DNEPROSPETSSTAL

Chairman of the Board
PrJSC «DNEPROSPETSSTAL»
Sergey Kiyko

*Esteemed business partners,*
*dear friends!*

*We are pleased to introduce you our production of special and alloyed steel in a wide range of brands, which complies with the standards requested by the most advanced technological processes and fields of application.*

*I wish you all the best hoping for a fruitful cooperation.*

*Sergey Kiyko*

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## MISSION STATEMENT

Using the state-of-the-art technologies Dneprospetsstal manufactures and sells high-quality products of special steels and alloys, does its business for the benefit of shareholders, partners and co-workers.

PJSC „Dneprospetsstal" is a key manufacturer of special stainless steels in the CIS market and an undisputed Ukrainian leader in this market segment.

Dneprospetsstal, as the largest international company, develops, manufactures and sells metal products of stainless, tool, high-speed (including those produced by the PM-method), bearing, structural, alloyed and carbon steel grades.

The technologies applied at DSS enable to produce high-quality materials used in a variety of industries, i.e. engineering, shipbuilding, automotive, aerospace, power generation, oil and gas, heavy equipment manufacturing.

Our metal is used to produce parts for vehicles and machinery, seamless tubes and bearings, tools for further processing of metals and alloys.

The geographical location of the company provides a significant advantage in entering the markets of the CIS and the EU. The products of Dneprospetsstal are in demand in more than 60 countries. Maintaining its leading position in the national market, DSS expands its presence in the CIS, Europe, America and Asia, working with partners and distributors in 15 countries.

## OUR HISTORY

Each year, since the date of DSS foundation, has been marked with the events significant not only for PJSC „Dneprospetsstal", but for the whole metallurgical industry as well.

1932 the first heat - DSS Foundation Day

1933 bearing steel production was set up

1934 production of stainless acid-resisting chromium-nickel steel was mastered

1941 the works evacuation to Siberia in a period of the World War II

1945-1953 the works' performance restoration after the World War II

1948 the first post-war heat

1955 ladle degassing was practised for the first time ever in the USSR

1956 heat-resistant alloys production was set up

1957 cold-drawn steel production was mastered

1958 electric-slag remelting process was set up for the first time ever in the world

1959 steel and alloy melting in the vacuum-arc furnaces was mastered for the first time ever in the USSR

1966 the biggest in Europe, at that time, specialized shop for ESR and VAR ingots melting was built

1972 manufacture of large capacity forgings in the forge-press shop was mastered

1980 manufacture of tool and high-speed steel using PM-method was mastered for the first time in the USSR

1987 gas-oxygen refining process was implemented for the first time in the USSR

1996 Danieli ladle-furnace was put into operation, and a modern technology of structural and bearing steel manufacture was set up using this Italian unit

1996 quality system according to ISO 9002:1994 was implemented and certified

1998 Mannesmann-Demag vacuum degasser was put into operation, and a Secondary metallurgy technology was set up using this German equipment

2002 metal surface finishing shop was put into operation

2002 quality system according to ISO 9001:2000 was implemented and certified

2003 ladle-furnace was put into operation in the Steel melting shop No.2, and resource saving technology of corrosion-resistant steel production was implemented using this unit

2006 drop-hammer plant was equipped with a scrap shear press unit

2007 slag processing shop was built

2008 quality system according to ISO 9001:2008 was implemented and certified

2009 Loeser RPS 377 line for 120-280 rolled stock finishing was put into operation at the finishing roll line area of the rolling mill

2012 CVS Makina's 1200 thousand cubic meters/hour Gas Treatment Station was put into operation in the Steel melting shop No.3

2012 ferromolybdenum manufacture area was put into operation in the Steel melting shop No.2

# QUALITY POLICY

## QUALITY MANAGEMENT SYSTEM

The contemporary market features the customer, first of all, who wishes to buy high-quality and cost-efficient products. An ability of meeting these requirements - is an assurance of the company's high competitiveness. So, the top targets of the company are the manufacture of high-quality products and the maximum satisfaction of the customers' needs.

The company has developed, implemented and certified the Quality Management System (QMS) according to ISO 9001:2008 in order to meet these objectives.

The System is aimed at improving the company's activities with quality as its priority in all departments at every production stage, distinct allocation of duties, and control of quality and efficiency of personnel training. The successful performance of QMS at Dneprospetsstal is confirmed by annual compliance audits, conducted by „TUV" Technical Supervisory Society.

Our products quality conform to the requirements of the national and international standards among which are GOST (CIS), ASTM, AISI (USA), EN (EU), DIN (Germany), BS (Great Britain), AFNOR (France), JIS (Japan). Besides, the company has developed its own technical delivery terms, which are harmonized with the above mentioned standards for manufacturing stainless, bearing, tool and structural steels.

Quality of the delivered products is monitored by SGS Society, which is a world leader in the area of providing the independent examinations, tests and certification.

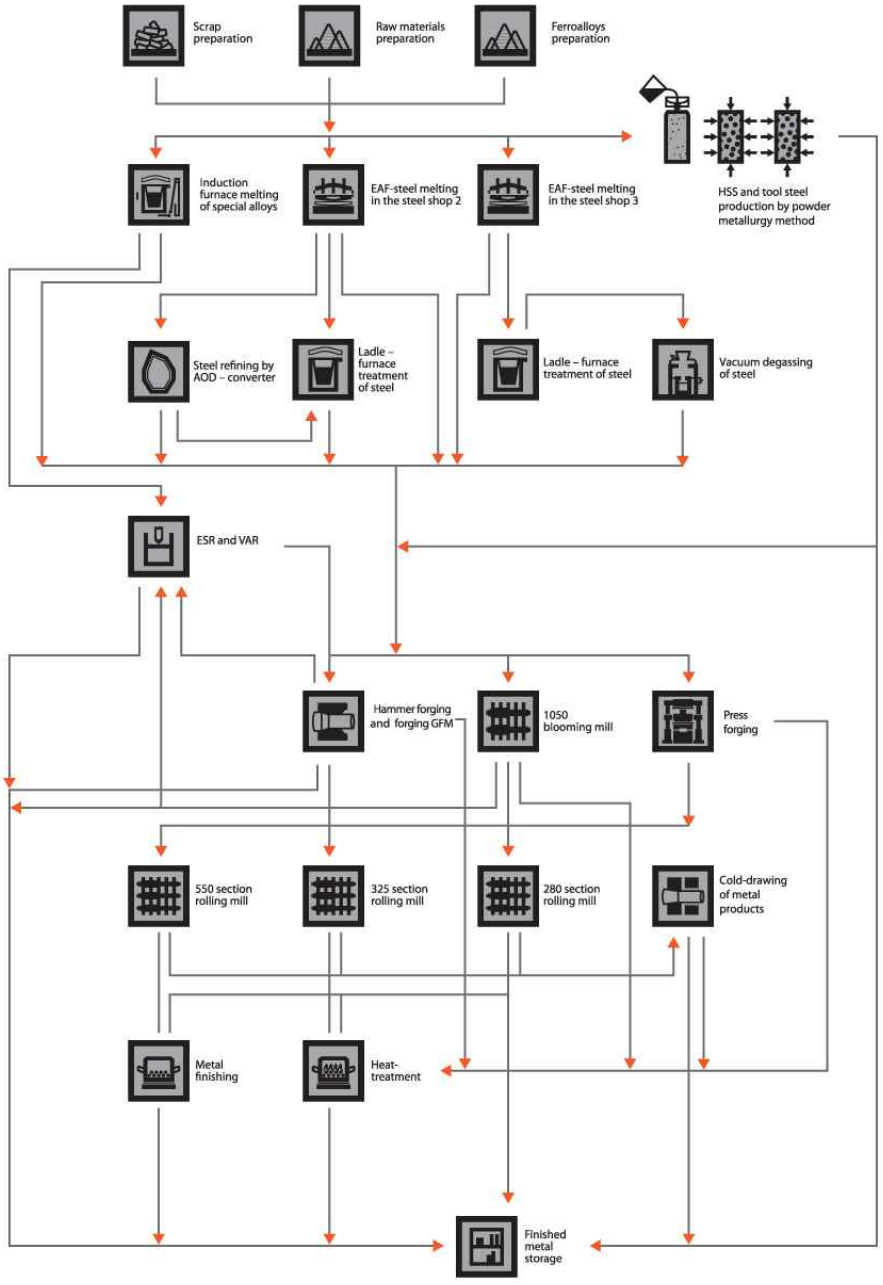
## CERTIFICATES BY PRODUCT TYPES

- Pressure Vessels:
  - AD 2000 Merkblatt W0/TRD100
  - DGRL 97/23/EG
- Construction Industry:
  - CPR 305/2011 EU
- Shipbuilding Industry:
  - Lloyd's Register
  - Germanischer Lloyd
  - Det Norske Veritas
  - Russian Maritime Register of Shipping
- Aircraft Industry:
  - Aviation Register of Interstate Aviation Committee (Russian Federation)
- Railway Machinery:
  - Register Certification of Railways Federation Agency (Russian Federation)
- Nuclear Industry:
  - National Nuclear Energy Company „Energoatom" (Ukraine)

Dneprospetsstal manufactures over 800 steel grades of 1200 section sizes. The company is constantly developing the industrial facilities and new technologies, installing advanced equipment, which enables to produce high-quality products.

## PRODUCTION CHART

Production chart comprises the best combination of various processes, which allows obtaining quality products with properties according to the individual orders of our customers.



## STEELMAKING

Steel making process at DSS is represented with four steel melting shops.

The powder metallurgy shop is equipped with a 4-ton induction furnace. ASEA-STORA process is used for producing more than 30 high-speed and tool steel grades conforming to the requirements of GOST, DIN, ASTM standards; ASEA-STORA process is represented with cold and hot-isostatic pressing at 1100-1150°C and 1000 atm.

Melting in the Steel melting shop No.2 is performed in an open electric-arc furnace followed by converting and processing in a ladle furnace, which allows obtaining of low-carbon corrosion resistant stainless steel. The shop is equipped with an 8-ton induction furnace for producing heat-resistant steels and special alloys.

Steel melting shop No.3 produces high-quality steel by means of semi-product processing in Danieli ladle furnace with further vacuum degassing of melt in Mannesmann Demag vacuum degasser.

Steel melting shop No.5 is equipped with ESR and VAR furnaces of different capacities, which enable to produce 0,9-6,0 ton ingots and 9,3-20,0 ton plate ingots. ESR technology allows to produce steel and special alloys for the major industries, such as: aeronautical, defence, as well as thermal and nuclear power.

DSS steel processing is represented with rolling, sizing, forging, forge-pressing, heat-treatment and metal surface finishing shops.

1050/950 blooming mill of the rolling shop is designed to manufacture billets for further rolling by section mills, as well as 130-280 mm bars. 550, 325 and 280 section rolling mills produce metal products from 8 up to 130 mm in diameter with as-rolled or as-machined surface. Surface is machined by centreless peelers; the process is completely automated. At the section of the rolling mill finishing line round 120-280 mm, up to 2,6 ton bars of the full grade range are machined by Loeser RPS 377 lathe. The technology of wet grinding „on a contact circle" or „with a free belt" is applied in the equipment. All the metal products from 20 mm and over in diameter have to be US-tested in accordance with EN 10308, ASTM A388 or SEP 1921 standards.

Round cold-drawn 2-45 mm bars, round 1,9-50 mm bars with special surface finishing and sized hexagons with incircle 12-46 mm diameter (for the CIS market) are produced in the sizing mill.

Large round, square and rectangular forgings of different steel grades are products of the forge-pressing shop. The shop is equipped with 60 MH and 32 MH hydraulic presses fitted with 5 and 10 ton handlers. The shop comprises special areas for forging heat-treatment, straightening and finishing, as well as US-testing.

The forging shop manufactures stainless, tool, high-speed steel products as well specializes in the production of bars of difficult-to-form alloy steel grades. Two radial-forging 10 MH and 3,4 MH machines are installed in the shop.

Heat treatment of metal products is performed in the heat-treatment shop and in the relevant areas of processing shops.

Metal surface finishing shop performs machining of 20-200 mm round bar surface; final machining of bars with special surface finishing into 160 mm rounds is made by RPS 327 unit. The shop comprises two lines designed for grinding and special surface finishing. The final processing of bars, supplied from 1050, 550, 325 and 280 rolling mills, as well as forging and forge-pressing shops, is performed here.

# BRIEF PRODUCT CATALOGUE

Dneprospetsstal has in possession multifold possibilities to produce various special steel products by virtue of its powerful industrial base.

## GRADE RANGE

### STAINLESS STEEL

### Austenitic Stainless Steel

| DIN EN | | ASTM/AISI | GOST |
|---|---|---|---|
| 1.4301 | X5CrNi18-10 | 304 | 07X18H10 |
| 1.4303 | X4CrNi18-12 | 305 | 06X18H12 |
| 1.4305 | X8CrNiS18-9 | 303 | 10X18H9-Y |
| 1.4306 | X2CrNi19-11 | 304L | 03X19H11 |
| 1.4307 | X2CrNi18-9 | 304L | 03X18H9 |
| 1.4401 | X5CrNiMo17-12-2 | 316 | 07X17H12M2 |
| 1.4404 | X2CrNiMo17-12-2 | 316L | 03X17H12M2 |
| 1.4435 | X2CrNiMo18-14-3 | 316L | 03X18H14M3 |
| 1.4436 | X3CrNiMo17-13-3 | 316L | 05X17H13M3 |
| 1.4541 | X6CrNiTi18-10 | 321 | 08X18H10T |
| 1.4571 | X6CrNiMoTi17-12-2 | 316Ti | 08X17H12M2T |
| | | 304H | 10X19H10 |
| | | 304N | 08X19AH10 |
| | | 304LN | 03X19AH10 |
| | | 309 | 20X23H14 |
| | | 309S | 08X23H14 |
| | | 309H | 10X23H14 |
| | | 310S | 08X25H20 |
| | | 310H | 10X25H20 |
| | | 316H | 10X17H13M2 |
| | | 316N | 08X17AH13M3 |
| | | 316LN | 03X17AH13M3 |
| | | 317 | 08X19H13M4 |
| | | 321H | 10X18H10T |
| | | 347 | 08X18H10Б |
| | | 347H | 10X18H10Б |
| 1.4841 | X15CrNiSi25-20 | 314 | 20X25H20C2 |

### Martensitic Stainless Steel

| DIN EN | | ASTM/AISI | GOST |
|---|---|---|---|
| 1.4006 | X12Cr13 | 410 | 12X13 |
| | | 403 | 15X13 |
| 1.4021 | X20Cr13 | 420 | 20X13 |
| 1.4028 | X30Cr13 | | 30X13 |
| 1.4031 | X39Cr13 | | 40X13 |
| 1.4034 | X46Cr13 | | 46X13 |
| | | 440A | 65X18 |
| | | 440B | 85X17 |
| | | 440C | 110X17 |
| 1.4057 | X17CrNi16-2 | 431 | 17X16H2 |
| 1.4122 | X39CrMo17-1 | | 39X17M |
| 1.4313 | X3CrNiMo13-4 | | 05X13H4M |
| 1.4418 | X4CrNiMo16-5-1 | | 06X16H5AM |
| | | | 40X9C2 |
| 1.4718 | X45CrSi9-3 | | 45X9C3 |

## Ferritic Stainless Steel

| DIN EN | | ASTM/AISI | GOST |
|---|---|---|---|
| 1.4000 | X6Cr13 | 410S | 08X13 |
| 1.4016 | X6Cr17 | 430 | 08X17 |
| 1.4113 | X6CrMo17-1 | 434 | 08X17M |

## Ferritic-Austenitic Stainless Steel (Duplex Steel)

| DIN EN | | ASTM/AISI | GOST |
|---|---|---|---|
| 1.4462 | | F51<br>S31803<br>S32205 | 03X22H5AM3 |

# STRUCTURAL STEEL

## Structural Carburizing Steel

| EN 10084, DIN | | ASTM/AISI | GOST |
|---|---|---|---|
| 1.1121 | C10E | 1010 | 10 |
| 1.1207 | C10R | | 10-У |
| 1.1141 | C15E | 1015 | 15 |
| 1.1140 | C15R | | 15-У |
| 1.1148 | C16E | | 15Г |
| 1.1208 | C16R | | 15Г-У |
| 1.7016 | 17Cr3 | | 17ХГ |
| 1.7014 | 17CrS3 | | 17ХГ-У |
| 1.7030 | 28Cr4 | | 28ХГ |
| 1.7036 | 28CrS4 | | 28ХГ-У |
| 1.7131 | 16MnCr5 | 5115 | 16ХГ |
| 1.7139 | 16MnCrS5 | | 16ХГ-У |
| 1.7160 | 16MnCrB5 | | 16ХГР |
| 1.7147 | 20MnCr5 | 5120 | 20ХГ |
| 1.7149 | 20MnCrS5 | | 20ХГ-У |
| 1.7243 | 18CrMo4 | | 18ХГМ |
| 1.7244 | 18CrMoS4 | | 18ХГМ-У |
| 1.7333 | 22CrMoS3-5 | | 22ХГМ-У |
| 1.7320 | 20MoCr3 | 4118 | 20ХМ |
| 1.7319 | 20MoCrS3 | | 20ХМ-У |
| 1.7321 | 20MoCr4 | | 20ХГМ |
| 1.7323 | 20MoCrS4 | | 20ХГМ-У |
| 1.5714 | 16NiCr4 | | 16ХГН |
| 1.5715 | 16NiCrS4 | | 16ХГН-У |
| 1.5805 | 10NiCr5-4 | | 10ХГН1 |
| 1.5810 | 18NiCr5-4 | 3120 | 18ХГН1 |
| 1.5918 | 17CrNi6-6 | | 17Х2ГН2 |
| 1.5752 | 15NiCr13 | | 17ХН3 |
| 1.6523 | 20NiCrMo2-2 | 8620 | 20ХГНМ |
| 1.6526 | 20NiCrMoS2-2 | | 20ХГНМ-У |
| 1.6566 | 17NiCrMo6-4 | | 17ХГН1М |
| 1.6569 | 17NiCrMoS6-4 | | 17ХГН1М-У |
| 1.6571 | 20NiCrMoS6-4 | | 20ХГН2М-У |
| 1.6587 | 18CrNiMo7-6 | | 18Х2ГН2М |
| 1.6657 | 14NiCrMo13-4 | 9310 | 14ХН3М |
| 1.5732 | 14NiCr10 | 655M13 | 14ХН3 |

## Structural Heat-Treatable Alloy Steel

| EN 10083-3, DIN | | ASTM/AISI | GOST |
|---|---|---|---|
| 1.7003 | 38Cr2 | | 38Х |
| 1.7006 | 46Cr2 | | 46Х |
| 1.7033 | 34Cr4 | 5130 | 34Х |
| 1.7037 | 34CrS4 | | 34Х-У |
| 1.7034 | 37Cr4 | | 37Х |
| 1.7038 | 37CrS4 | | 37Х-У |
| 1.7035 | 41Cr4 | 5140 | 41Х |
| 1.7039 | 41CrS4 | | 41Х-У |
| 1.7218 | 25CrMo4 | 4130 | 25ХМ |
| 1.7213 | 25CrMoS4 | | 25ХМ-У |
| 1.7220 | 34CrMo4 | 4137 | 34ХМ |
| 1.7226 | 34CrMoS4 | | 34ХМ-У |
| 1.7225 | 42CrMo4 | 4140 | 42ХМ |
| 1.7227 | 42CrMoS4 | | 42ХМ-У |
| 1.7228 | 50CrMo4 | 4150 | 50ХМ |
| 1.7264 | 20CrMo5 | | 25Х1ГМ |
| 1.6582 | 34CrNiMo6 | 4340 | 34Х2Н2М |
| 1.6580 | 30CrNiMo8 | 4340 | 30Х2Н2М |
| 1.8519 | 31CrMoV9 | | 30Х3МФ |
| 1.5815 | 35NiCr6 | | 35ХН1 |
| 1.6511 | 36CrNiMo4 | 9840 | 36ХНМ |
| 1.6773 | 36NiCrMo16 | | 36Х2Н4МА |
| 1.8509 | 41CrAlMo7 | | 38Х2МЮА |
| 1.6510 | 39NiCrMo3 | 9840 | 39ХНМ |
| 1.6747 | 30NiCrMo16-6 | | 30Х1Н4М |
| 1.6565 | 40CrNiMo6 | 4340 | 40Х2Н2МА |
| 1.0913 | 50Mn7 | 1552 | 50Г2 |
| 1.8159 | 51CrV4 | 6150 | 50ХГФ |

## Structural Heat-Treatable Non-Alloy Steel

| EN 10083-2 | | ASTM/AISI | GOST |
|---|---|---|---|
| 1.1151 | C22E | 1020 | 20 |
| 1.1149 | C22R | | 20-У |
| 1.1181 | C35E | 1035 | 35 |
| 1.1180 | C35R | | 35-У |
| 1.1186 | C40E | 1040 | 40 |
| 1.1189 | C40R | | 40-У |
| 1.1191 | C45E | 1045 | 45 |
| 1.1201 | C45R | | 45-У |
| 1.1206 | C50E | 1050 | 50 |
| 1.1241 | C50R | | 50-У |
| 1.1203 | C55E | 1055 | 55 |
| 1.1209 | C55R | | 55-У |
| 1.1221 | C60E | 1060 | 60 |
| 1.1223 | C60R | | 60-У |
| 1.1170 | 28Mn6 | | 28Г |

## Structural Non-Alloy Steel

| EN 10025 | | ASTM/AISI | GOST |
|---|---|---|---|
| 1.0045 | S355JR | | 20Г1С |
| 1.0553 | S355J0 | | 17Г1С |
| 1.0577 | S355J2 | | 17Г1С-У2 |

## Structural High-Strength Steel

| DIN EN 10273, DIN EN 10269, DIN | | ASTM/AISI | GOST |
|---|---|---|---|
| 1.5415 | 16Mo3 | F1 | 18М |
| 1.7335 | 13CrMo4-5 | F12 | 13ХМ |
| 1.7380 | 10CrMo9-10 | F22 | 15Х2М1 |
| 1.7390 | X15CrMo5-1 | F5 | 15Х5М |

## Spring Steel

| EN 10089, DIN | | ASTM/AISI | GOST |
|---|---|---|---|
| 1.5028 | 65Si7 | 9260H | 60С2Г |
| 1.7108 | 60SiCr7 | 9262 | 60С2ХА |
| 1.7176 | 55Cr3 | 5155 | 55ХГ |
| 1.8161 | 58CrV4 | 6145, 6150 | 58ХГФ |

## Bearing Steel

| DIN ISO 683-17 | | ASTM/AISI | GOST |
|---|---|---|---|
| 1.3505 | 100Cr6 | 52100 | ШХ15 |
| 1.3520 | 100CrMnSi6-4 | | ШХ15СГ |
| 1.3536 | 100CrMo7-3 | | ШХ20М |

# TOOL STEEL

## Tool Alloy Steel

| DIN EN 4957 | | ASTM/AISI | GOST |
|---|---|---|---|
| 1.2067 | 102Cr6 | L1 | Х |
| 1.2080* | X210Cr12* | D3* | Х12* |
| 1.2101 | 62SiMnCr4 | S4 | 6ХГС |
| 1.2162 | 21MnCr5 | | 20ХГ |
| 1.2210 | 115CrV3 | | ХФ |
| 1.2235 | 80CrV2 | L2 | 8ХФ |
| 1.2235 | 80CrV2 | L3 | 9ХФ |
| 1.2312 | 40CrMnMoS8-6 | | 40Х2ГМ |
| 1.2316 | X38CrMo16 | | 40Х16М |
| 1.2343 | X37CrMoV5-1 | H11 | 4Х5МФС |
| 1.2581 | X30WCrV9-3 | H21 | 3Х3В8Ф |
| 1.2344 | X40CrMoV5-1 | H13 | 4Х5МФ1С |
| 1.2357 | 50CrMoV13-14 | S7 | 5Х3СМ2Ф |
| 1.2363 | X100CrMoV5 | A2 | 95Х5ГМ |
| 1.2365* | 32CrMoV12-28* | H10* | 3Х3М3Ф* |
| 1.2367 | X38CrMoV5-3 | | 4Х5М3Ф |
| 1.2379* | X153CrMoV12* | D2* | Х12МФ* |
| 1.2380* | X220CrVMo13-4* | D7* | Х12МФ4* |
| 1.2419 | 105WCr6 | | ХВГ |
| 1.2436* | X210CrW12* | D6* | Х12В* |
| 1.2510 | 100MnCrW4 | O1 | 95ХГВФ |
| 1.2519 | 110WCrV5 | O7 | ХВФ |
| 1.2550 | 60WCrV8 | S1 | 6ХВ2ФС |
| 1.2714 | 55NiCrMoV6 | | 5ХН2МФ |
| 1.2764 | X19NiCrMo4 | | 20ХН4М |
| 1.2842 | 90MnCrV8 | O2 | 9Г2Ф |

* PM-method of manufacture is able

## Tool Carbon Steel

| DIN EN 4957 | | ASTM/AISI | GOST |
|---|---|---|---|
| 1.1520 | C70U | | У7 |
| 1.1525 | C80U | W108 | У8 |
| 1.1535 | C90U | W109 | У9 |
| 1.1545 | C105U | W110 | У10 |
| 1.1555 | C120U | W112 | У12 |

## Tool High-Speed PM-Steel

| DIN EN ISO | | ASTM/AISI | Innovator Designation | GOST |
|---|---|---|---|---|
| HS 12-1-4-5-PM | 1.3202-PM | T15-PM | | Р12МФ4К5-МП |
| HS 10-4-3-10-PM | 1.3207-PM | T42-PM | | Р10М4Ф3К10-МП |
| HS 6-5-2-8-PM | 1.3222-PM | M36-PM | ASP 2030 (Erasteel*)<br>CPM REX45 (Crucible*)<br>S590-PM (Böhler*) | Р6М5Ф3К8-МП |
| HS 6-5-2-5-PM | 1.3243-PM | | | Р6М5К5-МП |
| HS 2-9-1-8-PM | 1.3247-PM | M42-PM | | Р1М10К8-МП |
| HS 18-1-2-5-PM | 1.3255-PM | T4-PM | | Р18МФ2К5-МП |
| HS 12-1-4-PM | 1.3302-PM | | | Р12МФ4-МП |
| HS 12-1-2-PM | 1.3318-PM | | | Р12МФ2-МП |
| HS 6-5-2C-PM | 1.3343-PM | M2-PM | | Р6М5-МП |
| HS 6-5-3-PM | 1.3344-PM | M3-PM | ASP 2023 (Erasteel*)<br>S790-PM (Böhler*) | Р6М5Ф3-МП |
| HS 2-9-1-PM | 1.3346-PM | M1-PM | | Р2М9Ф-МП |
| HS 18-0-1-PM | 1.3355-PM | T1-PM | | Р18-МП |
| | | | S390-PM (Böhler*) | Р10М2Ф5К8-МП |
| HS 10-5-3-9-PM | | M48-PM | | Р10М5Ф3К9-МП |
| | | | ASP 2053 (Erasteel*) | Р4М3Ф8-МП |
| HS 6-7-6-10-PM | 1.3241-PM | | ASP 2060 (Erasteel*) | Р6М7Ф6К10-МП |
| HS 0-4-1-PM | 1.3551-PM | M50-PM | | Р0М4ФС-МП |
| HS 2-9-2-PM | 1.3348-PM | M7-PM | | Р2М9Ф2-МП |
| HS 6-5-4-PM | 1.3351-PM | M4-PM | S690-PM (Böhler*) | Р6М5Ф4-МП |
| HS 12-6-5-PM | | M61-PM | | Р12М6Ф5-МП |

* Metal products of these steel grades shall be manufactured only on obtaining the written confirmation from this steel grade engineering company and owner of licence to use it.

## Tool Alloy PM-Steel

| DIN EN ISO | | ASTM/AISI | Innovator Designation | GOST |
|---|---|---|---|---|
| X210Cr12-PM | 1.2080-PM | D3-PM | | Х12-МП |
| X153CrMoV12-PM | 1.2379-PM | D2-PM | | Х12МФ-МП |
| X220CrVMo13-4-PM | 1.2380-PM | D7-PM | K190-PM (Böhler*) | Х12МФ4-МП |
| X60WCrMoV9-4-PM | 1.2622-PM | | | 6Х4В9МФ-МП |
| | | | K340-PM (Böhler*) | 110Х8М2ФС-МП |
| | | | Vanadis 4-PM (Böhler*) | 150Х8М2Ф4С-МП |
| | | | CPM 9V (Crucible*) | Р0М2СФ9-МП |
| | | A11-PM | CPM 10V (Crucible*) | Р0М2СФ10-МП |

* Metal products of these steel grades shall be manufactured only on obtaining the written confirmation from this steel grade engineering company and owner of licence to use it.

## STAINLESS STEEL

| Size, mm | Round | | | | Square | |
|---|---|---|---|---|---|---|
| | Cold-Drawn (h11)* | Bars with Special Surface Finishing (ground and polished) h9-h11 (k9-k11) | Hot-Rolled | Forged | Hot-Rolled | Forged |
| 2 -11 | | | | | | |
| 12-40 | | | | | | |
| 41-80 | | | | | | |
| 81-180 | | | | | | |
| 181-190 | | | | | | |
| 191-195 | | | | | | |
| 196-400 | | | | | | |
| 401-500 | | | | | | |

## STRUCTURAL STEEL

| Size, mm | Round | | | | Square | |
|---|---|---|---|---|---|---|
| | Cold-Drawn (h11)* | Bars with Special Surface Finishing (ground and polished) h9-h11 (k9-k11) | Hot-Rolled | Forged | Hot-Rolled | Forged |
| 2-11 | | | | | | |
| 12-40 | | | | | | |
| 41-80 | | | | | | |
| 81-130 | | | | | | |
| 131-180 | | | | | | |
| 181-260 | | | | | | |
| 261-450 | | | | | | |
| 451-550 | | | | | | |

## BEARING STEEL

| Size, mm | Round | | | | Square | |
|---|---|---|---|---|---|---|
| | Cold-Drawn (h11)* | Bars with Special Surface Finishing (ground and polished) h9-h11 (k9-k11) | Hot-Rolled | Forged | Hot-Rolled | Forged |
| 2-11 | | | | | | |
| 12-40 | | | | | | |
| 41-80 | | | | | | |
| 81-130 | | | | | | |
| 131-180 | | | | | | |
| 181-230 | | | | | | |
| 231-250 | | | | | | |
| 251-450 | | | | | | |

* Metal products can be manufactured only for the CIS market, or when agreed upon between the manufacturer and the customer.

## TOOL STEEL

| Size, mm | Round | | | | Square | |
|---|---|---|---|---|---|---|
| | Cold-drawn (h11)* | Bars with Special Surface Finishing (ground and polished) h9-h11 (k9-k11) | Hot-Rolled | Forged | Hot-Rolled | Forged |
| 2-11 | | | | | | |
| 12-40 | | | | | | |
| 41-80 | | | | | | |
| 81-130 | | | | | | |
| 131-180 | | | | | | |
| 181-400 | | | | | | |
| 401-500 | | | | | | |

* Metal products can be manufactured only for the CIS market, or when agreed upon between the manufacturer and the customer.

## HIGH SPEED STEEL

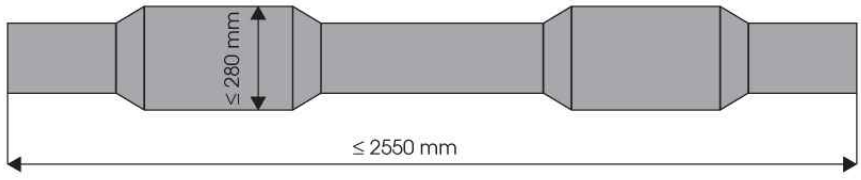
| Size, mm | Round | | | Square | |
|---|---|---|---|---|---|
| | Bars with Special Surface Finishing (ground and polished) h9-h11 (k9-k11) | Hot-Rolled | Forged | Hot-Rolled | Forged |
| 2-11 | | | | | |
| 12-74 | | | | | |
| 75-80 | | | | | |
| 81-130 | | | | | |
| 131-180 | | | | | |

## TOOL AND HIGH-SPEED PM-STEEL

| Size, mm | Round | | | Square | |
|---|---|---|---|---|---|
| | Bars with Special Surface Finishing (ground and polished) h9-h11 (k9-k11) | Hot-Rolled | Forged | Hot-Rolled | Forged |
| 3-11 | | | | | |
| 12-73 | | | | | |
| 74-79 | | | | | |
| 80-89 | | | | | |
| 90-130 | | | | | |
| 131-350 | | | | | |
| 351-410 | | | | | |

## FORGED ROUGH BILLET FOR RAILWAY CAR AXLES WITH IRREGULAR SECTION

Billet weight up to 900 kg



## FORGED FLATS

| Thickness, mm | Width, mm | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 80 | 90 | 100 | 110 | 120 | 130 | 140 | 150 | 160 | 200 | 300 | 350 | 400 | 500 | 600 | 700 | 800 |
| 30-55 | | | | | | | | | | | | | | | | | |
| 60-75 | | | | | | | | | | | | | | | | | |
| 80-85 | | | | | | | | | | | | | | | | | |
| 90-95 | | | | | | | | | | | | | | | | | |
| 100-105 | | | | | | | | | | | | | | | | | |
| 110-115 | | | | | | | | | | | | | | | | | |
| 120-125 | | | | | | | | | | | | | | | | | |
| 130-135 | | | | | | | | | | | | | | | | | |
| 140-145 | | | | | | | | | | | | | | | | | |
| 150 | | | | | | | | | | | | | | | | | |
| 155-250 | | | | | | | | | | | | | | | | | |
| 255-300 | | | | | | | | | | | | | | | | | |

## UTMOST DEVIATIONS FOR FORGED FLATS

| Thickness, mm |
|---|
| 30-64 |
| 65-89 |
| 90-150 |
| 151-250 |
| 251-300 |

| Thickness, mm |
|---|
| +2,5/-0,0 |
| +4,5/-0,0 |
| +5,0/-0,0 |
| +7,0/-0,0 |
| +10,0/-0,0 |

| Width, mm |
|---|
| 80-119 |
| 120-179 |
| 180-214 |
| 215-249 |
| 250-284 |
| 285-344 |
| 345-350 |
| 351-600 |
| 601-800 |

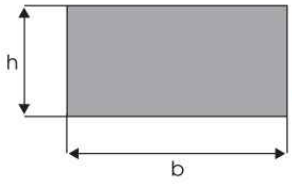
| Width, mm |
|---|
| +4,0/-0,0 |
| +5,0/-0,0 |
| +7,0/-0,0 |
| +8,0/-0,0 |
| +9,0/-0,0 |
| +10,0/-0,0 |
| +12,0/-0,0 |
| +15,0/-0,0 |
| +20,0/-0,0 |

## UTMOST DEVIATIONS FOR HOT-ROLLED FLATS

| Width, mm |
|---|
| +2,0/-0,0 |

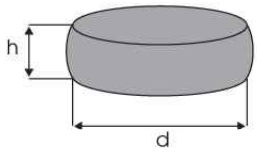
| Thickness, mm |
|---|
| +0,6/-0,0 |

## HOT-ROLLED FLATS




| Size, mm |
|---|
| h = 6-12 |
| b = 40-70 |

## FORGED DISCS




| Size, mm |
|---|
| h = 120-300 |
| d = 330-1100 |

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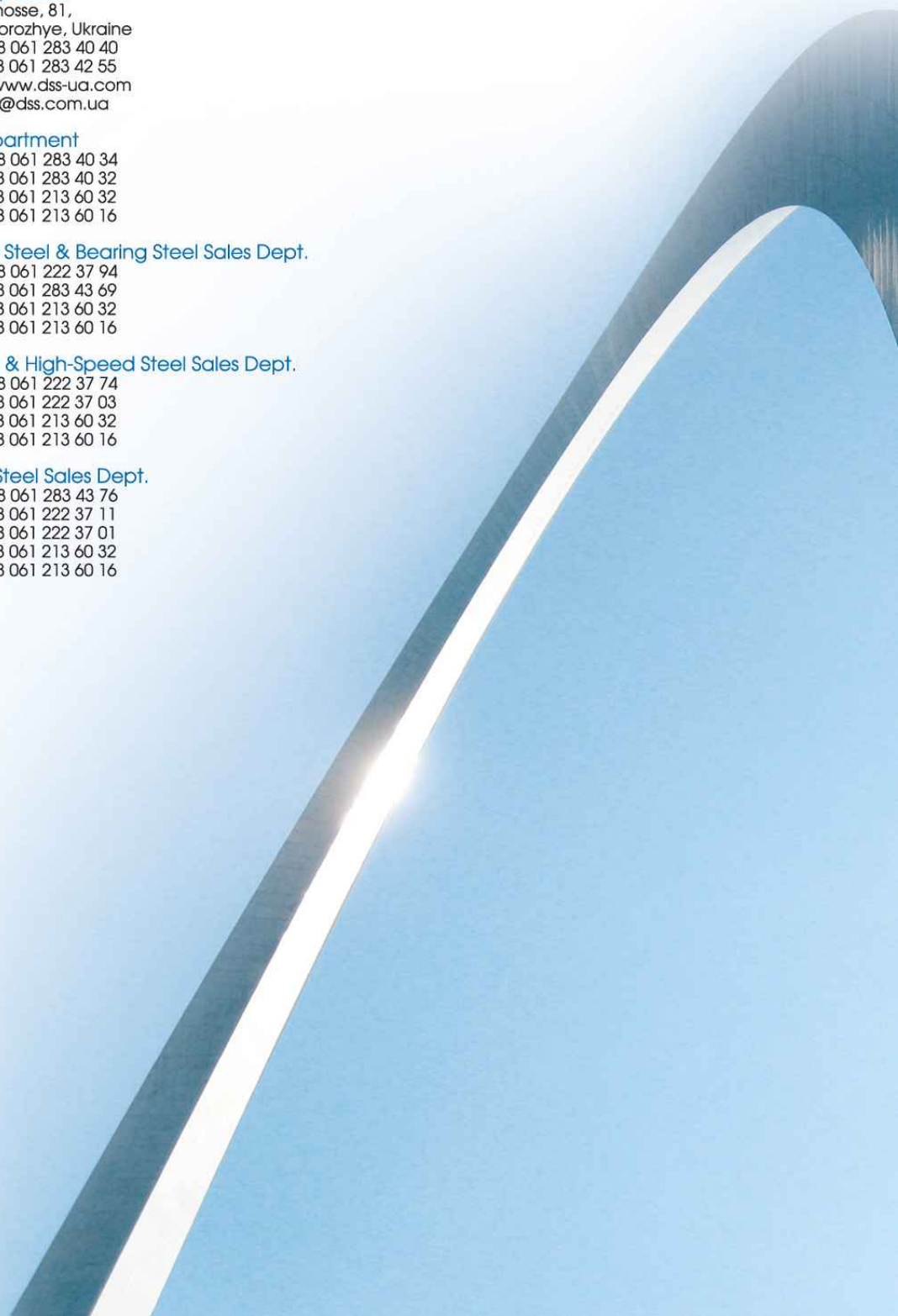

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