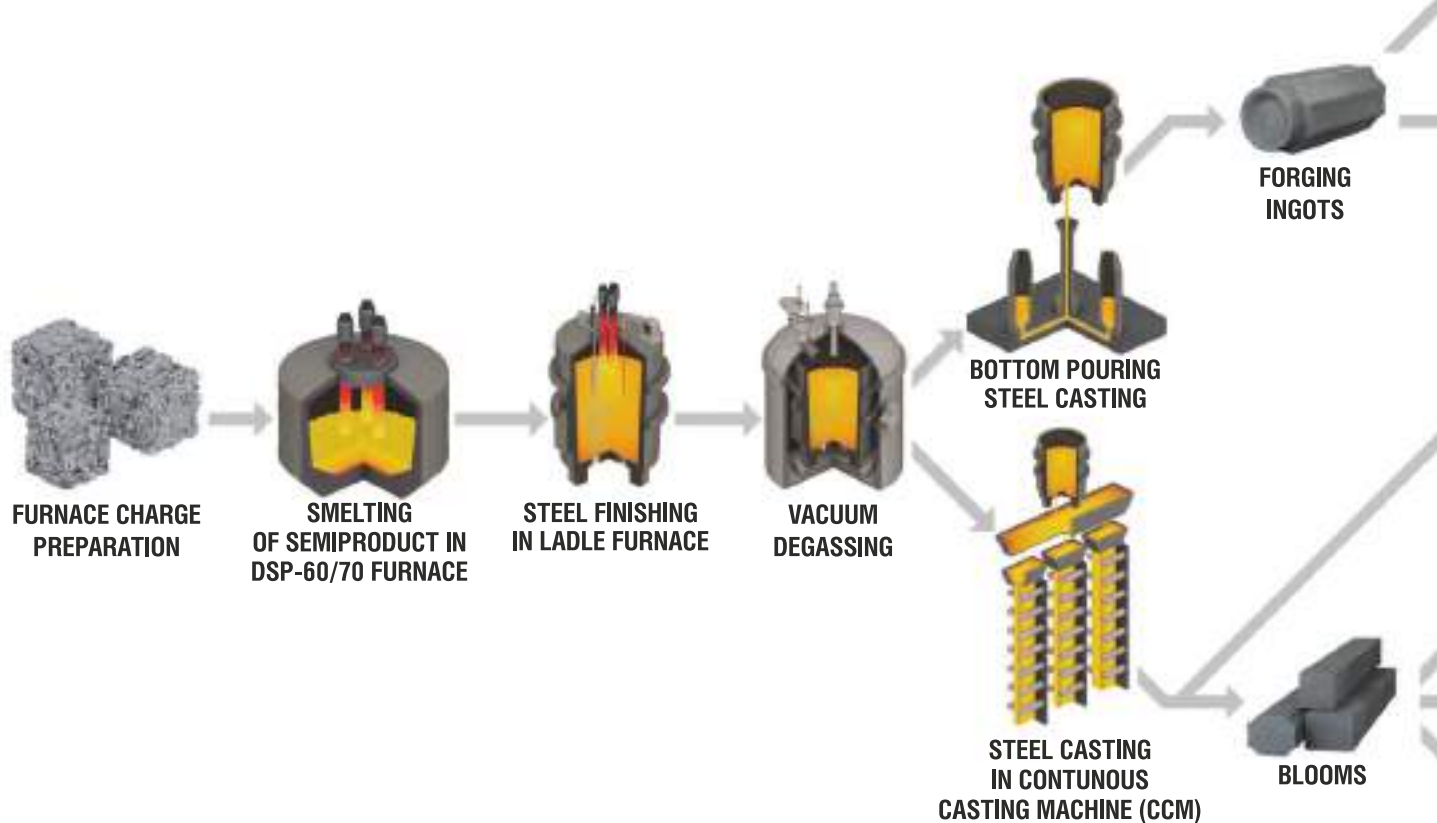


CATALOGUE
**METALLURGICAL
PRODUCTS**

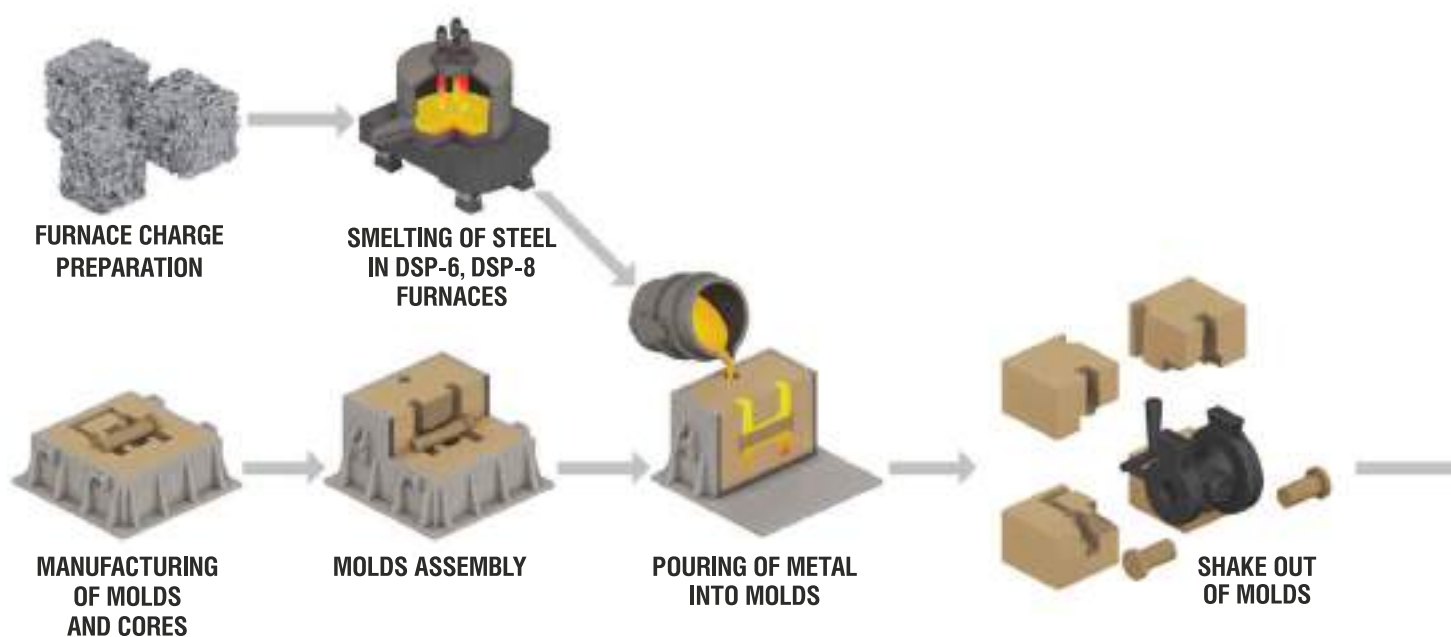


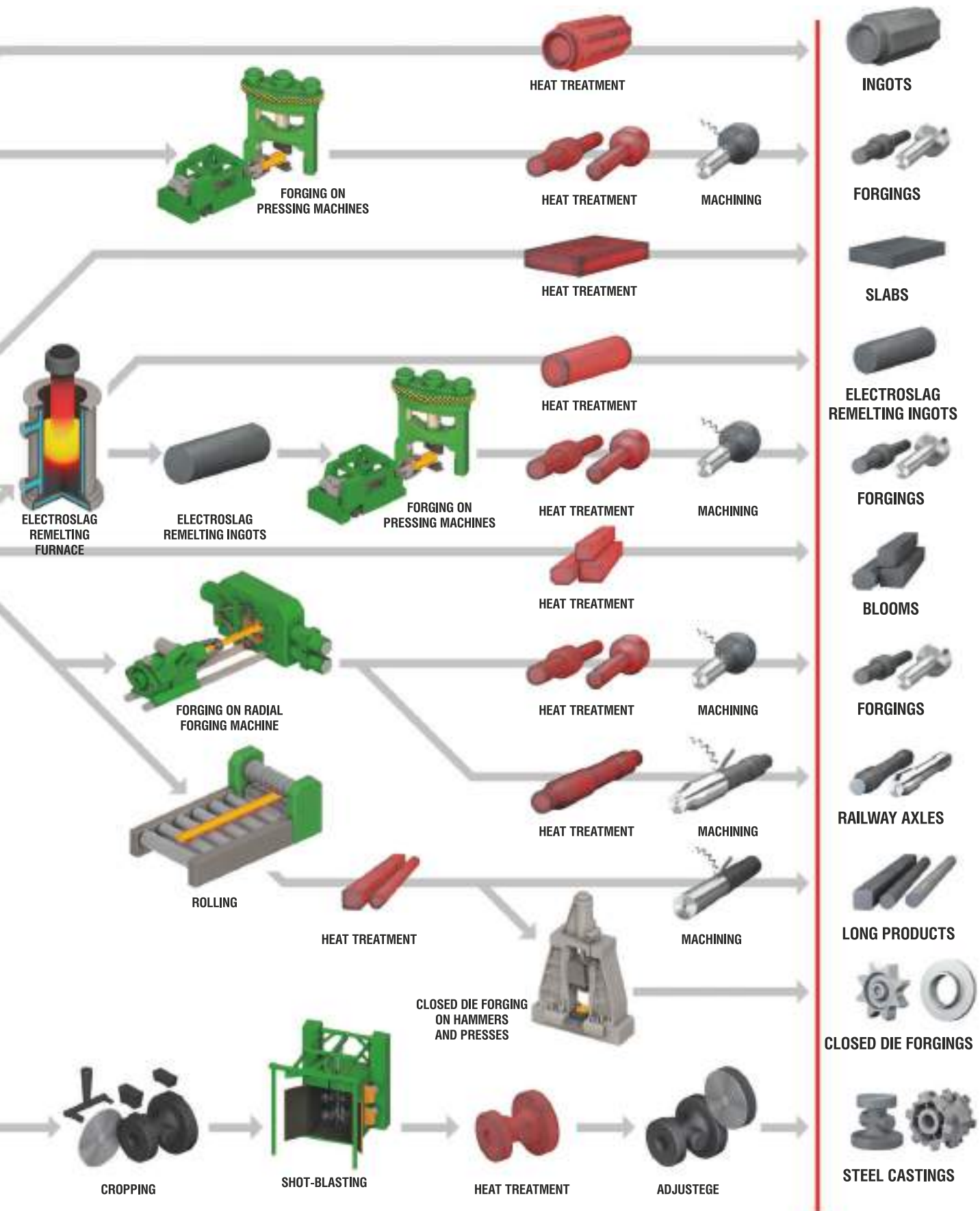
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METALLURGICAL MANUFACTURING PROCESS FLOW



FOUNDRY PRODUCTION





ABOUT MOTOVILIKHA

Motovilikha-Civil Machine Building LLC is a fully equipped state-of-the-art steelmaking enterprise offering all kinds of metallurgical conversion. Products and traditions of the plant have an almost three-hundred-year-old history.

Metallurgical production comprises a comprehensive cycle of product manufacturing. Use of in-house billets (forgings, closed die forgings, hot-rolled long products, steel castings) makes the machine building production unique. The company does not depend on external suppliers of metal and is ready to offer its consumers high-quality product at competitive prices.

GEOGRAPHY OF PRODUCT DELIVERIES



MOTOVILIKHA
CIVIL ENGINEERING COMPANY



**METALLURGICAL
PRODUCTS**



**OILFIELD AND DRILLING
EQUIPMENT**

COMPLETE MANUFACTURING CYCLE:
FROM STEELMAKING TO RELEASE OF FINISHED PRODUCT

FORGINGS

**ROUGH RAILCAR
AND LOCOMOTIVE AXLES**

CLOSED DIE FORGINGS

METALLURGICAL PRODUCTS

STEEL CASTINGS

LONG PRODUCTS

SEMIFINISHED PRODUCTS



DSP 60/70 (FAI-FUCHS) electric steelmaking arc furnace



Bottom-pouring of steel



Danieli forging system



SXP-55 (GFM) radial forging machine



Forging hammer



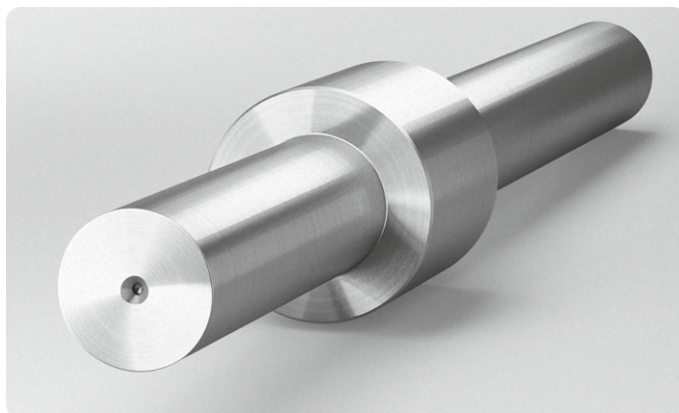
Cutting of forgings with band saw machines

BASIC EQUIPMENT

Basic manufacturing divisions	Equipment
Steelmaking	DSP 60/70 (FAI-FUCHS) electric steel arc furnace
	Ladle furnace for secondary refining (FAI-FUCHS)
	VD/VOD (Danieli) steel degassing unit
	Air separation unit (Kriogenmash)
	Steel continuous casting plant
	Steel bottom-pouring section
	Electroslag remelting units R-951, U-522
Press forging	3000 tf hydraulic press (Danieli)
	2000 tf hydraulic press
	Steam-air forging hammer, 3 t
	Steam-air forging hammer, 5 t
	Straightening equipment
	SXP-55 (GFM) radial forging machine
Closed die forging	Steam-air die hammer, 2 t
	Steam-air die hammer, 3 t
	Steam-air die hammer, 6 t
	450 tf hydraulic press
	700 tf hydraulic press
Rolling	Small section rolling mill 350
	Heavy section rolling mill 710
	Straightening equipment
Steel casting	DSP 6, DSP 8 electric steelmaking arc furnaces
	Molding section
	Pouring section

A **forging** is a blank manufactured with press forging equipment using the method of open die forging.

- More than 200 steel grades including tool steel, stainless steel, heat resistant steel.
- A variety of configurations of forged pieces.
- Diameter of shafts up to 900 mm, length up to 11800 mm; diameter of rings up to 2000 mm.
- Forged piece weight from 500 to 12500 kg.
- Unique properties are obtained by use of electroslag remelting.
- We accept low-tonnage orders for expensive tool steels.



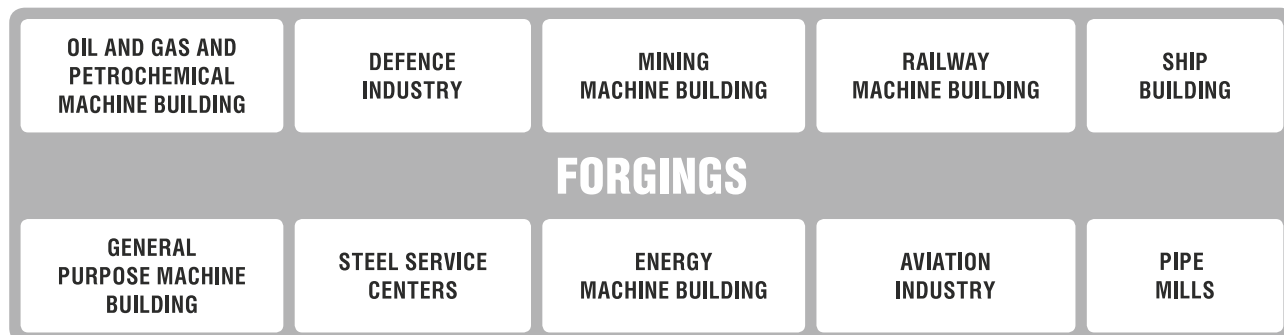
PRESS FORGING EQUIPMENT

Equipment name	Power, ton-force	Max. weight of forged pieces, kg
Steam-air forging hammers	3 ton drop section	75
	5 ton drop section	2 000
Radial forging machine	1000 ton-force per one striker	4 000
Straightening presses	1000	
	1600	

Manufacturing facilities of the company enable production of forged pieces with an accuracy of ± 1 mm and minimum allowances. The company disposes of a fleet of equipment for all types of machining and heat treatment, including equipment for manufacturing long and large-diameter pieces. There is a possibility to manufacture tailored products under individual orders and specific customer requirements.

Every year Motovilikha launches mass production of 2 or 3 new products and involves new steel grades into manufacturing.

CONSUMER INDUSTRIES



NOMENCLATURE OF FORGED PIECES

Black work	Types of forged pieces	Dimensions, mm	Weight, kg	Machined forged pieces
	Smooth circular and square section shafts	Diameter (square side): 170 – 900; Length: 1500 – 11 800	300 – 12 500	
	Variable section shafts	Diameter: 220 – 700; Length up to 5 000	400 – 8 300	
	Discs and pierced discs	Diameter: 500 – 1 700; Inner diameter: 150 – 350	350 – 8 000	
	Cubes	Side: 400 – 1 000	up to 8 000	
	Bars	Side up to 500; Length up to 4 000		
	Pierced cylinders	Diameter: 350 – 850; Wall thickness from 100	up to 4 000	
	Plates	Width up to 1 200; Thickness: 130 – 250; Length: 1 000 – 4 500	up to 12 500	
	Rolled rings	Outer diameter up to 2 000; Height: 170 – 800; Wall thickness from 130	350 – 8 000	
	Mushroom shaped forged pieces	Diameter: 600 – 1 100; Rod diameter: 170 – 700; Height up to 600	up to 3 500	

NOMENCLATURE OF STEEL GRADES

Steel type	Steel grades as per RF standards	Steel grades as per foreign standards
Construction carbon steel	10, 20, 35, 40, 45, 50, 55, 70, 08, 22K-Ш and others	CK45, CK60, 080M40, 070M20, AISI 1018, AISI 1045 and others
Construction low-alloyed steel	09Г2С, 10ХСНД, 15ГС, 17Г1С, 65Г and others	S355J2, St52.3, 42CrMo4, 25CrMo4, 34CrNiMo6, 36CrNiMo4, 51CrV4, 16MnCr5, 18CrNiMo5, 18CrMo4, 21CrMo10, 39NiCrMo3, 56NiCrMoV7, AISI 4140, AISI4145, AISI4340, 1.2379, 1.2343, 1.2344 and others
Construction alloyed steel	40Х, 20Г, 20Х2Н4А, 30ХГСА, 30ХМА, 35ХМ, 38ХМ, 40ХМФА, 40ХГМА, 38ХГН, 12Х1МФ, 15Х1М1Ф, 24ХМ1Ф, 25Х1МФ, 25Х2М1Ф, 40ХН, 40ХН2МА, 35ХН1М2ФА, 38Х2Н2МА, 38ХН3МА, 38ХН3МФА, 34ХН1М, 34ХН3МА, 38ХС, 50ХН, 18ХГТ, 12ХН3А, 12Х2Н4А, 13ХФА, 15Х2НМФ-Ш, ШХ15, АБ2-ПК, 14Х2ГМР, 55Х, 12Х2НВФА (ЭИ712), 14ХГЧ2МА-Ш (ЭП176Ш), 18Х2Н4МА-Ш, 08ГДНФ, 19ХГНМА, 07Х3ГНМЮА and others	
Tool steel	9Х1, 5ХНВС, 6ХВ2С, 4Х5МФС, 4Х5МФ1С, 5ХНМ, 9Х2МФ, 9Х2МФШ, 9ХС, 90ХМФ, 4Х5МФ1С, 5Х2МНФ, 75Х3МФА, У8А 7Х3, 4Х5В2ФС, ХВГ, 6Х6В3МФС, Х12МФ and others	X35CrMoV05KU
Corrosion resistant (stainless) steel	08-12Х18Н10Т, 20Х13, 40Х13, 14Х17Н2, 09Х17Н, 07Х16Н6, 07Х12НМБФ-Ш, 07Х16НМБ-Ш and others	
Heat resistant and heat-proof steel	15ХМ, 15Х5М, ЭП 609-Ш, ЭИ 961-Ш, 12Х2Г2НМФБ-Ш ЭП 517-Ш, 15Х1М1Ф and others	



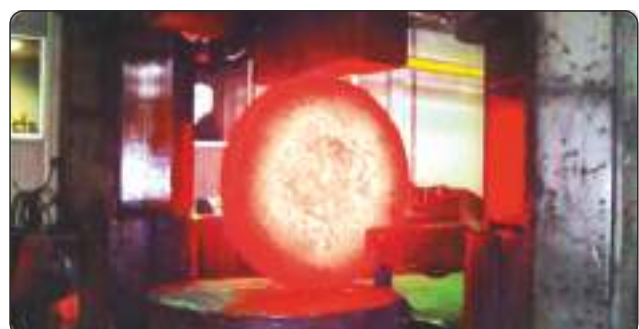
Danieli forging system



Heat treatment of forged pieces



Mandrel forging

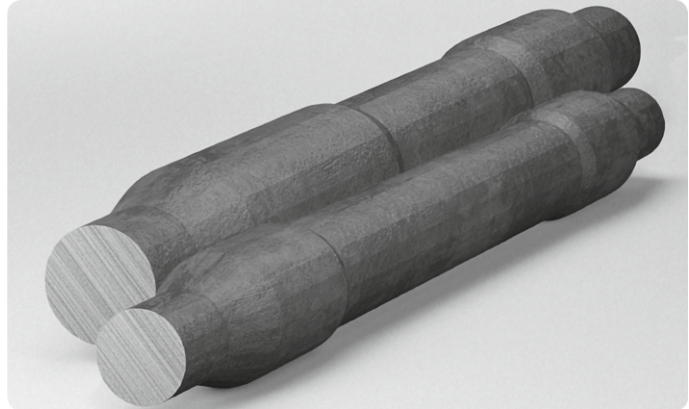


Disk forging in a pressing machine

ROUGH RAILCAR AND LOCOMOTIVE AXLES

Rough railcar and locomotive axles are workpieces manufactured by forging in a radial forging machine.

- Axles are made of in-house feedstock.
- Production by method of forging in a radial forging machine.
- Wide range of axles: railcar, locomotive, tram, subway, new types of railcar.
- Unique properties are obtained by use of electroslag remelting.



NOMENCLATURE OF ROUGH RAILCAR AXLES

Drawing	Axle type as per GOST 22780-93	Parameter	Basic dimensions, mm				Weight of rough axle, kg
			D of axle neck	D of axle body	D of axle seat	Length	
PKB-1-01	PY1Ш	Axle with tapered body (maximum load: 23.5 t)	150	185	210	2 224	527
PKB-1-02	PB2Ш	Axle with cylindrical body (maximum load: 25 t)	165	210	225	2 255	611
PKB-1-03	PM3	Axle with cylindrical body for high-speed railway cars	152	194	213	2 290	568
PKB-1-04	PY1Ш	Centered axle with cylindrical body (maximum load: 23.5 t)	145	187	210	2 220	496
PKB-1-07	PY1Ш	Axle with cylindrical body (maximum load: 23.5 t)	145	187	210	2 220	496
PKB-1-09	PM5	Axle with cylindrical body for electric motor coaches	155	200	221	2 480	628
PKB-1-10	PY1Ш	Centered axle with tapered body (maximum load: 23.5 t)	150	185	210	2 220	526
PKB-1-12	PY1	Axle with tapered body for passenger carriages (maximum load: 23.5 t)	148	187	210	2 370	548
PKB-1-17	-	Non-motored hollow axle for high-speed electric trains	170	230	-	2 340	670
PKB-1-18	-	Motored hollow axle for high-speed electric trains	170	205	240	2 340	649

NOMENCLATURE OF ROUGH LOCOMOTIVE AXLES

Drawing	Designation of finished axle	Main dimensions, mm				Weight of rough axle, kg
		D of axle neck	D of axle body	D of axle seat	Length	
РКЛ-2-2	8TC.205.412	160	218	251	2 430	665
РКЛ-2-3	Э12 (8TH.205.792)	210	235	275	2 550	985
РКЛ-2-4	8TH.205.813	195	220	250	2 550	840
РКЛ-2-5	8TC.205.203	195	215	245	2 550	840
РКЛ-2-6	8TC.205.382	195	252	275	2 550	1 040
РКЛ-2-7	2ЭС5	165	212	250	2 416	805
РКЛ-2-8	8TC.205.227	178	218	250	2 610	845
РКЛ-3-1	2ЭС6.31.110.001	195	235	255	2 475	890
РКЛ-3-2	017.35.10.001	177	232	255	2 550	865
РКЛ-3-3	2ЭС10.31.111.001	195	256	270	2 475	1 065
РКЛ-4-1	ЭП2К.31.15.101	175	220	255	2 600	810
РКЛ-4-2	ТЭП75.31.15.101	175	225	255	2 680	845
	ТЭ70.31.15.101			-	-	
РКЛ-5-1	11-587-120	195	240	275	2 492	985

Rough railway axles are manufactured of steel grade OC in accordance with GOST 31334-2007 by method of forging in a radial forging machine ensuring superior quality of the finished product. Certificates of conformity and permit for use of the certification system conformity mark are available for the produced axles.

Finished goods can be dispatched in small batches. Over the recent 10 years, Motovilikha has launched 13 types of railcar axles and 14 types of locomotive axles into production. Since 2014 the company is certified for manufacturing of axles for high-speed trains.



Forging of railcar axle workpieces in RFM

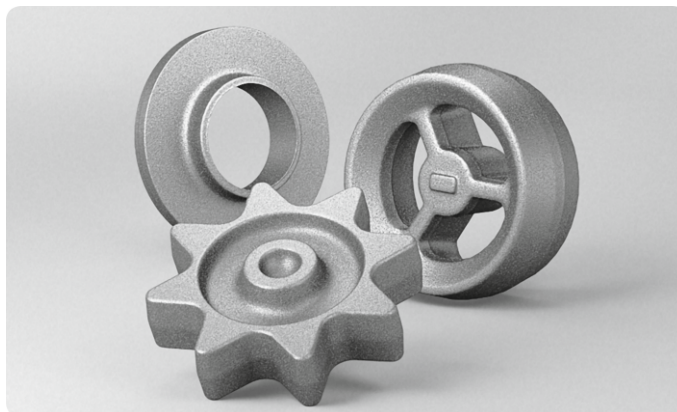


Railcar axle workpieces after forging

CLOSED DIE FORGINGS

A **closed die forging** is a blank manufactured in press forging equipment using the method of hot die forging.

- Wide range of closed die forged pieces.
- Diameter up to 430 mm, weight up to 300 kg.
- Stock reserve is available.
- Manufacturing of die tooling at the supplier's expense.



CLOSED DIE FORGING EQUIPMENT

Equipment name	Falling weight, ton	Maximum weight of closed die forged pieces, kg
Steam-air closed die forging hammers	2	3
	3	16
	6	90
Hydraulic presses	Power: 450 ton-force	300
	Power: 700 ton-force	

Our manufacturing facilities and technologies enable production of closed die forged pieces for the defence industry without acceptance by the customer's representative.

Motovilikha offers closed die forging from the customer's raw materials including heat-resistant grades of steel.

CONSUMER INDUSTRIES

OIL AND GAS AND PETROCHEMICAL MACHINE BUILDING	DEFENCE INDUSTRY	ENERGY MACHINE BUILDING
CLOSED DIE FORGINGS		
TRACTOR AND AGRICULTURAL MACHINE BUILDING	GENERAL PURPOSE MACHINE BUILDING	MINING MACHINE BUILDING

NOMENCLATURE OF CLOSED DIE FORGINGS

Type of stampings	Dimensions, mm	Weight, kg
Closed die forged flange blank as per GOST 33259-2015	Diameters up to 430; height up to 590	0.15 – 90 kg for closed die forging hammers 4 – 300 kg for hydraulic presses
Parts of shut-off valves		
Step-shaped shafts		
Gear wheel		
Pinions		
Discs		
Rings		
Star gears		
Bushings, track links		
Half-finished fasteners as per GOST 7798; 7796; 5915		
Pulling hooks		
Other parts		

NOMENCLATURE OF STEEL GRADES

Steel types	Grades
Construction carbon steel	10-70, OC and others
Construction low-alloyed steel	09Г2С, 15ГС, 65Г, 17Г1С and others
Construction alloyed steel	40Х, 20Г, 30ХГСА, 30ХМА, 38ХМ, 40ХМФА, 40ХГМА, 38ХГН, 12Х1МФ, 15Х1М1Ф, 24ХМ1Ф, 25Х1МФ, 25Х2М1Ф, 40ХН, 40ХН2МА, 38Х2Н2МА, 38ХН3МА, 38ХН3МФА, 38ХС, 12ХН3А, 12Х2Н4А, 40ГМФР, 40Г1Р and others



Types of finished closed die forged pieces

LONG PRODUCTS

Long products are workpieces manufactured in a rolling mill using hot rolling method.

- Available sections: circle, square, strip.
- Wide range of steel grades including stainless steel.
- Wide range of standard sizes of rolled products.
- Possibility to dispatch in small batches.
- Possibility of manufacturing from raw materials supplied by customer (rerolling).



LONG PRODUCTS, ROUND BARS

	Rolling mill 350		Rolling mill 710
Diameter, mm	19,1; 22,2; 25,5	28, 30, 32, 35, 36, 38, 40, 42, 45, 48, 50, 52, 55, 60, 65, 70, 75 80	105, 110, 115, 120, 125, 130, 140, 150, 160, 170, 180, 190, 200
Length, mm	8 000-9 500	2 000-6 000	2 000 - 5 000
Technical requirements to the range or dimensions	GOST 2590	GOST 2590	GOST 2590

Supply of machined rolled products is possible

LONG PRODUCTS, SQUARE BARS

	Rolling mill 350		Rolling mill 710
Dimension, mm	40, 45, 50, 55	60, 65, 70, 75, 80, 85, 90	100,105,110,115,120,125,130,140, 150, 160, 170, 180, 190, 200, 210, 220
Length, mm	2 000 - 5 300	1 500 - 4 500	2 000 - 4 000
Technical requirements to the range or dimensions	GOST 2591	TU 14-1-4492	TU 14-1-4492

LONG PRODUCTS, STRIP

	Rolling mill 710
Dimension, mm	80 x 220, 95 x 185, 102 x 205
Length, mm	1 500-3 000
Technical requirements to the range or dimensions	Technical agreement



Rolling in heavy section mill 710

NOMENCLATURE OF STEEL GRADES

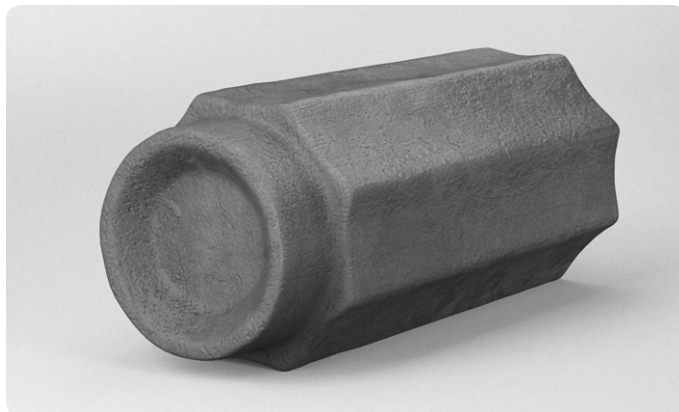
Standard	Steel grade
GOST 535	Ст3сп, Ст5сп Ст0-Ст6сп
GOST 1050	10-60, 35Г2, 45Г2, 08, 15Г-50Г, 10Г2-50Г2, 58 (55nn)
GOST 4543	15Х-50Х, 15Г-50Г, 10Г2-50Г2, 12ХН-50ХН, 15Н2М, 20Н2М, 12ХН2, 20ХГР, 18ХГТ-30ХГТ, 15ХМ, 35ХМ, 38ХМ, 33ХС-40ХС, 20ХГНР, 30ХМА-38ХМА, 38Х2Н2МА, 40ХН2МА, 38ХН3МА, 38ХН3МФА, 38Х2МЮА, 18Х2Н4МА, 12ХН3А, 20ХН3А, 38ХА, 20Х2Н4А, 40ХН, 30ХМ, 38ХМ, 40ХМФА, 20Х2Н4А, 40ХН2МА, 12Х2Н4А, 13ХФА, 20ХГСА-35ХГСА, 40ГМФР, 20Х2НМ, 40ХМФА, 40ХН2МФА, 32ХГМА and others
GOST 5950	5ХНМ, 5ХНВ, 4Х5МФС
GOST 19281	09Г2С, 10ХСНД, 15ХСНД
GOST 14959	70, 65Г, 50ХГ, 50ХГА, 50ХГФА, 55Г2А, 55С2, 55С2А, 60С2, 60ХФА, 70С3А, 60С2А, 60С2ХА, 60С2ВА, 60С2Н2А
TU 14-1-4949	40Г1Р
TU 14-1-4566	40ГМФР
GOST 5632	20Х13, 30Х13, 08Х18Н9Т, 08Х18Н10Т, 12Х18Н9Т, 12Х18Н10Т and others
GOST 5521	A, A32, A40S, B, D, D40S, E36 and others
GOST 20072	12Х1МФ, 25Х1МФ, 15Х5М
TU 3-1078-78	07Х3ГНМЮА
TU 098-153-07516250-2014	АБ2-2 (10ХН3МД)
TU 26-16-269-89	15Х2ГМФ



SEMIFINISHED PRODUCTS

Semifinished products are metallurgical workpieces (blooms, slabs, ingots) manufactured by steel pouring.

- More than 200 steel grades including stainless and heat resistant steel.
- Unique properties are obtained by use of electroslag remelting.
- Extensive range of ingot standard sizes.
- Three standard sizes for continuously cast workpieces.
- 450x540 forging bloom – ingot analogue.
- 270x370 bloom - alternative to ingot with high utilization.

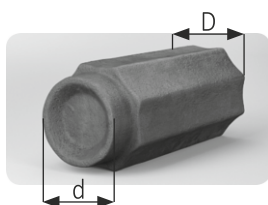


BLOOMS



Dimension, mm	270x370, 380x380, 450x540
Length, mm	up to 5 500 mm
Technical requirements to range of dimensions	TU 24.10.23-275-07500243-2017

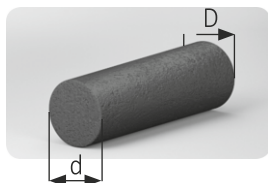
FORGING INGOTS



Ingot weight, t	4.1, 5.2, 6.0, 6.5, 7.3, 8.2, 9.1; 12.2
Height of ingot body, mm	1 588 – 2 260
Height of exterior part of ingot, mm	245 – 500
Diameter D, mm	708 – 1 120
Diameter d, mm	564 – 950
Technical requirements to the range of dimensions	TU 0883-229-53504410-2004

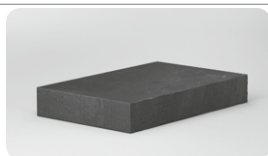
Forging ingots are cast by method of bottom pouring

ELECTROFLUX INGOTS



Ingot weight, t	0.8 – 9.8
Height of ingot body, mm	840 – 2 920
Diameter D, mm	410 – 930
Diameter d, mm	356 – 902
Technical requirements to the range of dimensions	TU 3 ПГ 72-2006

SLABS



Thickness, mm	170; 175
Width, mm	630; 1 020
Length, mm	up to 5 200

Delivery of semifinished goods of other standard sizes is possible

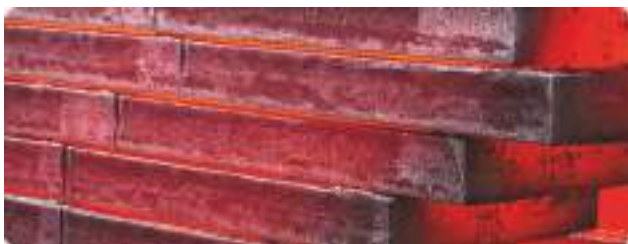
NOMENCLATURE OF STEEL GRADES

Steel type	Steel grades as per RF standards	Steel grades as per foreign standards
Construction carbon steel	10-70, 15 rim, 62ПП110, OC, 22K-Ш and others	CK15, CK22, CK35, CK45, CK60, 080M40, 070M20, LF2, C10E and others
Construction low-alloyed steel	09Г2С, 10ХСНД, 15ГС, 65Г, Э76 and others	
Construction alloyed steel	40Х, 20Г, 30ХГСА, 30ХМА, 38ХМ, 40ХМФА, 40ХГМА, 38ХГН, 12Х1МФ, 15Х1М1Ф, 24ХМ1Ф, 25Х1МФ, 25Х2М1Ф, 40ХН, 40ХН2МА, 38Х2Н2МА, 38ХН3МА, 38ХН3МФА, 34ХН1М, 34ХН3МА, 38ХС, 12ХН3А, 12Х2Н4А, 15Х2НМФ-Ш, АБ2-ПК, 14Х2ГМП and others	42CrMoV4, 21CrMo10, 21CrMo10V4, 20MnCrS5, 16MnCrS5, 18CDV4, St52.3 and others
Tool steel	9Х1, 5ХНБС, 6ХВ2С, 4Х5МФ1С-Ш, 5ХНМ, and others	
Corrosion-resistant (stainless) steel	08-12Х18Н10Т, 20Х13, 40Х13, 14Х17Н2 and others	
Heat resistant and heat-proof steel (forged ingots)	ЭП 609-Ш, ЭИ 961-Ш, ЭП 517-Ш and others	

Ingots and blooms are intended for further rolling in section rolling mills or processing with press-forging equipment. Slabs are intended for rolling into light-gauge and thick-gauge sheets.



Bloom



Slabs

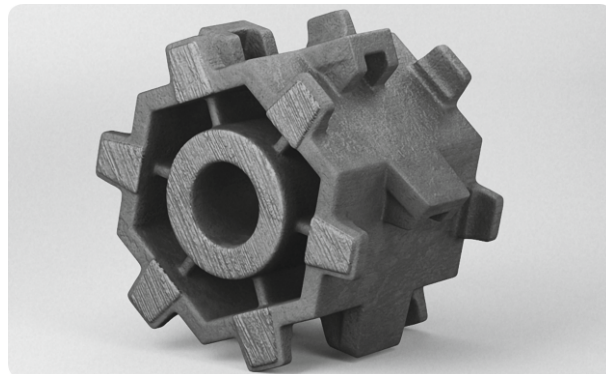


Ingot

STEEL CASTINGS

A **steel casting** is a workpiece manufactured by casting into molds.

- Closed manufacturing cycle.
- Shipment in small batches is possible.
- In-house pattern making.
- Production of castings from stainless and heat-resistant steel grades.



NOMENCLATURE OF STEEL CASTINGS

Product	Description
Spare parts for dredgers	Balers, lips, half-bushings, shafts, assembled upper excavating drums, lower excavating drums and others
Bodies for oilfield Christmas trees	Casing heads, T-pieces and others
Spare parts for tower cranes	Lifting eyes, collars wedges and others
Spare parts, consumables	Sets of milling sections for mills, linings, pallets, crushing plates and others
Other products	Rail track for hydraulic structures, bodies and covers of reducing gears and others

CHARACTERISTICS OF STEEL CASTINGS

Name	Large-sized casting	Precision casting
Casting type	Casting into sand molds from cold hardening mixtures and quick-set mixtures	Casting into sand molds from cold hardening mixtures and quick-set mixtures, investment casting
Steel grade	15Л-35Л, 08ГДНФЛ, 12ДН2ФЛ, 12ДХН1МФЛ, 30ХНМЛ, 35НГМЛ, 110Г13Л, 40Х24Н12СЛ8, 35ХМЛ, 20ХГСЛ, 80Г13Л, 30ХМЛ, 20Х18Н4Г5ДЛ	20Л, 25Л, 35Л-45Л, 40ХЛ, 20Х13Л, 35ХМЛ, 10Х18Н9ТЛ, 40Х24Н12СЛ, 110Г13Л, 08ГДНФЛ, 12ДН2ФЛ, 12ДН3МФЛ, 10ХН3МДЛ
Casting groups	I-III GOST 977-88	
Casting precision	12-13 GOST R 53464-2009	Investment casting: 9 – 10, cold hardening mixture: 11 – 13
Maximum dimensions	up to 2000 mm in diameter	Investment casting: not more than 460x460; cold hardening mixture: 800x400
Casting weight	up to 3 500 kg	Investment casting: not more than 20 kg; cold hardening mixture: not more than 50 kg

FINISHED PRODUCT NOMENCLATURE

Product	Description
Machined forged pieces	Forging with scalping, pre-finishing and finishing in accordance with the customer's drawings
Metallurgical tools and jigs	Steel continuous casting plant rollers, block molds, mandrels, die tooling and others
Long mandrels of pipe mills	Shank ends, work parts, drift-pins
Products for power engineering	Rotor shafts, step-shaped shafts, rail track for hydraulic structures, T-pieces of pipeline valves, body parts for gas pumping units made of stainless and heat-resistant steel grades
Production of mechanical rubber goods	Rings, bushings, sleeves and others
Machining services	Lathe machining, machining on a boring mill, treatment on a rigid-bed milling machine, treatment of bodies of rotation on a boring machine, other treatment on a boring machine, deep drilling, honing, tooth boring, cylindrical grinding, sawing jobs
Heat treatment services	Annealing, hardening, tempering, annealing of large parts and assemblies with a possibility of further straightening, control of hardness and mechanical properties; high-frequency current hardening, thyristor frequency converter hardening, carbonization
Services of coating application	Chrome-plating, nickel-plating, phosphate treatment and others



Machined workpieces



Dredging machine drum, ring for gas pumping units

INSPECTION METHODS. CERTIFICATES AND LICENSES

INSPECTION METHODS

X-ray (welding, casting)

Ultrasound inspection (in accordance with the methodology developed by the company, GOSTs and TUs)

Magnetic particle testing

Fluorescent penetrant inspection

Other inspection methods provided for by the regulatory technical documentation for metal products

CERTIFICATES AND LICENSES



Quality Systems Register
Certificate of QMS conformity to the
requirements of ISO 9001-2015



Military Register Voluntary
Certification System
Certificate of QMS conformity to
the requirements
of GOST RV-0015-002-2012



Federal Service for Environmental,
Technological and Nuclear Supervision
License for the right of manufacturing
equipment for nuclear plants



Register of Certification
for Federal Railway Transport,
Federal Budgetary Institution RS FGT
Certificates of conformity for
rough railcar and locomotive axles



Russian Maritime Register
Certificate of recognition for
manufacturing of workpieces
intended for shipbuilding



Russian River Register
Certificate of recognition
for manufacturing of forged
pieces intended for shipbuilding



American Bureau of Shipping
Certificate by American Bureau of
Shipping for manufacturing of
forgings and ingots

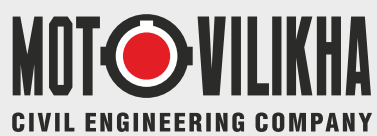


Lloyd's Register
Certificate of approval
of forged pieces
intended for shipbuilding



Det Norske Veritas
Certificate of approval
of manufacturing of steel
forged pieces, including those
made of alloyed steel,
intended for shipbuilding

FOR NOTES



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