

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 **Grapes, Fresh or Dried & Stainless Steel Wire** and imports of **Self Adhesive Plastic Materials and Enzyme** 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-0806 &7223for export and 3919 & 3507 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 October'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 Woven fabrics of Grapes, Fresh or Dried & Stainless Steel Wire and imports of Self Adhesive Plastic Materials and Enzyme. We will use both the 4 digit Commodity codes, for our analysis, as appropriate.

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 Grapes, Fresh or Dried with their shares in percentage.**
- **Table 2 : World's top 10 Exporters of Grapes, Fresh or Dried with their shares in percentage.**
- **Table 3 : World's top 10 Importers of Grapes, Fresh or Dried with their shares in percentage.**
- **Annex- I : Top 3 sources of Grapes, Fresh or Dried of World's top 3 Importers.**
- **Table 4 : India's top 10 Export destination of S.S. Wire with their shares in percentage.**
- **Table 5 : World's top 10 Exporters of S.S. Wire with their shares in percentage.**
- **Table 6 : World's top 10 Importers of S.S. Wire with their shares in percentage.**
- **Annex-II : Top 3 sources of S.S. Wire of World's top 3 Importers.**
- **Table 7 : India's top10 Sources of Self Adhesive Plastics Materials with their shares in percentage.**
- **Table 8 : World's top 10 Importers of Self Adhesive Plastics Materials with their shares in percentage.**
- **Table 9 : India's top 10 Sources of Enzyme with their shares in percentage.**
- **Table 10 : World's top 10 Importers of Enzyme with their shares in percentage.**

EXPORT

Grapes, Fresh or Dried

A **grape** is a fruit, botanically a berry, of the deciduous woody vines of the flowering plant genus *Vitis*. Grapes are a non-climacteric type of fruit, generally occurring in clusters.

The cultivation of grapes began perhaps 8,000 years ago, and the fruit has been used as human food over history. Eaten fresh or in dried form (as raisins, currants and sultanas), grapes also hold cultural significance in many parts of the world, particularly for their role in winemaking. Other grape-derived products include various types of jam, juice, vinegar and oil.

Grapes are a type of fruit that grow in clusters of 15 to 300, and can be crimson, black, dark blue, yellow, green, orange, and pink. "White" grapes are actually green in colour, and are evolutionarily derived from the purple grape. Mutations in two regulatory genes of white grapes turn off production of anthocyanins, which are responsible for the colour of purple grapes. Anthocyanins and other pigment chemicals of the larger family of polyphenols in purple grapes are responsible for the varying shades of purple in red wines. Grapes are typically an ellipsoid shape resembling a prolate spheroid.

The Middle East is generally described as the homeland of grape and the cultivation of this plant began there 6,000–8,000 years ago. Yeast, one of the earliest domesticated microorganisms, occurs naturally on the skins of grapes, leading to the discovery of alcoholic drinks such as wine. The earliest archaeological evidence for a dominant position of wine-making in human culture dates from 8,000 years ago in Georgia.

The oldest known winery was found in Armenia, dating to around 4000 BC. By the 9th century AD, the city of Shiraz was known to produce some of the finest wines in the Middle East. Thus it has been proposed that Syrah red wine is named after Shiraz, a city in Persia where the grape was used to make Shirazi wine.

Raw grapes are 81% water, 18% carbohydrates, 1% protein, and have negligible fat (table). A 100-gram (3+1/2-ounce) reference amount of raw grapes supplies 288 kilojoules (69 kilocalories) of food energy and a moderate amount of vitamin K (14% of the Daily Value), with no other micronutrients in significant content.

According to the Food and Agriculture Organization (FAO), 75,866 square kilometres of the world are dedicated to grapes. Approximately 71% of world grape production is used for wine, 27% as fresh fruit, and 2% as dried fruit. A portion of grape production goes to producing grape juice to be reconstituted for fruits canned "with no added sugar" and "100% natural". The area dedicated to vineyards is increasing by about 2% per year.

There are no reliable statistics that break down grape production by variety. It is believed that the most widely planted variety is Sultana, also known as Thompson Seedless, with at least 3,600 km² (880,000 acres) dedicated to it. The second most common variety is Airén. Other popular varieties include Cabernet Sauvignon, Sauvignon blanc, Cabernet Franc, Merlot, Grenache, Tempranillo, Riesling, and Chardonnay.^[16] Commercially cultivated grapes can usually be classified as either table or wine grapes, based on their intended method of consumption: eaten raw (table grapes) or used to make wine (wine grapes). While almost all of them belong to the same species, *Vitis vinifera*, table and wine grapes have significant differences, brought about through selective breeding. Table grape cultivars tend to have large, seedless fruit (see below) with relatively thin skin. Wine grapes are smaller, usually seeded, and have relatively thick skins (a desirable characteristic in winemaking, since much of the aroma in wine comes from the skin). Wine grapes also tend to be very sweet: they are harvested at the time when their juice is approximately 24% sugar by weight. By comparison, commercially produced "100% grape juice", made from table grapes, is usually around 15% sugar by weight.

These are broadly classified under **H.S. Code-0806**.

Table - 1

India's Top 10 destination of Grapes, Fresh or Dried (H.S Code-0806)

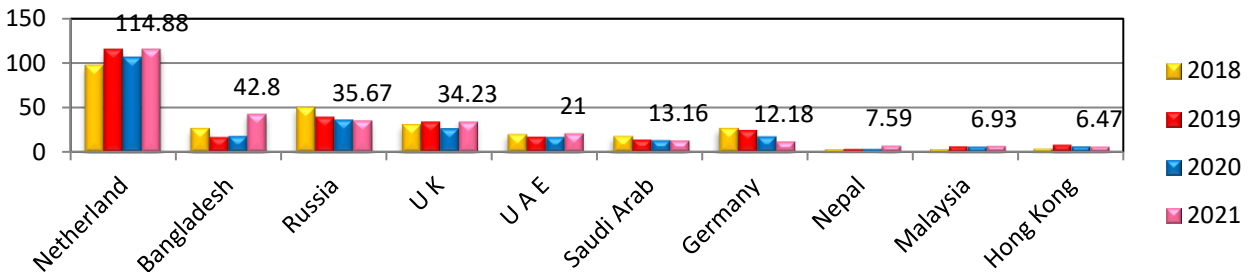
Rank	Countries	2018		2019		2020		2021	
		Value (million\$)	Share (%)	Value (million\$)	Share (%)	Value (million\$)	Share (%)	Value (million\$)	Share (%)
1.	Netherland	97.61	27.17	115.49	32.12	106.65	33.33	114.88	32.49
2.	Bangladesh	27.42	7.63	17.04	4.74	18.33	5.73	42.80	12.11
3.	Russia	50.83	14.15	40.03	11.14	36.67	11.46	35.67	10.09
4.	U K	31.63	8.81	34.32	9.55	27.02	8.44	34.23	9.68
5.	U A E	20.43	5.69	17.44	4.85	17.17	5.37	21.00	5.94
6.	Saudi Arab	18.18	5.06	14.13	3.93	13.56	4.24	13.16	3.72
7.	Germany	27.33	7.61	25.23	7.02	17.76	5.55	12.18	3.45
8.	Nepal	3.45	0.96	3.78	1.05	3.95	1.23	7.59	2.15
9.	Malaysia	3.38	0.94	6.69	1.86	6.15	1.92	6.93	1.96
10.	Hong Kong	4.27	1.19	8.40	2.34	6.53	2.04	6.47	1.83
	Others	74.70	20.79	76.95	21.41	66.22	20.69	58.68	16.60
	Total	359.23		359.50		320.00		353.59	

Source: DGCI&S.

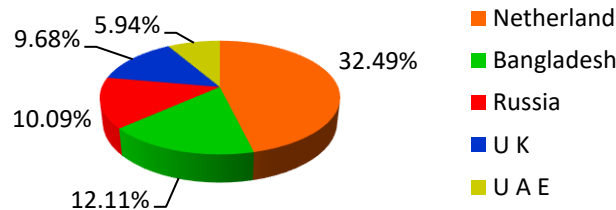
Note : India's Export including re-export

Leading importers of Grapes, Fresh or Dried from India from 2018-2021(Values in million USD)

Data label given on the basis of 2021



India's top 5 destinations of Woven Grapes, Fresh or Dried by percentage India in 2021:



In 2021, India exported US \$353.59 million in Grapes, Fresh or Dried, making it the 11th largest exporter of Grapes, Fresh or Dried in the world. In that year the major three destination of Grapes, Fresh or Dried exports from India were Netherland (US \$ 125.16 M), Bangladesh (US \$ 108.38M) and Russia (US \$ 87.91 M). These three countries together imports more than 50% share of Grapes, Fresh or Dried from India. Total export of Grapes, Fresh or Dried from India has increased by almost 10% in 2021 compared to that in the year 2020.

Table-2

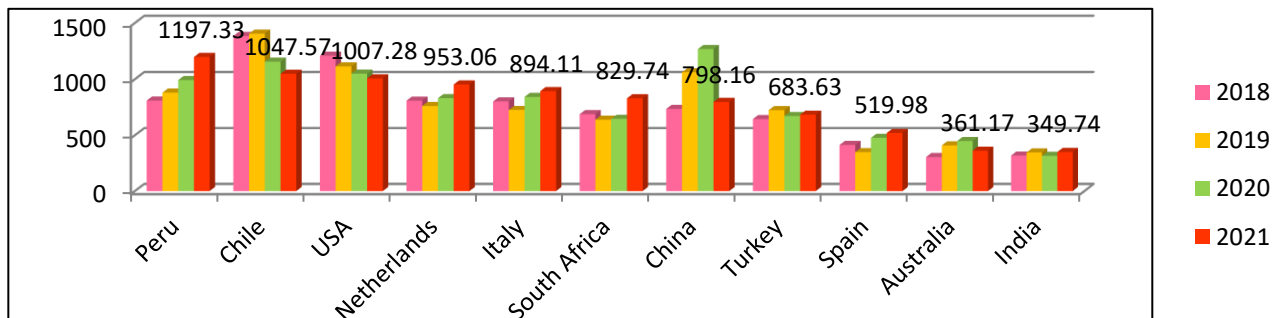
World's Top 10 exporter of Grapes, Fresh or Dried (H.S Code-0806)

Rank	Countries	2018		2019		2020		2021	
		Value (million \$)	Share (%)	Value (million\$)	Share (%)	Value (million\$)	Share (%)	Value (million\$)	Share (%)
1.	Peru	810.05	7.84	880.42	8.32	992.12	9.26	1197.33	10.83
2.	Chile	1384.08	13.40	1404.36	13.28	1155.37	10.79	1047.57	9.47
3.	USA	1208.52	11.70	1113.54	10.53	1048.91	9.79	1007.28	9.11
4.	Netherlands	809.18	7.83	761.38	7.20	831.42	7.76	953.06	8.62
5.	Italy	801.92	7.76	726.12	6.87	842.19	7.86	894.11	8.08
6.	South Africa	688.29	6.66	638.90	6.04	646.85	6.04	829.74	7.50
7.	China	735.41	7.12	1061.40	10.04	1267.29	11.83	798.16	7.22
8.	Turkey	644.69	6.24	724.19	6.85	671.91	6.27	683.63	6.18
9.	Spain	412.91	4.00	348.44	3.29	476.36	4.45	519.98	4.70
10.	Australia	304.35	2.95	408.54	3.86	447.87	4.18	361.17	3.27
11.	India	318.13	3.08	345.68	3.27	315.72	2.95	349.74	3.16
	Others	4626.33	44.79	5051.52	47.76	5195.38	48.50	5130.84	46.39
	Total	10328.37	100	10576.25	100	10712.24	100	11059.92	100

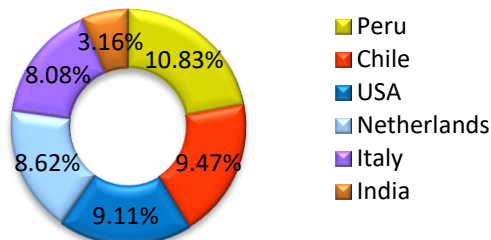
Source: UN Comtrade

Leading Grapes, Fresh or Dried of world during the period from 2018 to 2021 (Values in million USD)

Data label given on the basis of 2021



Country wise world's leading exporter of Grapes, Fresh or Dried by percentage in 2021 :



In 2021, world export of Grapes, Fresh or Dried was US \$ 11.05 billion and it was highest worth value of export of Grapes, Fresh or Dried form India. In that year the global exports of Grapes, Fresh or Dried increased by 3.25%, from 2020. Peru was the largest exporter of Grapes, Fresh or Dried exports structure in the world, which was US \$ 1.19 billion or accounted 10.83% of the global total in 2021, followed by Chile (9.47%) and USA (9.11%) globally. **India** stood at 11th position in ranking in the world leading exporting countries with 3.16% share of global export of Grapes, Fresh or Dried in 2021.

Table-3

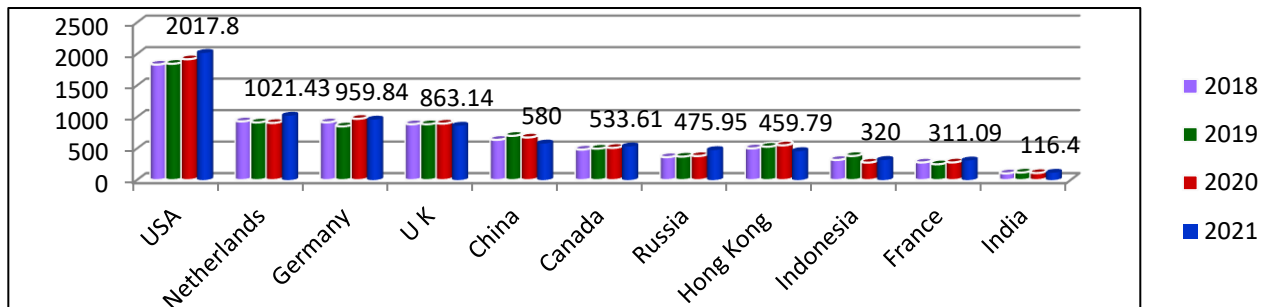
World's top 10 Importers of Grapes, Fresh or Dried (H.S Code-0806)

Rank	Countries	2018		2019		2020		2021	
		Value (million \$)	Share (%)	Value (million\$)	Share (%)	Value (million\$)	Share (%)	Value (million\$)	Share (%)
1.	USA	1833.77	16.40	1846.80	16.25	1918.40	16.69	2017.80	16.99
2.	Netherlands	932.06	8.34	915.37	8.06	907.53	7.90	1021.43	8.60
3.	Germany	916.79	8.20	852.81	7.51	972.89	8.47	959.84	8.08
4.	U K	886.41	7.93	886.45	7.80	896.95	7.81	863.14	7.27
5.	China	639.33	5.72	702.32	6.18	676.27	5.88	580.00	4.88
6.	Canada	484.88	4.34	499.53	4.40	511.71	4.45	533.61	4.49
7.	Russia	364.37	3.26	373.21	3.28	381.77	3.32	475.95	4.01
8.	Hong Kong	503.49	4.50	529.83	4.66	551.93	4.80	459.79	3.87
9.	Indonesia	319.52	2.86	382.51	3.37	277.97	2.42	320.00	2.69
10.	France	279.43	2.50	251.13	2.21	280.41	2.44	311.09	2.62
19.	India	106.41	0.95	120.43	1.06	112.36	0.98	116.40	0.98
	Others	3913.20	35.00	4001.06	35.22	4003.57	34.84	4215.41	35.50
	Total	11179.66	100	11361.46	100	11491.76	100	11874.47	100

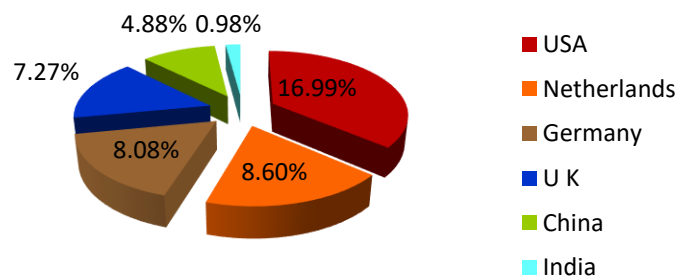
Source : UN Comtrade

Leading Grapes, Fresh or Dried importers of world from 2018 to 2021(Values in million USD)

Data label given on the basis of 2021



Country wise world's leading importers Grapes, Fresh or Dried by percentage in 2021

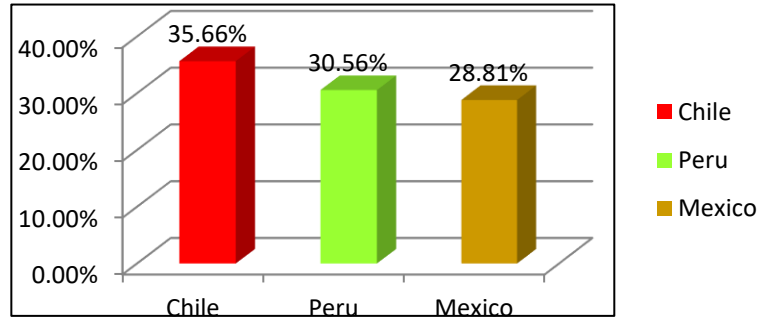


In 2021, USA was the leading Grapes, Fresh or Dried importing country in the world, with imports valued at approximately US \$ 2.01 billion, accounted for 17 % of world import value of it . The Netherlands ranked in second that year, with a share of 8.60% of global import and Germany ranked in 3rd in the world in the same year, with 8.08% share globally. India ranked in 19th position in the world with the share of 0.98% of total Global import value of Grapes, Fresh or Dried.

Annexure-1

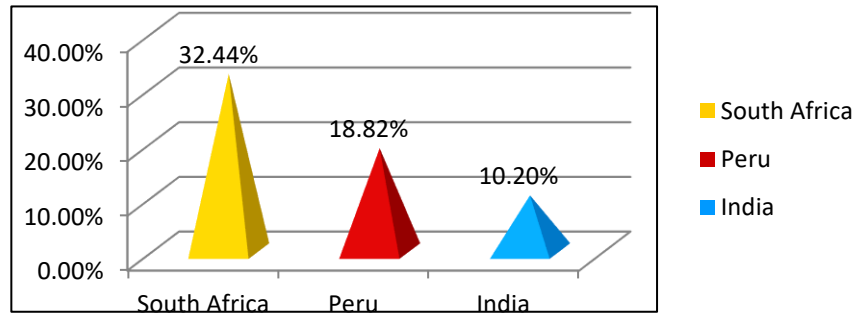
Major sources of world's top three importers of Grapes, Fresh or Dried (H.S Code-0806)

i) Top 3 Sources of Grapes, Fresh or Dried to USA in 2021 by percentage:



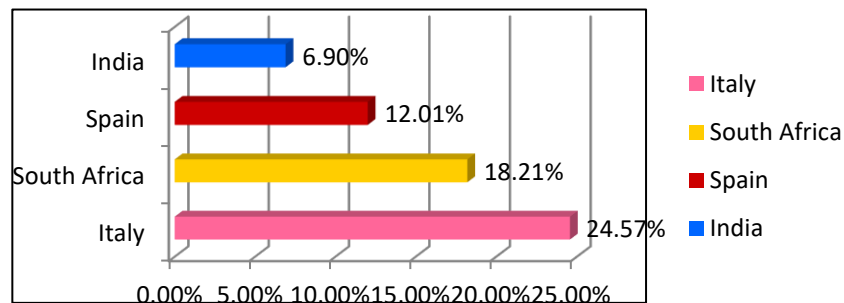
USA imported most of its Grapes, Fresh or Dried from Chile, nearly 36% share of USA's total import value of it came from Chile in 2021 which was followed by Peru (30.56%) and Mexico (28.81%). India exports only 0.06% share in 2021 to USA. (Source : UN Comtrade)

ii) Top 3 Sources of Grapes, Fresh or Dried to Netherlands in 2021 by percentage:



Netherlands imports most of its requirements of Grapes, Fresh or Dried from South Africa (32.44 %), from Peru (18.82%) and from **India** (10.20%) in 2021. (Source: UN Comtrade)

iii) Top 3 Sources of Grapes, Fresh or Dried to Germany in 2021 by percentage:



Germany's three major source countries of Grapes, Fresh or dried in 2021 were Italy (24.57%), South Africa (18.21%) and Spain (12.01%) in 2021. **India** also a good source of Grapes to Germany. In 2021 **India** has exported 6.90 % share of Grapes, Fresh or Dried to Germany. (Source: UN Comtrade)

Stainless Steel Wire

Stainless steel is any of a group of ferrous alloys that contain a minimum of approximately 11% chromium, a composition that largely inhibits the iron from rusting and provides heat-resistant properties. Different types of stainless steel include the elements carbon, nitrogen, aluminium, silicon, sulphur, titanium, nickel, copper, selenium, niobium, and molybdenum. Specific types of stainless steel are often designated by their AISI three-digit number, e.g., 304 stainless. The ISO 15510 standard lists the chemical compositions of stainless steels of the specifications in existing ISO, ASTM, EN, JIS, and GB standards in a useful interchange table.

Stainless steel's resistance to rusting results from the presence of chromium in the alloy, which forms a passive film that protects the underlying material from corrosion attack, and can self-heal in the presence of oxygen.

The addition of nitrogen also improves resistance to pitting corrosion and increases mechanical strength. Thus, there are numerous grades of stainless steel with varying chromium and molybdenum contents to suit the environment the alloy must endure.

Resistance to corrosion and staining, low maintenance, and familiar luster make stainless steel an ideal material for many applications where both the strength of steel and corrosion resistance are required. Moreover, stainless steel can be rolled into sheets, plates, bars, wire, and tubing. These can be used in cookware, cutlery, surgical instruments, major appliances, vehicles, construction material in large buildings, industrial equipment (e.g., in paper mills, chemical plants, water treatment), and storage tanks and tankers for chemicals and food products.

The biological clean ability of stainless steel is superior to both aluminium and copper, having a biological clean ability comparable to glass. Its clean ability, strength, and corrosion resistance have prompted the use of stainless steel in pharmaceutical and food processing plants.

Like steel, stainless steels are a relatively poor conductor of electricity, with significantly lower electrical conductivity than copper. In particular, the electrical contact resistance (ECR) of stainless steel arises as to the result of the dense protective oxide layer and limits its functionality in applications as electrical connectors. Copper alloys and nickel coated connectors tend to exhibit lower ECR values, and are preferred materials for such applications. Nevertheless, stainless steel connectors are employed in situations where ECR poses a lower design criteria and corrosion resistance is required, for example in high temperatures and oxidizing environments.

As with all other alloys, the melting point of stainless steel is expressed in the form of a range of temperatures, and not a singular temperature, his temperature range goes from 1,400 to 1,530 °C (2,550 to 2,790 °F) depending on the specific consistency of the alloy in question.

Martensitic and ferritic stainless steels are magnetic. Ferritic steel consists of ferrite crystals, a form of iron with up to 0.025% carbon. Due to its cubic crystalline structure, ferritic steel only absorbs a small amount of carbon, which consists of one iron in each corner and a central iron atom. The central atom is responsible for its magnetic properties. Grades with low coercive field have been developed for electro-valves used in household appliances and for injection systems in internal combustion engines. Some applications require non-magnetic materials, such as magnetic resonance imaging. Annealed austenitic stainless steels are usually non-magnetic, though work hardening can make cold-formed austenitic stainless steels slightly magnetic. Sometimes, if austenitic steel is bent or cut, magnetism occurs along the edge of the stainless steel because the crystal structure rearranges itself.

Stainless steel wire is the raw material for screws, springs, metallic net, cable wire and hardware. It is widely used in filter, building and important for electronic parts, oil and fibre industry, kitchenware and hardware.

These are broadly classified under **H.S. Code-7223**.

Table - 4

India's Top 10 destination of Stainless Steel Wire (HS Code -7223)

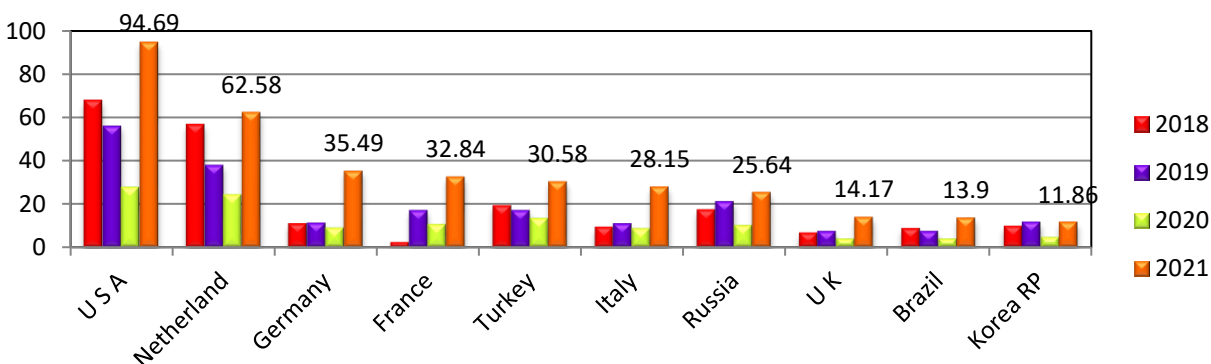
Rank	Countries	2018		2019		2020		2021	
		Value (million\$)	Share (%)	Value (million\$)	Share (%)	Value (million\$)	Share (%)	Value (million\$)	Share (%)
1.	U S A	68.01	22.37	56.19	19.28	27.78	16.44	94.69	20.11
2.	Netherland	56.97	18.74	38.18	13.10	24.40	14.44	62.58	13.29
3.	Germany	11.14	3.66	11.54	3.96	9.16	5.42	35.49	7.54
4.	France	2.49	0.82	17.28	5.93	10.75	6.36	32.84	6.98
5.	Turkey	19.54	6.43	17.31	5.94	13.54	8.02	30.58	6.50
6.	Italy	9.62	3.17	11.24	3.86	8.81	5.21	28.15	5.98
7.	Russia	17.54	5.77	21.34	7.32	10.26	6.07	25.64	5.45
8.	U K	6.88	2.26	7.57	2.60	4.12	2.44	14.17	3.01
9.	Brazil	9.01	2.96	7.68	2.64	4.10	2.43	13.90	2.95
10.	Korea RP	9.98	3.28	11.93	4.09	4.78	2.83	11.86	2.52
	Others	92.82	30.53	91.17	31.28	51.24	30.33	120.92	25.68
	Total	304.00	100	291.44	100	168.94	100	470.83	100

Source: DGCI&S

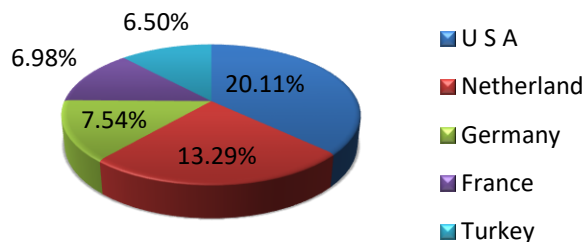
Note : India's Export including re-export

Leading S. S. Wire importers from India during the period from 2018-2021(Values in million USD)

Data label given on the basis of 2021



India's top 5 major destinations of S. S. Wire by percentage India in 2021:



The above table represents top ten countries where has been exporting Stainless Steel Wire in the year 2021 the export of S.S.Wire from India was US \$ 470.83 million and increased to nearly 3 times than that in the year 2020. USA was the top most destination of S.S. Wire imports 20.11% share of India's total export value of S.S. Wire from India in 2021, followed by Netherland (13.29%) and Germany (7.54%).

Table - 5

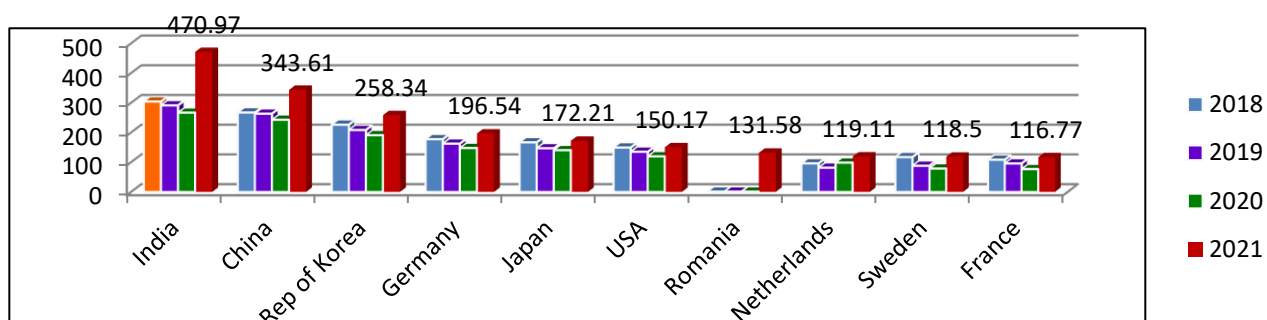
World's Top 10 exporters of Stainless Steel Wire (HS Code –7223)

Rank	Countries	2018		2019		2020		2021	
		Value (million \$)	Share (%)	Value (million\$)	Share (%)	Value (million\$)	Share (%)	Value (million\$)	Share (%)
1.	India	304.28	13.12	291.38	13.70	266.72	13.75	470.97	16.44
2.	China	267.21	11.52	263.28	12.38	242.92	12.52	343.61	12.00
3.	Rep of Korea	226.34	9.76	208.33	9.79	190.82	9.84	258.34	9.02
4.	Germany	177.52	7.66	162.49	7.64	147.73	7.61	196.54	6.86
5.	Japan	166.91	7.20	146.75	6.90	140.51	7.24	172.21	6.01
6.	USA	149.44	6.45	135.04	6.35	119.71	6.17	150.17	5.24
7.	Romania	1.03	0.04	1.08	0.05	1.06	0.05	131.58	4.59
8.	Netherlands	95.97	4.14	81.44	3.83	98.62	5.08	119.11	4.16
9.	Sweden	117.10	5.05	88.08	4.14	78.69	4.06	118.50	4.14
10.	France	108.37	4.67	95.84	4.51	76.78	3.96	116.77	4.08
	Others	704.45	30.38	653.49	30.72	576.61	29.72	786.15	27.45
	Total	2318.64	100	2127.20	100	1940.15	100	2863.96	100

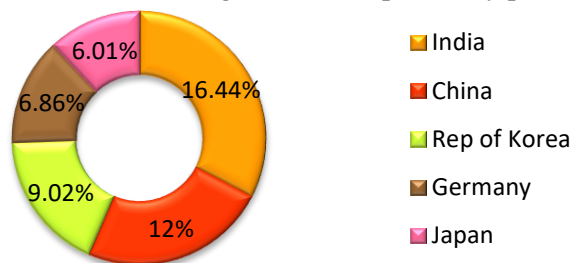
Source: UN Comtrade

Leading S Swire exporters of world during the period from 2018 to 2021 (Values in million USD)

Data label given on the basis of 2021



Country wise export trends in world's leading S S Wire exporters by percentage in 2021:



As India Being the top most exporter of S.S. Wire in the world in 2021 India's Export value of S.S. Wire was estimated at US \$470.97 million. Accounted for 16.44% of global export value of S.S. Wire. China followed at 12% share of world export value of S.S. Wire and stood at 2nd position in the world, followed by Rep of Korea (9.02%). Germany, Japan and USA were other important exporter of the commodity. The above table shows that in 2021 the world export of S.S Wire was US \$ 2.86 Billion, which has increased by 48% than that in the year 2020.

Table - 6

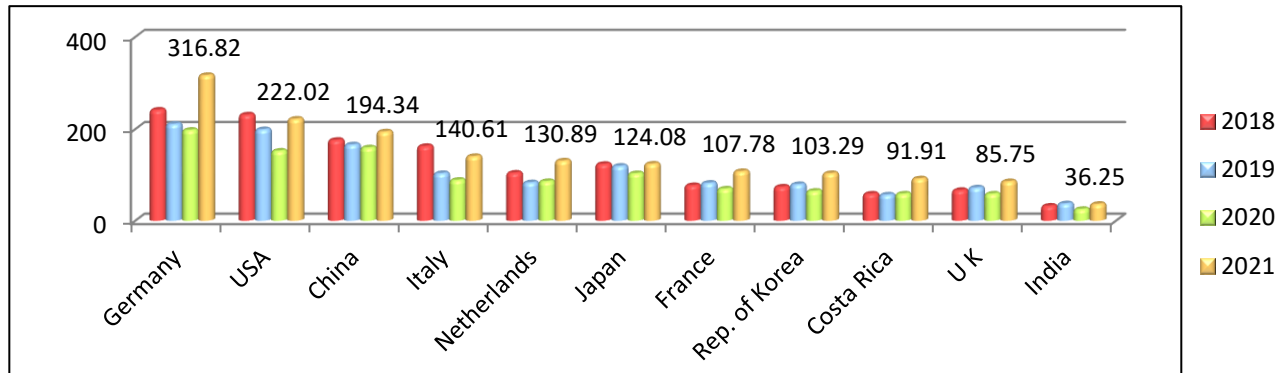
World's Top 10 Importers of Stainless Steel Wire (HS Code -7223)

Rank	Countries	2018		2019		2020		2021	
		Value (million \$)	Share (%)	Value (million\$)	Share (%)	Value (million\$)	Share (%)	Value (million\$)	Share (%)
1.	Germany	241.59	9.77	210.99	9.50	197.87	10.19	316.82	11.63
2.	USA	231.15	9.35	199.19	8.97	152.39	7.85	222.02	8.15
3.	China	175.92	7.12	166.01	7.48	159.50	8.22	194.34	7.14
4.	Italy	162.58	6.58	103.41	4.66	88.73	4.57	140.61	5.16
5.	Netherlands	104.31	4.22	83.33	3.75	86.01	4.43	130.89	4.81
6.	Japan	123.46	4.99	119.36	5.37	103.17	5.31	124.08	4.56
7.	France	77.03	3.12	82.26	3.70	69.65	3.59	107.78	3.96
8.	Rep. of Korea	73.92	2.99	79.38	3.57	64.72	3.33	103.29	3.79
9.	Costa Rica	58.55	2.37	56.64	2.55	58.61	3.02	91.91	3.38
10.	U K	66.53	2.69	72.02	3.24	58.65	3.02	85.75	3.15
22.	India	32.30	1.31	37.35	1.68	25.17	1.30	36.25	1.33
	Others	1124.79	45.50	1010.85	45.52	876.81	45.17	1169.30	42.94
	Total	2472.11	100	2220.78	100	1941.25	100	2723.04	100

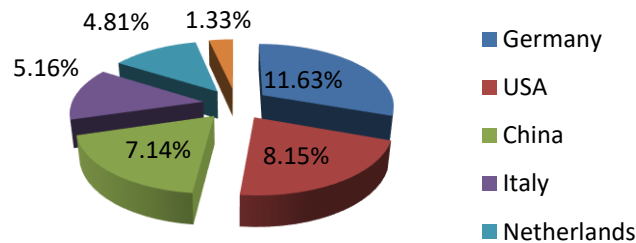
Source :UNComtrade

Leading S S. Wire importers of world during the period from 2018 to 2021 (Values in million USD)

Data label given on the basis of 2021



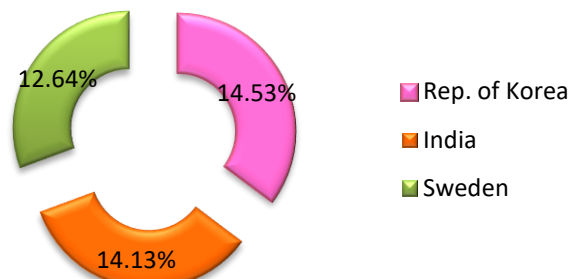
Country wise import trends in world's S. S. Wire importers by percentage in 2021 :



In the year 2021, the main importing countries for S.S. Wire were Germany (US \$ 316.82M), USA (US \$ 222 M), China(US \$ 194.34 M), Italy (US \$ 140.61 M) and Netherlands(US \$ 130.89 M). In 2021 these five countries together imported totalled US \$ 1Billion of S.S.Wire and accounted 36.89% share of total world import value of S.S.Wire. There are very little trade data for **India**, **India** imports only 1.33% share of world's total import value of S.S.Wire and holds 22nd position in ranking in 2021.

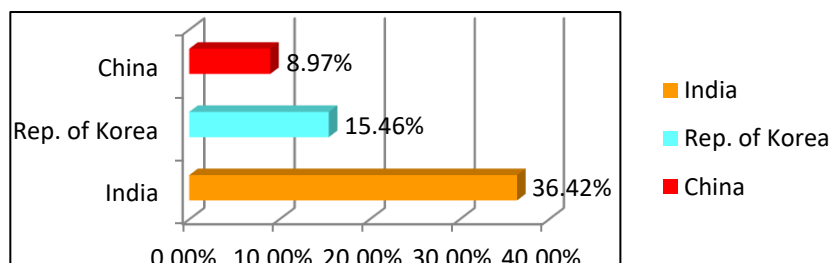
Major sources of world's top three importers of S S Wire (HS Code –7223).

- i) Top 3 Sources of S. S. Wire to Germany in 2021 by percentage:



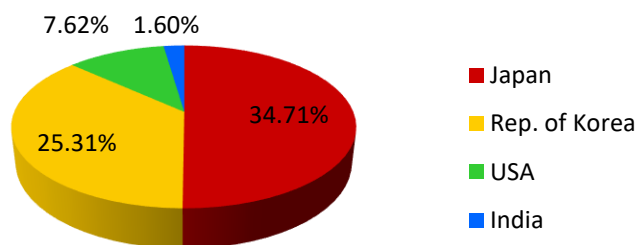
Germany imports most of its requirements of S. S. Wire from Rep of Korea with 14.53 % share of Germany's total import of S. S. Wire comes from Rep. of Korea in 2021. India (14.13%) & Sweden (12.64%) were the 2nd and 3rd major source of the commodity to Germany in the same year. (Source: UN Comtrade)

- ii) Top 3 Sources of S. S. Wire to USA in 2021 by percentage:



36.42% of S.S. Wire imports of USA comes from **India** in 2021, followed by Rep. of Korea(15.46%) and China(8.97%). (Source: UN Comtrade)

- iii) Top 3 Sources of S. S. Wire to China in 2021 by percentage:



Japan was the largest source of S. S. Wire to China in 2021, 34.71% of total S. S. Wire import by China from Japan in 2021. Rep. of Korea and USA were other major sources of S. S. Wire to China in that year. India has exported 1.60% share of China's total import in that year (Source : UN Comtrade)

IMPORT

Self Adhesive Materials of Plastics

Self-adhesive plastic sheet, known in the United Kingdom as **sticky-backed plastic**, is wide plastic sheet or film with an adhesive layer on one side, used as a surface coating for decorative purposes. It is typically smooth and shiny, but can also come in textured varieties, in which case it can sometimes be used as a cheap alternative to veneer. The plastic is often PVC. The sheeting is typically sold with a removable paper release liner to prevent it from adhering prematurely.

Self-adhesive vinyl sheet was introduced to the UK market in the 1960s under the brand name Fablon. It was extensively used in DIY at the time, and notably featured in children's DIY projects on the British TV show Blue Peter, but always under the generic name "sticky-backed plastic". Smooth self-adhesive plastic sheet is typically used to cover the studio floor for shiny-floor shows, thus giving them their name.

Pressure-sensitive tape, known also in various countries as PSA tape, adhesive tape, self-stick tape, sticky tape, Sellotape, or just tape, is an adhesive tape that will stick with application of pressure, without the need for a solvent (such as water) or heat for activation. It can be used in the home, office, industry, and institutions for a wide variety of purposes.

The tape consists of a pressure-sensitive adhesive coated onto a backing material such as paper, plastic film, cloth, or metal foil. Some have a removable release liner which protects the adhesive until the liner is removed. Some have layers of adhesives, primers, release agents, filaments, printing, etc. made for specific functions.

It will stick without the need for a solvent such as water or heat for activation. By contrast, "gummed" or "water activated" adhesive tapes require warm water for activation and "heat activated" tapes require heat.

Single-sided tapes allow bonding to a surface or joining of two adjacent or overlapping materials. Double-sided tape (adhesive on both sides) allows joining of two items back-to-back. Pressure-sensitive adhesive was first developed in 1845 by Dr. Horace Day, a surgeon. Commercial tapes were introduced in the early twentieth century. Hundreds of patents have since been published on a wide variety of formulations and constructions.

Adhesive transfer tape does not have a backing material. Instead, adhesive is on a double-coated release liner for winding on a roll. Sometimes the adhesive is sandwiched between two liners. Archival tape is similar to transparent office tape, with low-acid adhesives that will not degrade surfaces they are applied to, protecting documents from damage during long-term storage. Archival tape is similar to transparent office tape, with low-acid adhesives that will not degrade surfaces they are applied to, protecting documents from damage during long-term storage. Transparent office tape is used for repairing torn paper products, sealing envelopes, general holding, etc. It is a transparent film of cellophane, cellulose, polypropylene, or other plastic, with an acrylic or synthetic rubber-based adhesive. Clear tape with a matte finish is branded "Scotch Magic Tape" or called "invisible tape". Clear tape is sold in pre-filled single-use tape dispensers and in "refill" rolls for permanent desktop tape dispensers. Famous brands include Sellotape, Scotch Tape, Duck, Tesa, LePage's, Texcel, etc.

The Global import value of self adhesive plastic was US \$ 26.17 in 2021.. The global import of the commodity exhibited a upline of 21.26% in 2021 as compared to the year 2020.

These are broadly classified under **H. S. Code 3919**.

Table - 9

India's Top 10 Sources of Self Adhesive Plastics Materials (HS Code : 3919)

Rank	Countries	2018		2019		2020		2021	
		Value (million \$)	Share (%)	Value (million\$)	Share (%)	Value (million\$)	Share (%)	Value (million\$)	Share (%)
1.	China	129.74	30.91	142.73	31.48	70.20	33.33	176.45	38.08
2.	Korea RP	47.76	11.38	62.36	13.75	26.99	12.81	46.94	10.13
3.	Viet Nam	36.86	8.78	47.54	10.49	11.87	5.64	38.59	8.33
4.	U S A	49.01	11.68	45.31	9.99	19.42	9.22	36.01	7.77
5.	Japan	29.27	6.97	25.98	5.73	12.49	5.93	26.95	5.82
6.	Singapore	20.98	5.00	20.14	4.44	8.79	4.17	23.99	5.18
7.	Germany	19.62	4.67	17.93	3.95	9.33	4.43	22.17	4.79
8.	Hong Kong	9.34	2.23	21.14	4.66	15.66	7.43	20.59	4.44
9.	Taiwan	11.26	2.68	9.36	2.06	4.46	2.12	11.41	2.46
10.	Thailand	12.90	3.07	8.41	1.85	5.48	2.60	10.03	2.16
	Others	52.97	12.62	52.49	11.58	25.93	12.31	50.18	10.83
	Total	419.72	100	453.40	100	210.61	100	463.30	100

Source: DGCI&S

Note : India's Import including Re-import

The above data indicates that India's import of self-Adhesive Plastics Materials has grown to US \$ 463.30 million in 2021 from US \$ 210.61 million in 2020, which shows a growth of 120 % from the previous year's import i.e. in 2020. In the year 2021 India's major sources of Self Adhesive Plastic Materials are China (US \$ 176.45 Million), Rep. of Korea (US \$ 49.94 Million), Viet Nam (Us \$ 38.59 Million), USA (US \$ 36.01Million) and Japan (US \$ 26.95 Million). These 5 countries in total sold US \$ 325 Million value of Self Adhesive Plastic import into India Which shows more than 70% of total world import value of Self Adhesive Plastic imported by India from these 5 countries in 2021.

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Table - 10

World Top 10 Importer of Self Adhesive Materials of Plastics (HS Code :3919)

Rank	Countries	2018		2019		2020		2021	
		Value (million\$)	Share (%)	Value (million\$)	Share (%)	Value (million\$)	Share (%)	Value (million\$)	Share (%)
1.	China	2834.68	12.70	2794.31	12.96	2889.12	13.39	3420.65	13.07
2.	USA	1339.54	6.00	1353.89	6.28	1363.84	6.32	1765.95	6.75
3.	Germany	1297.08	5.81	1260.72	5.85	1258.39	5.83	1538.87	5.88
4.	Mexico	1272.65	5.70	1269.02	5.88	1136.64	5.27	1437.55	5.49
5.	Viet Nam	1162.17	5.21	984.31	4.56	1094.39	5.07	1147.75	4.39
6.	France	807.95	3.62	787.09	3.65	747.21	3.46	952.08	3.64
7.	U K	640.41	2.87	653.32	3.03	615.10	2.85	789.61	3.02
8.	Poland	474.01	2.12	169.63	0.79	549.46	2.55	716.95	2.74
9.	Canada	590.24	2.65	576.82	2.67	572.73	2.65	682.48	2.61
10.	Hong Kong	814.62	3.65	790.62	3.67	645.38	2.99	653.21	2.50
19.	India	420.57	1.88	453.68	2.10	348.70	1.62	463.17	1.77
	Others	10659.96	47.77	10473.59	48.56	10363.79	48.01	12602.79	48.16
	Total	22313.87	100	21567.00	100	21584.75	100	26171.07	100

Source :UNComtrade

China has become the world's largest importer among world's largest importers. Imports 13.07% share of world's import of Self Adhesive materials of Plastic in 2021 followed by USA and Germany. India's imports of Self Adhesive materials of Plastics have hit an all-time high and its share in the world-wide export market of this product was 1.77 % of total world import trade value of Self Adhesive materials of Plastics and ranked in 19th position in the world. In the 2021 the worth value of global import of the commodity was US \$ 26.17 Billion, which was US \$ 4.59 Billion more from 2020 and was on the pick level during the review period from 2018 to 2021.

Enzyme

Enzyme, a substance that acts as a catalyst in living organisms, regulating the rate at which chemical reactions proceed without itself being altered in the process.

The biological processes that occur within all living organisms are chemical reactions, and most are regulated by enzymes. Without enzymes, many of these reactions would not take place at a perceptible rate. Enzymes catalyze all aspects of cell metabolism. This includes the digestion of food, in which large nutrient molecules (such as proteins, carbohydrates, and fats) are broken down into smaller molecules; the conservation and transformation of chemical energy; and the construction of cellular macromolecules from smaller precursors. Many inherited human diseases, such as albinism and phenyl ketonuria, result from a deficiency of a particular enzyme.

Enzymes also have valuable industrial and medical applications. The fermenting of wine, leavening of bread, curdling of cheese, and brewing of beer have been practiced from earliest times, but not until the 19th century were these reactions understood to be the result of the catalytic activity of enzymes. Since then, enzymes have assumed an increasing importance in industrial processes that involve organic chemical reactions. The uses of enzymes in medicine include killing disease-causing microorganisms, promoting wound healing, and diagnosing certain diseases.

A large protein enzyme molecule is composed of one or more amino acid chains called polypeptide chains. The amino acid sequence determines the characteristic folding patterns of the protein's structure, which is essential to enzyme specificity. If the enzyme is subjected to changes, such as fluctuations in temperature or pH, the protein structure may lose its integrity (denature) and its enzymatic ability. Denaturation is sometimes, but not always, reversible.

In most chemical reactions, an energy barrier exists that must be overcome for the reaction to occur. This barrier prevents complex molecules such as proteins and nucleic acids from spontaneously degrading, and so is necessary for the preservation of life. When metabolic changes are required in a cell, however, certain of these complex molecules must be broken down, and this energy barrier must be surmounted. Heat could provide the additional needed energy (called activation energy), but the rise in temperature would kill the cell. The alternative is to lower the activation energy level through the use of a catalyst. This is the role that enzymes play. They react with the substrate to form an intermediate complex—a "transition state"—that requires less energy for the reaction to proceed. Enzyme activity can be inhibited in various ways. Competitive inhibition occurs when molecules very similar to the substrate molecules bind to the active site and prevent binding of the actual substrate. Penicillin, for example, is a competitive inhibitor that blocks the active site of an enzyme that many bacteria use to construct their cell walls.

Enzymes are used in the food, agricultural, cosmetic, and pharmaceutical industries to control and speed up reactions in order to quickly and accurately obtain a valuable final product. Enzymes are crucial to making cheese, brewing beer, baking bread, extracting fruit juice, tanning leather, and much more. The industrial uses of enzymes are also increasing since they are being used in the production of bio fuels and biopolymers. The enzymes can be harvested from microbial sources or can be made synthetically. Yeast and *E. coli* are commonly engineered to over express an enzyme of interest. This type of enzyme engineering is a powerful way to obtain large amounts of enzyme for bio catalysis in order to replace traditional chemical processes.

The global enzymes market was valued at USD 7.24 billion in 2021. Growing consumer awareness regarding health has resulted in surging demand for functional food and beverage products, which is further anticipated to trigger the product demand in the coming years. Enzymes are derived from the organs of animals such as plant materials, microorganisms, and calf stomach. With the advent of different technologies including genetic engineering, enzyme manufacturers have an option to produce the necessary quantity of enzymes in selected production hosts such as transgenic plants and microorganisms.

These are broadly classified under **H. S. Code 3507**.

Table - 9

India's Top 10 Source Countries of Enzyme (HS Code : 3507)

Rank	Countries	2018		2019		2020		2021	
		Value (million \$)	Share (%)	Value (million\$)	Share (%)	Value (million\$)	Share (%)	Value (million\$)	Share (%)
1.	China	37.07	28.06	42.59	36.57	27.04	34.60	50.92	30.36
2.	Germany	10.18	7.70	9.32	8.01	8.01	10.24	31.58	18.82
3.	Denmark	20.74	15.70	20.65	17.73	13.77	17.62	21.16	12.61
4.	U S A	18.03	13.65	11.32	9.72	8.07	10.32	15.30	9.12
5.	Lithuania	0.35	0.27	0.30	0.26	0.46	0.59	10.53	6.28
6.	Austria	4.37	3.31	3.22	2.76	2.45	3.13	8.26	4.93
7.	Netherland	5.54	4.19	7.30	6.27	5.15	6.59	7.58	4.52
8.	Singapore	4.86	3.68	5.99	5.14	2.80	3.58	5.45	3.25
9.	Japan	2.59	1.96	2.78	2.38	1.23	1.57	3.53	2.11
10.	U K	0.69	0.52	0.68	0.58	0.22	0.29	2.69	1.60
	Others	27.70	20.97	12.31	10.57	8.95	11.45	10.74	6.40
	Total	132.12	100	116.46	100	78.16	100	167.74	100

Source: DGCI&S

Note : India's Import including Re-import

The value of imports of Enzymes to **India** totaled US \$ 167.74 million in 2021. Sales of Enzymes to India increased by more than double in value terms compared to 2020. Major five source countries of Enzymes to India in 2021 are China (US \$ 50.92 Million), Germany (US \$ 31.58 Million), Denmark (US \$ 21.16 Million), USA (US \$ 15.30 Million) and Lithuania (US \$ 10.53 Million). These 5 countries in total exported US \$ 799.64 Million value of Enzymes to India which rounds up to 77.19% of the total Enzymes import into India.

Table - 10

World Top 10 Importer of Enzyme (HS Code :3507)

Rank	Countries	2018		2019		2020		2021	
		Value (million\$)	Share (%)	Value (million\$)	Share (%)	Value (million\$)	Share (%)	Value (million\$)	Share (%)
1.	USA	869.63	16.07	784.63	14.83	959.97	16.51	1191.96	16.44
2.	Germany	365.12	6.75	376.74	7.12	395.87	6.81	595.90	8.22
3.	Netherlands	346.06	6.40	376.92	7.13	441.26	7.59	536.35	7.40
4.	China	249.59	4.61	238.63	4.51	299.48	5.15	441.43	6.09
5.	France	249.44	4.61	215.19	4.07	215.79	3.71	244.17	3.37
6.	Denmark	220.85	4.08	193.29	3.65	175.79	3.02	236.97	3.27
7.	Brazil	167.05	3.09	162.39	3.07	182.30	3.13	232.96	3.21
8.	Russia	116.08	2.15	120.59	2.28	129.14	2.22	200.92	2.77
9.	Singapore	125.38	2.32	122.33	2.31	156.48	2.69	189.53	2.61
10.	Italy	128.39	2.37	138.92	2.63	142.38	2.45	175.67	2.42
13.	India	131.57	2.43	116.40	2.20	122.80	2.11	167.71	2.31
	Others	2442.14	45.13	2443.03	46.19	2594.20	44.61	3035.72	41.88
	Total	5411.29	100	5289.07	100	5815.46	100	7249.29	100

Source :UNComtrade

The imports of the Five major importers of Enzymes, namely USA, Netherlands, Germany, China and France represented more than one- third of total imports in 2021. In value terms, USA (US \$ 1.19 B), Germany (US \$ 595.90 M), Netherlands (US \$ 536.35 M), China(US \$ 441.43 M) and France (244.17M) constituted the countries with the highest levels of imports in 2021, together accounting for 41.52% share of global imports of Enzymes. India experienced the highest growth rate of the value of imports, among the main importing countries and ranked in 13th position in the world with 2.31% share of Global import of Enzymes in 2021.