Role of HR / CR / Galvanised Steel Products in India's Industrial Development

– By Sanjay Sengupta

Finished steel products are usually categorised into two categories viz non-flat products (often called long products) and flat products. In the flat product segment, hot rolled coils / sheets, cold – rolled coils, sheets and galvanised sheets and coils together play a very vital and important role in a country's industrial growth. The products are essential inputs for manufacturing sector comprising of engineering automotive, oil and gas, railway coaches and wagons, construction segments to name a few.

In 2009-10, the share of HR Coils / Skelp, HR Sheets, CR Sheets / Coils and GP/GC had a share of about 79 percent in the total production for sale of flat product and 39 percent in the total production for sale of carbon finished steel.

In apparent consumption based on 'Production for Sale', the share of the above group of products in the flat steel segment in 2009 was 77.91 percent and 45 percent in the apparent consumption of total finished steel after accounting for 'double counting'. It may be mentioned here that 'Production for Sale' is arrived at after deducting inter-plant transfers (IPT) and producer's own consumption from gross production.

"In 2009-10, the share of HR Coils / Skelp, HR Sheets, CR Sheets / Coils and GP/GC had a share of about 79 percent in the total production for sale of flat product and 39 percent in the total production for sale of carbon finished steel"

HR Coils / Strips / Sheets

Hot – Rolled Coils / Sheets are the most important production in the flat steel segment. Their downstream products like CR Sheets / Coils, GP/GC Sheets Tinplates, Pipes etc. play a significant role in the industrial development of a country. The global market demand and prices of HR Coils determine the fate of all its downstream products.

These products are made in both narrow and wide width's though at present there are no narrow width producer in the organised sector. Major producers like SAIL, Tata, Essar Steel etc. are now supplying narrow strips / sheets through their consignment agents.

SAIL's Skelp Mill at the Durgapur Steel Plant produces Skelp in the width range of 147 to 234 mm. It is an ISO – 9001 certified mill.

In 2009-10, production for sale of HR Coils / Skelp was 11.45 MT over 11.17 MT in the previous year with a growth of 2.51 percent. Contribution of Skelp was insignificant. Production for sale of HR Sheets went down by 1.95 percent in 2009-10.

Table – 1: Gross Production of HR Coils / Skelp / Sheets in India ('000 tonnes)

Year	Gross Production of		Total	Y-o-Y Change (%)
	HR Coils/Skelp	HR Sheets		
2001-02	7208	655	7863	==
2002-03	8735	519	9254	17.69
2003-04	9280	856	10136	9.53
2004-05	9774	1110	10884	7.38
2005-06	11082	610	11692	7.42
2006-07	12989	703	13692	17.11
2007-08	13684	757	14441	5.47
2008-09	14210	615	14825	2.66
2009-10 (p)	15162	625	15787	6.49

Production of HR Coils / Skelp / Sheets in India

The gross production of HR Coils / Skelp / Sheets (including IPT) producers own consumption between 2001-02 and 2009-10 are shown in Table – 1.

N.B. Gross production has been used in the table to maintain the comparability of data with earlier years. Production for sale is a recent introduction by JPC.

The decline in output in 2008-09 was due to a slowdown in industrial activity during the second half of the year. The gross production of HR Coils / Skelp in 2009-10 at 15.16 MT is the highest produced by India.

Industry Groupwise Consumption of HR Coils / Skelp and HR Sheets in India During 2009-10 are shown below :
Industry Groupwise Consumption of HR Products During 2008-09

Industry Group	% of Total Consumption
C.R. Units	30.8
Tube Makers	27.0
Galvanised / Coated Sheets	8.7
Electrical Manufacturers	6.8
Machinery Manufacturers	4.2
Auto / Tractor / Cycle Industries	4.0
LPG Cylinder Industry	3.0
Other Engineering Units	3.5
Others	12.0
Total	**100.00**

Imports of HR Coils

Imports of HR Coils by India between 2001-02 and 2009-10 are shown in Table – 2.

The negative growth in 2002-03 was due to the continuation of the south – east Asian crisis. Imports of HR Coils reached the level of 1.5 MT plus during 2005-06 and 2006-07 due to robust domestic demand and further to about 2.9 MT and above in 2007-08 and 2009-10 and then going down by 22.29 percent in 2008-09 due to global industrial crisis.

Major Applications of HR Coils / Sheets / Skelp

Grade / Specifications	Applications
IS:10748/95 Graders I to V	Tube Making
IS : 11513/85, Grades, O, D, DD & EDD	Cold reduction, manufacturing of GP/GC Sheets, auto, white goods & general engineering
IS : 1079/94, Grades, O, D, DD & EDD	General structural application and forming purposes, general engineering
IS : 2062/99, Grade A, B, C IS : 5986/1992, FE 330, 360, 410, 510	Fabrication of engineering structurals, Manufacturer of Hamilton and other poles, flanging applications.
Medium Carbon SAE 1030, E-34, E-38, SAPH – 310, SAPH – 370, 440, B SK-46	Strapping of high strength. Fabrication of long and cross members for LCV, MCV and HCV
JISC 3113, SAPH45, SAPH-310, SAPH-370, SAPH-400, SAPH-440, BSK-46	Long and cross member of LCV & MCV, wheelers disc, wheel rim and other structural components of passenger cars.
SAE – 1541	Manufacturer of forks & spokes for two wheelers
IS : 6240 / 1999	Domestic and Auto LPG Cylinders
JISG-3116, EN-10120,	Export quality LPG Cylinders
SAE – 1012	Manufacture of wheel disc & cold formed sections
Medium Carbon Grades : SAE-1040, SAE 1045, SAE-1055	Chains including cycle chains, hair chips, clutch plates, hacksaw plates etc.
Grade 2062 / 1199, Grade B with Copper, IRSM-41 / HCRS	Manufacture of corrosion resistant engineering products
API5L, Grades A, B, X-42, X-46, X-56, X-60, X-65, X-70 and X-80	Manufacture of tubes and pipes mostly for oil and gas sectors
IS : 5986 Fe 510, IS-8500	For high tensile, structural applications

Exports of HR Coils

Exports of Hot Rolled Coils by India between the years 2001-02 and 2008-09 are furnished in Table – 3.

N.B. Gross production has been used in the above table to maintain the comparability of data with earlier years.

The drop in the exports of Hot – Rolled Coils by India in 2004-05 and 2005-06 was due to the fact that as a result of very robust

Table – 2 : Imports of HR Coils by India : 2001-02 to 2009-10 ('000 tonnes)

Year	Imports	Y-o-Y Growth (%)
2001-02	362	-
2002-03	318	(-) 12.15
2003-04	413	29.87
2004-05	817	97.82
2005-06	1527	86.90
2006-07	1572	2.95
2007-08	2948	87.53
2008-09	2293	(-) 22.22
2009-10 (P)	2939	28.17

Data Source : JPC (P) = Provisional

Table – 3 : Exports of Hot Rolled Coils by India : 2001-02 and 2009-10 ('000 tonnes)

Year	Exports	Y-o-Y Growth (%)	Export as a % age of Production
2001-02	979	==	13.58
2002-03	1393	42.29	15.98
2003-04	1522	9.26	16.40
2004-05	1328	(-) 12.25	13.59
2005-06	1263	(-) 4.89	11.40
2006-07	1580	25.10	12.16
2007-08	1391	(-) 11.96	10.17
2008-09	943	(-) 32.21	6.64
2009-10 (P)	540	(-) 42.74	3.56

Data Source : JPC (P) = Provisional

Table – 4: Apparent Consumption of Hot – Rolled Coils / Skelp in India between 2001-02 and 2009-10 ('000 tonnes)

Year	Apparent consumption of HR Coils / Skelp	Y-o-Y Growth (%)
2001-02	6261	==
2002-03	7326	17.01
2003-04	7657	4.52
2004-05	8597	12.28
2005-06	9523	10.77
2006-07	13041	36.95
2007-08	15256	16.98
2008-09	15474	1.43
2009-10 (P)	17357	12.17

Data Source : JPC (P) = Provisional

domestic demand, many leading Indian producers pegged their exports to meet the requirements of the domestic market.

The hefty drop of 32.21 percent and 42.74 percent in 2008-09 and 2009-10 was as a result of lack of demand in the global market and not so high world export prices particularly from October, 2008.

India recorded her highest export of Hot – Rolled Coils at 15.80 MT in 2006-07. In that year, the Y-o-Y growth was high at 15.10 percent and the share of export of the product in India's total output was 12.16 percent.

The highest share of exports of Hot – Rolled Coils in the country's gross domestic production at 16.40 percent was achieved in 2003-04.

Apparent Consumption of HR Coils / Skelp

The apparent consumption of Hot – Rolled coils / Skelp in India between 2001-02 and 2009-10 are shown in Table – 4.

N.B. 1. In the above figures the share of Skelp is marginal.

2. Apparent consumption figures are based on gross production and are inclusive of feed materials used by C. R. Units.

The low growth in apparent consumption at 1.43 percent in 2008-09 over the previous year was due to the influence of global crisis.

Thin Slab Casting

Broadly defined, thin slab casting technology eliminates the primary breakdown portion of a Hot Strip Mill. Also in this technology, the equipment needed to continuously cast a 2 – inch thick slab is much less than a conventional 8 – inch or 10 – inch thick slab. This makes the thin slab casting technology relatively inexpensive.

The major advantages for EAF steelmaking which are tied to a hot strip mill include the following:

- Low capital costs. By the elimination of slab handing facilities, re-heating system and the breakdown mill, the technology can reduce the total capital costs by about 50 percent.
- Relatively few workers are employed.
- High yield.
- Rising output is achieved as new technologies are developed to increase the casting speed.
- Modification of the rolling mill can produce even thinner sheets in the hot strip mill.
- It is a cost effective technology.

It has been found that the uniform conditions of the slab in a thin slab caster produce a finished coil with uniform exit conditions in terms of gauge and temperature. Tolerances, gauge control, crown and wedge at these facilities are among the best in the industry.

The second generation thin slab casters are employing a number of new features like electro – magnetic brake, hydraulic mould oscillation and some type of liquid core slab reduction system to improve the product quality.

Major Thin Slab Casting Processes are:

- SMS Demag's (now SMS Siemag) compact Strip Production (CSP) technology.
- In-line Strip Production (ISP) technology developed by Mannesman Demag.
- Conroll Process developed by Voest Alipine (now Siemens VAI) of Austria.

India's Ispat Industries Ltd. has installed CSP technology in its HS Mill at Dolvi in Maharashtra with the following advantages.

- About 50 percent space is required as compared to conventional HS Mill of the same size.
- Overall energy consumption for production of HR Coils per ton is only 90,000 kCal as compared to 350,000 kCal with cold charged EAF.
- Only 29/30 minutes of process time is required as against

8 hours in a thick slab casting process.

- From liquid steel to Hot – Rolled Coils stage, the yield is 96/97 percent as against 93/94 percent in the conventional process.
- Since no slab re-heating or roughing reduction is required, the rolling mill cost index is just 100 against 150 for the conventional thick slab rolling process.
- Labour productivity is very high.
- Ispat's HS Mill is capable of producing strips below 1.00 mm thickness.

Cold – Rolled Products

Cold – Rolled Coils / strips / sheets are versatile steel products that are used as critical inputs in various sophisticated industries which demand very stringent quality specifications, high level of surface finish and close tolerances in dimensions.

Important applications of cold – rolled products are found in the manufacture of automotive body, auto components, petroleum tankers, lube grease barrels, bitumen drums, agricultural and electrical equipment, earth moving equipment, furniture, office equipment, precision tubes, bicycle components, fabricated parts of engineering machinery, production of GP/GC sheets, railway coaches, locomotives, railway wagons, elevators, containers, trucks and cold formed sections.

Industry Group wise Consumption of CR Products

The industry group wise consumption of CR products in India is show below:

The industry group wise consumption of CR products in India is show below:

Industry Group	% Share in Total Consumption of CR Products
Auto / Tractor / Cycle	21.00
Drums / Barrels / Containers	12.50
Galv / Coated Sheets	13.70
Oil Sector	11.80
Tube Makers	6.50
Furniture Makers	6.85
Consumer Durables	7.15
Agri Implements	4.50
Other Engg. Units	3.75
Machinery Manufacturers	3.25
Electrical Manufacturers	2.80
CR Units	3.00
Total	**100.00**

N. B. : The figures are indicative

Major Applications of Cold – Rolled Products

Grade wise applications (major) of Cold – Rolled Products are shown below :

The industry group wise consumption of CR products in India is show below:

Specification / Grades	Applications
Full Hard IS : 513-0 Un-annealed	Coated sheets
IS : 513-0 (SK) / D (K)	Packaging, Precision tubes
IS : 513 D/DD/EDD	Household applications, Automobiles
IRSM – 41	Railway coaches, Wagons
IS : 5130/D with Copper	Corrosion resistant applications
Semi – Processed Electrical Steel	Fractional horse power motors
	and electrical applications
HSCR 26/35	Load bearing components for
	automobiles, Rolled formed sections,
	Industrial storage systems, Drums, Barrels etc.

N. B. : The figures are indicative

Production

The Gross Production of CR Sheets / Coils in India between 2001-02 and 2009-10 are shown in Table – 5.

Table – 5: Gross Production of CR Sheets / Coils between 2001-02 & 2009-10

Year	Gross Production	Y-o-Y Growth (%)
2001-02	4800	==
2002-03	5055	5.31
2003-04	5597	10.72
2004-05	6151	9.90
2005-06	6791	10.40
2006-07	7447	9.66
2007-08	7451	0.05
2008-09	7598	1.97
2009-10 (P)	7558	-0.53

Data Source : JPC (P) = Provisional

The low growth in production in 2007-08 on Y-o-Y basis was mainly due to a lower production of 99,000 tons by SAIL's Bokaro Steel Plant at its CR Mill was shutdown for capital repairs for some period.

The low growth in 2008-09 was due to the global crisis which also affected the Indian steel industry adversely.

In 2009-10, gross production came down as IPT/producers own consumption came down to 1.82 MT in the year from 2.98 MT in 2008-09. Production for sale, however, has increased by 24.2 percent at 5.74 MT over 4.62 MT in 2008-09.

Imports

Imports of CR Coils / Sheets by India between 2001-02 and 2009-10 are shown in Table – 6.

Table – 6: Imports of CR Coils / Sheets by India: 2001-02 to 2009-10 ('000 Tonnes)

Year	Imports	Y-o-Y Growth (%)
2001-02	204	==
200203	303	48.53
2003-04	243	(-) 19.20
2004-05	287	18.11
2005-06	485	68.99
2006-07	606	24.95
2007-08	821	35.48
2008-09	710	(-) 13.52
2009-10 (P)	882	24.23

Data Source : JPC (P) = Provisional

Imports of CR Coils have increased substantially since 2005-06 due to higher domestic demand as a result of robust industrial growth except in 2008-09 when there was a drop of 13.52 percent – the reason being the global crisis.

Exports

Exports of Cold – Rolled products by India are shown in Table – 7.

Table – 7 : Exports of CR Products by India : 2001-02 to 2009-10 ('000 Tonnes)

Year	Exports	Y-o-Y Growth (%)
2001-02	320	6.67
2002-03	574	11.36
2003-04	770	13.76
2004-05	1266	20.58
2005-06	1158	17.05
2006-07	386	5.18
2007-08	510	6.84
2008-09	341	4.89
2009-10 (P)	345	4.56

Data Source : JPC (P) = Provisional
N.B. The production figures are gross production.

India exported at significant proportion of her production in 2004-05 and 2005-06. But in 2006-07 and 2007-08, the producers had to peg their exports to meet the robust domestic demand. In 2008-09, exports were low due to very sharp decline in the demand in the global market and lower export prices. In 2009-10, the same continued in the first half of the year.

Apparent Consumption

The apparent consumption of CR Sheets / Coils in India between 2001-02 and 2009-10 is furnished in Table – 8.

Table – 8 : Apparent Consumption of CR Sheets / Coils in India : 2001-02 to 2009-10 ('000 Tonnes)

Year	Apparent Consumption	Y-o-Y Growth (%)
2001-02	4539	==
2002-03	4783	5.38
2003-04	5070	6.00
2004-05	5172	2.01
2005-06	6118	18.29
2006-07	7562	23.60
2007-08	7742	2.38
2008-09	7982	3.10
2009-10 (P)	7978	(-) 0.05

Data Source : JPC (P) = Provisional
N.B.I : The apparent consumption figures are based on gross production and include feed materials.

The negative growth in 2009-10 is due to a decline in IPT/Producers own consumption which came down from 2.98 MT in 2008-09 to 1.82 MT as these figures are included in gross production. Based on production for sales, which excludes IPT / producters' own consumption, the apparent consumption CR Sheets / Coils in 2009-10 was 6.16 MT over 5.0 MT in the previous year, recording a growth of 23.2 percent.

Structures of Cold Rolling Industry in India

There are two types of cold rolling mills in India. These are :

- Narrow width mills producing in the width range of 650mm to 750 mm.
- Wide width producer producing in the width range of 1000mm to 200 mm.

Major companies like SAIL, Tata Steel, Jindal South West Steel Ltd., Lloyds Steel and Bhushan Steel (new plant in Orissa) etc. have their own captive hot strip mills. The capacity of the narrow width producers is about 20 percent of the total 8.0 MT.

Most of the narrow width mills have installed slitters to slit the wide width sheets into sizes suitable for their mills. Some of these mills outsource slitting to service centres. Slitting is also required for CR Sheets / strips since end use industries like automotive, consumer goods, tube makers, drums / barrel, furniture makers, manufacturers of machinery and agricultural implements etc. require in narrow widths and cut lengths.

Changing Pattern of Cold Rolled Product Demand

The demand for Cold – Rolled products in India is showing an accelerated growth. The requirements of product quality are also changing fast. The change in the usage of Cold – Rolled steel is evident in two major areas. These are:

- To retain the steel intact with full initial strength
- To increase the life of any suitable finishing system applied over it.
- To provide the surface a more pleasing appearance.

Advantages of Zinc Coating

- It protects steel from corrosive attack in most atmospheres, acting as a continuous and lasting shield between the steel and the atmosphere as long as the zinc sheath remains unbroken.
- It acts as a galvanic protector sacrificing itself slowly in presence of corrosive elements by continuing to protects the steel even when moderate – sized areas of the base metal is exposed. This ability of zinc results from the fact that zinc is more electro-chemically active than all of the industrial coating materials, and zinc alone possess this type of dual property.

Structure of Galvanised Steel / Colour Coated Sheets in India

The structures of Galvanised and Colour Coated steel in India is furnished below (as on 2008-09) :

The structures of Galvanised and Colour Coated steel in India is furnished below (as on 2008-09) :

Industry	Total Units	Working Units	Total Capacity ('000 Tonnes)
GP / GC Sheets	18	18	3,786
Color Sheets	5	5	465

Source : Background Paper, CII Steel Summit, 2009

Broad Sectorwise Consumption Pattern of Galvanised Steel in India

The broad sectorwise consumption pattern of galvanised plain (GP) and galvanised corrugated (GC) sheets in India are shown below :

The broad sectorwise consumption pattern of galvanised plain (GP) and galvanised corrugated (GC) sheets in India are shown below :

Sector	% Share in Consumption
Construction	40
Consumer Durables	10
Drums / Barrels / Containers	9
Railways / Power / Irrigation	8
CPWD / PWD / Other Govt.	7
Tube Makers	4
Furniture Makers	5
Engg. Units	5
Colour Coated	5
Automobile	5
Others	2
Total	100

N. B. : The figures are indicative

Special Quality Galvanised Coated Sheets

✢ Galvanised (GA) Sheets

The process was developed to satisfy the stringent quality requirement for producing the outer and inner panels of autobody at optimum cost. In this process, an inner metallic of iron and zinc is formed on the surface of the strip by diffusing iron from the surface into the zinc coating. The surface characteristics become more important in galvannealing than in galvanising. These steels are used by the automotive industry because of improved performance in models which require lighter and stronger grades of steel.

✢ Galvalume of Zincalume

This consists of 55 percent aluminium, 43.5 percent zinc and 1.5 percent of silicon by weight. It provides a tough barrier between atmospheric condition and inner core of steel. Protection is offered by the corrosion resistance of the coating itself. It also protects steel from corrosion at cut edges and scratches which is achieved by the sacrificial protection provided by zinc in the coating. Galvolume has a life three times more than of ordinary galvanised steel.

Advantages of using Galvalume are:

I. Resistance atmospheric corrosion at cut edges and crack protection.

ii. Yield advantage: Aluminium makes up to 55 percent of Galvalume by weight but comprises 80 percent by volume, so the coating weight is less, giving more square feet per ton of material.

iii. It has good formability, can be sent rolled formed and drawn without sacrificing coating adhesion.

iv. It is high temperature resistant and can withstand temperature up to 6000F without surface decolourisation. It also has very good thermal reflectivity.

✢ Galfan

It is 95 percent zinc and 5 percent aluminum with outstanding coating adhesion. It is an ideal material for deep drawn 'zero thickness' bend application. Galfan is three times corrosion resistant than ordinary galvanised steel.

✢ Galbo Sheets

It is highly corrosion resistant with good formability, durability and paintability. It is used in white goods manufacturing and in the production of colour coated sheets.

✢ Galvano Sheets

This galvanised plain steel with 'zero spangles' has been developed by Tata Steel under the brand name 'Galvano'. The product is available in sheet and coil form and is being used successfully for general engineering applications.

Production of GP/GC Sheets in India

Production figures of galvanised plain and galvanised corrugated (GC) sheets in India between 2001-02 and 2009-10 are shown in Table – 9.

Table – 9 : Production of GP/GC Sheets in India : 2001-02 to 2009-10 ('000 Tonnes)

Year	Production	Y-o-Y Growth (%)
2001-02	2356	==
2002-03	2790	18.42
2003-04	3130	12.19
2004-05	3672	17.32
2005-06	3782	3.00
2006-07	4321	14.25
2007-08	4381	1.39
2008-09	4554	3.95
2009-10 (P)	4470	1.84

Data Source : JPC (P) = Provisional

The decline in production in 2009-10 was due to a sharp fall in the output of other secondary producers (except secondary majors viz Essar, Ispat and JSWL) of 19.2 percent at 2.15 MT over 2.66 MT in 2008-09. Production of secondary major at 1.55 MT in 2009-10 went up by 30.25 percent over 1.19 MT in the previous year. Production of main producers at 765,000 tons in 2009-10 went up by 7.59 percent as compared to 711,000 tons in 2008-09. Main Producers are SAIL and Tata Steel.

Imports

Imports of GP/GC Sheets by India between 2001-02 and 2009-10 are presented in Table – 10.

Table – 10 : Imports of GP/GC Sheets in India Between 2001-02 to 2009-10 ('000 tonnes)

Year	Imports	Y-o-Y Growth (%)
2001-02	97	==
2002-03	92	(-) 5.15
2003-04	102	10.87
2004-05	106	3.92
2005-06	134	26.42
2006-07	195	45.52
2007-08	268	37.44
2008-09	294	9.70
2009-10 (P)	287	(-) 2.38

Data Source : JPC (P) = Provisional

It is observed that imports of GP/GC has increased considerably since 2006-07 due to higher domestic demand. The low growth of 9.70 percent was due to the global crisis in 2008-09. In 2009-10 the drop of 2.38 percent was due to lower domestic demand as the stocks with the producers increased from 127,000 tons on April 1, 2009 to 239,000 tons as on March 31, 2010 – an increase of 112,000 tons.

Exports

The exports of GP/GC sheets by India between 2001-02 and 2009-10 are shown in Table – 11.

Table – 11 : Exports of GP/GC Sheets By India : 2001-02 to 2009-10 ('000 Tonnes)

Year	Exports	% of Export in Production
2001-02	695	29.50
2002-03	1610	57.71
2003-04	1486	47.48
2004-05	1843	50.19
2005-06	1244	32.89
2006-07	2173	50.29
2007-08	2026	46.25
2008-09	1849	40.60
2009-10 (P)	1287	28.79

Data Source : JPC (P) = Provisional

Since 2002-03, India exported between 33 to 58 percent of her production. The high quality of Indian GP/GC products has been well accepted in the global market. Exports declined in 2008-09 due to a sharp decline in global demand and low export prices. In 2009-10, exports were pegged by many leading producers to meet the robust domestic demand and not so high prices in the global market.

Apparent Consumption

The apparent consumption of GP/GC sheets in India is shown in Table – 12.

Table – 12 : Apparent Consumption of GP/GC Sheets : 2001-02 to 2009-10 ('000 Tonnes)

Year	App. Consumption	Y-o-Y Growth (%)
2001-02	1750	==
2002-03	1265	(-) 27.71
2003-04	1691	33.68
2004-05	1926	13.90
2005-06	2051	6.49
2006-07	2400	17.02
2007-08	2617	9.04
2008-09	3018	15.32
2009-10 (P)	3358	11.27

Data Source : JPC (P) = Provisional

The decline of 27.71 percent in apparent consumption in 2002-03 was due to low domestic demand and the producers exported 57.71 percent of domestic production. Even in 2008-09 which was a difficult year for the steel industry, India's apparent consumption of GP/GC sheets increased by over 15 percent at 3.02 MT. The high growth of 28.79 percent in 2009-10 was as a result of the government's stimulus package to revive the construction sector including housing.

Colour Coated Sheets

Colour coating usually refers to the application of a liquid paint coat over the substrate in a automatic, continuous process after pre-treatment. The pre-painted colour coated steel is a very high value product that combines the best properties of bath substrate and organic coating, additionally imparting it an aesthetic finish, high degree of durability and high corrosion resistance.

Colour coating is done on various substrates to produce the most cost-effective high quality products with top coat compatible with environment. The substrates usually used for production of colour coated sheets are :

- Hot – Dipped Galvanised Steel
- Electro – Galvanised Steel
- Galvalume
- Galbo sheets
- Aluminium

Producers of Colour Coated Sheets in India

Originally, there were two producers of colour coated sheets in India. These were: Ispat Industries Ltd. and Shree Precoated Steels Ltd. (SPSL) each with a capacity of 50,000 tpy. Presently, Ispat has planned to increase its capacity to 100,000 tpy and SPSL's has been acquired by Essar Steel Ltd.

Bhushan Steel and Strips Ltd., has commissioned 120,000 tpy capacity colour coating line at Khopoli in Maharashtra. Tata Steel and BlueScope Steel of Australia has entered into a joint venture on 50:50 basis and have set up a metallic and colour coating and painting facility at Bara near Jamshedpur and aluminium coated steel called zincalume (Galvalume) and pre-painted zinc and aluminium coated steel branded as 'COLORBOND' whose capacity is 150,000 tpy.

Uttam Galva Steel has set up a 80,000 tpy colour coating line at Khopoli in Maharashtra. Arcelor Mittal, the World's largest steel producer, has acquired about 34 percent stake of Uttam Galva and is ultimately planning to acquire 44.2 percent stake in the company.

Conclusion

Hot-Rolled, Cold-Rolled and galvanised steel products play a crucial role in the industrial development of a country. Leading producers of these products in India have installed very sophisticated state-of-the art technologies in their plants and are producing quality products for high end applications.

The reorientation of product-mix is a very important factor for these products for meeting the challenges of the market. Higher realisations and margins are associated with these products especially the cold – rolled segment.

Compared with the previous year, in 2009-19, India's automotive sector has posted robust growth. Production has

increased by 25.76 percent, domestic sales by 26.41 percent and exports by 17.90 percent. This has boasted the demand of these products, particularly that of cold – rolled and galvanised steel products. With the proposed expansion of India's railway network, the demand for these products may go up substantially in future in the form of railway coaches, wagons and locomotives.

With increased market demand and planned capacity expansion, the manufacturers of Hot-Rolled, Cold-Rolled and glavanised steel products in India are destined to see brighter days in future.