



ArcelorMittal

Heavy Plates Catalogue

ArcelorMittal Galati

Valid as of November 1st 2015

ArcelorMittal Galati has a nominal capacity of 1.5 million tons of hot rolled quarto plates. The mill is strategically located in Romania with easy access to the Danube river and the Black Sea. The mill offers a wide range of plates suitable for various applications.



Applications

- Structural Steel: Industrial constructions, Commercial and residential constructions, Civil engineering
- Shipbuilding Steel: Container ships, Tankers, Multi-purpose vessels, Coaster vessels, Tugs, Offshore support vessels, Pontoons, Floating docks, Barges
- Windmill Steel: Onshore tubular wind towers
- Energy pipes Steel: Oil and Gas linepipes
- General purpose pipe Steel: Boiler pipes, Construction and Industrial pipes, Water pipes
- Pressure vessels Steel: Cylindrical and spherical tanks for gas and liquid storage/ transport, Boilers, Condensers
- Steel for Mining equipment and Yellow goods: High strength steel for lifting and transportation equipment

Production Range

Technical Delivery Conditions

- Chemical properties & Mechanical properties according to ordered standards.
- For Furnace Normalized supply condition – thickness max. 100 mm.
- Sizes and Tolerances according to: EN10029; ASTM A6; ASTM A20; JIS G 3193

Dimensional capability

Thickness • 6 – 40 mm shear cutting
• 40.01 – 180 mm flame cutting

Plate unit weight for width 1500 – 1900 mm is max. **11.3 MT**

Plate unit weight for width over 1900 mm is max. **15 MT**

Max. weight **18 MT** with mill acceptance

Thickness [mm]	Width [mm]					Length [mm]	
	1500	3400	3600	3800	4000	min	max
6.0 – 8.9						6000	13000
9.0 – 11.9						5000	14000
12.0 – 19.9						5000	15000
20.0 – 40.0						4000	16000
40.1 – 180						2000	16000

Width between 1400mm – 1500mm & Length over 16000mm with mill acceptance

Ultrasonic testing according to :

EN 10160, ASTM A578 (Level A – max 100mm; Level B max 60mm; Level C – max 20 mm), ASTM A435, BS 5996, ISO 12094)

UT level / thickness plates range				
	E0	E1	E2	E3
S0	6-150 mm			
S1		6-100mm	6-60mm	6-40mm
S2			6-40mm*	6-40mm*
S3				6-40mm*

* more than 40mm thickness with prior mill acceptance

Z test according to :

EN 10164/2004; ASTM A770/2001
For plates of thickness less than 15 mm the standard does not require through-thickness tensile tests. ArcelorMittal Galati guarantee plates with improved through-thickness properties in thickness range 6mm – 15mm, but does not perform tests.

Z test / thickness plates range			
	15-60mm	60-80mm	80-100mm
Z15			
Z25			
Z35*			

* Between 60-80mm and for shipbuilding grades with prior mill acceptance

Marking

By painting and die stamping indicating: Made in Romania, ArcelorMittal logo, number of contract, size, quality standard, plate number and heat number.

Document of Quality

Mill's quality documents according to EN 10204/2004 type 2.2; 3.1 (DB, TUV); 3.2(LRS, GL, BV, ABS, DNV, RINA,NKK and others as per request)

Grades and standards

Structural Steel for general applications			Weldable fine grain structural steels - normalized	
EN 10025-2	S185	Delivery state – As rolled, Normalizing Rolled, Furnace Normalized	EN 10025-3	S275; S355; S420; S460 (N; NL)
	S235JR/JRC; JO/JOC; J2/J2C			
	S275JR/JRC; JO/JOC; J2/J2C			
	S355 JR/JRC; JO/JOC; J2/J2C; K2/K2C			
ASTM A36/A36M	A36	Without mechanical properties (WMP) for thickness >100mm	ASTM A572/ A572M	A572Grade (50; 60) (type 1; 2)
ASTM A283/A283M	A283Grade (C; D)			
ASTM A573/A573M	A573Grade (65; 70)			
JIS G 3101	SS400; SS490			

Thickness Capability [mm]	25	40	70	80	100	130	140	150	160	170	180
A572 Gr60 Type1 / Type2											
A572 Gr70											
A588 Grade A											
S235JR/JO/J2+N class 1											
S235JR/JO +N class 3											
S235JR/JO + N											
S235J2+N class 3											
S275JR/JO class 3											
S275JR/JO + N											
S275J2 + N class3											
S275N/NL											
S355JR/JO class 3											
S355JR/JO+N											
S355J2+N class3											
S355JR/JO/J2 _CEV max 0.43											
S355K2 /N /NL											
S420N											
S420NL											
S420N/NL class 3											
S460N /NL											
S460N /NL class 3											

Legend: WMP



TMCP Steel - Weldable fine grain structural steel

		Thickness Capability	15	20	25	30	40	50	60	70	80
EN 10025/4-2004 EN 10149/2-1996	S275M	S275M									
	S275ML	S275ML									
	S355M/MC	S355M/MC									
	S355ML	S355ML									
	S420M/MC	S420M/MC									
	S420ML	S420ML									
	S460M/MC	S460M/MC									
	S460ML	S460ML									
	S500MC	S500MC									

Delivery state – Thermomechanical rolled weldable fine grain structural steels. | CEV lower than 0.40% for high grades. Impact test down to -50°C. Suitable for bending process, suitable for flanging without cracking. | Up to Z35 through-thickness tensile tests.

Offshore Steel - weldable structural steels for fixed offshore structures

		Thickness Capability	15	20	25	30	40	50	60
EN 10225:2009	S355G2+N	S355G2+N							
	S355G3+N	S355G3+N							
	S355G5+M	S355G5+M							
	S355G6+M	S355G6+M							
	S355G7+M	S355G7+M							
	S355G8+M	S355G8+M							

Delivery state – Normalizing rolled G2;G3 Thermomechanical rolled G5/G6/G7/G8 weldable fine grain structural steels..

CEV lower than 0.40% for high grades. Impact test down to -60grdC.

Suitable for bending process, suitable for flanging without cracking.

Option 10 ; Option 11 – PWHT

Option 12 – Strain ageing test

Option 13 – Trough thickness test (Z35)

Legend: WMP

Structural steel with improved corrosion resistance

ASTM A 242/1991		Type 1	Thickness Capability [mm]	12	50	60	70	80	100
EN 10025/5 2004	S235JOW +N	S235JOW +N	S235J0/J2W +N						
	S235J2W +N	S235J2W +N	S235J0/J2W +N						
	S355JOW +N	S355JOW +N	S355J0/J2W +N						
	S355JOWP +N	S355JOWP +N	S355K2W +N						
	S355J2W +N	S355J2W +N	S355J0/J2WP +N						
	S355J2WP +N	S355J2WP +N	S355K2W +N						
	S355K2W +N	S355K2W +N							

Delivery state: As Rolled, Normalizing Rolled, Furnace Normalized

Pipeline Steels

		Thickness Capability [mm]	15	20	25	30	40
API 5LED44	A; B; X42; X46; X52; X60; X65; X70	API5L / ISO 3183 (EN 10208/1/2)					
EN 10208-1	L210GA; L235GA; L245GA; L290GA; L360GA	Grade B / L245 M/N					
EN 10208-2	L245NB; L290NB; L360NB; L415NB; L415MB	X42 / L290 M/N					
EN 10219-1	S235JRH; S275JOH; S275J2H; S355JOH; S355J2H; S355K2H	X46 / L320 M/N					
		X46MO - offshore grade					
EN 10217/1	P195TR1; P195TR2; P235TR1; P235TR2; P265TR1; P265TR2	X52 / L360 M/N					
		X52MO - offshore grade					
EN 10217/5	P235GH; P265GH	X56 / L390 M/N					
		X60 / L415 M/N					
GOST 19281	15GF	X65 / L450 M					
GOST 380	St 3 sp	X70 / L485 M					
Delivery state: Normalizing rolled, thermomechanical controlled rolling (TMCP) based on prior acceptance by the mill		GOST					
For grades higher than X42 prior acceptance by the mill is mandatory for all requirements		ST3sp - K46					
		15GF - K50					
		17G1S - K52					
		15G2SF - K55					

With prior mill acceptance

Bridges

		Thickness Capability [mm]	15	20	30	32	40	50
GOST 6713-91	15HSND-2	15HSND						
STAS 12187-88	OL 37 EP	OL 37 EP						
	OL 52 EP	OL 52 EP						

Delivery state – Furnace Normalized

Boilers and pressure vessel steels

		Thickness Capability [mm]	25	50	60	70	80	100
EN 10028-2	P235GH; P265GH; P295GH; P355GH; 16Mo3	16MO3						
IS 2002	Grade 2	A515 G60						
ASTM A515/A515M	A515Grade (60; 65; 70)	A515 G70(CVN)						
		A516 G60(CVN)						
BS1501	151 – 430 (A); 224 – 490 (A; B)	A516 G60						
		A516 G60(PWHT)						
EN 10028-3	P275(NH; NL1; NL2)	A516 G70(CVN)						
		A516 G70						
	P355 (N; NH; NL1; NL2)	A516 G70(PWHT)						
		A537 CLS1						
P460 (NH; NL1; NL2)	P235 GH/ P265 GH							
	P295 GH							
ASTM A285/A285M	A285Grade (A; B; C)	P355 GH						
ASTM A516/A516M	A516Grade (55; 60; 65; 70)	P275 NH						
		P275 NL1/ NL2						
ASTM A537/A537M	A537Class1	P355N/ NH						
		P355NL1/ NL2						
(A516 – 4 Cycles Post-Weld Heat Treatment (PWHT) as per ASME, guarantee 1 cycle without request, Z test, Shear area, CVN -46° Celsius)		P460NL1/ NL2						

Legend: CVN – Charpy V Notch

Shipbuilding

		Thickness Capability [mm]	25	50	60	70	80	100
ASTM A131/ A131MBV; LR; ABS; RINA	A; B; D; E; AH32; DH32; EH32; AH36; DH36; EH36	SHIP-A/B						
GL	A; B; D; E; A32; D32; E32; A36; D36; E36	SHIP-D						
		SHIP-D32						
DNV	NVA; NVB; NVD; NVE; NVA32; NVD32; NVE32; NVA36; NVD36; NVE36	SHIP-D36						
		SHIP-E/E32						
NKK	KA; KB; KD; KE; KA32; KD32; KE32; KA36; KD36; KE36	SHIP-E36						

Delivery state – According to requirements of class societies (LRS, GL, BV, ABS, DNV, RINA, NKK)

Current service and product development portofolio

Cutting and beveling

Integrated processing supply chain to serve the Wind Energy segment. Rolling over Plate Mill no.2 and full processing (oxy gas cutting/ mechanical beveling/ edge anticorrosion painting) executed in Plate Mill no.1 on ArcelorMittal Galati industrial platform.

The processing supply chain is designed for 2kt/month and is aiming to 3 kt/month. Dimensional feasibility:

- 7mm – 80mm thickness
- Max. 16.000mm length
- Max. 4.000mm width
- Weight / plate max. 18t

Dimensional tolerances:

- +/-1mm dimensional range
- +/-2° for bevel angle

Processing in PM1 (Plate mill no.1)

is planned to be executed in 2 steps:

- Oxy-cutting using SATO SATRONIK D 6000 machine
- Mechanical beveling using N.KO UZ50 machine

SATO SATRONIK D 6000 oxy-cutting machine technical parameters/feasibility:

- 12.000–20.000mm/minute productivity depending on plate thickness
- 6–150mm plate thickness
- Max. 6.000mm plates width
- Max. 30.000mm plates length
- Capability for straight/ radius cutting (CAD nesting programs available)
- 4 oxy-cutting heads with the capability to process 2 steel plates at the same time

N.KO UZ50 & 3D manipulator mechanical beveling machine technical parameters / feasibility:

- Max. 1.100mm/minute productivity depending on the plates thickness
- 3D manipulator provides maximum flexibility in beveling execution

Steel plates manipulation is done using electromagnetic cranes of max. 25t.

The solution is fully operational since Q1 2014.

Ongoing projects for new feasibilities

Number	Project	Product Type	Timeline
1	Project - Pressure Vessels TMCP Grade up to P460ML 40mm	Pressure Vessels	Q1 2016
2	Project - API 5L grade X60MO up to 25mm (CTOD Test)	Pipe Energy	Q3 2016
3	Project - TMCP Offshore Structural Steel S355G9/G10 M up to 40mm	Offshore Structural Steel	Q2 2016
4	Project - Normalized Offshore Structural Steel S355G9/G10 N up to 40mm	Offshore Structural Steel	Q3 2016
5	Project - Normalized Shipbuilding Steel FH36 DNV_GL homologation	Shipbuilding Steel	Q2 2016
6	Project - Normalized Shipbuilding Steel FH40 DNV_GL homologation	Shipbuilding Steel	Q4 2016
7	Project - TMCP grade up to FH40 Lloyds Register homologation	Shipbuilding Steel	Q2 2016
8	Project - TMCP grade up to FH40 DNV_GL homologation	Shipbuilding Steel	Q1 2017
9	Project - HIC Grade ASTM A516 - Grade 70	Pressure Vessels	Q1 2017
10	Project - TMCP Offshore Structural Steel S420 MO up to 40mm	Offshore Structural Steel	Q1 2017

Salient features of service offering

Lead times

ArcelorMittal Galati ensures flexible production lead times with the possibility to produce and expedite heavy plates in structural grades and thickness between 9 - 60 mm, width max. 2500 mm, length max. 12000 mm in four weeks from the date of releasing the order into production.

Lead time	Specification/ Destination	Time
Normal lead time (NLT)	Plates in thickness between 6 - 8 mm	8 weeks
	Plates in thickness over 8 mm for delivery by train or truck to Germany, Slovakia, Czech Republic, France, Denmark, Poland, Hungary	6 weeks
	Projects and Export (Far East, Middle East, Near East, India, South America and North America)	8 weeks
	Plates in thickness above 8 mm for Romania, Greece, Turkey, Balkan countries	5 weeks
Short lead time (SLT)	Structural grades (S235 - S355) and their equivalent naval grades; thickness from 9 to 60 mm; width up to 2500 mm; length up to 12000 mm to all destinations	4 weeks

Nominal quantity tolerances

ArcelorMittal Galati ensures delivery of exact number of plates for quantities per items of minimum 5 Mt.

Communication

The existence of a dedicated team in charge of order follow up provides customers regular updates on the order status as well as on the production completion date and shipment.

Regular train shipments towards Central Europe

- Starting with 2012, new logistics solution has been developed by organizing regular train transportation for deliveries to following destinations:
 - Poland
 - Czech Republic
 - Germany
 - Slovakia (Žilina)
 - France
- Trains to above mentioned destinations can be organized on a weekly basis (1000-1200 Mt)
- For orders with smaller volume going to customers with access to railway, direct train transportation to the destination can be organized by single wagon system
- For customers with no access to railway, a logistics solution by using the facilities of a hub located in Gliwice (Poland), in Regensburg or in Ziltendorf (Germany) is being used. Material is shipped from the logistics hub to customer's premises by truck.
- Availability of special wagons type SLPSU 725 allows dispatching of wide plates

Value for the customer

- Better stock planning and continuous delivery of material
- Stable transportation time – in average 7 days to destination
- Better control of working capital

Classification society / Homologation

Register	Ongoing	Grade	Deoxidation	12 mm cut for wide strip	15	20	25	30	35	40	50	60	100	
DNV	31-Dec-2016	NV A, NV B, NV D	FG Al	AR, N				N						
		NV E	FG Al	N										
		NV A32, NV D32, NV A36, NV D36, NV E32, NV E36	FG Al	N										
		NV 410-0 A, NV 460-0A	FG Al	AR										
		NV 410-0 N, NV 460-0 N, NV 490-0 N, NV 410-1 FN, NV 460-1 FN, NV 490-1 FN, NV 510-1 FN	FG Al	N										
		NV 4-2	FG Al+Nb+V	N										
DNV/Z35 up to 60mm	31-Dec-2016	NV D, E, A32, A36, D32, D36, E32, E36, all grades Z15, Z25, Z35	FG Al	N										
LR	2-Dec-2016	A, B	Killed	AR										
		A, B, D	FG Al	AR, NR, N						NR, N				
		E	FG Al	N										
		A, B, D, E	FG Al+ Nb	N										
		DH27S, DH32, DH36	FG Al	AR					NR, N					
		AH27S, AH32, AH36	FG Al	AR										
		AH27S, AH32, AH36, DH27S, DH32, DH36, EH27S, EH32, EH36	FG Al	N										
		AH27S, AH32, AH36, DH27S, DH32, DH36	FG Al	NR										
		AH27S, AH32, AH36, DH27S, DH32, DH36, EH27S, EH32, EH36	FG Al+Nb	N										
		AH27S, AH32, AH36, DH27S, DH32, DH36, EH27S, EH32, EH36	FG Al+Nb+Ti	NR										
		AH27S, AH32, AH36, DH27S, DH32, DH36, EH27S, EH32, EH36	FG Al+Nb+V	N										
		AH27S, AH32, AH36, DH27S, DH32, DH36, EH27S, EH32, EH36	FG Al+Nb+V+Ti	NR										
		360 AR, 410 AR	Killed	AR										
		460 FG, 490 FG, 510 FG	FG Al+Nb	N										
		360 FG, 410 FG	FG Al+Nb	N										
		360 FG, 410 FG, 460 FG, 490 FG, 510 FG	FG Al+Nb+V	N										
		360 FG, 410 FG, 460 FG, 490 FG, 510 FG	FG Al	NR, N										
360 FG, 410 FG, 460 FG, 490 FG, 510 FG	FG Al+Nb+V+Ti	NR												
360 FG, 410 FG, 460 FG, 490 FG, 510 FG	FG Al+Nb+Ti	NR												
LR/Z35 up to 60 mm	2-Dec-2016	All Grades Lloyds Register Z15, Z25, Z35		N										
TUV + PED	Ongoing	P235GH, P265GH, P295GH, P355GH	Plates	N										
		13CrMo4-5	Plates	Quenched and tempered										
		S235JR, S235J2, S275JR, S275J2, S355J2	Plates	N										
		S355K2	Plates	N										
		S235JR, S235J2, S275JR, S275J2, S355J2, S355K2	Plates	Controlled rolled										
		P275NH, P275NL1, P275 NL2	Plates	N										
		P355N, P355NH, P355NL1, P355 NL2	Plates	N										
		S235JR, S235J2, S275JR, S275J2, S355J2	Strip, plate from strip											
BV	6-Jan-2016	A	Killed	AR										
		A, B, D	FG Al	AR, N						N				
		E	FG Al	N										
		AH32, AH36, DH32, DH36, EH32, EH36	FG Al	N										
		AH32, AH36 DH32, DH36, EH32, EH36	FG Al + Nb	N										
BV Z25	6-Jan-2016	All Grades Z15, Z25												
BVZ35/ up to 60 mm	6-Jan-2016	All Grades Z35												
NKK	30-Jun-2018	KA, KB	Killed Si+Mn	AR, NR, N										
		KD	Killed Si+Mn+Al	AR, NR, N						N				
		KE	Killed Si+Mn+Al	N										
		KA32, KD32, KA36, KD36	Killed Si+Mn+Al	NR, N				N						
		KE32, KE36	Killed Si+Mn+Al+N	N										

Legend: Deoxydation **K** - killed | **FG** - fine grain

Delivery condition **AR** - as rolled | **NR** - normalized rolled | **N** - normalized in furnace

For more information on ArcelorMittal Galati entire range of certifications, please contact our local teams.

Certification / Homologation

Register	Validity	Grade	Deoxidation	12 mm cut for wide strip	15	20	25	30	35	40	50	60	100	
RINA	18-May-2016	A, B	Si Killed	AR										
		A, B, D	FG Al	AR, NR, N						NR, N				
		E	FG Al	N										
		AH32, AH36	FG Al	NR, N						N				
		AH32, AH36	FG Al + Nb	N										
		DH32, DH36	FG Al	NR, N				N						
		DH32, DH36	FG Al + Nb	N										
RINA Z25	18-May-2016	All Grades Z15, Z25												
ABS	17-Nov-2018	A, B	Si Killed	AR										
		A, B, D	Si - Al Killed	NR, N			N							
		E	Si - Al Killed	N										
		AH32, AH36, DH32, DH36	FG Al+Nb+V+Ti	NR, N			N							
		EH32, EH36	FG Al+Nb+V+Ti	N										
		A, B, D (sheets HSM)	Si - Al Killed	NR										
		AH32, AH36, DH32, DH36 (sheets HSM)	FG Al+Nb+V+Ti	NR										
ABS Z25	17-Nov-2018	All Grades Z15, Z25												
ABS Z35/ up to 60 mm	14-Nov-2018	All Grades Z35												

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