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SAIL JYOTI

GP COIL / SHEETS & GC SHEETS



*Long-Lasting
Roofing, Cooling
and Storing
Solutions*



There's a little bit of SAIL in everybody's life

SAIL JYOTI GALVANISED PLAIN COILS & SHEETS FROM BOKARO & ROURKELA STEEL PLANT

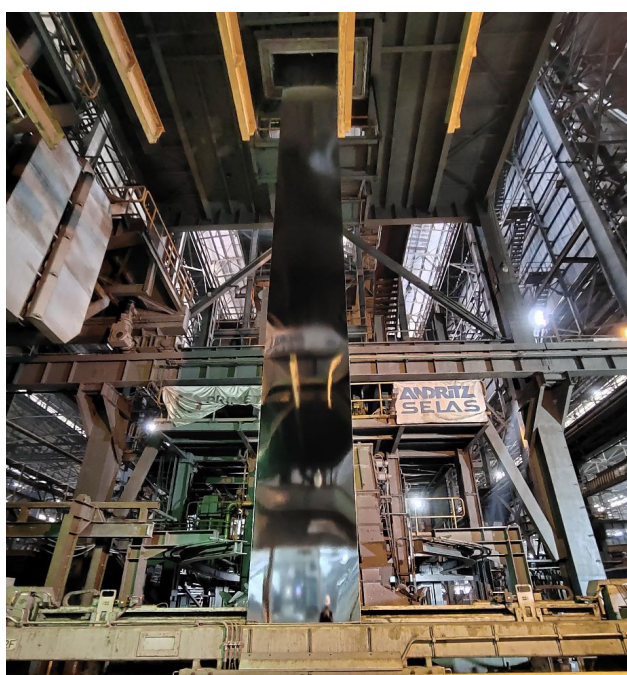
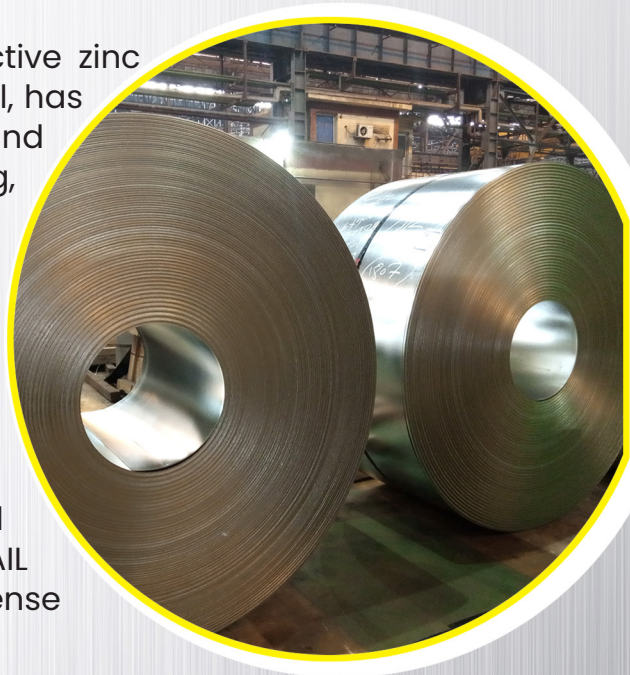
Galvanisation is the process of applying a protective zinc coating to steel, to prevent rusting. Galvanised steel, has bright surface finish, is durable, long-lasting and economic solution for a number of storage, roofing, cooling, ducting and other applications of everyday life and industrial usage.

SAIL, one of India's largest and trusted steel maker, produces steel products in this category in the form of Galvanised Plain (GP) sheets/coils and Galvanised Corrugated (GC) sheets. These value-added high-performance steel products are tough, sturdy, lightweight, bright and corrosion-resistant. Branded as **SAIL JYOTI**, SAIL Galvanised products add value to life in the true sense of the term.

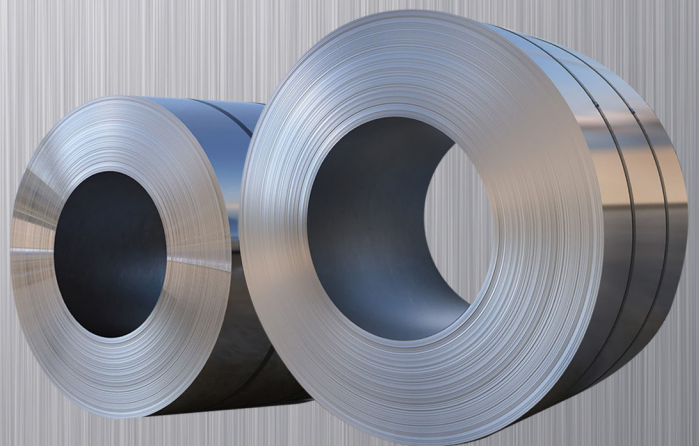
SAIL Galvanised Products are manufactured at Bokaro Steel Plant and Rourkela Steel Plant with Cold Rolled coils as input material, which are then zinc-coated. **SAIL JYOTI** galvanised products conform to IS 277/2018.

SAIL Galvanised sheets and coils are popular input material for manufacture of AC ducts, coolers, ice-boxes and even bus/truck bodies. SAIL JYOTI is extensively used as roofing material for household and industrial sheds to bins for storage of grains, water and other goods.

Environment-friendly and economically viable, SAIL JYOTI Galvanised sheets/coils are available at all company Warehouses, distributors and Dealer outlets across the length and breadth of the country.



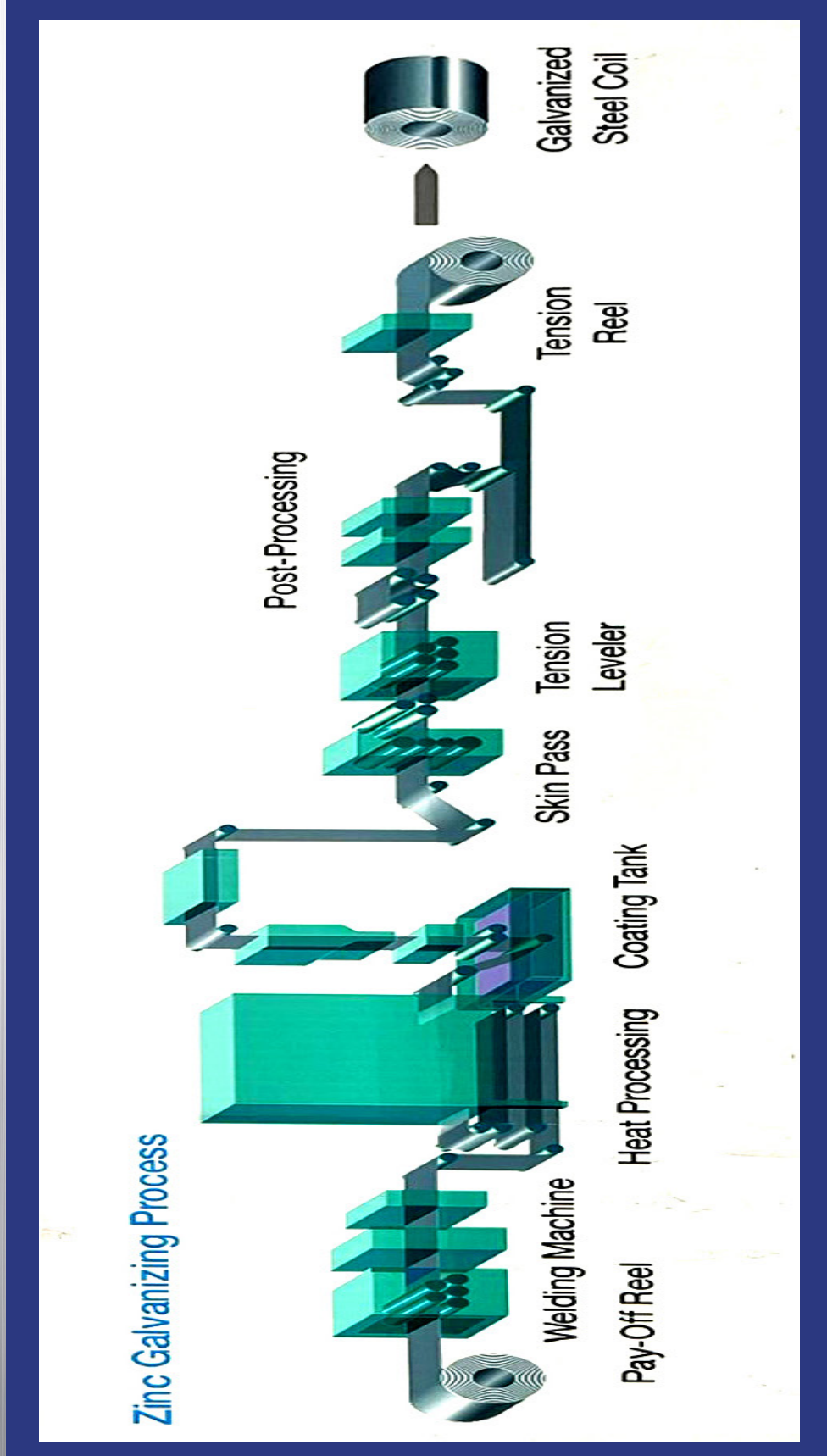
Zero-Spangle Premium Galvanized Product



Bokaro Steel Plant

Bokaro GP Coils are produced from new **Hot Dip Galvanising Lines (HDGL)** of CRM-III. This is state-of-the-art mill with electrolytic cleaning, supplied by M/s. SIEMENS VAI and facility of differential Zinc Coating, Skin Pass Mill. Annual capacity of this mill is 3,24,000 tons. This mill can produce high strength high coating Galvanised coils/sheets in thickness 0.4mm to 2mm.

HDGL Process Flow



Bokaro Steel Plant

HDGL Coil Data

Incoming Coil Details:

Properties	Entry Coil	Exit Coil
Thickness	0.40 – 2 mm	0.40 – 2 mm
Width	800 – 1560mm	800 – 1560 mm
Coil ID	508 mm	508 mm
Coil OD	1000 – 2000mm	1000 – 2000mm
Coil Weight (Max.)	10 – 25 Ton	10 – 25 Ton

HDGL Features

- Products : Galvanised Plain Coils
- Light Laser Welder
- Movable Induction heating Furnace
- Propane Fired Furnace instead of Coke-oven gas
- Electrolytic Cleaning before Furnace (similar to ECL)
- Camera Inside Furnace for better visibility
- High Tech Zinc Coating Control (Dynamic Air Knife) :
Coating Mass:
GI : 80 to 600 g/m²
- Differential Coating:
– GI : 80 to 180 g/m²
- Both Vertical Looper before and after Furnace
- Better Elongation Control using Bridles
- Vertical and horizontal Inspection Section
- Electrostatic Oiling
- Wet Skin Passing
- Online Weighing Machine
- Exclusive and advanced Packaging Line

Tension Leveling & Inspection Line (HDGL)

- Turret type Side Trimming
 - Trimming Width : 2 –15 mm
 - Burr Masher : Flattens edge burrs
- Inspection Station
 - Horizontal & Vertical Inspection Station
 - Inspection both side of the strip
 - Stroboscopic Light for identification of defect, if any
- TL provides tension to the strip to maintain the flatness and also corrects shape of the strip by reducing the bow error.
- IL is used for automatic inspection of the strip for any errors.
- Only Strip Surface inspection can also be given without Tension leveler.

Bokaro Steel Plant

SKIN PASS MILL at HDGL/CRM-III

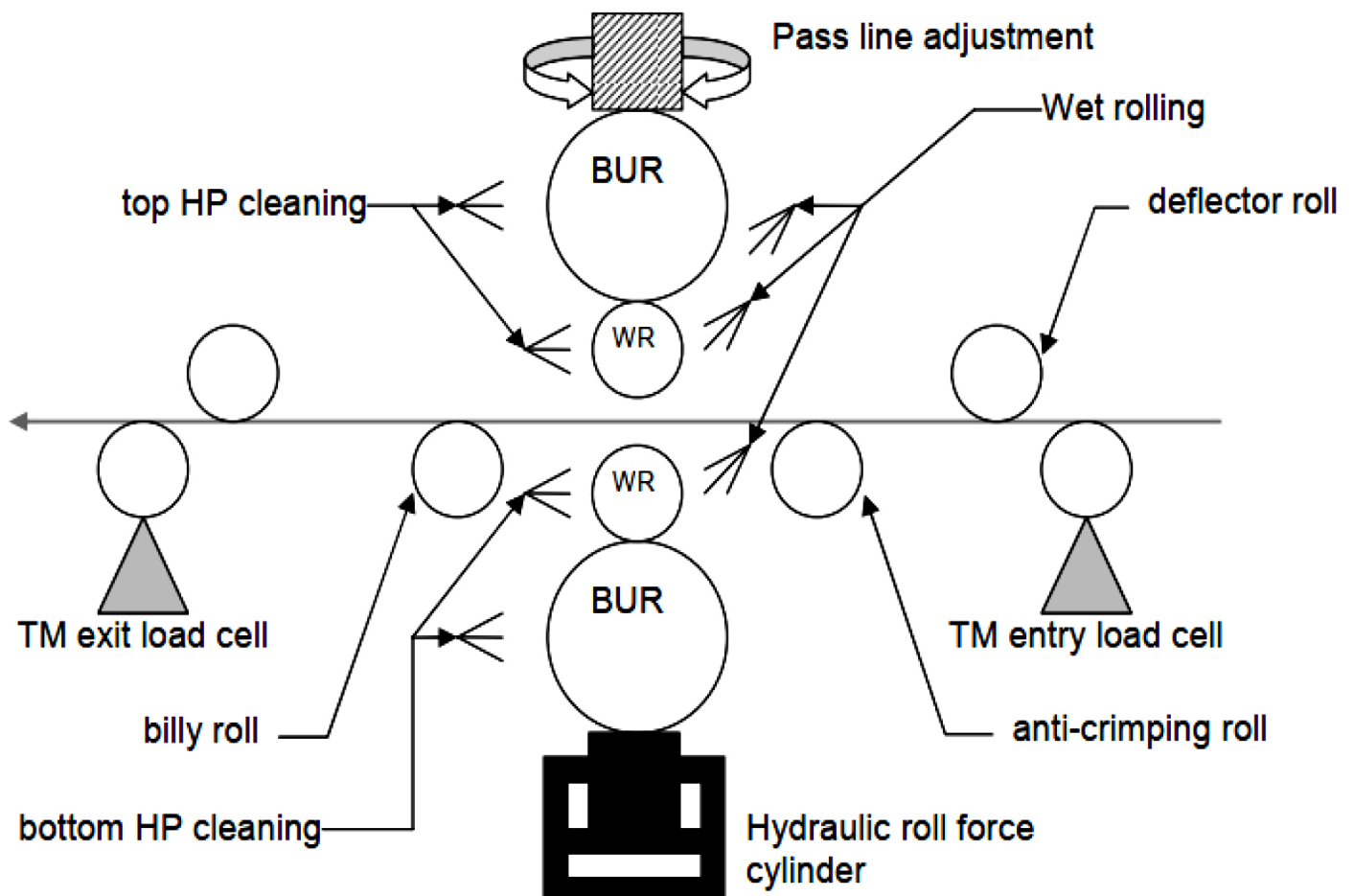
Function

Skin Pass Mill has two main functions which are:

1. Transfer the work rolls roughness to the strip surface improving the paintability and developing a matte-finished, non-glossy galvanized spangle-free product.
2. Provide, along with the entry and intermediate tension bridles, the mechanical work needed for strip elongation. Elongation improves flatness, with a relatively high rolling force and includes changes in the product metallurgical properties such as yield point.

Brief Description

The necessary roll force to achieve these objectives of strip surface texture and elongation is provided by the Skin Pass Mill stand, a four-high mill with AC motor-driven backup rolls. With a relatively high roll force, elongation changes the metallurgical properties of the product, such as yield stress, and improves strip flatness. The Skin Pass Mill roll force and elongation depends on the roughness of the rolls, product characteristics, and the rolling mode. A simplified view of the Skin Pass Mill is given below:



Bokaro Steel Plant

SKIN PASS MILL

Design Data of the Plant

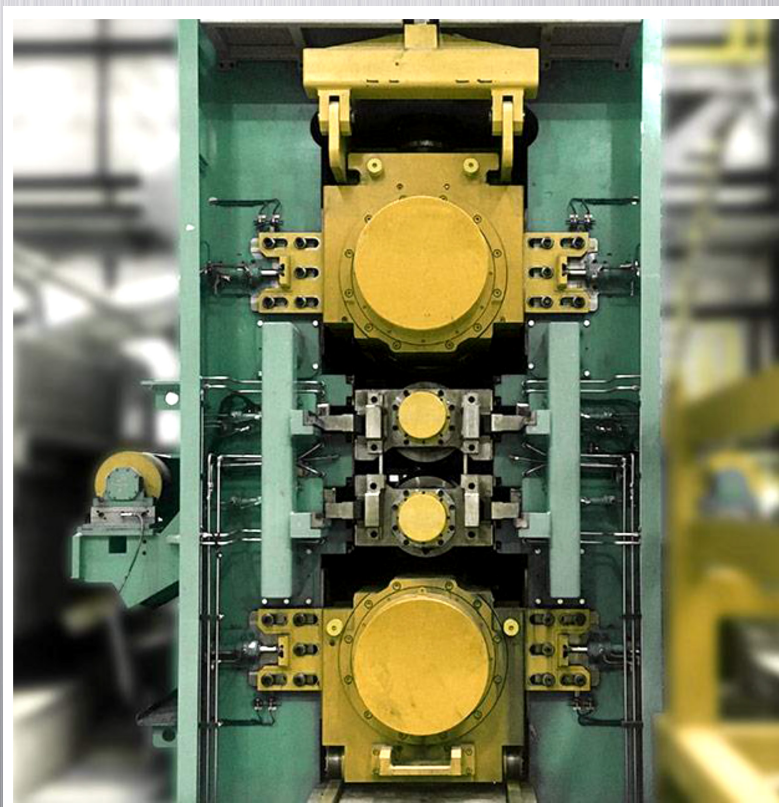
1. Plant can supply GP ranging from Ordinary-GP, Drawing (lock forming)-GPL, Deep drawing- GPD, structural steel grades 230(GP230), structural steel grades 250 (GP250), structural steel grades 275 (GP 275), structural steel grades 300 (GP300), structural steel grades GP350CL-1 (GP350CL-1), structural steel grades GP350CL-2 (GP350CL-2), structural steel grades GP450 (GP450), structural steel grades GP550 (GP550)
2. Thickness (mm) : 0.4 to 2.0 mm
3. Width (mm) : 800 to 1560 mm
4. Max yield point (Mpa) : 700
5. Max temperature of the strip before TM(°C) : 40

Line Capability Design

1. Max Line Temper Mill Speed (mpm) : 180
2. Maximum tensions (daN): 8200
3. Elongation rate (%) : Adjustable from 0 to 2

Skin Pass Mill Design

1. Maximum roll force (Tons): 900
2. Bending force (Tons): 90
3. Back up roll diameter (mm): 1000
4. Work roll diameter (mm): 450 (Hard product), 600 (Soft product)



Bokaro Steel Plant

SAIL JYOTI GALVANISED PLAIN COILS & SHEETS

Chemical Analysis

Sl. No.	Designation	Grade	C Max	Mn Max	S Max	P Max	Ti Max
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
i)	GP	Ordinary	0.25	1.70	0.045	0.050	--
ii)	GPH	Ordinary Hard	0.15	0.60	0.040	0.050	--
iii)	GC	Corrugated ordinary	0.15	0.60	0.040	0.050	--
iv)	GPL	Drawing (Lock forming)	0.12	0.50	0.035	0.040	--
v)	GPD	Deep drawing	0.10	0.45	0.030	0.025	--
vi)	GP230	Structural steel grade 230	0.20	1.35	0.040	0.040	--
vii)	GP250	Structural steel grade 250	0.20	1.35	0.040	0.050	--
viii)	GP275	Structural steel grade 275	0.25	1.35	0.040	0.050	--
ix)	GP300	Structural steel grade 300	0.25	1.35	0.040	0.050	--
x)	GP350 Class-1	Structural steel grade 350 Class-1	0.25	1.35	0.040	0.050	--
xi)	GP350 Class-2	Structural steel grade 350 Class-2	0.25	1.35	0.040	0.050	--
xii)	GP450	Structural steel grade 450	0.25	1.60	0.040	0.050	--
xiii)	GP550	Structural steel grade 550	0.25	1.70	0.040	0.050	--

Mechanical Properties

S.No.	Quality		Yield Stress, R_e MP _a	Tensile Strength R_m MP _a	Elongation, Percent A Min	
	Designation	Name			L ₀ =80 mm	L ₀ =50 mm
(1)	(2)	(3)	(4)	(5)	(6)	(7)
i)	GP	Ordinary	--	--	--	--
ii)	GPH	Ordinary Hard	400 Min	--	--	--
iii)	GC	Corrugated ordinary	--	--	--	--
iv)	GPL	Drawing (Lock forming)	350 Max	450 Max	24	25
v)	GPD	Deep drawing	280 Max	430 Max	26	27
vi)	GP230	Structural steel grade 230	230 Min	310 Min	18	20
vii)	GP250	Structural steel grade 250	250 Min	360 Min	18	20
viii)	GP275	Structural steel grade 275	275 Min	380 Min	18	20
ix)	GP300	Structural steel grade 300	300 Min	400 Min	18	20
x)	GP350 Class-1	Structural steel grade 350 Class-1	350 Min	420 Min	12	13
xi)	GP350 Class-2	Structural steel grade 350 Class-2	350 Min	--	12	13
xii)	GP450	Structural steel grade 450	450 Min	480 Min	8	9
xiii)	GP550	Structural steel grade 550	550 Min	570 Min	--	--



Unmatched Gloss and Surface Finish. Staggered Winding for Better Coiling Control.

Mass of Coating (Total Both Sides)

Sl. No.	Class of Coating	Minimum Average Coating Triple Spot Test g/m ²	Minimum Coating Single Spot Test g/m ²
(1)	(2)	(3)	(4)
i)	600	600	510
ii)	550	550	470
iii)	450	450	380
iv)	350	350	300
v)	275	275	235
vi)	220	220	190
vii)	200	200	170
viii)	180	180	155
ix)	120	120	100

Mass of Coating

Sl. No.	Class of Coating	Minimum Average Coating Triple Spot Test g/m ²	Minimum Coating Single Spot Test g/m ²
(1)	(2)	(3)	(4)
i)	100	100	90
ii)	90	100	80
iii)	80	100	75

Various zinc coatings available from BSL, as per specification IS: 277/2018 are as follows:

Thickness	Zinc wt g/m ²
0.4-0.5mm	120-275
0.6-0.8mm	80-275
0.8-1.0mm	80-450
1.0-2.0mm	80-600

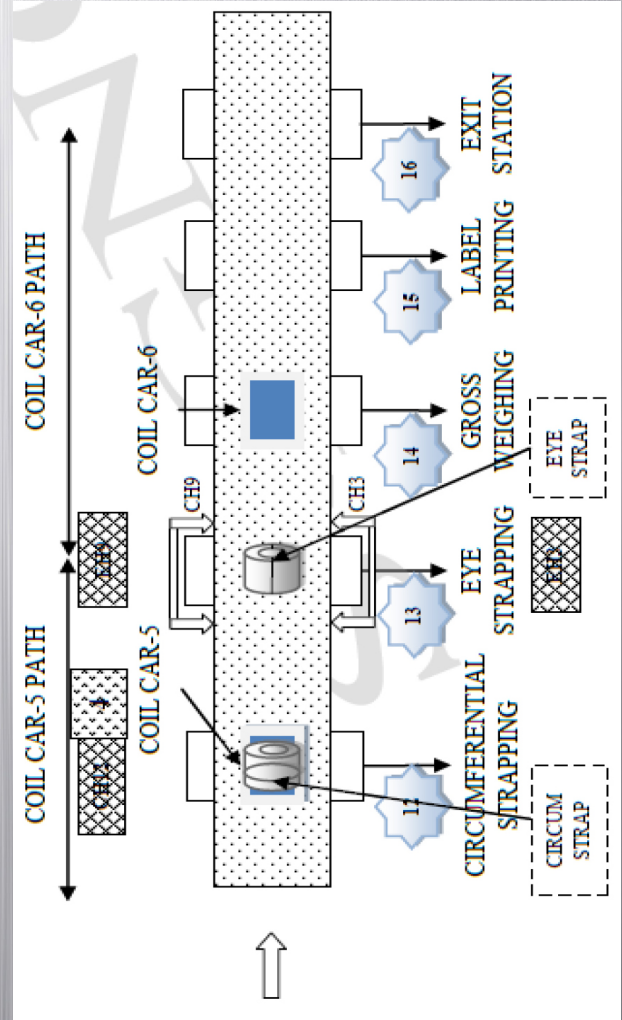
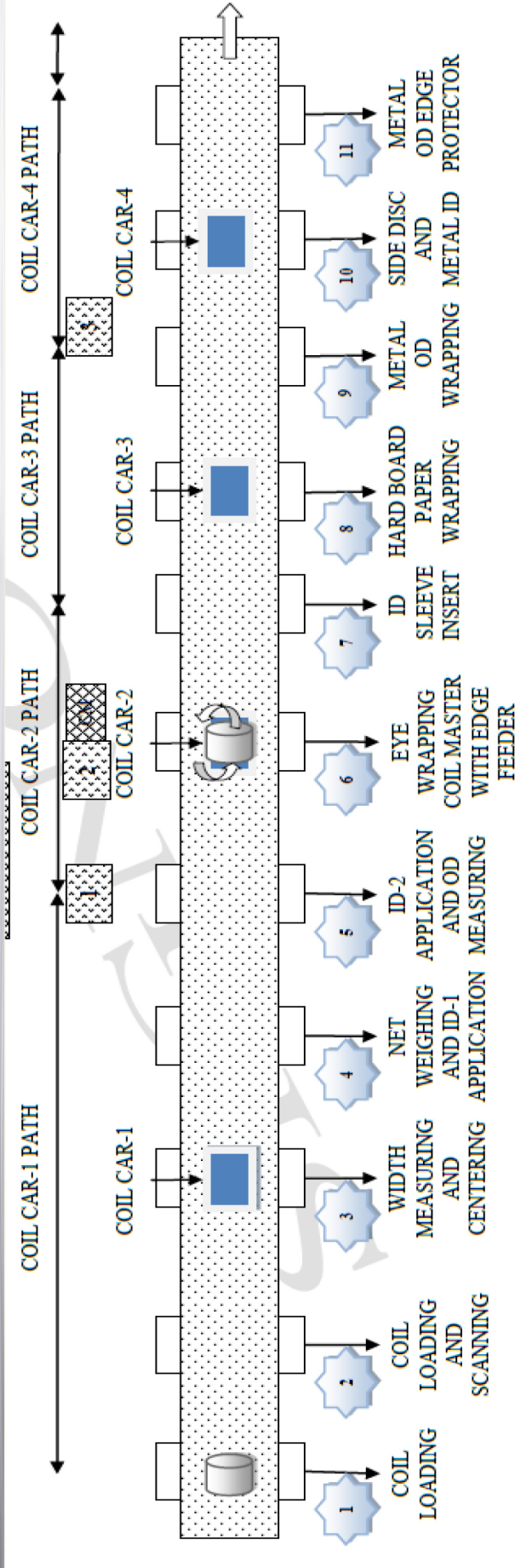
Sizes of Galvanised Plain Coils

Thickness Range (mm)	Width Range (mm)
0.40, 0.45	900, 1000, 1220
0.50	900, 1000, 1100, 1220, 1250
0.60-1.50	900, 1000, 1100, 1220, 1250, 1320
2	900, 1000, 1100, 1220, 1250

Bokaro Steel Plant-HDGL

Coil Packaging line-I (CPL)

CPL1 Process Flow



CPL Features

- Stretch film wrapping with coil master.
- Damage proof and moisture proof packaging.
- Eye Wrapping & Circumferential Wrapping.
- Highly efficient coil tracking system with PLC based automation.
- Each coil also strapped with 32 mm strap.

Bokaro Steel Plant-HDGL

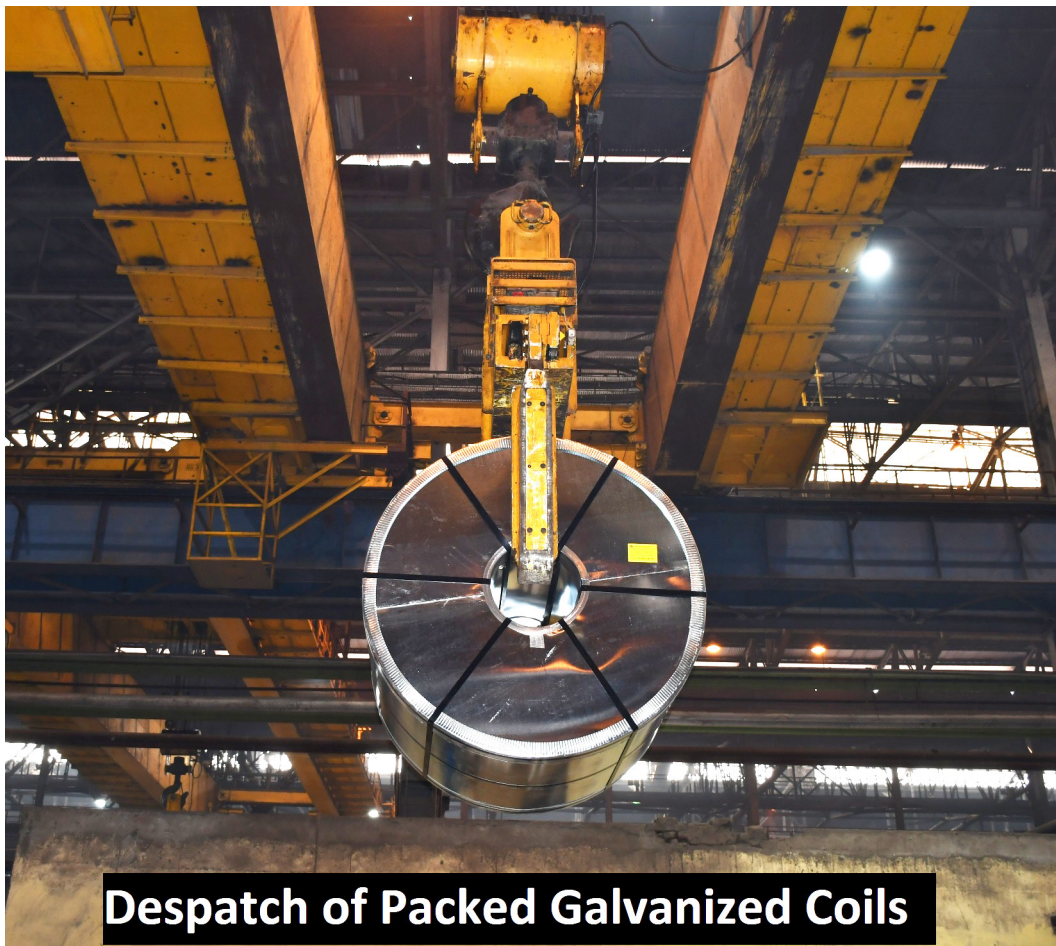
Touch-Free Coil Packaging



Bokaro Steel Plant-HDGL



Industry-Leading Packaging Quality



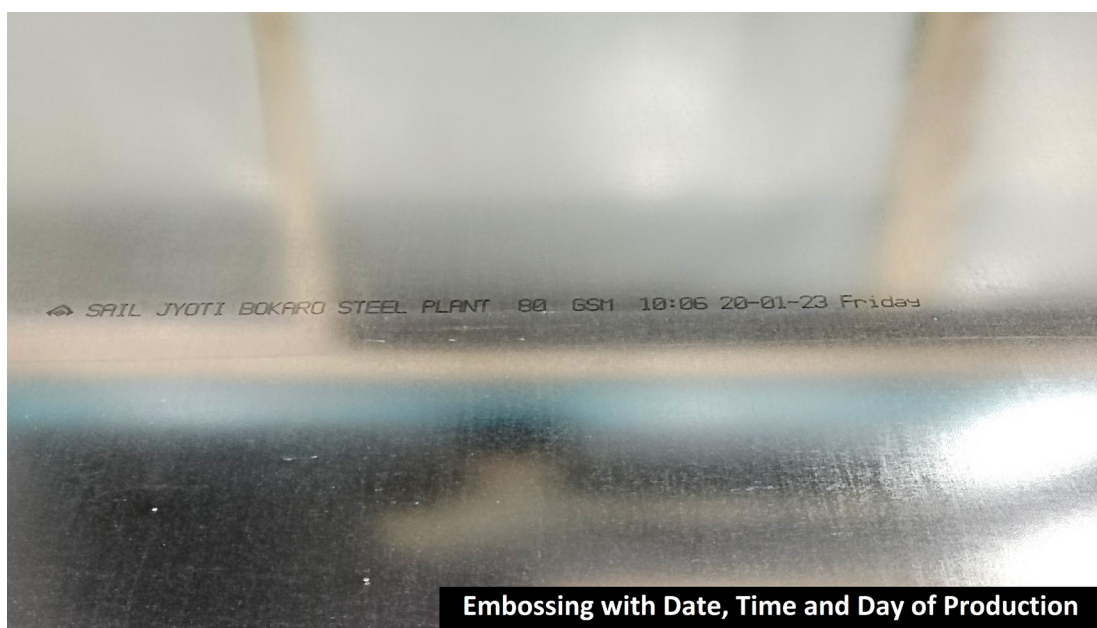
Despatch of Packed Galvanized Coils

Bokaro Steel Plant

SAIL JYOTI GALVANISED PLAIN COILS & SHEETS

Product Features

- Galvanized Zero Spangle Product- No Lead and Antimony used.
- Flatness control with Tension Leveller.
- Electrolytic Degreasing prior to annealing.
- Chrome-3 based Passivation for surface treatment
- Guaranteed Conformance to IS: 277/2018 product specifications.
- Zero-T test for ensuring superior adherence
- Marking of type of coating, date/time/day of production.
- Surface treatment - (Surface protection) - Chemical Passivation : (C)-Chromic Acid spray used.
- Mechanical properties if asked can be given in high strength GP grades but not in ordinary / normal GP grades (GPD/GPL)
- Surface finish Classes - Dull Finish
- Surface finish Designation - D
- Coating finish type-N-Normal coating as coated and S-Normal coating with skin pass (on commission).



Applications

Material	Application
GP Coils & Sheets	AC ducts, Panelling, door frames, shutters, coolers, storage bins, auto sector, ice box drums, buckets, tubs, tanks, trunks, tubes, Grain Silos, Solar Plants etc

SAIL-JYOTI Applications



MILK CAN



TORNADO



Cooling Tower



AC Ducting

SAIL-JYOTI Applications

GRAIN SILOS



SOLAR PLANT

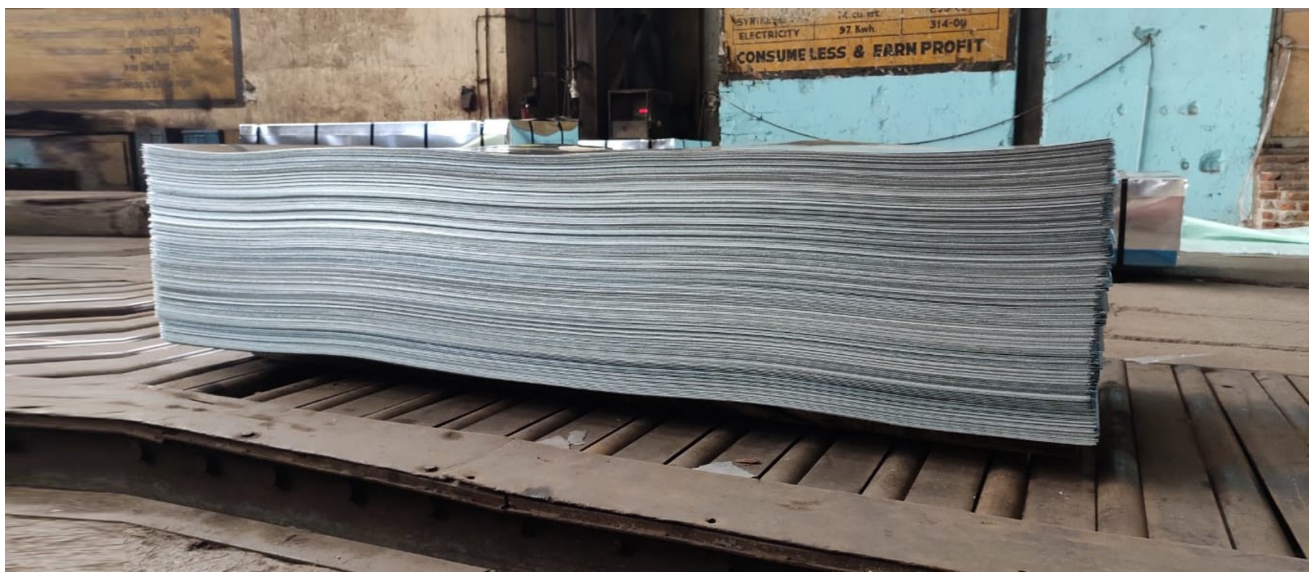


Trunk

Rourkela Steel Plant

SAIL JYOTI GALVANISED PLAIN & CORRUGATED SHEETS

Capacity : 1,60,000 Tonns per year



GP Sheets

Mass of Coating (Both sides included)

Thickness (mm)	Width (mm)	Length (mm)	Grade	Grams per Meter square (Class of Coating)
0.35 - 1.25	900/1000	1800-3600	IS277/2018	120 / 180 / 275 / 350 / 450

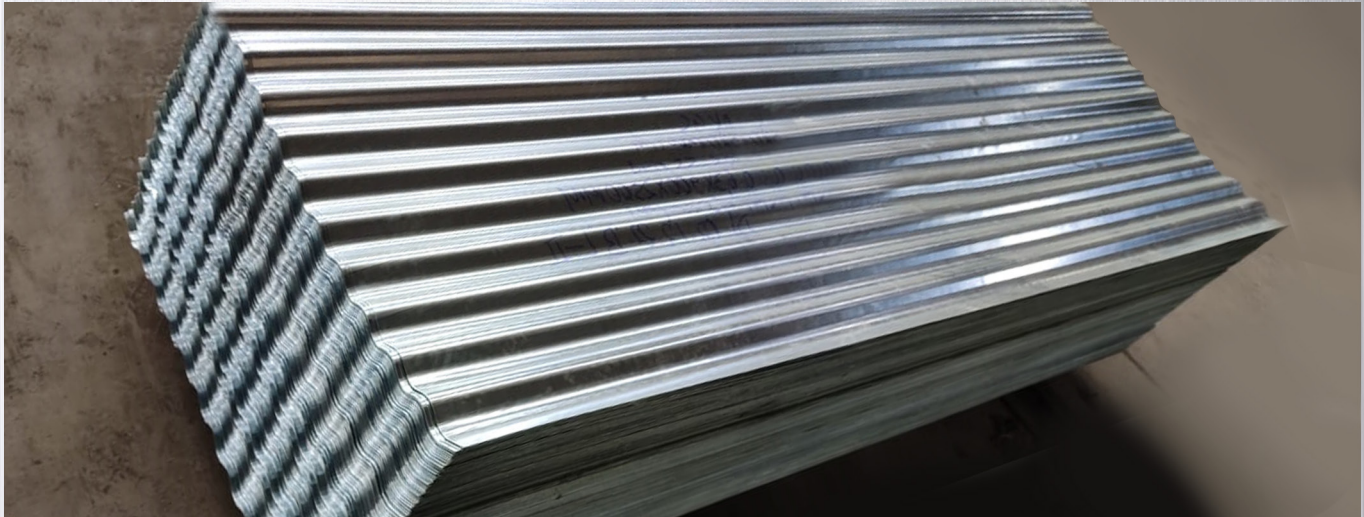


Packaging unit at Rourkela Plant

GP Sheet – Hardness 65 HRB • GC Sheet 70-75 HRB

Rourkela Steel Plant

GC Sheets			Mass of Coating (Both sides included)	
Thickness (mm)	Width (mm)	Length (mm)	Grade	Grams per Meter square (Class of Coating)
0.5 - 1.25	810/910	1800-3600	IS277/2018	120 / 180 / 275 / 350 / 450



GC Sheets in 810 with ± 25 mm • No. of Corrugation - 10

GC Sheets in 910 with ± 25 mm • No. of Corrugation - 11

Depth of Corrugation = $17.5\text{mm} \pm 2.5\text{mm}$

Pitch = $75\text{ mm} \pm 5\text{mm}$

Coating finish for GP/GC - Normal coating - N, as coated surface-(A)

Surface treatment - Chemical passivation - C type - Chromic acid as a passivator.

Surfaces finish - Dull finish - designation - D type

RSP supplying material in two category GP - Ordinary, GC - Corrugated Ordinary.

Chemical Analysis

Sl. No.	Designation	Grade	C Max	Mn Max	S Max	P Max	Ti Max
i)	GP	Ordinary	0.25	1.70	0.045	0.050	--
ii)	GC	Corrugated ordinary	0.15	0.60	0.040	0.050	--

Mechanical Properties

S.No.	Quality		Yield Stress, R_e MP_a	Tensile Strength R_m MP_a	Elongation, Percent A Min	
	Designation	Name			$L_o=80$ mm	$L_o=50$ mm
i)	GP	Ordinary	--	--	--	--
iii)	GC	Corrugated ordinary	--	--	--	--

Mass of Coating (Total Both Sides)

Sl. No.	Class of Coating	Minimum Average Coating Triple Spot Test g/m^2	Minimum Coating Single Spot Test g/m^2
(1)	(2)	(3)	(4)
iii)	450	450	380
iv)	350	350	300
v)	275	275	235
viii)	180	180	155
ix)	120	120	100



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