



Steel products for the mining sector

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 METINVEST®

Thread bars for rock bolting

Rock bolts are steel rod inserted into holes drilled into the roofs or walls of rock formations to provide support to the roofs or sides of the cavities. Rock bolt reinforcement can be used in any excavation geometry, including mines and tunnels. Thread bars have a continuous, right hand thread rolled on it.


Description/Parameters

PRODUCER:	Yenakieve Iron & Steel Works Makiivka Branch
BAR LENGTH:	6-12 meters
DELIVERY CONDITION:	thermomechanically strengthened after rolling
MISC:	Bar spacing and thread are controlled by the full-length screwing of a controlling nut

	ASH400	ASH500	ASH600
DIAMETER*, mm	20, 22	20, 22	20, 22
MIN. YIELD STRENGTH, H/mm ²	400	500	600
MIN ELONGATION, %	16	20	18

Chemical composition for ASH500, ASH600

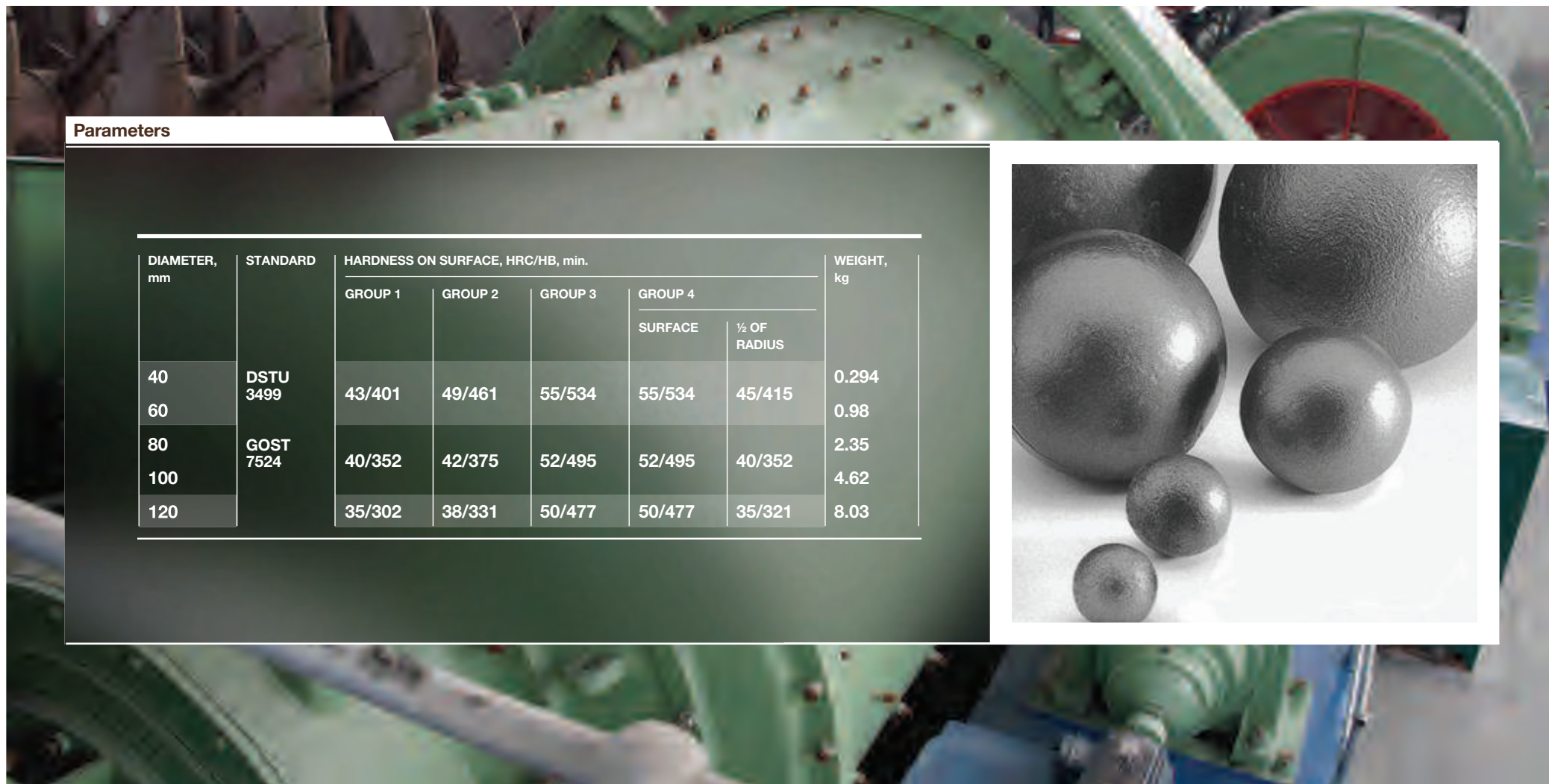
C	Si	Mn	P max	S max	N max
↓	↓	↓	↓	↓	↓
0.25-0.35	0.60-1.10	0.90-1.40	0.040	0.050	0.012



* other diameters to be mastered 18 mm, 25 mm, 28 mm

Grinding balls

Grinding balls are made from high carbon steel with proper alloying elements. They are used to grind mineral resources (any kind of ore, cement, etc.) in grinding mills. Steel balls are loaded into the mills and added on a regular basis. Metinvest produces grinding balls from high carbon steel (0.40-1.10% of C content) at Azovstal Iron & Steel Works.



Parameters

DIAMETER, mm	STANDARD	HARDNESS ON SURFACE, HRC/HB, min.					WEIGHT, kg
		GROUP 1	GROUP 2	GROUP 3	GROUP 4		
					SURFACE	½ OF RADIUS	
40	DSTU 3499	43/401	49/461	55/534	55/534	45/415	0.294
60					55/534	45/415	
80	GOST 7524	40/352	42/375	52/495	52/495	40/352	2.35
100					52/495	40/352	4.62
120					50/477	35/321	8.03

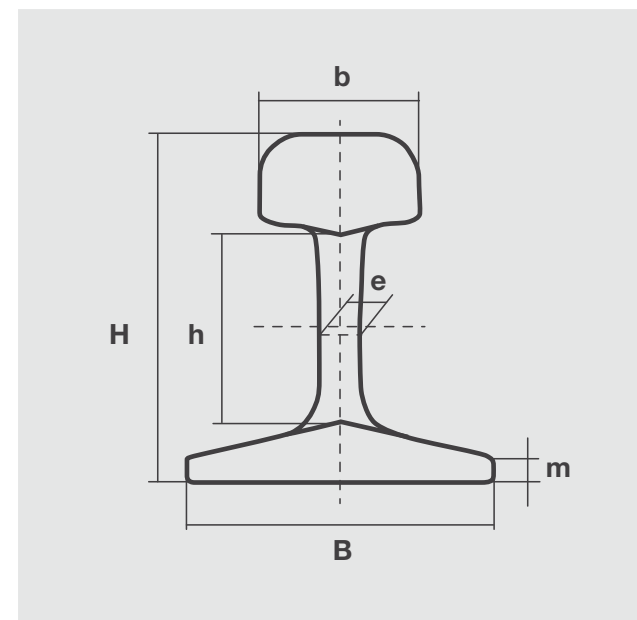


Light rails

Light rails are used to construct narrow gauge railway lines. These rails are widely used by mines, mills to transport cargos in small railcars with a capacity of 0.5-8 m³. METINVEST is capable of producing heavy rails such as S-49, R-50, R-65, UIC-60, OR-50, OR-65, GT-140PS with a length of up to 25 meters.

Parameters

	R-18	R-24	R-34
PRODUCER	EMZ	AZOVSTAL IRON & STEEL WORKS	
STEEL GRADE	50, 60, 70 AS PER DSTU 3799-98 H50 AS PER TT232-14-2014		
WEIGHT, kg/m	17.91	24.96	34.1
HEIGHT, mm, H	90	108	128
HEIGHT OF FISHING, mm, h	38	59	68
WIDTH OF HEAD, mm, b	40	51	60
WIDTH OF FOOT, mm, B	80	92	110
HEIGHT OF FOOT TOE, mm, m	4.25	6.75	8.59
THICKNESS OF WEB, mm, e	10	10.5	13
LENGTH, m	8, 10, 11		



Support section profiles

All underground mine workings must have reliable support that meets necessary technical requirements for strength, toughness, flexibility. Mining support section profiles are used to prevent mine working from failing. These sections can be installed every 0.7-1 meter on average. Metinvest produces support section profiles at Azovstal Iron & Steel Works.

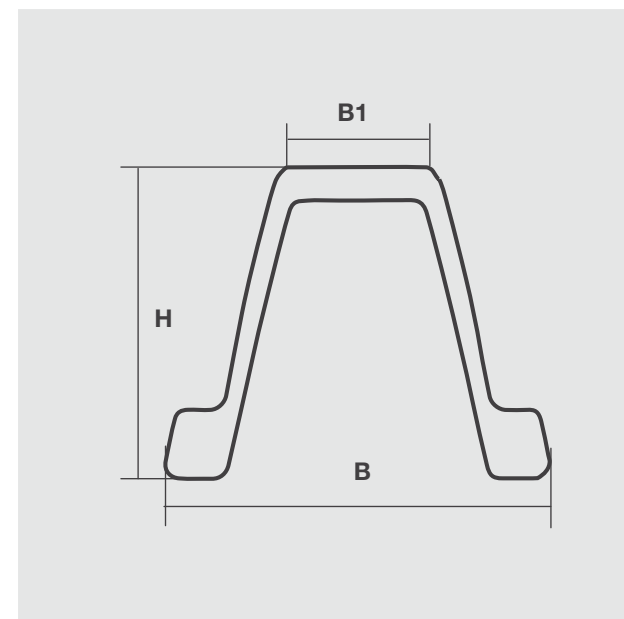


Parameters

TYPE	SIZE			WEIGHT, kg/m
	B, mm	B1, mm	H, mm	
SVP 19	136	60.0	102	19.2
SVP 22	145.5	60.0	110	21.9
SVP 27	149.5	59.5	123	27
SVP 33	166	66.0	137	33.39

STEEL GRADE	YIELD STRENGTH, H/mm ² min	TENSILE STRENGTH, H/mm ² min	ELONGATION, %
5sp	285	490	20
20G2AF	440	590	20

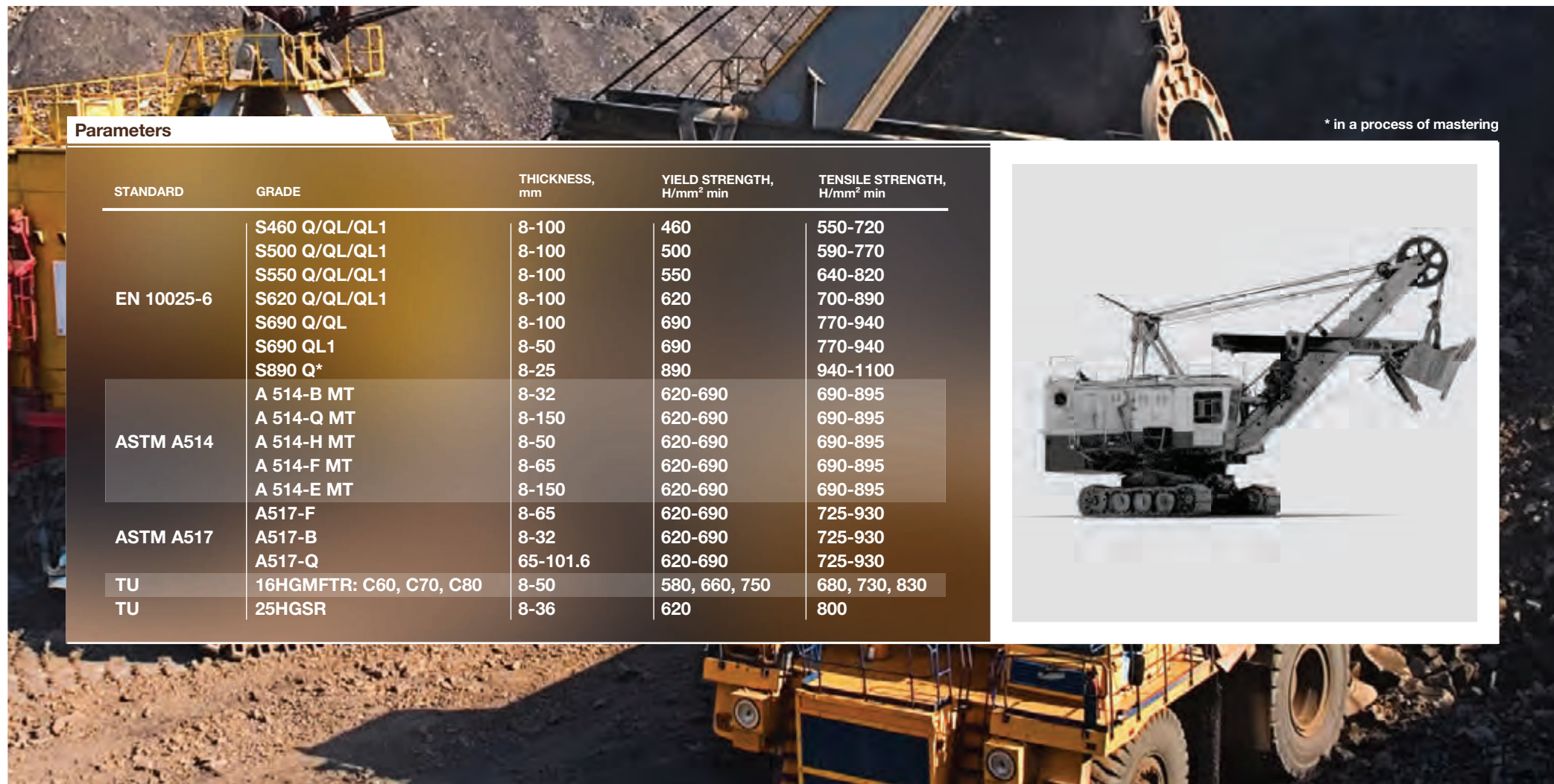
* — low alloyed 20G2AF steel allows to use one size smaller profiles with greater load-carrying capabilities



High strength plates

- BENEFITS:**
- Longer service time**
 - Higher payload**
 - Lower costs for repairs and maintenance**
 - Improved productivity**

High strength steel has high hardness and strength values that a few times higher than ordinary steel. These properties are achieved through heat treatment and low alloying. Q&T steel's wear resistance characteristics help to improve the service time of equipment in difficult, high-wear mining conditions. Q&T steel plate application: truck bodies, bucket components, earthmoving and mining equipment, etc. Metinvest produces Q&T steel plates at Azovstal Iron & Steel Works and has a long successive history of supplying locally and globally (USA, Europe, CIS).



Parameters

* in a process of mastering

STANDARD	GRADE	THICKNESS, mm	YIELD STRENGTH, H/mm ² min	TENSILE STRENGTH, H/mm ² min
EN 10025-6	S460 Q/QL/QL1	8-100	460	550-720
	S500 Q/QL/QL1	8-100	500	590-770
	S550 Q/QL/QL1	8-100	550	640-820
	S620 Q/QL/QL1	8-100	620	700-890
	S690 Q/QL	8-100	690	770-940
	S690 QL1	8-50	690	770-940
	S890 Q*	8-25	890	940-1100
	ASTM A514	A 514-B MT	8-32	620-690
A 514-Q MT		8-150	620-690	690-895
A 514-H MT		8-50	620-690	690-895
A 514-F MT		8-65	620-690	690-895
A 514-E MT		8-150	620-690	690-895
ASTM A517	A517-F	8-65	620-690	725-930
	A517-B	8-32	620-690	725-930
	A517-Q	65-101.6	620-690	725-930
TU	16HGMFTR: C60, C70, C80	8-50	580, 660, 750	680, 730, 830
TU	25HGSR	8-36	620	800



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