FLAT PRODUCTS

HOT ROLLED FLAT STEEL
MANUFACTURED TO TIGHT TOLERANCES



ezzsteel
The Middle East Steel Professionals

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STRENGTH IN STEEL

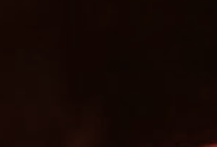
TRUSTED WORLDWIDE FOR QUALITY, RELIABILITY AND SERVICE

Ezz Steel is one of the world's fastest growing and most technically advanced steel producers. At our purpose-built steelmaking plants across Egypt, we have a production capacity of 7 million tons of steel per year, comprising 4.7 million tons of long products and 2.3 million tons of hot rolled flat steel (HRC).

We produce more than 450 grades of steel to provide the properties required for a huge range of applications, from concrete reinforcement to high-tensile cables, from household goods to a host of automotive and shipbuilding components.

Our dedication to investing in the latest technology and in the skills of our people, coupled with a commitment to continuous improvement and unparalleled customer service, have established Ezz Steel as a major player in the global steel marketplace.

Led by a clear vision, Ezz Steel is a name synonymous with quality, reliability and service excellence.



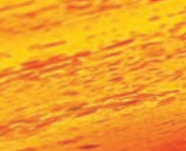
$4BN TOTAL INVESTMENTS



TOTAL ANNUAL CAPACITY (LONG PRODUCTS & HRC)



8,000+ STEEL PROFESSIONALS



MORE THAN 450 GRADES OF STEEL

FLAT PRODUCTS

SETTING THE STANDARD FOR HRC INNOVATION

Ezz Steel's revolutionary plants have the capacity to produce 2.3 million tons of HRC per year. Our world-leading range of HRC products includes precision-produced ultra-thin coil.

HRC PRODUCED TO TIGHT TOLERANCES

Ezz Steel uses advanced thin-slab continuous casting technology to produce HRC to thicknesses as low as 1.0 mm. Few mills worldwide can produce such thin steel. Our thickness tolerance for thin and ultra-thin gauges is +0.05/-0.15 mm, providing a greater flat area and length per ton of steel for our customers.

TECHNICALLY ADVANCED HOT STRIP MILLS

Our hot strip mills at Alexandria and Suez are equipped with the latest HRC production facilities. These include Compact Strip Production (CSP) technology from SMS Demag and flexible Thin Slab Casting and Rolling (fTSCR) technology from Danieli.

GRADES DESIGNED FOR SPECIFIC APPLICATIONS

Our HRC is produced in more than 300 steel grades, to meet the specific demands of many industrial, commercial and domestic applications. These include cookers, washing machines and other household goods, earthmoving equipment, infrastructure for nuclear projects, pipes, barrels and drums and a host of automotive and shipbuilding components.

ONGOING INNOVATION IN STEEL COMPOSITION

The chemical composition of our steel grades complies with challenging international engineering standards and customer specifications. Ezz Steel metallurgists are constantly innovating with steel properties and developing new steel compositions to meet changing market demands.



HRC is used to manufacture; cylinders and canisters, cookers, washing machines, refrigerators and other household goods, wheels, exhausts, suspension parts and other automotive components, barrels and drums, shipbuilding components, transportation containers, pipes, and earthmoving equipment.

2.3M TPY

HRC ANNUAL CAPACITY

WHY CHOOSE EZZ STEEL?

EFFICIENT, ACCURATE, COST-EFFECTIVE STEELMAKING – FROM START TO FINISH

Ezz Steel produces HRC at fully integrated plants employing state-of-the-art technology. Intelligent plant design facilitates a continuous, automated process from raw material intake through to finished product dispatch – delivering exceptional steel quality, accuracy, process efficiency and productivity.

QUALITY IN...

80% DIRECT REDUCED IRON (DRI) + HIGH-GRADE STEEL SCRAP

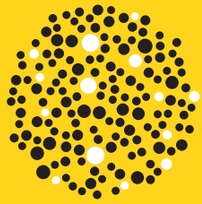
Ezz Steel converts iron ore into high-purity iron in four advanced direct reduction plants (DRP). Using the Midrex technology and the HYL technology by Danieli, these plants have an output capacity of 5 million tons of DRI per year, which is fed directly into electric arc furnaces in a continuous process.

Ezz Steel electric arc furnaces use 80% DRI in the steelmaking process, which is combined with high-grade steel scrap. This enables us to maintain precise control over the metallurgical properties of our steel and ensure a consistently high-quality end product.





DIRECT-REDUCED IRON ANNUAL CAPACITY



$550M INVESTED IN NEWEST DIRECT-REDUCTION MEGA MODULE



LOW LEVELS OF RESIDUAL ELEMENTS – FOR HIGH-PURITY STEEL

QUALITY OUT...

UNBEATABLE DIMENSIONAL ACCURACY AND QUALITY CONTROL

Careful handling and monitoring maintains steel cleanness throughout the steelmaking process. The addition of alloying elements, gas stirring and heating in the ladle furnace produces the precise chemical composition required for each steel grade, ensuring low levels of inclusions.

Rolling processes use advanced automation controls to deliver consistent dimensional accuracy in width, length, thickness and flatness. Our laminar cooling system provides precise control over metallurgical characteristics, resulting in excellent mechanical properties.

Our HRC service centers use leading technology to prepare coil, slit coil or sheets to exact customer specifications.

A strict regime of quality inspections along the entire process route, from raw materials to finished product, guarantees the quality of our HRC. Only material that meets the required standards at each stage is passed for further processing.

WELL LOCATED FOR EFFICIENT EXPORTS

Ezz Steel hot strip mills are located close to major ports. HRC can be sent to the docks for shipment with minimal inland transportation, providing cost reductions and efficiency benefits for customers worldwide. The development of Ain Sokhna port to accommodate ships up to 150,000 dwt has further increased our export capacity.

Customers within the region also benefit from efficient deliveries, with each Ezz Steel plant having direct access to major road, rail and water transport routes.

"FEW OTHER STEELMAKERS HAVE SUCH DIRECT ACCESS TO PORTS FOR EFFICIENTLY IMPORTING RAW MATERIALS AND EXPORTING FINISHED GOODS. THE ADVANTAGEOUS LOCATION OF EZZ STEEL PLANTS OFFERS CUSTOMERS COST-EFFECTIVE, RESPONSIVE DELIVERIES, WHEREVER THEY ARE."

George Matta,
CHIEF MARKETING OFFICER – EZZ STEEL



INVESTING FOR GROWTH

AMBITIOUS INVESTMENTS GIVE EZZ STEEL THE EDGE

To lead the way in world steel markets, Ezz Steel recognizes the need to invest in the most advanced technologies and the most talented and skilled people.

INVESTMENT FUELS CAPACITY AND CAPABILITY GROWTH

Investment in improved plants and equipment is an ongoing process. Our investment strategy ensures continued growth, enabling Ezz Steel to increase capacity and capabilities in line with ambitious targets and growing demand for our highly regarded steel products.

ADVANCED DRI PLANTS – INVESTING IN RAW MATERIAL PURITY

Our major investment in a new, state-of-the-art direct reduction plant at Suez means we now have in-house direct reduction capabilities at two of our four steelmaking facilities. Integrating these plants with our steelmaking facilities creates process and operational efficiencies, improves quality control and optimizes energy use.

With four direct reduction plants now operational, Ezz Steel has an output capacity of 5 million tons of DRI per year. That made Ezz Steel the second largest producer of DRI in the world (2017).

INVESTING IN TALENTED PEOPLE

The high caliber of Ezz Steel's skilled and enthusiastic workforce is your guarantee of exceptional service and product quality. We invest heavily in training our people to the highest standards, as well as recruiting the most promising graduates to nurture the next generation of pioneering steel professionals.

"EZZ STEEL IS A LEAN, EFFICIENT ORGANIZATION, EMPLOYING SKILLED PEOPLE TO PRODUCE LARGE VOLUMES OF STEEL, AND INVESTING IN THE VERY BEST TECHNOLOGY TO MAINTAIN OUR IMPRESSIVE QUALITY STANDARDS AND PRODUCTIVITY LEVELS."

Hassan Nouh, MANAGING DIRECTOR – EZZ STEEL





"PRODUCING IRON BY DIRECT REDUCTION GIVES US A HIGH-PURITY INGREDIENT FOR STEELMAKING, WITH LOW LEVELS OF RESIDUAL ELEMENTS."

Fouad Emam,
CORPORATE CHIEF TECHNICAL OFFICER – EZZ STEEL





COMMITMENT TO QUALITY

"FROM THE CEO TO MANAGERS, FROM THE CHAIRMAN TO STEEL PLANT WORKERS, A SPIRIT OF EXCELLENCE AND CONTINUOUS IMPROVEMENT PERVADES THE BUSINESS."

Raed El-Beblawy,
MANAGING DIRECTOR – EZDK

TESTING, MONITORING AND QUALITY CONTROL FOR PRODUCT EXCELLENCE

Ezz Steel is renowned for the consistent quality of its products. Such high standards are achieved through rigorous quality inspections, a policy of continuous improvement and a quality-management system developed in line with ISO 9001, combined with the skill and expertise of our people and significant investments in the latest iron and steelmaking technologies.

HIGH-PURITY INGREDIENTS FOR STEELMAKING

Quality assurance begins with the selection of raw materials. Only high-grade iron ore is chosen for our advanced direct-reduction plants, which provide up to 80% of the feedstock for steelmaking. The remainder is high-grade steel scrap. This assures customers of very low levels of impurities in the finished product.

CONTINUOUS TESTING AND QUALITY CONTROL

Steel is quality tested throughout the steelmaking, rolling and finishing processes. Samples are taken for testing in our ISO/IEC 17025-certified laboratories. Sophisticated analytical equipment and techniques are used to verify the precise chemical composition of the steel. Advanced computerized control systems make continuous adjustments to the steel as it passes through the mill, ensuring consistent dimensional and compositional accuracy.

CARE FOR THE FINISHED PRODUCT

The finished coil, strip or sheets undergo demanding mechanical tests to confirm compliance with relevant standards. Final quality checks and careful handling in the dispatch yard ensure products are delivered to customers in the best possible condition.

CUSTOMER SERVICE

FROM RESPONSIVE DELIVERIES TO TECHNICAL SUPPORT

The steel professionals at Ezz Steel understand the needs of customers across the region and worldwide. Our dedicated people are united by a shared determination to maintain Ezz Steel at the forefront of the global steel industry by forging supportive relationships with our customers.

UNDERSTANDING OUR CUSTOMERS – SHARING OUR EXPERTISE

We use our knowledge and experience to understand individual business requirements and provide technical advice to customers on the optimum steel products for their needs. Strong customer relationships are essential to the way we work. Customers know they can rely on the quality of our steel and the ability of our people to advise and support them.

SHORT LEAD TIMES AND EXCELLENT AVAILABILITY

Our efficient production processes mean we can offer excellent stock availability and short lead times – to fulfil the most urgent requirements. We are able to respond quickly to changing demand, and to produce steel to order to meet the most challenging customer specifications and timings.

Such a responsive service and short lead times set Ezz Steel apart from many less agile steelmakers. By working alongside our customers we ensure that our products, service and delivery performance always live up to expectations.





SUSTAINABLE GROWTH

"WE RESPECT AND VALUE THE COMMUNITIES AROUND US AND WE HAVE BEEN VERY CAREFUL TO MINIMIZE OUR IMPACT ON NEIGHBORS AND THE ENVIRONMENT. THE MEASURES WE TAKE RANGE FROM MAINTAINING GOOD HOUSEKEEPING STANDARDS TO INVESTING IN ADVANCED PURIFICATION AND RECYCLING TECHNOLOGY."

Fouad Emam,
CORPORATE CHIEF TECHNICAL OFFICER – EZZ STEEL

TAKING RESPONSIBILITY FOR OUR ENVIRONMENTAL IMPACT

Protecting our environment and our people is a commitment that influences everything we do at Ezz Steel.

PROTECTING OUR PLANET

Our investments in efficient steel production technology have been matched by investments in environmental protection systems. These range from water purification and recycling technologies to advanced filters to purify our emissions.

Ezz Steel is the first steel producer in Egypt to have its energy-management system certified in compliance with ISO 50001. Our trained energy specialists ensure that we reduce our energy consumption through operational, technical and behavioural improvements – and that we continuously maintain and enhance our environmental performance.

We maintain the strictest controls over dust, gas and other airborne emissions, as well as liquid effluents, noise levels and even electrical pollution, which could affect the national electricity grid and other consumers.

All of our plants comply with internationally recognized environmental and occupational health and safety standards, and we meet international guidelines for CO_2 emissions.

PROTECTING OUR PEOPLE

Health and safety standards are never compromised at Ezz Steel. Our skilled and diligent people are our most valuable asset and we work hard to keep them safe and healthy. Strict, internationally verified safety procedures are in place and we are ever vigilant for opportunities to enhance our safety performance.

Every member of staff goes through rigorous safety training, which is regularly updated and refreshed. We give all our people the knowledge, tools and resources they need to work in the safest possible way and to keep the safety and wellbeing their colleagues and visitors at the heart of everything we do.

ISO 14001 ISO 45001 ISO 50001

$100M INVESTED IN CSR PROJECTS

EXPORT CAPABILITIES

TAKING HRC PRODUCTS WORLDWIDE

Ezz Steel's HRC is distributed worldwide where the quality, accuracy and reliability of our steel are highly valued by customers in many industries.

SERVING OUR INTERNATIONAL NEIGHBORS

One of the principal markets for Ezz Steel products is the wider Middle East and North Africa region. Rapid growth and development over recent decades has resulted in an escalation of demand from these countries for reliable supplies of high-quality HRC.

MEETING DEMAND FROM EUROPE, ASIA AND THE USA

The remainder of our HRC exports are destined for Europe, Asia and the USA, where our product quality is seen as the equal of many local steel producers. As well as our product quality, overseas customers value our reliable deliveries, flexible production capabilities and competitive prices.

RAPID DISPATCH AND DELIVERY – ANYWHERE IN THE WORLD

Efficient deliveries worldwide are supported by the strategic location of our steel plants close to major ports and other arterial transport routes.

As part of the continuous integrated steel production process, our extensive storage facilities are located at the end of the steel rolling and cooling line, enabling fast, efficient transfer with minimal handling. That not only helps to maintain product quality by minimizing the risk of mechanical damage, but also facilitates rapid loading onto transport for onward delivery by road, rail or ship.



"OUR FLEXIBLE BUSINESS MODEL ALLOWS EZZ STEEL TO FOLLOW DEMAND ANYWHERE IN THE WORLD, AIDED BY THE PROXIMITY OF OUR PLANTS TO THE PORTS."

Hassan Nouh,
MANAGING DIRECTOR – EZZ STEEL

TECHNICAL SPECIFICATIONS

TABLE 1 – ABBREVIATIONS

Symbol	Unit	Description
TS	MPa	Tensile Strength.
YS	MPa	Yield Strength.
El	%	Elongation Percentage.
Gr.	–	Steel Grade.
EAF	–	Electric Arc Furnace.
LF	–	Ladle Furnace.
TSC	–	Thin Slab Casting.
LCR	–	Liquid Core Reduction.
HSM	–	Hot Strip Mill.
HRC	–	Hot Rolled Coil.
SKP	–	Skin Pass Mill.
PKL	–	Pickling (Chemical Surface Treatment Plant).
SLT	–	Slitting.
CTL	–	Cut–to–Length.
NGO	–	Non Grain Oriented.
FB	–	Ferritic–Bainitic.
CP	–	Complex Phase.
DP	–	Dual–Phase.
TRIP	–	Transformation–Induced Plasticity.
ISO	–	International Organization for Standardization.
API	–	American Petroleum Institute.
EN	–	European Standard.
BS	–	British Standard.
DIN	–	Deutches Institut für Normung.
ASTM	–	ASTM International Standard (formerly, American Society for Testing and Materials).
JIS	–	Japanese Industrial Standard.
MT	Ton	Metric Ton.

1. PRODUCT FEATURES

1.1 Ultra-thin Gauge

Ezz Steel is equipped with the latest hot rolled coil (HRC) production facilities. These facilities include Compact Strip Production (CSP®) technology from SMS Demag and Quality Strip Production (QSP®) technology from DANIELI. Advanced thin slab continuous casting and Liquid Core Reduction (LCR) technologies enable Ezz Steel to produce hot-rolled coils (HRC) to thickness of 1.0 mm. Few mills worldwide can produce such ultra-thin gauge.

1.2 Tolerance and Uniform Distribution

Hot rolled coils are produced with very accurate tolerance and uniform distribution along the coil regarding dimensions, flatness and mechanical properties through latest up to date technology models.

1.3 High Quality Steel

Direct reduced iron (DRI) is the major raw material for producing Ezz Steel's hot rolled coils which allows producing high quality steel.

1.4 Surface Quality

It is continuously monitored using online inspection system "PARSYTEC™" for ensuring high quality flat products delivered to our customers.

2. EZZ STEEL FACILITIES FOR HOT ROLLED FLAT STEEL PRODUCTION

2.1 Two Electric Arc Furnaces (EAF) to produce low and medium carbon steel.

2.2 Two Ladle Furnaces (LF) for production of clean steel up to specified chemical, mechanical and metallurgical properties.

2.3 Two Thin Slab Continuous Casters (TSC) to produce thin slabs with thickness range from 48 mm to 80 mm.

2.4 Two Hot Strip Mills (HSM) to produce hot-rolled coils (HRC) with variant thickness range from 1.0 mm to 14.0 mm.

2.5 Two Skin Pass Mills (SKP) to enhance produced HRC flatness.

2.6 One surface chemical treatment plant (PKL) to produce pickled and oiled coils.

2.7 One slitting line (SLT) to slit coils into rings or trimmed coils with various widths and weights.

2.8 Two Cut-to-Length lines (CTL) to produce sheets with various lengths and widths.

3. DIMENSIONS AND TOLERANCE

3.1 Dimensions

Specifications of produced hot rolled flat steel:

Dimension Range (mm)	Plant Product				
	HSM	SKP	Pickling	Slitting	CTL
Thickness	1.0–14.0	1.0–5.0	1.0–5.0	1.0–10.0	1.0–13.0
Width	900–1,600	900–1,600	900–1,500	60–1,580	600–1,600
Length	–	–	–	–	600–12,000
Inner Diameter	762	762	610 or 762	610 or 762	–
Outer Diameter	2,000 (max.)				–

3.2 Coil Weight

Coil maximum weight that can be produced is 28.8 tons (based on maximum 18 kg/mm width).

3.3 Coil Length (m) = $\dfrac{\text{Coil Weight (ton)} \times 1{,}000{,}000}{\text{Coil Width (mm)} \times \text{Coil Thickness (mm)} \times 7.85}$

3.4 Tolerance

Regular produced hot rolled flat steel specified tolerances on dimensions, shape and flatness according to Ezz Steel's standard which is tighter than international standards (e.g. EN 10051: 2010, ASTM A635/A635M-15 and ASTM A568/A568M-19 a).

Tighter tolerances may be produced upon request, please contact sales team for more details.

3.4.1 Thickness Tolerance

Thickness Range, t (mm)	Lower Tolerance (mm)	Upper Tolerance (mm)
1.0 ≤ t ≤ 2.0	-0.15	+0.05
2.0 < t ≤ 4.0	-0.19	+0.06
4.0 < t ≤ 14.0	-0.20	+0.10

3.4.2 Width Tolerance

Nominal Width (mm)	Width Tolerance (mm)			
	Mill Edge		Trimmed Edge	
	Lower	Upper	Lower	Upper
900–1,600	0	+20	0	+3

3.4.3 Length Tolerance

Nominal Length, L (mm)	Lower Tolerance (mm)	Upper Tolerance (mm)
L < 2,000	0	+7
2,000 ≤ L < 8,000	0	+10 ~ +32 [1]
8,000 ≤ L	0	+30

[1] Tolerance = +0.004 × L

4. APPLICATIONS OF EZZ STEEL HOT ROLLED FLAT STEEL

Ezz Steel produces hot rolled flat steel for various applications:

- Tubes, built up sections and home appliances.
- Enameling steel for home appliances.
- General structural applications, steel furniture.
- Automotive internal parts.
- Gas bottles and closed vessels.
- Line pipes (petroleum piping according to API specifications).
- Lamination for motors, generators and transformers.
- Outdoor constructions (atmospheric corrosion resistance steel/weathering steel).

5. PRODUCIBLE STANDARDS

Ezz Steel produces hot rolled flat steel according to international standards:

5.1 Egyptian Standard

ES 260-2:2018, ES 260-4:2015, ES 260-5:2015

5.2 American Standards

ASTM A1011M – 18a, ASTM A569M – 98, ASTM A570M – 98, ASTM A1018M –18, ASTM A907M – 96, ASTM A568M – 19a, ASTM A53M – 18, ASTM A283M – 18, ASTM A36M – 19, ASTM A572M – 18, ASTM A516M – 17, API 5L: 2018

5.3 European Standards

EN 10111: 2008, EN 10025-2: 2019, EN 10025-4: 2019, EN 10025-5: 2019, EN 10083-1: 2006, EN 10346:2015, EN 10120: 2017, EN 10149-2: 2013, EN 10208:2009, EN 10341: 2006, EN 10336: 2007, EN 10346: 2015

5.4 Japanese Standards

JIS G3131:2010, JIS G3132:2018, JIS G3113:2018, JIS G3101: 2015, JIS G3134: 2018, JIS G3116: 2013, JIS G3125: 2015

5.5 German Standards

DIN 17100: 2016, DIN 1614-1: 1986, DIN 1614-2: 1986

Other standards can be produced upon customer request. Please contact sales team for more details.

6. HOT ROLLED COIL (BLACK AND PICKLED) CATEGORIES

- Steel for cold forming/cold rolling applications.
- Low strength steel for structural/general applications.
- Medium strength steel for structural/general applications.
- High strength steel for structural/general applications.
- Steel for engineering and automotive applications.
- Steel for gas bottles and closed vessels applications.
- Steel for petroleum piping (according to API requirements).
- Atmospheric corrosion resistance (weathering steel).
- Steel for electrical applications.

7. HOT ROLLED FLAT PRODUCTS DIMENSIONS

7.1 Black and Pickled HRC Dimensions

Steel Group	Nominal Thickness (mm)		Nominal Width, max. (mm)				Steel Grades
			Black		Pickled		
	From	To	Mill Edge	Trim Edge	Mill Edge	Trim Edge	
Cold Forming Cold Rolling Enameling	1.00	1.29	1,250	1,230	1,250	1,230	**EN 10111:** DD11, DD12, DD13, DD14
	1.30	1.39	1,500	1,480	1,500	1,480	**DIN 1614-1:** St22, St24, RRSt23
	1.40	4.00	1,600	1,580	1,500	1,480	**DIN 1614-2:** StW22, StW24, RRStW23
	4.01	5.00	1,600	1,575 [1]	1,500	1,480	**ASTM A569M:** Type B
	5.01	7.50	1,600	1,560 [1]	–	–	**ASTM A1011M and ASTM A1018M:** CS type B, DS type B
	7.51	10.00	1,600	1,550 [1]	–	–	**A568M:** SAE1006, SAE1008
	10.01	14.00	1,600	–	–	–	**JIS G3131:** SPHC, SPHD, SPHE
							JIS G3132: SPHT1, SPHT2

[1] Black trimmed edge max. Width, mm = (Black mill edge max width, mm) - (5×Thickness).

Steel Group	Nominal Thickness (mm)		Nominal Width, max. (mm)				Steel Grades
			Black		Pickled		
	From	To	Mill Edge	Trim Edge	Mill Edge	Trim Edge	
Low Strength Steel	1.00	1.39	1,250	1,230	1,250	1,230	**ES 260-2:** S235 series
	1.40	1.59	1,500	1,480	1,500	1,480	**EN 10025-2:** S235 series
	1.60	4.00	1,600	1,580	1,500	1,480	**DIN 17100:** St 37-2
	4.01	5.00	1,600	1,575 [1]	1,500	1,480	**ASTM A570M and ASTM A907M:** Gr. 30, Gr. 33
	5.01	7.50	1,600	1,560 [1]	–	–	**ASTM A1011M and ASTM A1018M:** Gr. 30(SS), Gr. 33(SS)
	7.51	10.00	1,600	1,550 [1]	–	–	**ASTM A568M:** SAE1010
	10.01	14.00	1,600	–	–	–	**ASTM A53M and ASTM A283M:** Gr.A, Gr.B, Gr.C
							JIS G3113: SAPH370

[1] Black trimmed edge max. Width, mm = (Black mill edge max width, mm) - (5×Thickness).

Steel Group	Nominal Thickness (mm)		Nominal Width, max. (mm)				Steel Grades
			Black		Pickled		
	From	To	Mill Edge	Trim Edge	Mill Edge	Trim Edge	
Medium Strength Steel	1.30	1.50	1,000	980	1,000	980	**ES 260-2:** S275 Series, S355 Series **EN 10025-2:** S275 Series, S355 Series **DIN 17100:** St 44, St 52 **ASTM A36M:** A36 **ASTM A570M and ASTM A907M:** Gr. 36, Gr. 40, Gr. 50 **ASTM A1011M and ASTM A1018M:** SS: Gr. 36, 40, 45, 50. HSLA: Gr. 45, Gr. 50 **ASTM A572M:** Gr. 50 **ASTM A568:** SAE 1015, 1018, 1022 **JIS G3101:** SS400
	1.51	1.59	1,300	980	1,000	980	
	1.60	1.70	1,400	1,230	1,250	1,230	
	1.71	1.80	1,500	1,230	1,250	1,230	
	1.81	2.24	1,560	1,230	1,250	1,230	
	2.25	2.44	1,560	1,480	1,500	1,480	
	2.45	4.00	1,600	1,580	1,500	1,480	
	4.01	5.00	1,600	1,575 [1]	1,500	1,480	
	5.01	7.50	1,600	1,560 [1]	–	–	
	7.51	10.00	1,600	1,550 [1]	–	–	
	10.01	14.00	1,600	–	–	–	

[1] Black trimmed edge max. Width, mm = (Black mill edge max width, mm) - (5×Thickness).

Steel Group	Nominal Thickness (mm)		Nominal Width, max. (mm)				Steel Grades
			Black		Pickled		
	From	To	Mill Edge	Trim Edge	Mill Edge	Trim Edge	
High Strength Steel	1.45	1.50	1,000	980	1,000	980	**ASTM A570M and ASTM 907M:** Gr. 55 **ASTM A1011M and ASTM A1018M:** SS: Gr. 55, 60 HSLA: Gr. 55, class-1 **ASTM A572M:** Gr. 65 **EN 10025-4:** S420M **ES 260-4:** S420M
	1.51	1.54	1,300	980	1,000	980	
	1.55	1.60	1,300	1,080	1,100	1,080	
	1.61	1.70	1,400	1,080	1,100	1,080	
	1.71	1.74	1,500	1,080	1,100	1,080	
	1.75	1.80	1,500	1,180	1,200	1,180	
	1.81	1.89	1,560	1,180	1,200	1,180	
	1.90	1.94	1,560	1,200	1,225	1,200	
	1.95	2.09	1,560	1,240	1,260	1,240	
	2.10	2.39	1,560	1,330	1,350	1,330	
	2.40	2.44	1,560	1,430	1,450	1,430	
	2.45	2.49	1,560	1,480	1,500	1,480	
	2.50	2.59	1,560	1,500	1,500	1,480	
	2.60	4.00	1,600	1,580	1,500	1,480	
	4.01	5.00	1,600	1,575 [1]	1,500	1,480	
	5.01	7.50	1,600	1,560 [1]	–	–	
	7.51	10.00	1,600	1,550 [1]	–	–	
	10.01	12.70	1,600	–	–	–	

[1] Black trimmed edge max. Width, mm = (Black mill edge max width, mm) - (5×Thickness).

Steel Group	Nominal Thickness (mm)		Nominal Width, max. (mm)				Steel Grades
			Black		Pickled		
	From	To	Mill Edge	Trim Edge	Mill Edge	Trim Edge	
Engineering and Automotive (High Strength)	2.00	2.24	1,250	1,230	1,250	1,230	**EN 10149-2:** S315MC, S355MC, S420MC, S460MC, S500MC **EN 10336:** Multiphase (FB, DP, CP, TRIP), HDT580X, HDT780C **JIS G3134:** SPFH 540, SPFH 590Y
	2.25	2.44	1,500	1,480	1,500	1,480	
	2.45	4.00	1,600	1,580	1,500	1,480	
	4.01	5.00	1,600	1,575 [1]	1,500	1,480	
	5.01	6.00	1,600	1,570 [1]	–	–	
Engineering and Automotive (Medium Strength)	1.30	1.59	1,000	980	1,000	980	**JIS G3113:** SAPH400, SAPH440
	1.60	2.24	1,250	1,230	1,250	1,230	
	2.25	2.44	1,500	1,480	1,500	1,480	
	2.45	4.00	1,600	1,580	1,500	1,480	
	4.01	5.00	1,600	1,575 [1]	1,500	1,480	
	5.01	7.50	1,600	1,560 [1]	–	–	
	7.51	10.00	1,600	1,550 [1]	–	–	
	10.01	14.00	1,600	–	–	–	

[1] Black trimmed edge max. Width, mm = (Black mill edge max width, mm) - (5×Thickness).

Steel Group	Nominal Thickness (mm)		Nominal Width, max. (mm)				Steel Grades
			Black		Pickled		
	From	To	Mill Edge	Trim Edge	Mill Edge	Trim Edge	
Gas Bottles and Closed Vessels (245 series)	1.00	1.39	1,250	1,230	1,250	1,230	**EN 10120:** P245NB
	1.40	1.59	1,500	1,480	1,500	1,480	
	1.60	4.00	1,600	1,580	1,500	1,480	
	4.01	5.00	1,600	1,575 [1]	1,500	1,480	
Gas Bottles and Closed Vessels (265 series)	1.30	1.59	1,000	980	1,000	980	**EN 10120:** P265NB **JIS G3116:** SG255
	1.60	2.24	1,250	1,230	1,250	1,230	
	2.25	2.44	1,500	1,480	1,500	1,480	
	2.45	4.00	1,600	1,580	1,500	1,480	
	4.01	5.00	1,600	1,575 [1]	1,500	1,480	
	5.01	6.00	1,600	1,560 [1]	–	–	

[1] Black trimmed edge max. Width, mm = (Black mill edge max width, mm) - (5×Thickness).

Steel Group	Nominal Thickness (mm)		Nominal Width, max. (mm)				Steel Grades
			Black		Pickled		
	From	To	Mill Edge	Trim Edge	Mill Edge	Trim Edge	
API (petroleum piping)	1.30	1.59	1,000	980	1,000	980	**API 5L PSL 1:** Gr. A **API 5L PSL 2:** Gr. B, X42M, X46M
	1.60	2.24	1,250	1,230	1,250	1,230	
	2.25	2.44	1,500	1,480	1,500	1,480	
	2.45	4.00	1,600	1,580	1,500	1,480	
	4.01	5.00	1,600	1,575 [1]	1,500	1,480	
	5.01	7.50	1,600	1,560 [1]	–	–	
	7.50	10.00	1,600	1,550 [1]	–	–	
	10.01	13.00	1,600	–	–	–	
API (petroleum piping) X52	5.00	5.50	1,600	1,570 [1]	–	–	**API 5L PSL 2:** X52
	5.51	7.99	1,600	–	–	–	
	8.00	13.00	1,480	–	–	–	
API (petroleum piping) X56, X60	4.00	10.00	1,560	–	–	–	**API 5L PSL 2:** X56, X60
	10.01	12.70	1,340	–	–	–	
API (petroleum piping) X65, X70	4.00	10.00	1,560	–	–	–	**API 5L PSL 2:** X65, X70
	10.01	12.70	1,200	–	–	–	

[1] Black trimmed edge max. Width, mm = (Black mill edge max width, mm) - (5×Thickness).

Steel Group	Nominal Thickness (mm)		Nominal Width, max. (mm)				Steel Grades
			Black		Pickled		
	From	To	Mill Edge	Trim Edge	Mill Edge	Trim Edge	
Weathering Steel (S235 series)	2.00	2.49	1,000	980	1,000	980	**ES 260-5:** S235J0W, S235J2W **EN 10025-5:** S235J0W, S235J2W
	2.50	3.00	1,450	980	1,000	980	
	3.01	3.50	1,560	1,230	1,250	1,230	
	3.51	5.00	1,560	1,375 [1]	1,400	1,380	
	5.01	10.00	1,600	1,560 [1]	–	–	
	10.01	12.70	1,600	–	–	–	
Weathering Steel (S355 series)	2.00	2.49	1,000	980	1,000	980	**ES 260-5:** S355J2WP, S355J2W **EN 10025-5:** S355J2WP, S355J2W **JIS G3125:** SPA-H
	2.50	3.00	1,450	980	1,000	980	
	3.01	3.50	1,560	1,230	1,250	1,230	
	3.51	5.00	1,560	1,375 [1]	1,400	1,380	
	5.01	10.00	1,600	1,560 [1]	–	–	
	10.01	12.70	1,600	–	–	–	

[1] Black trimmed edge max. Width, mm = (Black mill edge max width, mm) - (5×Thickness).

Steel Group	Nominal Thickness (mm)		Nominal Width, max. (mm)				Steel Grades
			Black		Pickled		
	From	To	Mill Edge	Trim Edge	Mill Edge	Trim Edge	
Steel for Electrical Applications Silicon steels, NGO Si <0.8%	1.96	5.00	1,500	1,480 [1]	1,500	1,480	Tailored hot rolled steel grades according to customer requirements suitable for producing with silicon content up to 1.4%.
	5.01	10.00	1,500	1,475 [1]	–	–	
	10.01	12.70	1,500	–	–	–	
Steel for Electrical Applications Silicon steels, NGO Si 0.8 - 1.4%	1.96	2.24	1,250	1,230	1,250	1,230	
	2.25	5.00	1,500	1,480 [1]	1,500	1,480	
	5.01	10.00	1,500	1,475 [1]	–	–	
	10.01	12.70	1,500	–	–	–	

[1] Black trimmed edge max. Width, mm = (Black mill edge max width, mm) - (5×Thickness).

7.2 Hot Rolled Slit Ring Dimensions and Weight

7.2.1 Available Slit Ring Width

Nominal Thickness (mm)		Slit Ring Width, min. (mm)	
From	To	Black Slit Ring	Pickled Slit Ring
1.00	2.50	60	60
2.51	3.00	100	100
3.01	3.50	150	150
3.51	4.00	200	200
4.01	4.50	300	300
4.51	5.00	400	400
5.01	6.50	500	–
6.51	7.50	600	–
7.51	10.00	600	–

7.2.2 Available Slit Ring Weight

Ring Width (mm)	Slit Ring Weight (Ton)			
	Coil Inner Diameter: 610 mm		Coil Inner Diameter: 762 mm	
	Min.	Max.	Min.	Max.
60	0.31	1.06	0.23	0.98
70	0.36	1.24	0.27	1.15
80	0.41	1.41	0.31	1.31
90	0.46	1.59	0.35	1.47
100	0.52	1.77	0.39	1.64
110	0.57	1.94	0.43	1.80
120	0.62	2.12	0.47	1.97
130	0.67	2.30	0.50	2.13
140	0.72	2.47	0.54	2.29
150	0.77	2.65	0.58	2.46
175	0.90	3.09	0.68	2.87
200	1.03	3.53	0.78	3.28
250	1.29	4.42	0.97	4.10
300	1.55	5.30	1.16	4.92
350	1.81	6.19	1.36	5.74
400	2.07	7.07	1.55	6.56
450	2.32	7.95	1.75	7.37
500	2.58	8.84	1.94	8.19
550	2.84	9.72	2.13	9.01
600	3.10	10.60	2.33	9.83
700	3.61	12.37	2.71	11.47
800	4.13	14.14	3.10	13.11
900	4.65	15.91	3.49	14.75
1,000	5.16	17.67	3.88	16.39
1,200	6.20	21.21	4.65	19.67
1,300	6.71	22.97	5.04	21.30
1,400	7.23	24.74	5.43	22.94
1,580	8.16	27.92	6.13	25.89

7.3 Hot Rolled Cut-to-Length Dimensions

7.3.1 Dimensions and Bundle Weight for (Black) Hot Rolled Cut-to-length

Nominal Thickness (mm)		Available Width (mm)				Available Length (mm)		Bundle Weight (Ton)	
		Mill Edge		Trim Edge					
From	To	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
1.00	4.00	900	1,600	600	1,580	600	6,000	2.50	5.00
4.01	5.00	900	1,600	600	1,575 [1]	1,000	12,000	5.00	8.00
5.01	7.50	900	1,600	600	1,560 [1]	1,000	12,000	5.00	8.00
7.51	10.00	900	1,600	600	1,550 [1]	1,000	12,000	5.00	8.00
10.01	13.00	900	1,600	–		1,000	12,000	5.00	8.00

[1] Black trimmed edge max. Width, mm = (Black mill edge max width, mm) - (5×Thickness).

7.3.2 Dimensions and Bundle Weight for (Pickled) Hot Rolled Cut-to-length

Nominal Thickness (mm)		Available Width (mm)				Available Length (mm)		Bundle Weight (Ton)	
		Mill Edge		Trim Edge					
From	To	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
1.00	4.00	900	1,500	600	1,480	600	3,000	2.50	5.00
4.01	5.00	900	1,500	600	1,480	1,000	3,000	2.50	5.00

8. HOT ROLLED FLAT PRODUCTS MECHANICAL PROPERTIES

8.1 Steel for Cold Forming/Cold Rolling/Enameling Applications

Standard	Grade	Yield Strength (MPa)		Tensile Strength (MPa)		El (%) Thickness-wise
		<3 mm	≥3 mm	<3 mm	≥3 mm	
EN10111	DD11	170–360	170–340	≤440		22–28
	DD12	170–340	170–320	≤420		24–30
	DD13	170–330	170–310	≤400		27–33
	DD14	170–310	170–290	≤380		30–36
DIN1614-1	St22	–		–		–
	RRSt23	–		–		–
	St24	–		–		–
DIN1614-2	StW22	–		≤440		25–29
	RRStW23	–		≤420		27–31
	StW24	–		≤410		30–34
ASTM A569M	type B	205–345		–		≥25
ASTM A1011M, ASTM A1018M	CS, type B	205–340		–		≥25
	DS, type B	205–310		–		≥28
ASTM A568M	SAE1006	220–340		320–420		≥28
	SAE1008	220–340		320–420		≥28
JIS 3131	SPHC	–		≥270		27–31
	SPHD	–		≥270		30–39
	SPHE	–		≥270		31–41
JIS 3132	SPHT-1	–		≥270		30–37
	SPHT-2	–		≥340		25–32

8.2 Low Strength Steel for Structural/General Application

Standard	Grade	Yield Strength (MPa)		Tensile Strength (MPa)		El (%) Thickness-wise
		<3 mm	≥3 mm	<3 mm	≥3 mm	
EN10025-2, ES 260-2	S235 series	≥235		360–510	360–510	16–24
DIN17100	St37-2	≥235		360–510	340–470	16–24
ASTM A570M	Gr. 30	≥205		≥340		21–25
	Gr. 33	≥230		≥360		18–23
ASTM A907M	Gr. 33	≥230		≥360		≥22
ASTM A53M	Gr. A	≥205		≥330		19–29
	Gr. B	≥240		≥415		16–24
ASTM 283M	Gr. C	≥205		380–515		22–25
ASTM A1011M, ASTM A1018	Gr. 30 (SS)	≥205		≥340		21–25
	Gr. 33 (SS)	≥230		≥360		18–23
ASTM A568M	SAE1010	≥210		350–480		≥28
JIS G3113	SAPH370	≥255		≥370		32–37

8.3 Medium Strength Steel for Structural/General Applications

Standard	Grade	Yield Strength (MPa)		Tensile Strength (MPa)		El (%) Thickness-wise
		<3 mm	≥3 mm	<3 mm	≥3 mm	
EN10025-2, ES 260-2	S275 series	≥275		430–580	410–560	14–21
	S355 series	≥355		510–680	470–630	13–20
DIN17100	St44	≥275		430–580	410–540	13–20
	St52	≥355		510–680	490–630	13–20
JIS G3101	SS400	≥245		400–510		17–21
ASTM A568	SAE1015, MOD	≥280		400–530		≥25
	SAE1018, MOD	≥320		≥400		≥26
	SAE1022, MOD	≥300		≥450		≥25
ASTM A36M	A36	≥250		400–550		15–18
ASTM A907M	Gr. 36	≥250		≥365		≥21
	Gr. 40	≥275		≥380		≥19
ASTM A570M	Gr. 36,type 1	≥250		≥365		17–22
	Gr. 36, type 2	≥250		400–550		16–21
	Gr. 40	≥275		≥380		16–21
	Gr. 50	≥345		≥450		11–17
ASTM A572M	Gr. 50	≥345		≥450		11–16
ASTM A1011M	Gr. 36, type 1	≥250		≥365		17–22
	Gr. 36, type 2	≥250		400–550		16–21
	Gr. 40 (SS)	≥275		≥380		16–21
	Gr. 45 (SS)	≥310		≥410		14–19
	Gr. 50 (SS)	≥340		≥450		11–17
ASTM A1011M, ASTM A1018M	HSLA Gr. 45 class 2	≥310		≥380		23–25
	HSLA Gr. 50, class1	≥340		≥450		20–22
	HSLA Gr. 50, class2	≥340		≥410		20–22

8.4 High Strength Steel for Structural/General Applications

Standard	Grade	Yield Strength (MPa)		Tensile Strength (MPa)		El (%) Thickness-wise
		<3 mm	≥3 mm	<3 mm	≥3 mm	
ASTM A570M, ASTM A907M	Gr. 55	≥380		≥480		9–15
ASTM A1011M, ASTM A1018M	Gr. 55 (SS)	≥380		≥480		9–15
	Gr. 60 (SS)	≥410		≥480		8–14
	HSLA Gr. 55 C1	≥380		≥480		18–20
ASTM A572M	Gr. 65	≥450		≥550		≥15
EN 10025-4, ES 260-4	S420M	≥420		520–680		≥19

8.5 Steel for Engineering and Automotive Applications

Standard	Grade	Yield Strength (MPa)		Tensile Strength (MPa)		El (%) Thickness-wise
		<3 mm	≥3 mm	<3 mm	≥3 mm	
EN10149-2	S315MC	≥315		390–510		20–24
	S355MC	≥355		430–550		19–23
	S420MC	≥420		480–620		16–19
	S460MC	≥460		520–670		14–17
	S500MC	≥500		550–700		12–14
EN 10336, EN 10346	HDT580X	330-460		≥580		≥19
	HDT780C	680-830		≥780		≥10
JIS G3113	SAPH400	235–255		≥400		31–37
	SAPH440	275–305		≥440		29–35
JIS G3134	SPFH540	≥355		≥540		21–24
	SPFH590Y	≥325		≥590		22–24

8.6 Steel for Gas Bottle and Pressure Vessels Applications

Standard	Grade	Yield Strength (MPa)		Tensile Strength (MPa)		El (%) Thickness-wise
		<3 mm	≥3 mm	<3 mm	≥3 mm	
EN 10120	P245NB	≥245		360–450		26–34
	P265NB	≥265		410–500		≥24
JIS G3116	SG255	≥255		≥400		≥28

8.7 Steel for Petroleum Piping (API)

Standard	Grade	Yield Strength (MPa)		Tensile Strength (MPa)		El (%) Thickness-wise
		<3 mm	≥3 mm	<3 mm	≥3 mm	
API 5L (PSL1)	Gr. A	≥210		≥335		23–36
API 5L (PSL2)	Gr. B	245–450		415–655		18–24
	X42M	290–495		415–655		15–24
	X46M	320–525		435–655		18–23
	X52M	360–530		460–760		18–22
	X56M	390–545		490–760		17–21
	X60M	415–565		520–760		20–24
	X65M	450–600		535–760		16–23
	X70M	485–635		570–760		18–21

8.8 Atmospheric Resistant Steels (Weathering Steel)

Standard	Grade	Yield Strength (MPa)		Tensile Strength (MPa)		El (%) Thickness-wise
		<3 mm	≥3 mm	<3 mm	≥3 mm	
EN 10025-5, ES 260-5	S355J2W (COR-TEN B)	≥355		510–680	470–630	14–22
	S355J2WP (COR-TEN A)	≥355		510–680	470–630	14–22
	S235J0W	≥235		360–510		17–24
	S235J2W	≥235		360–510		17–24
JIS G3125	SPA-H	≥355		≥490		15–22

8.9 Steel for Electrical Applications

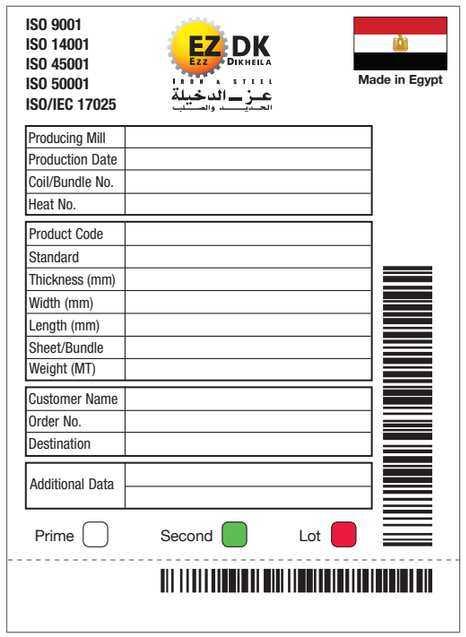
Ezz Steel is capable of producing Non Grain Oriented (NGO) silicon steel qualities for electrical applications according to customer requirements with silicon content up to 1.4%.

9. LABELING AND PACKING

The products are marked with a heat and dirt-resistance GRAPHIPLAST® label containing the following data:

- Producing mill.
- Production date.
- Coil/Bundle number.
- Heat number.
- Product code.
- Standard.
- Thickness (mm).
- Width (mm).
- Length (mm).
- Sheet/bundle.
- Weight (MT).
- Customer name.
- Order number.
- Destination.
- Additional data.
- White colour for prime product.
- Green colour for second product.
- Red colour for lot product.

Wide Label for Coil/Bundle



Narrow Label for Rings

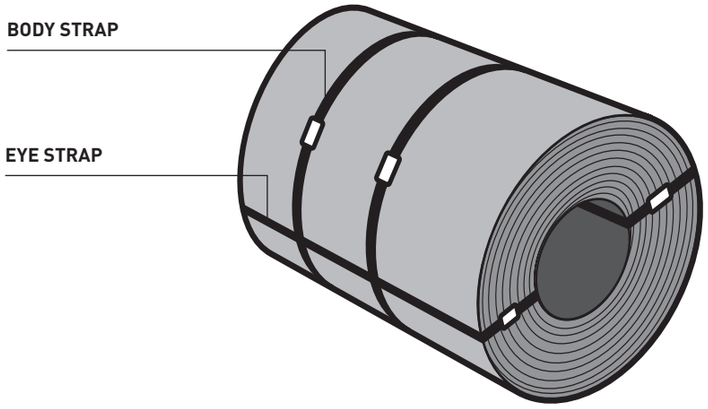


NOTES:

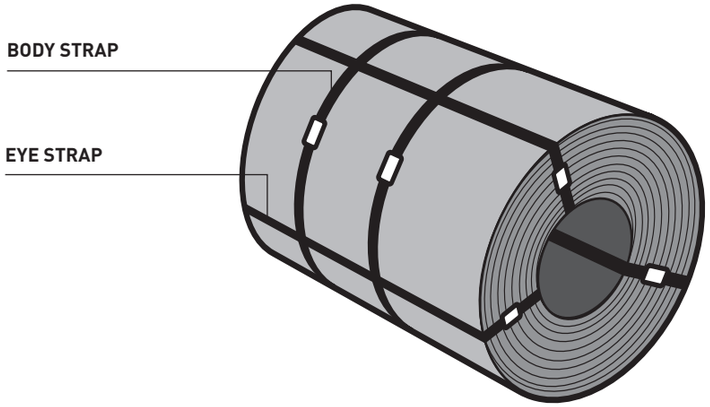
- **For local market:** One label at the coil/bundle.
- **For export markets:** Two labels at the coil/bundle.
- **Normal wide label is used for both coil/bundle.**
- **Narrow label for rings with width less than 140 mm.**

APPLIED PACKING FOR HOT ROLLED COILS (BLACK)

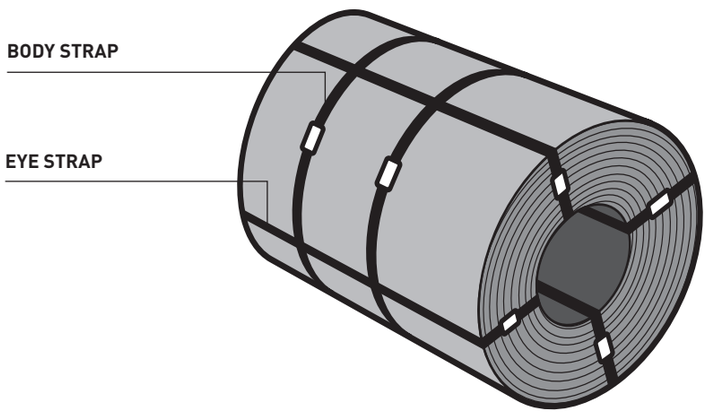
a. Local



b. Export



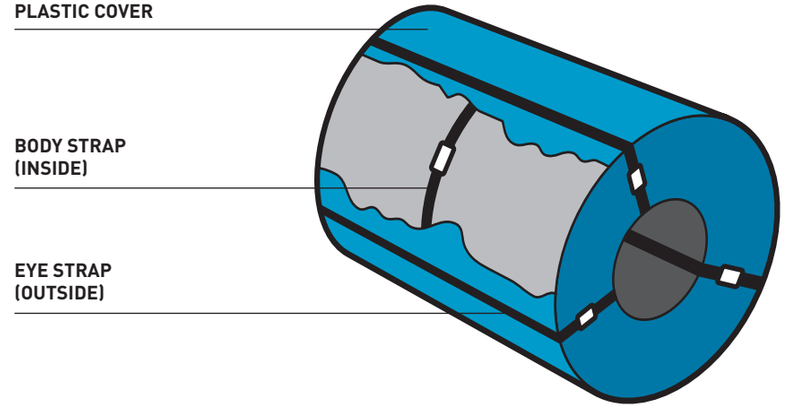
c. Special Export for USA, Canada and Gulf Area



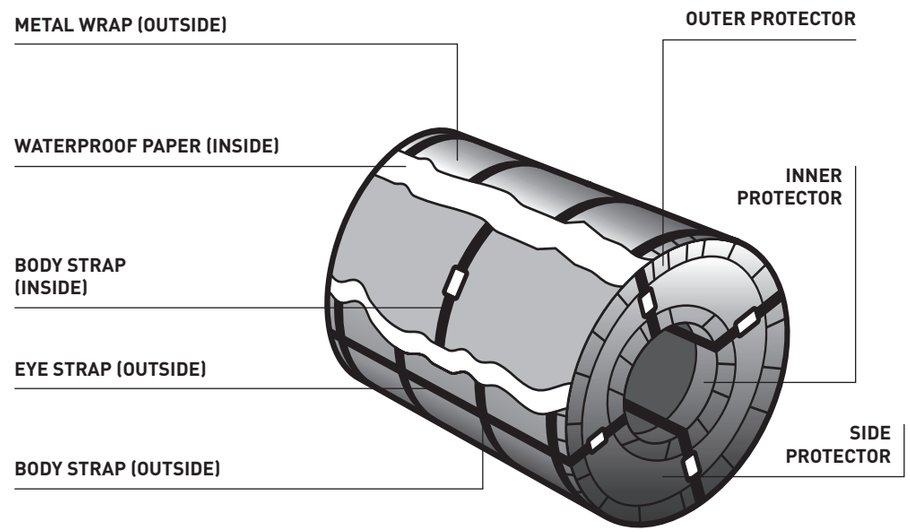
Slit rings of ≤200 mm are normally delivered as eye-to-sky.

APPLIED PACKING FOR HOT ROLLED COILS (PICKLED)

a. Local



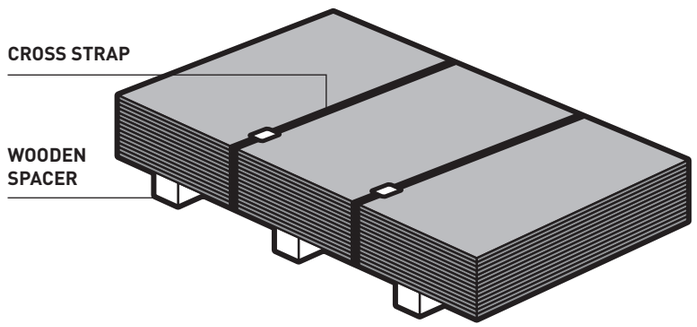
b. Export



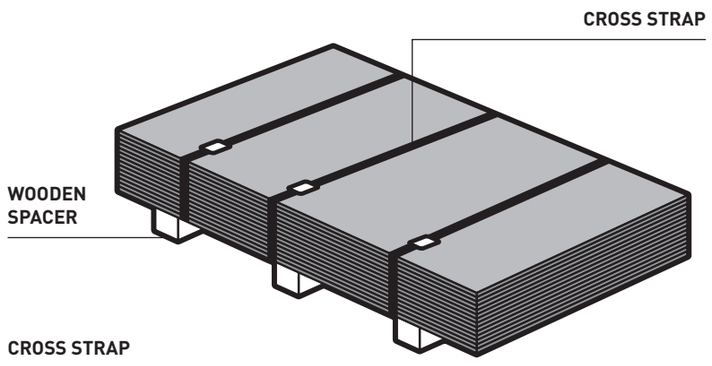
Slit rings of ≤200 mm are normally delivered as eye-to-sky.

APPLIED PACKING FOR HOT ROLLED SHEETS (BLACK)

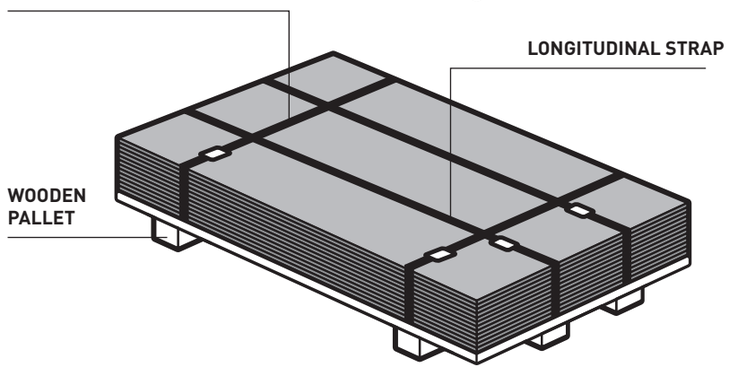
a. Local up to 6,000 mm long



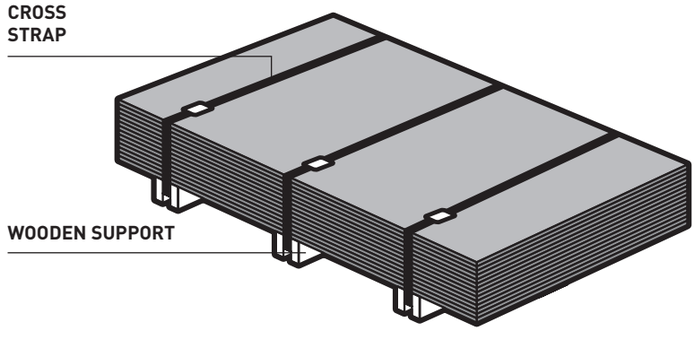
b. Local higher than 6,000 mm long



c. Export up to 3,000 mm long and up to 5.0 mm thickness

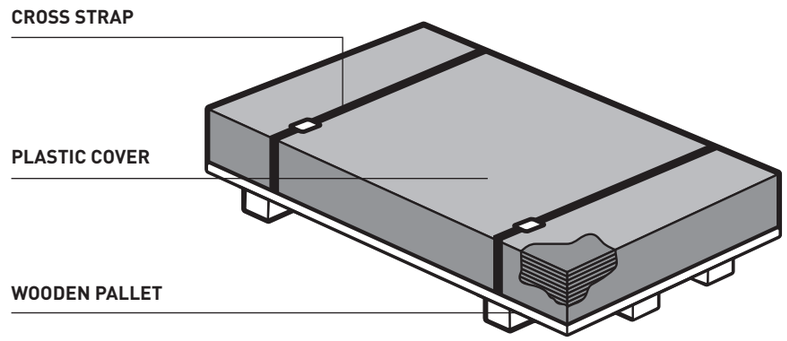


d. Export higher than 3,000 mm long or higher than 5.0 mm thickness

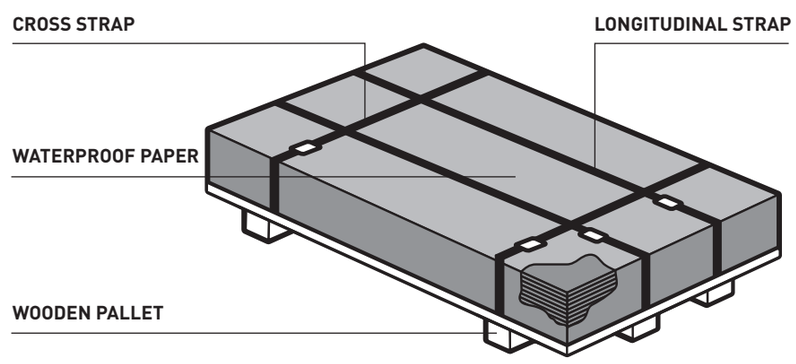


APPLIED PACKING FOR PICKLED SHEETS

a. Local

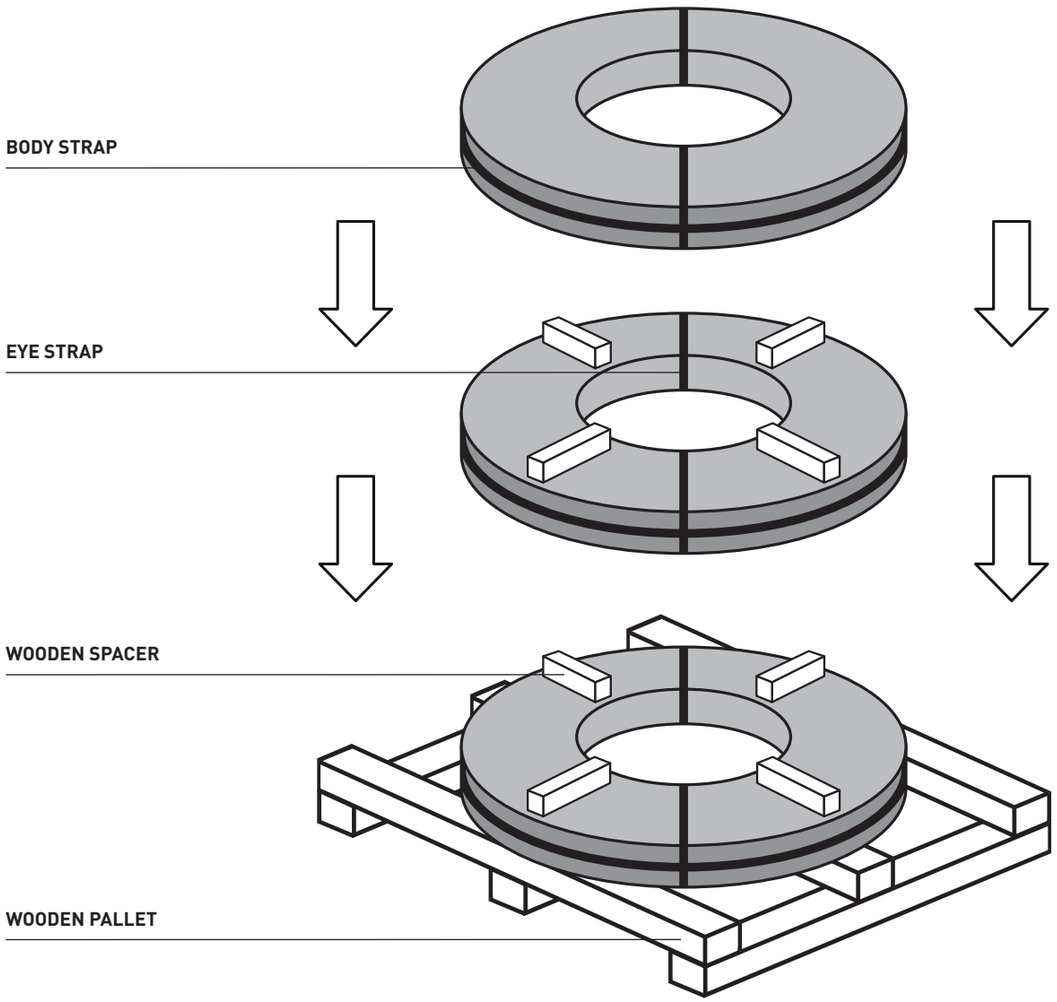


b. Export



APPLIED PACKING FOR SLIT RINGS (WIDTH ≤200 MM)

a. Local/Export



DEDICATION TO INVESTING IN THE LATEST TECHNOLOGY AND IN THE SKILLS OF OUR PEOPLE, COUPLED WITH A COMMITMENT TO CONTINUOUS IMPROVEMENT AND UNPARALLELED CUSTOMER SERVICE.

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