	0.85	4.20	1.18	4.59
5.	U K	0.23	1.10	0.09	0.46	0.18	0.87	1.14	4.41
6.	Switzerland	0.13	0.60	0.04	0.21	0.10	0.52	0.71	2.74
7.	Germany	1.37	6.46	1.10	5.52	1.51	7.45	0.65	2.50
8.	Japan	0.74	3.48	0.27	1.37	0.20	0.96	0.55	2.13
9.	Netherland	0.35	1.65	0.66	3.31	0.34	1.68	0.49	1.90
10.	Australia	0.06	0.29	0.07	0.34	0.01	0.05	0.07	0.26
	Others	0.25	1.20	0.10	0.52	0.16	0.81	0.11	0.42
	Total	21.26	100	19.99	100	20.26	100	25.78	100

Source: DGCI&S

Note : India's Import including re-import

The dollar value of Esters of Phosphoric Acids and their salts import in 2021 stood at US $ 25.78 Million and US $ 20.26 Million in 2020, which shows a the import of Esters of Phosphoric Acids and their salts in India grew by more than 27.24% compare to the year 2020. In 2021 India imported Esters of Phosphoric Acids and their salts maximum worth value of US $ 15.62 Million from China or 60.60% of India's total import, which shows the India's dependency upon China for this commodity. In second and third place were Singapore and USA, from where India imported around 13.43% and 7.02% share of Esters of Phosphoric Acids and their salts.

Table – 8

World's Top 10 Importer of Esters of Phosphoric Acids and their salts (H.S. Code – 2919)

Rank	Countries	2018		2019		2020		2021	
		Value (million$)	Share (%)	Value (million$)	Share (%)	Value (million$)	Share (%)	Value (million$)	Share (%)
1.	USA	121.48	13.57	116.02	12.83	102.73	11.79	184.94	13.20
2.	Rep. of Korea	97.43	10.89	93.27	10.31	94.31	10.83	154.32	11.02
3.	Netherlands	77.74	8.69	73.95	8.18	66.00	7.58	117.85	8.41
4.	Germany	61.91	6.92	68.90	7.62	62.07	7.13	100.17	7.15
5.	Italy	44.57	4.98	41.33	4.57	31.82	3.65	59.73	4.26
6.	Canada	29.91	3.34	28.14	3.11	25.67	2.95	56.21	4.01
7.	Spain	34.38	3.84	33.38	3.69	28.21	3.24	54.27	3.87
8.	China	40.08	4.48	37.33	4.13	37.33	4.29	51.78	3.70
9.	Mexico	17.31	1.93	27.14	3.00	23.83	2.74	48.51	3.46
10.	Hungary	19.20	2.15	30.55	3.38	30.64	3.52	45.65	3.26
21.	**India**	**21.09**	**2.36**	**20.06**	**2.22**	**20.28**	**2.33**	**25.82**	**1.84**
	Others	329.81	36.85	334.49	36.98	348.15	39.97	501.63	35.81
	Total	894.92	100	904.55	100	871.03	100	1400.88	100

Source :UNComtrade

In 2021, the global Esters of Phosphoric Acids and their salts imports amounted to US $ 1.40 Billion, increasing by more than 60.83% against the previous year figure. Over the period under review, global Esters of Phosphoric Acids and their salts imports reached its maximum level of US $ 1.40 Billion in this year, however, from 2018 to 2020, it was on almost flat level. In 2021 USA (US $ 184.94 M) constitutes the largest market for imported Esters of Phosphoric Acids and their salts worldwide, making up 13.20 % of global imports. The second position in the ranking was occupied by Rep. of Korea (US $ 154.32 M), with the share of 11.02% of global imports. It was followed by the Netherlands, with the share of 8.41%. India's position in world import of Esters of Phosphoric Acids and their salts was 21st with share of 1.84% of world import in the same year.

Paints and Varnishes (Including Enamels and Lacquers)

The use of paints and varnishes for decoration is nearly as old as human culture itself. Prehistoric people used colored earth and clay to make ritual drawings on the walls of caves. Centuries later Asian cultures developed hard, clear varnishes to add luster to their art and craft work.

Modern paints and varnishes, however, not only beautify but also protect surfaces from decay and corrosion. For instance, buildings, bridges, and machines require paint and varnish that protect their surfaces, and guided missiles, rockets, and spaceships need coatings that will withstand friction and extreme temperatures. Paint is widely used in homes as well as in industry because painted surfaces are attractive and easy to keep clean. Paint and varnish manufacture is a major industry in many industrialized nations.

Paints and varnishes fall into three categories: architectural, product, and special-purpose coatings. Architectural coatings constitute the largest segment of the paint market and are used to decorate, protect, and maintain homes and other buildings. Product coatings cover cars, trucks, planes, ships, furniture, equipment, and thousands of other products. Special-purpose coatings are developed for such applications as reflective traffic paint or for ship hulls that must withstand extreme environments.

Paints have three major components—pigments, binders, and solvents. Pigments are designed to color, cover, and protect a surface. Organic and inorganic pigments are available in a wide array of colors. Organic pigments, though often more expensive than inorganic colors, offer a wider range of shades. Inorganic pigments are derived from various metallic ores. The most commonly used of these pigments is white titanium dioxide. Other pigments include carbon black, red lead, chrome yellow, molybdate orange, zinc yellow, and iron oxides.

Different paints and varnishes are made for homeowners, for artists, and for industrial customers. Each group requires different types of paints and varnishes for their particular uses. A typical house is constructed with a variety of materials—wood, metal, plastic, concrete, paper, and wallboard. As a result, most homeowners use different varnishes and various latex, oil-based, enamel, and luminous paints to match the surfaces and conditions of house materials.

Industrial customers use product and special-purpose paints and varnishes that must be able to withstand harsh weather, heavy usage, and extremes in environmental conditions. Transportation-equipment makers, for example, use a variety of resins that provide attractive corrosion and weather protection for vehicles that travel in water or air or on land. Auto makers are the largest consumers of industrial coatings. Primers, topcoats, and protective coatings are used for underbody parts and components. Topcoats are usually made of acrylic enamels or lacquers, while undercoats are composed of mainly alkyd and epoxy resins. Coatings for marine applications such as offshore rigs, ships, and pleasure craft are made of alkyd paints as well as of epoxy, urethane chlorinated rubber, or vinyl mixtures.

The global paints and coatings market is projected to grow from $150.76 billion in 2021 to $217.66 billion in 2028 at a CAGR of 5.4% in forecast period

These are broadly classified under **H. S. Code 3208**.

Table - 7

India's Top 10 Sources of Paints &Varnishes (HS Code : 3208)

Rank	Countries	2018		2019		2020		2021	
		Value (million $)	Share (%)	Value (million$)	Share (%)	Value (million$)	Share (%)	Value (million$)	Share (%)
1.	Italy	27.67	12.99	31.43	14.24	13.90	12.11	39.26	15.76
2.	Germany	28.88	13.56	27.08	12.27	14.68	12.79	29.51	11.85
3.	Korea RP	16.77	7.87	23.11	10.47	12.93	11.27	26.73	10.73
4.	U S A	22.07	10.36	22.12	10.03	13.32	11.60	21.67	8.70
5.	China	11.46	5.38	11.72	5.31	6.14	5.35	19.63	7.88
6.	Thailand	15.87	7.45	13.55	6.14	7.82	6.82	16.40	6.58
7.	Japan	15.02	7.05	11.67	5.29	5.27	4.59	13.53	5.43
8.	Belgium	13.25	6.22	13.23	5.99	6.65	5.80	12.78	5.13
9.	U A E	7.85	3.69	8.51	3.86	4.60	4.01	9.32	3.74
10.	Netherland	5.33	2.50	8.24	3.74	4.62	4.03	9.27	3.72
	Others	48.84	22.93	49.99	22.66	24.84	21.65	51.04	20.49
	Total	213.02	100	220.65	100	114.77	100	249.15	100

Source: DGCI&S

Note : India's Import including re-import

In 2021, India imported US $ 249.15 million Paints and Varnishes which is huge increased by ,more than 100% than 2020.India imports Paints and Varnishes primarily from Italy(US $39.26M), Germany (US $29.51M), Korea RP(US $ 26.73M), USA (US $ 21.67M) and China (US $ 19.63M).These 5 countries in total exported US $ 136.80 Million value of Insulated Wire to India which rounds up to 55% of the total Insulated Wire import into India 2021.

Table 10

World's top 10 Importers of Paints &Varnishes (HS Code : 3208)

Rank	Countries	2018		2019		2020		2021	
		Value (million$)	Share (%)	Value (million$)	Share (%)	Value (million$)	Share (%)	Value (million$)	Share (%)
1.	China	766.79	5.45	954.84	6.93	1035.18	7.84	1214.51	7.88
2.	Germany	763.97	5.43	704.77	5.11	680.80	5.16	798.25	5.18
3.	USA	663.58	4.72	672.09	4.88	635.79	4.82	765.79	4.97
4.	Rep. of Korea	593.16	4.22	528.40	3.83	522.08	3.96	604.65	3.93
5.	Netherlands	465.85	3.31	468.83	3.40	473.44	3.59	584.97	3.80
6.	Poland	524.80	3.73	499.68	3.62	499.06	3.78	571.61	3.71
7.	France	534.23	3.80	502.49	3.65	450.77	3.42	561.55	3.65
8.	Canada	563.60	4.01	552.03	4.00	496.09	3.76	556.53	3.61
9.	Spain	457.67	3.26	449.84	3.26	430.60	3.26	545.11	3.54
10.	Russia	538.11	3.83	527.14	3.82	492.02	3.73	537.17	3.49
20.	**India**	**213.24**	**1.52**	**220.57**	**1.60**	**183.34**	**1.39**	**248.94**	**1.62**
	Others	7972.72	56.71	7704.58	55.89	7299.44	55.30	8414.36	54.63
	Total	14057.72	100	13785.26	100	13198.61	100	15403.45	100

Source: UN Comtrade

Worldwide import of Paints and Varnishes by country totaled US$15.40 billion in 2021. The overall value of Paints and Varnishes imports up by 16.71% for all importing countries in 2021 from 2020. The China imported US $ 1.21 billion worth of the commodity in 2021, making it the leading importer of the commodity worldwide that year. Germany and USA followed in second and third place, importing US $ 798.25 million and US $ 765.79 million worth of Paints and Varnishes in 2021. The import value of Paints and Varnishes into India amounted to approximately US $ 248.94 million in the year 2021 and ranked in 20th position in the world with the share of 1.62% of total Global import value of Paints and Varnishes.