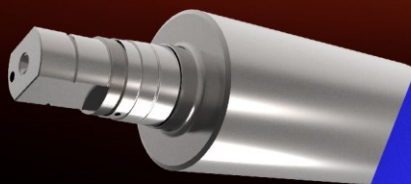
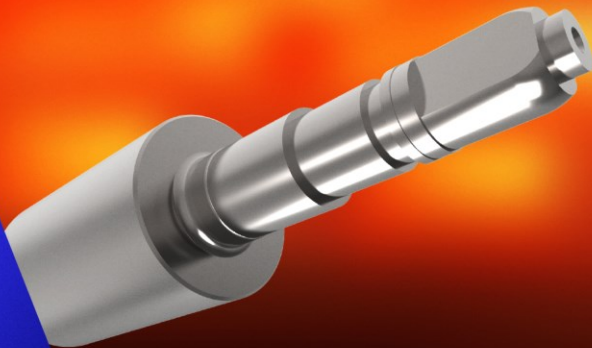
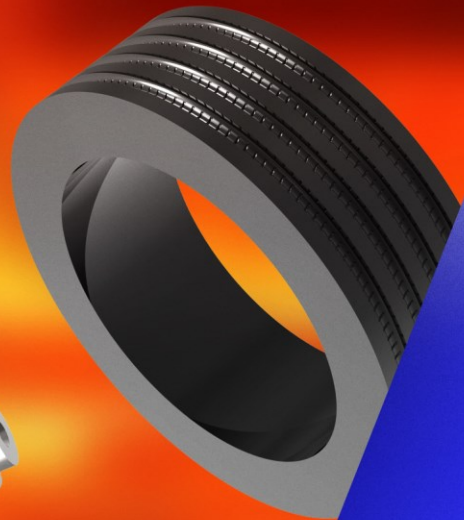
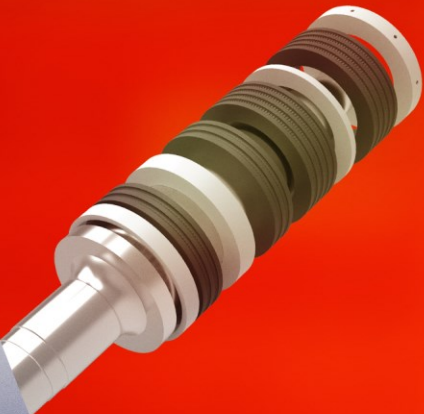
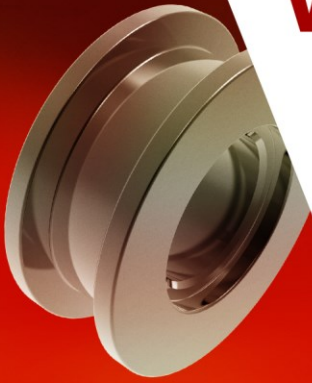


VULCAN METAL





VULCAN METAL

Vulcan Metal Dış Ticaret ve Danışmanlık Ltd. Şti.

Facts

Founded in Istanbul, Türkiye
Operates Worldwide
Easy to Communicate
Solution-Oriented
Metal Enthusiast



Fundamentals

Dynamic Communication
Analytical Approach
Tailored Solutions
Accurate Technical Support
Sustainable Supply Chain



Vulcan Metal set out itself to be a leading firm that specializes in providing rolling mills with a tailored service to achieve highest customer satisfaction.

We provide precise and affordable supply chain solutions through our manufacturing partners and offer consultation resolving technical and commercial issues. Our goal is to create and cultivate a successful partnership with our esteemed customers through hard work, built on honesty and trust. We aim to be recognized as the company that best understands and fulfills the needs of clients within the metal industry.

With a vision for the future of the industry shaped by demands of the ever-changing world, **Vulcan Metal's** founder and managing partner Sinan Çağlayan wanted to ensure cost-effective work execution and gain customers' trust through exceptional performance. Together with a team of experienced executives who are happy to tackle any task, he is committed to fulfilling the needs of each and every customer no matter how big or small, perpetuating a sense of community.

Services and Products

Rolls & Rings	
Static Cast Rolls	Forged Rolls
Static Cast Rings & Sleeves	Forged Rings & Sleeves
Edger Rolls & Rings	Forged Shafts (Arbors)
Big Steel Cast Rolls	Centrifugal (Spun) Cast Rolls
Tungsten Carbide Rings	Centrifugal (Spun) Cast Rings & Sleeves
Composite Rolls	Centrifugal Cast Backup Rolls
Roll & Ring Failure Report	Scrap Rolls & Rings
Equipment & Spares	
Melt Shop Equipment	Rolling Mill Equipment
Cranes & Components	Roll Shop Lathes & Machines





VULCAN METAL

Vulcan Metal Dış Ticaret ve Danışmanlık Ltd. Şti.

Static Cast Rolls, Rings & Sleeves



Vulcan Metal provides cast roll, ring and sleeve solutions tailored to specific needs of customers through our manufacturing partners. We offer an extensive range of grades with varying sizes.

The quality management system of our partners is certified to ISO 9001:2015 in full compliance with global industry requirements.

Vulcan Metal strives to create value and make a difference through precise grade selection based on our expertise and knowledge. Services offered include customized chemical composition specification, heat-treatment process assignment and crucial quality-control management.

We believe taking the proactive approach is the key to ensure ultimate customer satisfaction, maintaining a strong connection based on trust and communication at every step along the way.



Big Steel Cast Rolls



Vulcan Metal's product range of rolls includes big steel cast rolls for heavy-duty applications.

Heat treatment of these rolls is a complex multi-stage procedure imparting optimal working properties onto steel. Enhancing properties such as fracture toughness is essential to the production of steel rolls subjected to demanding requirements of heavy-duty applications.

Mill Types / Applications

Bar & Rod Mills

Bloom, Billet & Slabbing Mills

Merchant Mills

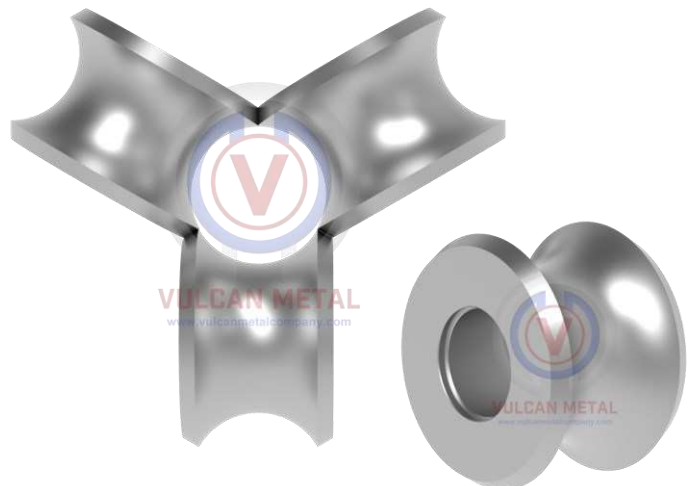
Seamless Pipe (Tube) Mills

Section Mills including Rail & Structural Mills

Edging Stands
(including Flat Product Rolling Mills)

Straightening Stands

Universal Stands



Vulcan Metal Company

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VULCAN METAL

Vulcan Metal Dış Ticaret ve Danışmanlık Ltd. Şti.

Static Cast Rolls, Rings & Sleeves

Static Cast Roll and Ring Material Grades

	Material Grade	Outstanding Properties	Average Mechanical Properties
SG-PC	Pearlitic Nodular Cast Iron	Fair Wear Resistance Fair Thermal Resistance Good Impact Resistance	Tensile Strength: 400 N/mm ² Bending Strength: 850 N/mm ² Torsional Shear Strength: 400 N/mm ²
SG-PC Cr	Pearlitic Nodular Cast Iron <i>Chromium Enhanced</i>	Enhanced Wear Resistance Fair Thermal Resistance Good Impact Resistance	Tensile Strength: 400 N/mm ² Bending Strength: 850 N/mm ² Torsional Shear Strength: 400 N/mm ²
SG-AC	Acicular Nodular Cast Iron	Superior Wear Resistance Fair Thermal Resistance Good Impact Resistance	Tensile Strength: 570 N/mm ² Bending Strength: 1000 N/mm ² Torsional Shear Strength: 650 N/mm ²
SG-AC-Cr	Acicular Nodular Cast Iron <i>Chromium Enhanced</i>	Enhanced Wear Resistance Fair Thermal Resistance Good Impact Resistance	Tensile Strength: 570 N/mm ² Bending Strength: 1000 N/mm ² Torsional Shear Strength: 650 N/mm ²
SG-AC-Si	Acicular Nodular Cast Iron <i>Silicone Treated</i>	Great Chip-off Resistance Superior Thermal Resistance <i>Tailored to Dogbone & Slitting Stands</i>	Tensile Strength: 570 N/mm ² Bending Strength: 1000 N/mm ² Torsional Shear Strength: 650 N/mm ²
AIC	Alloy Indefinite Chill Cast Iron	Excellent Surface Quality	Tensile Strength: 200 N/mm ² Bending Strength: 320 N/mm ² Torsional Shear Strength: 320 N/mm ²
ACS	Alloy Cast Steel	Great Impact Resistance High Fracture Toughness Stable Hardness	Tensile Strength: 725 N/mm ² Bending Strength: 1250 N/mm ² Fracture Toughness: 49 MNm ^{-3/2}
GST	Graphitic Cast Steel (Adamite)	Superior Impact Resistance High Fracture Toughness Stable Hardness	Tensile Strength: 625 N/mm ² Bending Strength: 1100 N/mm ² Fracture Toughness: 40 MNm ^{-3/2} Torsional Shear Strength: 800 N/mm ²
SG-F	Ferritic Nodular Cast Iron	Great Thermal Resistance High Mechanical Properties Stable Hardness <i>Tailored to Roughing Stands</i>	Tensile Strength: 625 N/mm ² Bending Strength: 1150 N/mm ² Torsional Shear Strength: 625 N/mm ²
SG-F-Ni	Ferritic Nodular Cast Iron <i>Nickel Enhanced</i>	Great Thermal Resistance High Mechanical Properties Stable Hardness <i>Tailored to Roughing Stands</i>	Tensile Strength: 725 N/mm ² Bending Strength: 1250 N/mm ² Torsional Shear Strength: 625 N/mm ²





VULCAN METAL

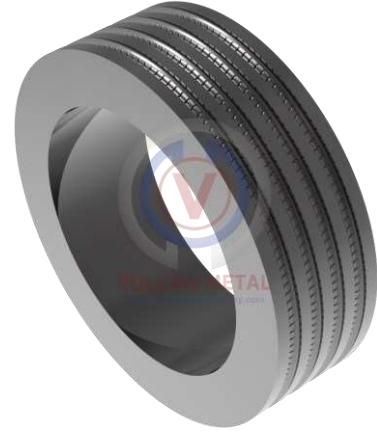
Vulcan Metal Dış Ticaret ve Danışmanlık Ltd. Şti.

Tungsten Carbide Rings & Composite Rolls

Vulcan Metal provides tungsten carbide ring and composite roll solutions tailored to specific needs of steel mills through our manufacturing partners. We offer an extensive range of grades with optimal quality.

The quality management system of our partners is certified to ISO 9001:2015 in full compliance with global industry requirements.

Vulcan Metal strives to create value and make a difference through precise grade selection based on our expertise and knowledge.



Composite Rolls



Vulcan Metal's tungsten carbide product range includes composite rolls for demanding rolling conditions.

Composite rolls contribute greatly to maximizing mill output owing to the combined advantages of durable forged steel shaft and the high wear resistant tungsten carbide rings.

The barrel diameter of the roll can go up to 470 mm.

Mill Categories and Applications

Bar Mills	Intermediate Rolls
Bar & Rod Mills	Prefinishing Rolls
Merchant Mills	Leader Roll
Rod Mills	Finishing Rolls
Block Mills	KOCKS Rings
Stainless Steel Mills	Pinch Rolls
Super Light Section Mills	Reducer Rolls
Tube Mills	Sizer Rolls





VULCAN METAL

Vulcan Metal Dış Ticaret ve Danışmanlık Ltd. Şti.

Tungsten Carbide Rings & Composite Rolls

Tungsten Carbide Grades

Vulcan Grade	Co+Ni %	WC %	Density (g/cm ³)	Hardness (HRA)	Transverse Rupture Strength (≥Mpa)	Compressive Strength (≥Mpa)	Thermal Conductivity (sec/°C)	Elasticity (KN/mm ²)
VMC - 1A	6	94	14,75	88	2.500	4.000	0,22	580
VMC - 1B	6	94	14,90	88	2.500	4.300	0,21	600
VMC - 1C	6	94	14,90	88	2.600	4.300	0,21	630
VMC - 2A	8	92	14,70	88	2.850	4.100	0,22	580
VMC - 3A	10	90	14,35	87	2.500	3.900	0,21	560
VMC - 3B	10	90	14,50	86	2.800	3.900	0,22	560
VMC - 3C	10	90	14,50	87	3.000	4.100	0,22	580
VMC - 4A	13	87	14,20	85	2.700	3.700	0,21	550
VMC - 4B	13	87	14,15	86	2.700	3.900	0,21	570
VMC - 5A	15	85	14,00	84	2.700	3.500	0,20	530
VMC - 5B	15	85	14,00	85	2.700	3.800	0,20	550
VMC - 5C	15	85	13,80	86	2.800	3.500	0,20	530
VMC - 6A	18	82	13,70	83	2.600	3.300	0,20	490
VMC - 6B	18	82	13,75	83	2.800	3.500	0,20	530
VMC - 7A	20	80	13,60	82	2.600	3.100	0,19	480
VMC - 7B	20	80	13,60	83	2.600	3.300	0,19	510
VMC - 7C	20	80	13,30	84	2.800	3.100	0,19	480
VMC - 8A	22	78	13,40	81	2.550	3.000	0,18	460
VMC - 8B	22	78	13,40	82	2.700	3.200	0,19	500
VMC - 8C	22	78	13,40	82	2.800	3.000	0,18	460
VMC - 9A	25	75	13,10	79	2.400	2.900	0,17	440
VMC - 9B	25	75	13,15	81	2.600	3.100	0,18	480
VMC - 9C	25	75	12,75	82	2.800	2.900	0,17	440
VMC - 10A	27	73	12,95	78	2.300	2.700	0,17	420
VMC - 10B	27	73	12,95	81	2.300	3.000	0,17	440
VMC - 11A	30	70	12,80	77	2.200	2.600	0,17	300
VMC - 11B	30	70	12,70	79	2.400	2.800	0,16	430
VMC - 11C	30	70	12,70	79	2.500	2.800	0,16	430
VMC - 11D	30	70	12,30	81	2.800	2.600	0,16	420
VMC - 11E	30	70	12,70	79	2.500	2.800	0,16	430





VULCAN METAL

Vulcan Metal Dış Ticaret ve Danışmanlık Ltd. Şti.

Centrifugal (Spun) Cast Rolls, Rings & Sleeves

Vulcan Metal provides centrifugal (spun) cast roll, ring and sleeve solutions tailored to specific needs of customers through our manufacturing partners. We offer an extensive range of grades with varying sizes.

The quality management system of our partners is certified to ISO 9001:2015 in full compliance with global industry requirements.



Vulcan Metal strives to create value and make a difference through precise grade selection based on our expertise and knowledge. Services offered include customized chemical composition specification, heat-treatment process assignment and crucial quality-control management.

We believe taking the proactive approach is the key to ensure ultimate customer satisfaction, maintaining a strong connection based on trust and communication at every step along the way.

Mill Categories and Applications

Billet & Bloom Mills	Merchant Mills
Bar Mills	Rail Mills
Barod Mills	Rod Mills
Edging Stands	Slabbing Mills
Heavy Plate Mills	Stainless Steel Mills
Heavy Section Mills	Steckel Mills
Hot Plate Mills	Straightening Stands
Hot Skin Pass Mills	Structural Mills
Hot Strip Mills	Tinplate Mills
Light & Super Light Section Mills	Tube Mills
Medium Section Mills	Universal Stands





VULCAN METAL

Vulcan Metal Dış Ticaret ve Danışmanlık Ltd. Şti.

Centrifugal (Spun) Cast Rolls, Rings & Sleeves

Centrifugal (Spun) Cast Shell Material Grades

Vulcan Grade	Grade Detail	Outstanding Properties	Mill Type
HSS-R	High Speed Steel (<i>Roughing Stands</i>)	Great Overload Resistance Superior Wear Resistance Superior Gripping	Flat Product Mills & Long Product Mills
HSS-F	High Speed Steel (<i>Finishing Stands</i>)	Great Overload Resistance Great Wear Resistance Superior Gripping	Flat Product Mills & Long Product Mills
HSS-DS	High Speed Steel (<i>Dogbone & Slitting Stands</i>)	Great Chip-off Resistance Superior Thermal Resistance Enhanced Wear Resistance	Long Product Mills
HSS-Semi	Semi-High Speed Steel	Fair Overload Resistance Good Wear Resistance Good Gripping	Flat Product Mill
HiCr-S	High Chrome Steel	Great Gripping Superior Overload Resistance Fair Wear Resistance	Flat Product Mills & Long Product Mills
HiCr-SC	Carbide Enhanced High Chrome Steel	Great Gripping Superior Overload Resistance Good Wear Resistance	Flat Product Mills & Long Product Mills
HiCr-I	High Chrome Iron	Great Gripping Superior Overload Resistance Superior Wear Resistance	Flat Product Mills & Long Product Mills
HiCr-IC	Carbide Enhanced High Chrome Iron	Great Gripping Superior Overload Resistance Great Wear Resistance	Flat Product Mills & Long Product Mills
ICDP	Indefinite Chill Double Poured	Great Overload Resistance Great Fire-Cracking Resistance Good Wear Resistance	Flat Product Mills & Long Product Mills
E-ICDP	Enhanced Indefinite Chill Double Poured	Great Overload Resistance Great Fire-Cracking Resistance Enhanced Wear Resistance	Flat Product Mills & Long Product Mills
GS-HSS	Graphitic High Speed Steel	Superior Overload Resistance Perfect Wear Resistance Great Gripping	Flat Product Mill
D-CS	Duplex Cast Steel	Great Overload Resistance Fair Wear Resistance High Fracture Toughness	Flat Product Mills & Long Product Mills
D-AS	Duplex Adamite Steel	Superior Overload Resistance Good Wear Resistance High Fracture Toughness	Flat Product Mills & Long Product Mills
D-GS	Duplex Graphitic Steel	Enhanced Overload Resistance Enhanced Wear Resistance High Fracture Toughness	Long Product Mills





VULCAN METAL

Vulcan Metal Dış Ticaret ve Danışmanlık Ltd. Şti.

Forged Rolls, Rings, Sleeves & Shafts (Arbors)

Vulcan Metal provides forged roll, ring and sleeve solutions tailored to specific needs of hot steel, cold steel and aluminum mills through our manufacturing partners. We offer an extensive range of grades with varying sizes.

The quality management system of our partners is certified to ISO 9001:2015 in full compliance with global industry requirements.

Vulcan Metal's forged grade range includes carbon steel and alloyed steel grades varying from 0,40 to 8,00% chromium content, as well as special alloyed steel grades. The precise grade selection is determined by customer requirements.



Mill Categories and Applications

Aluminum Mills	Hot Strip Mills
Annealing Lines	Rail Mills
Billet & Bloom Mills	Reversing Cold Mills
Cold Plate Mills	Sendzimir Mills
Cold Skin Pass Mills	Stainless Steel Mills
Galvanizing Lines	Steckel Mills
Heavy Plate Mills	Structural Mills
Heavy Section Mills	Tandem Cold Mills
Hot Plate Mills	Tinplate Mills
Hot Skin Pass Mills	Tube Mills

Main Forged Roll and Ring Types

Auxiliary Rings	Shafts (Arbors)
Auxiliary Rolls	Skin Pass Work Rolls
Backup Rolls	Sleeves
Intermediate Drive Rolls	Special Rolls
Intermediate Idler Rolls	Work Rings
Intermediate Work Rolls	Work Rolls





VULCAN METAL

Vulcan Metal Dış Ticaret ve Danışmanlık Ltd. Şti.

Scrap Rolls & Rings

Industrial scrap metal recycling is no doubt essential for our planet, helping to preserve natural resources, reduce landfill waste and decrease the emission of harmful gases formed during the mining and manufacturing of new items from virgin ore. Maintaining high and cost-effective production levels assisting industries like steelmaking in addition to creating new jobs constitutes the financial aspect of scrap metal recycling.

Despite these facts, vast scrap roll yards can quite often be spotted on-site, especially in rolling mills without melt shops. Furthermore, some rolling mills cannot use their own roll scraps in their melt shops because of the differences between the particular chemical compositions of rolls and the billets.

Vulcan Metal contributes to global circular economy by locating potential buyers among its established local roll and ring scrap customers reclaiming scraps from rolling mills around the world. Re-integrating that scrap back into the industry, **Vulcan Metal** facilitates the needs of each party by providing a fair deal, creating economic and environmental benefits.

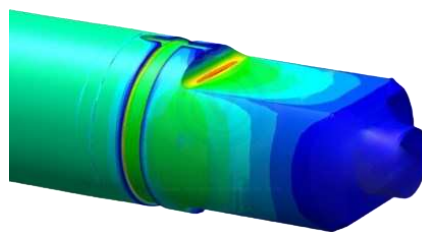


Preliminary Roll & Ring Failure Report

Rolls and rings are elementary mechanical components of rolling mills and the quality of the rolled product is mainly dependent on their quality. Roll failures may occur due to defective rolls, improper grade or hardness specification, unfavorable rolling conditions or a combination of all of the above.

Failure of rolls gives rise to critical problems such as likely damage to the equipment, downtime and replacement costs, partial or total loss of the production batch and missed deadlines, resulting in an overall decline in efficiency, reduced productivity and monetary loss. Therefore, it is essential to determine the root-cause of failure and identify preventative measures to be taken in order to prevent recurrence and improve overall mill performance.

Investigating the main reasons for failure as an impartial third party, **Vulcan Metal** aims to give helpful guidance with preliminary failure report, outlining the findings and providing context.





VULCAN METAL

Vulcan Metal Dış Ticaret ve Danışmanlık Ltd. Şti.

Melt Shop & Rolling Mill Equipment

Vulcan Metal's tailored product and service range includes melt shop and mill equipment, components and spare parts through his manufacturer partners specialized in their fields. The product and service needs of customers are facilitated thanks to proficiency of subject matter experts, cutting-edge technology and hard work put forth to achieve customer satisfaction.

The deliverables by **Vulcan Metal** include an extensive mix of products and services, featuring superior quality while conforming with precise specifications. The combined expertise and experience of several reputable companies together with our own allow us to significantly improve our offering and excel in partnerships with domestic and international accounts.

Feel free to contact **Vulcan Metal** for any additional information. Do not hesitate to inquire services or products that are not listed below.

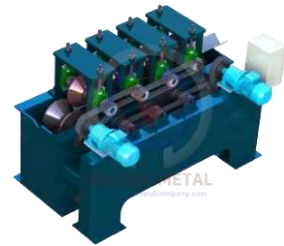
Rolling Mills

Bar Handling System	Labeling Machine
Binding Machine	Labyrinth Ring
Bundling Machine	Looper
Bundling Machine	Mill Stand
Chain Transfer	Neck Ring
Chock	Pinch Roll Stand
Cold Shear for Finished Products	Quenching Box (Tempcore)
Conveyor Roller	Roller
Cooling Bed	Rolling Guide
Crop Shear	Shaft
Dividing Shear	Spacer
Drives & Automation	Sprocket
Flying Shear	Straightening Machine
Gearbox	Tail Breaker Stand
Hydraulic Cold Billet Shear	Twin Channel
Hydraulic Hot Billet Shear	Weighing Unit



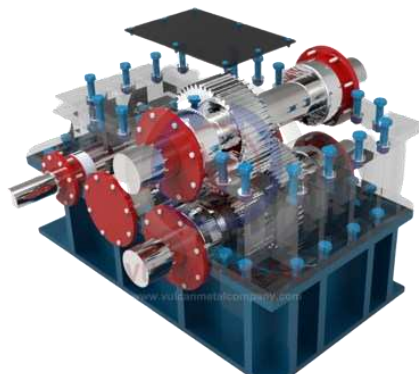
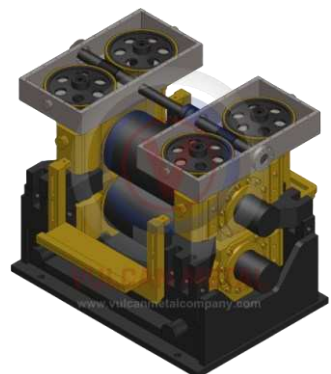
Melt Shops

- Blast Furnace Charging Bell
- Ladle Transfer Car
- Slag Ladle (Slag Pot)
- Tuyere (Blast Furnace Air Nozzle)



Roll Shops

- CNC Roll Notching & Branding Lathe
- CNC Roll Turning Lathe
- ZNC EDM Branding Machine





VULCAN METAL

Vulcan Metal Dış Ticaret ve Danışmanlık Ltd. Şti.

Cranes & Components

Vulcan Metal offers custom lifting solutions via his industry recognized local partner who manufactures robust state-of-the-art equipment upholding highest security standards in compliance with FEM, DIN, VDI and CMAA requirements.

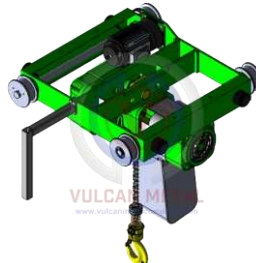
All crane needs are met relying on in-depth knowledge and extensive experience, with dedication to delivering outstanding after-sales service. Ultimate customer satisfaction is guaranteed through exceptional teamwork maintaining regular performance monitoring of equipment, supplying swift service and genuine spare parts whenever necessary.



Cranes	
Special Cranes	Rolling Mill (Steel Mill) Cranes
Overhead (Bridge) Cranes	Single Girder Overhead Crane
	Double Girder Overhead Crane
Gantry Cranes	Gantry Crane
	Semi-Gantry Crane
	Shaft Process Gantry Crane
	Heavy-Duty Gantry Crane
Jib Cranes	Ground Mounted Jib Crane
	Direct & Wall Mounted Jib Crane
	Wall Travelling Jib Crane



Crane Components	
Coil Transfer Car	Clamshell Grab
Coil Upender	Magnet-Slab Tong
Coil Tong	Wire Rope Hoist
C Hook	Chain Hoist
Electro-Hydraulic Scrap Grab	Stainless Steel Crane





VULCAN METAL

Vulcan Metal Dış Ticaret ve Danışmanlık Ltd. Şti.

Hardness Conversion Table for Cast Rolls

Leeb E	Leeb D	Shore C ShC	Shore D ShD	Brinell HB	Rockwell HRc	Vickers HV (DPN) (30 Kg)	Leeb E	Leeb D	Shore C ShC	Shore D ShD	Brinell HB	Rockwell HRc	Vickers HV (DPN) (30 Kg)
440	456	25	24	180	9	191	645	679	59	61	432	45	441
445	462	26	25	185	10	196	650	684	60	62	440	45	450
450	467	27	26	189	12	200	655	689	61	63	448	46	458
455	473	28	27	194	13	205	660	695	62	64	456	47	467
460	478	29	28	199	14	210	665	700	62	65	464	47	475
465	484	30	29	204	15	215	670	705	63	65	472	48	484
470	489	31	30	209	16	219	675	710	64	66	481	49	493
475	495	31	31	214	17	224	680	716	65	67	489	49	503
480	500	32	33	219	18	229	685	721	66	68	497	50	512
485	506	33	34	224	19	234	690	726	67	69	506	50	521
490	511	34	35	229	20	239	695	731	67	70	515	51	531
495	517	35	36	234	21	245	700	736	68	71	523	51	541
500	522	36	37	240	22	250	705	741	69	71	532	52	551
505	528	36	38	245	23	255	710	746	70	72	541	53	561
510	533	37	38	251	24	260	715	752	71	73	550	53	571
515	539	38	39	256	25	266	720	757	72	74	559	54	582
520	544	39	40	262	26	271	725	762	73	75	569	54	593
525	550	40	41	268	26	277	730	767	73	76	578	55	603
530	555	41	42	274	27	283	735	772	74	77	587	55	614
535	561	41	43	280	28	288	740	777	75	78	597	56	626
540	566	42	44	286	29	294	745	782	76	79	606	57	637
545	572	43	45	292	30	300	750	787	77	80	616	57	648
550	577	44	46	298	31	306	755	792	78	81	626	58	660
555	583	45	47	304	32	312	760	797	79	82	636	58	672
560	588	45	47	311	32	319	765	802	80	83	645	59	684
565	593	46	48	317	33	325	770	807	81	84	655	59	696
570	599	47	49	324	34	331	775	812	82	86	666	60	709
575	604	48	50	330	35	338	780	816	82	87	676	60	722
580	610	49	51	337	36	344	785	821	83	88	686	61	734
585	615	49	52	344	36	351	790	826	84	89	696	61	747
590	620	50	52	351	37	358	795	831	85	90	-	62	761
595	626	51	53	358	38	365	800	836	86	91	-	62	774
600	631	52	54	365	39	372	805	841	87	93	-	63	788
605	636	53	55	372	39	379	810	845	88	94	-	63	802
610	642	53	56	379	40	387	815	850	89	95	-	64	816
615	647	54	56	386	41	394	820	855	90	97	-	64	830
620	652	55	57	394	41	402	825	860	91	98	-	65	845
625	658	56	58	401	42	409	830	864	92	99	-	65	859
630	663	57	59	409	43	417	835	869	93	101	-	66	874
635	668	57	60	416	43	425	840	874	94	102	-	66	889
640	674	58	60	424	44	433	845	878	95	104	-	67	905





VULCAN METAL

Vulcan Metal Dış Ticaret ve Danışmanlık Ltd. Şti.

Hardness Conversion Table for Forged Rolls

Vickers HV30	Rockwell HRc	Shore HSC & HSD	Shore HFRSc & HFRSd	Brinell HB	Leeb (<i>Equotip</i>) HLD	Leeb (<i>Equotip</i>) HLE	UTS N/mm ²
ASTM E92	ASTM E18	JIS B7727	ASTM 4448	ASTM E10	ASTM A956	ASTM A956	DIN 50150
920	67,5	102	105	–	885	850	–
900	67	100,5	103	–	880	845	–
880	66,5	99	101,5	–	870	840	–
860	66	97	100	–	865	830	–
840	65,5	95,5	98,5	–	860	825	–
820	64,5	94	96,5	–	855	820	–
800	64	92,5	95	–	845	810	–
780	63,5	91	93,5	–	840	805	–
760	62,5	89,5	92	–	830	800	–
740	61,5	87,5	90,5	–	825	790	–
720	61	86	89	–	815	780	–
700	60	85	87	–	810	775	–
680	59,5	83,5	85,5	–	800	765	–
660	58,5	82	84	–	790	760	–
640	57,5	80,5	82,5	610	785	750	2145
620	56,5	78,5	81	590	775	740	2070
600	55,5	76,5	79	570	765	730	1995
580	54	75	77,5	550	755	720	1920
560	53	73	76	530	745	710	1845
540	51,5	71	74,5	515	735	700	1775
520	50,5	69	72,5	495	725	690	1700
500	49	67	71	475	710	680	1630
480	47,5	65	69	455	700	665	1555
460	46	63	67,5	435	690	655	1480
440	44,5	61	65	415	675	640	1420
420	43	59	63	400	660	630	1350
400	41	57	58	380	645	615	1300
380	39	54	55,5	360	630	600	1220
360	37	52	53,5	340	615	585	1155
340	34,5	49	51	325	600	570	1095
320	32,5	46,5	50	305	585	555	1030
300	30	44	48	285	565	540	965
280	27	41,5	45	265	550	525	900
260	24	39	–	250	530	510	835
240	20,5	36	–	230	510	490	770
220	–	–	–	210	–	–	705
200	–	–	–	190	–	–	640
180	–	–	–	170	–	–	575





VULCAN METAL

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