Element analysis

OF FRITSCH PRODUCTS

Version 4.0

1 Explanations on hardness data. 4

2 Elemental analysis of grinding parts. 6

2.1 Grinding parts made of agate. 6

2.2 Grinding parts made of zirconium oxide Mg- stabilized 7

2.3 Grinding parts made of zirconium oxide Y- stabilized. 7

2.4 Grinding parts made of hardened stainless steel 1.4125. 8

2.5 Grinding parts made of hard metal tungsten carbide CTF12E. 9

2.6 Grinding parts made of hard metal tungsten carbide CTF24E (GC20). . 10

2.7 Grinding parts made of sintered corundum. 10

2.8 Grinding parts made of silicon nitride. 11

2.9 Grinding parts made of PTFE 12

2.10 Grinding parts made of chromium free tool steel 1.1740 12

2.11 Grinding parts made of stainless steel 1.4404/316L. 13

2.12 Cutting Tool made of tool steel 1.2379 - Rotorknife. 14

2.13 Cutting Tool made of construction steel 1.0037- Rotor Body. 14

2.14 Grinding parts made of construction steel - 1.0330 - nor rust-proof. . 15

2.15 Funnel / cyclone separator made of stainless steel - 1.4301. 15

2.16 Grinding parts made of hardened stainless steel - 1.4112. 16

2.17 Grinding parts made of stainless steel - 1.4305. 17

2.18 Grinding parts made of aluminum 3.4365. 18

2.19 Grinding parts made of stainless steel 1.4057. 18

2.20 Grinding parts made of pure titanium 3.7035. 19

2.21 Grinding parts coated with titanium nitride. 20

2.22 Grinding parts made of cast iron GG20 0.6020. 20

2.23 Grinding parts made of hardened steel 1.2080. 20

2.24 Grinding vessel lid made of silicone - LR 3003/70 A/B 21

2.25 Parts made of polypropylene (PP). 21

2.26 Grinding vessel lid made of polycarbonate - PC. 22

2.27 Grinding parts made of stainless steel 1.4028. 22

2.28 Grinding parts made of stainless steel 1.4034. 23

2.29 Grinding parts made of stainless steel 1.4571. 23

2.30 Grinding parts made of manganese steel 1.3401. 24

2.31 Grinding parts made of cast steel 1.2602. 24

2.32 Grinding parts made of hard porcelain. 25

2.33 Part made of Polyoxymethylene POM. 26

2.34 Divider made of aluminum 6026. 26

2.35 Part made of Polyethylen PE. 27

3 Parts in contact with samples per device. 28

3.1 P-19. 28

4 Overview according to devices. 32
5 Copyright and legal Information. 33

1 Explanations on hardness data

Scratch Hardness according to Mohs:

The Mohs' hardness scale consists of 10 well known minerals, each of which represents a definite degree of hardness / scratch hardness.

Each mineral scratches all minerals with a lower hardness number.

Hardness according to Rockwell (HRC):

For the hardness test according to Rockwell a cone-shaped test piece is pressed into the boundary layer of a working piece with a defined pressure and the remaining impression depth is measured.

Depending on the pre-force, on the additional force and on the kind of the penetration stamp different Rockwell test methods are used. With the Rockwell B procedure (penetration stamp = steel **b**all) and the Rockwell C procedure (penetration stamp = **c**one) only two of the most common procedures are to be introduced here.

EXAMPLE:

59 HRC the Rockwell hardness, measured in the scale C is 59

Hardness according to Vickers (HV):

Here the point of a pyramid of diamond is pressed into the surface of the working piece for 10-30 sec. with a defined pressure and the diagonal of the resulted imprint of the pyramid is measured.

EXAMPLES:

640 HV 30: the Vickers hardness value 640 was determined with a pressure of 294.2 N = 30 kp and a short working period from 10 to 15 seconds.

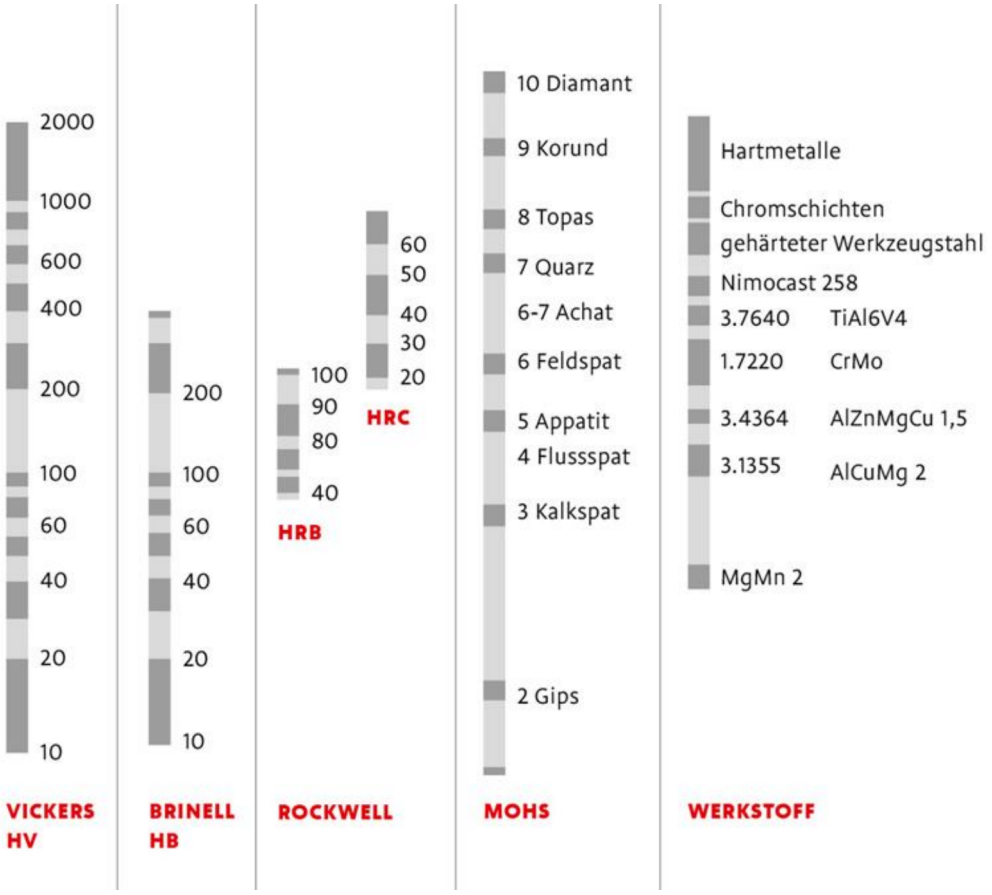
545 HV 1/20: the Vickers hardness value 545 was determined with a pressure of 9,807 N = 1 kp and a short working period of 20 sec.

Hardness according to Brinell (HBW):

For the hardness test according to Brinell a ball made of tungsten carbide is pressed into the surface for more than 10 sec. with a defined pressure and is left there for 10 to 15 sec. The Brinell hardness HBW is determined from the diameter of the ball impression.

EXAMPLE:

350 HBW 5/750 Brinell hardness 350, is determined with a ball of 5 mm diameter and a test pressure of 7.355 kN and has been left there for 10 to sec.



This chart is intended for approximate orientation only. Vickers, Brinell and Rockwell values are based on different test methods and are only approximately comparable depending on the material and its condition.

HRB and HRC are separate Rockwell scales. The Mohs scale describes qualitative, non-linear scratch hardness and is not directly convertible to indentation hardness values. Binding specifications require the applicable test method, test load or scale, material condition and, where applicable, a test certificate.

2 Elemental analysis of grinding parts

2.1 Grinding parts made of agate

Please note that agate is a natural product and is therefore subject to certain fluctuations.

Name	Formula	Percentage
Silicon oxide	SiO_2	99.9 %
Aluminum oxide	Al_2O_3	< 0.02 %
Iron oxide	Fe_2O_3	< 0.02 %
Calcium oxide	CaO	< 0.02 %
Magnesium oxide	MgO	< 0.02 %
Sodium oxide	Na_2O	< 0.02 %
Potassium oxide	K_2O	< 0.02 %
Manganese oxide	MnO	< 0.02 %

Physical and mechanical properties

Chemical resistance	not resistant by contact with HF
Density	2.65 g/cm³
Hardness	6.5 – 7 Mohs

Related Products

Vibratory Mill	P-0
Mortar Grinder	P-2
Planetary Mill	P-5
Planetary Mill	P-5 premium
Planetary Mill	P-6
Planetary Mill	P-7
Planetary Mill	P-7 premium
Vibratory Mill	P-9
Sieve Shaker	A-3

2.2 Grinding parts made of zirconium oxide Mg- stabilized

Name	Formula	Percentage
Zirconium oxide	ZrO_2	94.2 – 95.2 %
Hafnium oxide	HfO_2	1 – 2 %
Magnesium oxide	MgO	3.5 %
Silicon dioxide	SiO_2	0.1 %
Aluminum oxide	Al_2O_3	0.1 %
Other	-	0.1 %

Physical and mechanical properties

Density	5.7 g/cm³
Hardness	1200 HV 10

Related Products

Vibratory Mill	P-0
Jaw Crusher	P-1
Mortar Grinder	P-2
Planetary Mill	P-5
Planetary Mill	P-5 premium
Planetary Mill	P-6
Planetary Mill	P-7
Planetary Mill	P-7 premium
Rotor Mill	P-14
Vibratory Mill	P-23

2.3 Grinding parts made of zirconium oxide Y- stabilized

Name	Formula	Percentage
Zirconium oxide	ZrO_2	95 %
Yttrium oxide	Y_2O_3	5 %

Physical and mechanical properties

Density	6 g/cm³
Hardness	1300 HV 10

Related Products

Planetary Mill	P-5
Planetary Mill	P-5 premium
Planetary Mill	P-6
Planetary Mill	P-7
Planetary Mill	P-7 premium
Vibratory Mill	P-9
Disk Mill	P-13
Disk Mill	P-13 premium
Vibratory Mill	P-23

2.4 Grinding parts made of hardened stainless steel 1.4125

ISO/EN/DIN Code: X105CrMo17

Name	Formula	Percentage
Iron	Fe	81.4 %
Chromium	Cr	17 %
Carbon	C	1.1 %
Molybdenum	Mo	0.5 %

Physical and mechanical properties

Density	7.7 g/cm³
Hardness	~60 HRC

Related Products

Vibratory Mill	P-0
Planetary Mill	P-5
Planetary Mill	P-5 premium
Planetary Mill	P-6

Planetary Mill	P-7
Planetary Mill	P-7 premium
Vibratory Mill	P-9
Vibratory Mill	P-23

2.5 Grinding parts made of hard metal tungsten carbide CTF12E

CTF12E (GC10)

Name	Formula	Percentage
Tungsten carbide	TC	93,8 %
Cobalt	Co	6 %

Physical and mechanical properties

Density	14.95 g/cm³
Hardness	92.1 HRA

Related Products

Vibratory Mill	P-0
Jaw Crusher	P-1
Mortar Grinder	P-2
Planetary Mill	P-5
Planetary Mill	P-5 premium
Planetary Mill	P-6
Planetary Mill	P-7
Planetary Mill	P-7 premium
Vibratory Mill	P-9
Disk Mill	P-13
Disk Mill	P-13 premium
Rotor Mill	P-14
Rotor Mill	P-16
Cutting Mill	P-19

2.6 Grinding parts made of hard metal tungsten carbide CTF24E (GC20)

ISO/EN/DIN Code: K40

Name	Formula	Percentage
Tungsten carbide	TC	87,85 %
Cobalt	Co	12 %

Physical and mechanical properties

Density	14.3 g/cm³
Hardness	89.7 HRA

Related Products

Vibratory Mill	P-0
Jaw Crusher	P-1
Mortar Grinder	P-2
Planetary Mill	P-5
Planetary Mill	P-5 premium
Planetary Mill	P-6
Planetary Mill	P-7
Planetary Mill	P-7 premium
Vibratory Mill	P-9
Disk Mill	P-13
Disk Mill	P-13 premium
Rotor Mill	P-14
Rotor Mill	P-16
Cutting Mill	P-19

2.7 Grinding parts made of sintered corundum

Name	Formula	Percentage
Aluminum oxide	Al_2O_3	99.651 %
Silicon oxide	SiO_2	0.257 %
Calcium oxide	CaO	0.081 %

Name	Formula	Percentage
Other	-	0.011 %

Physical and mechanical properties

Density	3.8 g/cm³
Hardness	Mohs 9

Related Products

Vibratory Mill	P-0
Mortar Grinder	P-2
Planetary Mill	P-5
Planetary Mill	P-6
Planetary Mill	P-7
Planetary Mill	P-7 premium

2.8 Grinding parts made of silicon nitride

ISO/EN/DIN Code: SNCB5

Name	Formula	Percentage
Silicon nitride	Si_3N_4	91 %
Yttrium oxide/ aluminum oxide	Y_2O_3 / Al_2O_3	9 %

Physical and mechanical properties

Hardness	91.1 HRA
Density	3.25 g/cm³

Related Products

Planetary Mill	P-5
Planetary Mill	P-5 premium
Planetary Mill	P-6
Planetary Mill	P-7
Planetary Mill	P-7 premium

2.9 Grinding parts made of PTFE

CAS Number: 9002-84-0

Name	Formula	Percentage
Polytetrafluoroethylene	C_2F_4	100 %

Physical and mechanical properties

Hardness	ISO 868, ISO 2039-2, Shore D55
Density	2.16g/cm³
Melting point	327° C
Max. application temp constant	260° C
Max. application temp briefly	300° C

Related Products

Rotor Mill	P-14
Vibratory Mill	P-23
Sample Divider	L-27

2.10 Grinding parts made of chromium free tool steel 1.1740

ISO/EN/DIN Code: C60W3

Name	Formula	Percentage
Iron	Fe	98.08 - 98.63%
Carbon	C	0.55 – 0.65 %
Silicon	Si	0.15 – 0.4 %
Manganese	Mn	0.6 – 0.8 %
Phosphorus	P	< 0.035 %
Sulphur	S	< 0.035 %

Physical and mechanical properties

Hardness	50 - 55 HRC
Density	7.8 g/cm³

Related Products

Jaw Crusher	P-1
Vibratory Mill	P-9
Cutting Mill	P-15

2.11 Grinding parts made of stainless steel 1.4404/316L

ISO/EN/DIN Code: X2CrNiMo17-12-2/ DIN SEW410

Name	Formula	Percentage
Iron	Fe	~62.8 %
Carbon	C	0.03 %
Silicon	Si	1 %
Manganese	Mn	2 %
Phosphorus	P	0.045 %
Sulphur	S	0.015 %
Chromium	Cr	18.5 %
Molybdenum	Mo	2.5 %
Nickel	Ni	13 %
Nitrogen	N	0.11 %

Physical and mechanical properties

Hardness	≤ 215 HB
Density	8.0 g/cm³

Related Products

Disk Mill	P-13
Disk Mill	P-13 premium
Rotor Mill	P-14
Cutting Mill	P-15
Rotor Mill	P-16
Cutting Mill	P-19
Cutting Mill	P-29

Sieve Shaker	A-18
Vibratory Feeder	L-24

2.12 Cutting Tool made of tool steel 1.2379 - Rotorknife

ISO/EN/DIN Code: X155CrVMo12/1/59350

Name	Formula	Percentage
Iron	Fe	85.79 – 82.14 %
Carbon	C	1.45 – 1.6 %
Silicon	Si	0.1 – 0.6 %
Manganese	Mn	0.2 – 0.6 %
Phosphorus	P	0.03 %
Sulphur	S	0.03 %
Chromium	Cr	11 – 13 %
Molybdenum	Mo	0.7 – 1 %
Tungsten	W	0.7 – 1 %

Physical and mechanical properties

Hardness	59 – 62 HRC
Density	7.7 g/cm³

Related Products

Jaw Crusher	P-1
Cutting Mill	P-15

2.13 Cutting Tool made of construction steel 1.0037- Rotor Body

ISO/EN/DIN Code: S235JR

Name	Formula	Percentage
Iron	Fe	98.34 %
Carbon	C	0.17 %
Manganese	Mn	1.4 %
Phosphorus	P	0.045 %

Name	Formula	Percentage
Sulphur	S	0.045 %
Chromium	Cr	1.66 %

Physical and mechanical properties

Hardness	102 – 140 HB
Density	7.85 g/cm³

Related Products

Cutting Mill	P-15

2.14 Grinding parts made of construction steel - 1.0330 - nor rust-proof

ISO/EN/DIN Code: DC01, EN 1013

Name	Formula	Percentage
Iron	Fe	99.19 %
Carbon	C	0.12 %
Manganese	Mn	0.6 %
Phosphorus	P	0.045 %
Sulphur	S	0.045 %

Physical and mechanical properties

Hardness	86 HRA
Density	7.85 g/cm³

Related Products

Cutting Mill	P-15
Rotor Mill	P-16
Cutting Mill	P-19

2.15 Funnel / cyclone separator made of stainless steel - 1.4301

ISO/EN/DIN Code: X5CrNi1810

Name	Formula	Percentage
Iron	Fe	66.805 %
Carbon	C	0.07 %

Name	Formula	Percentage
Silicon	Si	1.0 %
Manganese	Mn	2.0 %
Phosphorus	P	0.045 %
Sulphur	S	0.03 %
Chromium	Cr	19.5 %
Nickel	Ni	10.5 %
Nitrogen	N	0.11 %

Physical and mechanical properties

Hardness	96 HRB
Density	7.8 g/cm³

Related Products

Disk Mill	P-13
Disk Mill	P-13 premium
Rotor Mill	P-16
Cutting Mill	P-19
Sieve Shaker	A-3
Sieve Shaker	A-18

2.16 Grinding parts made of hardened stainless steel - 1.4112

ISO/EN/DIN Code: X90CrMoV18 / EN 10088

Name	Formula	Percentage
Iron	Fe	79 - 77 %
Chromium	Cr	17 – 19 %
Silicon	Si	1.0 %
Manganese	Mn	1.0 %
Molybdenum	Mo	0.9 – 1.3
Carbon	C	0.85 – 0.95 %
Vanadium	V	0.07 – 0.12 %

Name	Formula	Percentage
Phosphorus	P	0.04 %
Sulphur	S	0.015 %

Physical and mechanical properties

Hardness	56 - 58 HRC
Density	7.7 g/cm³

Related Products

Rotor Mill	P-14
Rotor Mill	P-16
Cutting Mill	P-19
Cutting Mill	P-29

2.17 Grinding parts made of stainless steel - 1.4305

ISO/EN/DIN Code: X10CrNiS18-9 / X8CrNiS18-9

Name	Formula	Percentage
Iron	Fe	70.6 – 66.4 %
Carbon	C	0.1 %
Silicon	Si	1.0 %
Manganese	Mn	2.0 %
Phosphorus	P	0.045 %
Sulphur	S	0.15 – 0.35 %
Chromium	Cr	17 – 19 %
Nickel	Ni	8 – 10 %
Copper	Cu	1.0 %
Nitrogen	N	0.11 %

Physical and mechanical properties

Hardness	~60 HRB
Density	7.8 g/cm³

Related Products

Mortar Grinder	P-2
Rotor Mill	P-14

2.18 Grinding parts made of aluminum 3.4365

ISO/EN/DINCode: 3.4365

Name	Formula	Percentage
Iron	Fe	0.5 %
Silicon	Si	0.4 %
Copper	Cu	1.2 – 2.0 %
Manganese	Mn	0.3 %
Chromium	Cr	0.18 -0.28 %
Zinc	Zn	5.1 – 6.1 %
Titan	Ti	0.2 %

Physical and mechanical properties

Hardness	2.75 Mohs
Density	2.7 g/cm³

Related Products

Rotor Mill	P-14

2.19 Grinding parts made of stainless steel 1.4057

AISI Code: 431

ISO/EN/DIN Code: X17CrNi16-2

Name	Formula	Percentage
Iron	Fe	77.7 – 80.8 %
Carbon	C	0.12 – 0.22 %
Silicon	Si	≤ 1.0 %
Manganese	Mn	≤ 1.5 %
Chromium	Cr	15 - 17 %

Name	Formula	Percentage
Nickel	Ni	1.5 – 2.5 %
Phosphorus	P	≤ 0.04 %
Sulphur	S	0.015 %

Physical and mechanical properties

Hardness	295 HB
Density	7.7 g/cm³

Related Products

Rotor Mill	P-14

2.20 Grinding parts made of pure titanium 3.7035

ISO/EN/DIN Code: DIN 17861

Name	Formula	Percentage
Titanium	Ti	99.4 – 99.5 %
Oxygen	O	0.18 %
Nitrogen	N	0.05 %
Carbon	C	0.06 %
Hydrogen	H	0.013 %
Iron	Fe	0.2 %

Physical and mechanical properties

Hardness	150 HBW
Density	4.5 g/cm³

Related Products

Rotor Mill	P-14

2.21 Grinding parts coated with titanium nitride

Name	Formula	Percentage
Titanium nitride	TiN	100%

Physical and mechanical properties

Hardness	1800 HV
Density	5.22 g/cm³

Related Products

Rotor Mill	P-14

2.22 Grinding parts made of cast iron GG20 0.6020

ISO/EN/DIN Code: EN-GJL200

Name	Formula	Percentage
Iron	Fe	93.6 %
Carbon	C	3.65 %
Silicon	Si	1.8 %
Manganese	Mn	0.55 %
Phosphorus	P	0.3 %
Sulphur	S	0.1 %

Physical and mechanical properties

Hardness	180 HBW
Density	8.2 g/cm³

Related Products

Rotor Mill	P-16

2.23 Grinding parts made of hardened steel 1.2080

ISO/EN/DIN Code: X210Cr12

Name	Formula	Percentage
Iron	Fe	85.5 %
Carbon	C	1.9 – 2.2 %
Silicon	Si	0.1 – 0.4 %

Name	Formula	Percentage
Manganese	Mn	0.15 – 0.45 %
Sulphur	S	≤ 0.03 %
Chromium	Cr	11 – 12 %

Physical and mechanical properties

Hardness	60 - 63 HRC
Density	7.9 g/cm³

Related Products

Mortar Grinder	P-2
Rotor Mill	P-16

2.24 Grinding vessel lid made of silicone - LR 3003/70 A/B

Physical and mechanical properties

Hardness	Shore A70
Density	1.14 g/cm³

Related Products

Knife Mill	P-11

2.25 Parts made of polypropylene (PP)

ISO/EN/DIN Code: 1183

Name	Formula	Percentage
Polypropylene	C_3H_6	100 %

Physical and mechanical properties

Hardness	Shore D70
Density	0.903 g/cm³
Melting point	163° C
Max. application temp constant	100° C
Max. application temp briefly	140° C

Related Products

Knife Mill	P-11
Cutting Mill	P-19

2.26 Grinding vessel lid made of polycarbonate - PC

ISO/EN/DIN Code: 7391-PC

Name	Formula	Percentage
Polycarbonate	HO-C_6H_4-R-C_6H_4-OH	100 %

Physical and mechanical properties

Hardness	115 HB
Density	1.2 g/cm³
Melting point	150° C

Related Products

Knife Mill	P-11

2.27 Grinding parts made of stainless steel 1.4028

ISO/EN/DIN Code: X30Cr13 / DIN EN 10088-3 / AISI 420

Name	Formula	Percentage
Iron	Fe	87.74 – 85.65 %
Carbon	C	0.26 – 0.35 %
Chromium	Cr	12 - 14 %

Physical and mechanical properties

Hardness	24 HRC
Density	7.7 g/cm³

Related Products

Knife Mill	P-11

2.28 Grinding parts made of stainless steel 1.4034

ISO/EN/DIN Code: X46Cr13 / DIN EN 10088-3 / AISI 420

Name	Formula	Percentage
Iron	Fe	87.07 – 82.93 %
Carbon	C	0.43 – 0.5 %
Silicon	Si	0 – 1 %
Manganese	Mn	0 – 1 %
Phosphorus	P	0 – 0.04 %
Sulphur	S	0 – 0.03 %
Chromium	Cr	12.5 – 14.5 %

Physical and mechanical properties

Hardness	245 HB
Density	7.7 g/cm³

Related Products

Knife Mill	P-11

2.29 Grinding parts made of stainless steel 1.4571

ISO/EN/DIN Code: X6CrNIMo Ti17-12-2

Name	Formula	Percentage
Iron	Fe	63 %
Carbon	C	≤ 0.08 %
Silicon	Si	≤ 1 %
Manganese	Mn	≤ 2 %
Phosphorus	P	≤ 0.045 %
Sulphur	S	0.03 %
Chromium	Cr	16.5 – 18.5 %
Molybdenum	Mo	2- 2.5 %
Nickel	Ni	10.5 – 13.5 %
Titan	Ti	≤ 0.7 %

Physical and mechanical properties

Hardness	95 HB
Density	8 g/cm³

Related Products

Jaw Crusher	P-1

2.30 Grinding parts made of manganese steel 1.3401

ISO/EN/DIN Code: X120Mn12

Name	Formula	Percentage
Iron	Fe	83.56 – 85.96 %
Chromium	Cr	< 1,5 %
Silicon	Si	0.3 – 0.5 %
Manganese	Mn	12 - 13 %
Carbon	C	1.1 – 1.3 %
Phosphorus	P	< 0.1 %
Sulphur	S	< 0.04 %

Physical and mechanical properties

Hardness	27 – 32 HRC
Density	7.9 - 8 g/cm³

Related Products

Jaw Crusher	P-1
Disk Mill	P-13
Disk Mill	P-13 premium

2.31 Grinding parts made of cast steel 1.2602

ISO/EN/DIN Code: GX165CrMoV12

Name	Formula	Percentage
Iron	Fe	83.59 – 85.94 %
Carbon	C	1.55 – 1.75 %

Name	Formula	Percentage
Silicon	Si	0.25 – 0.4 %
Manganese	Mn	0.2 – 0.4 %
Phosphorus	P	0.03 %
Sulphur	S	0.03 %
Chromium	Cr	11 - 12 %
Molybdenum	Mo	0.5 – 0.7 %
Vanadium	V	0.1 – 0.5 %
Wolfram	W	0.4 – 0.6 %

Physical and mechanical properties

Hardness	60 HRC
Density	3.85 g/cm³

Related Products

Disk Mill	P-13
Disk Mill	P-13 premium

2.32 Grinding parts made of hard porcelain

Name	Formula	Percentage
Quartz	SiO_2	68.5 %
Aluminum oxide	Al_2O_3	26.1 %
Titanium oxide	TiO_2	0.1 %
Iron oxide	Fe_2O_3	0.52 %
Manganese oxide	MgO	0.2 %
Calcium oxide	CaO	0.09 %
Sodium oxide	Na_2O	0.2 %
Potassium oxide	K_2O	3.92 %

Physical and mechanical properties

Open porosity	< 0.5 %
Density	2.4 – 2.5 g/cm³
Hardness	1200 – 1400 HV

Related Products

Mortar Grinder	P-2

2.33 Part made of Polyoxymethylene POM

ISO/EN/DIN Code: DIN 7728 C9021

Name	Formula	Percentage
Polyoxymethylene	$C_xH_2xO_x$	100 %

Physical and mechanical properties

Hardness	Shore D81
Density	1.41 g/cm³
Melting point	165° C
Max. application temp constant	90° C
Max. application temp briefly	140° C

Related Products

Sample Divider	L-27
Plunger	P-19

2.34 Divider made of aluminum 6026

ISO/EN/DIN Code: EN AW-6012

Name	Formula	Percentage
Iron	Fe	≤ 0.7 %
Zinc	Zn	≤ 0.3 %
Silicon	Si	0.6 – 1.4 %
Manganese	Mn	0.2 - 1 %
Magnesium	Mg	0.6 – 1.2 %
Copper	Cu	0.2 – 0.5 %

Name	Formula	Percentage
Chromium	Cr	≤ 0.3 %
Titan	Ti	≤ 0.2 %
Lead	Pb	≤ 0.4 %
Bismuth	Bi	0.5 – 1.5 %
Tin	Sn	≤ 0.05 %

Physical and mechanical properties

Hardness	80 HV
Density	2.72 g/cm³

Related Products

Sample Divider	L-27

2.35 Part made of Polyethylen PE

ISO/EN/DIN Code: DIN 7728 C9021

Name	Formula	Percentage
Polyethylen	C_2H_4	100 %

Physical and mechanical properties

Hardness	Shore D 64-67
Density	0,94 g/cm³
Melting point	130 - 135° C
Max. application temp constant	-200° C
Max. application temp briefly	80° C

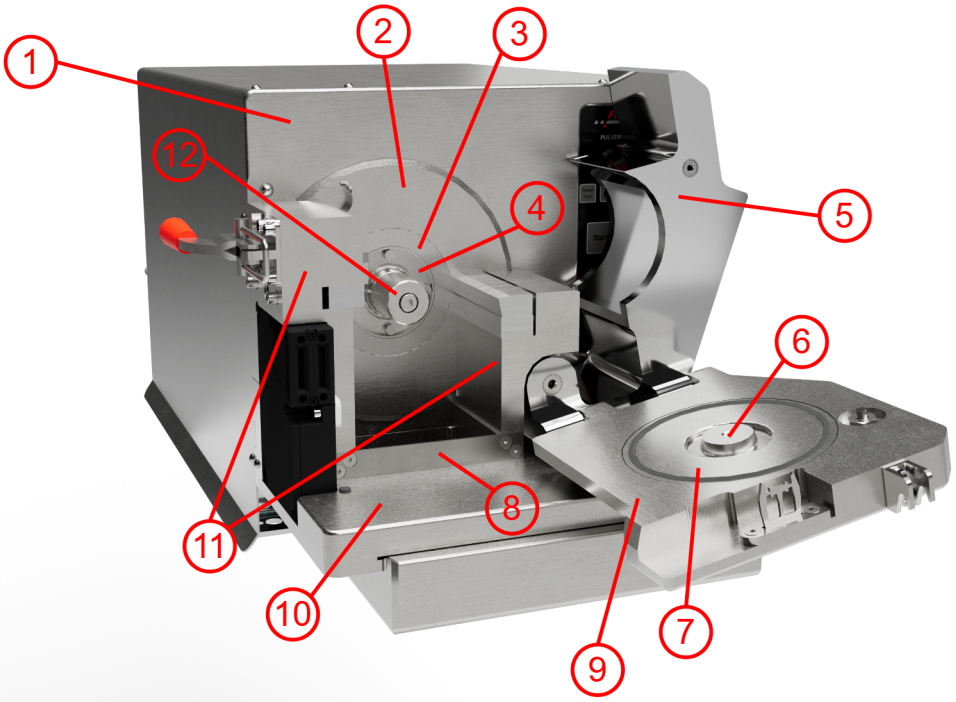
Related Products

Plunger	P-19

3 Parts in contact with samples per device

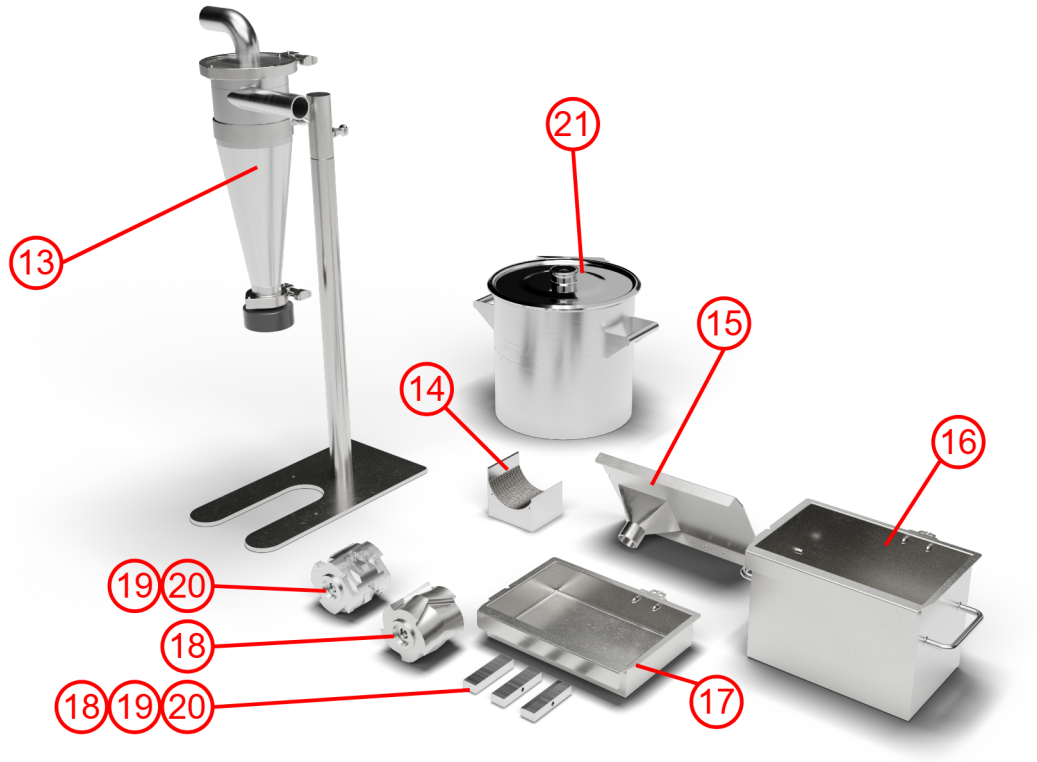
3.1 P-19

Materials of parts getting in touch with sample P-19 - 19.30x0.00 / 19.31x0.00

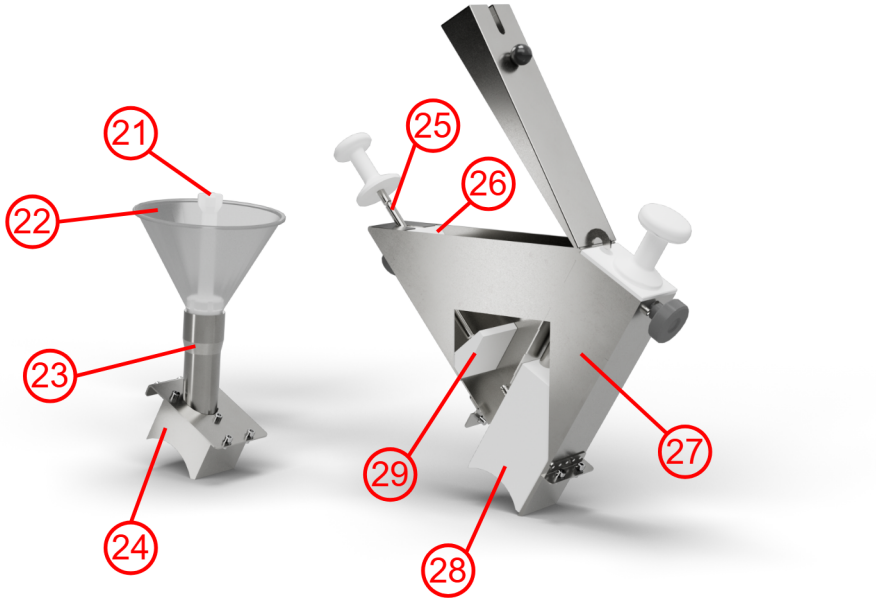


Device	Figure	Part description	Material P-19 19.30x0.00	Material P-19 19.31x0.00 stainless steel
Grinding chamber	10	■ Flange holder for collecting pan	➦ *Aluminum* 3.4365	➦ *Stainless Steel 316L* 1.4404
	1	■ Back plate	➦ *Aluminum* 3.4365	➦ *Stainless Steel 316L* 1.4404
	2	■ Flange for center	➦ *Stainless Steel* 1.4305	➦ *Stainless Steel 316L* 1.4404
	3	■ Labyrinth ring for stator	➦ *Stainless Steel* 1.4305	➦ *Stainless Steel 316L* 1.4404
	11	■ Bottom case left/right	➦ *Aluminum* 3.4365	➦ *Stainless Steel 316L* 1.4404
	8	■ Cover sheet metal	➦ *Stainless Steel 316L* 1.4404	➦ *Stainless Steel 316L* 1.4404

Device	Figure	Part description	Material P-19 19.30x0.00	Material P-19 19.31x0.00 stainless steel
	5	■ Housing upper part	➦ *Aluminum* 3.4365	➦ *Stainless Steel 316L* 1.4404
	9	■ Front cover	➦ *Aluminum* 3.4365	➦ *Stainless Steel 316L* 1.4404
	7	■ Flange for bearing	➦ *Stainless Steel* 1.4305	➦ *Stainless Steel 316L* 1.4404
	12	■ Holder for cutting tools	➦ *Hardened stainless steel* 1.4112	➦ *Hardened stainless steel* 1.4112
	4	■ labyrinth ring tool holder	➦ *Stainless Steel* 1.4305	➦ *Stainless Steel* 1.4305
	6	■ Cone bearing	➦ *Hardened stainless steel* 1.4112	➦ *Hardened stainless steel* 1.4112



Accessories	Figure	Part description	Material
Other parts	18	■ Standard rotor with V-cutting edges and fixed knives made of hardened stainless steel	➦ *Hardened stainless steel* 1.4112
	14	■ Sieve cassettes ■ (different sizes)	➦ *Stainless Steel 316L* 1.4404
	13	■ High performance cyclone	➦ *Stainless Steel 316L* 1.4404
	21	■ Collecting vessel for cyclone	➦ *Stainless Steel 316L* 1.4404
	16 17	■ Collecting vessel 3 and 10 liters	➦ *Stainless Steel 316L* 1.4404
	19	■ Rotor with notched edges and fixed knives made of hardened stainless steel	➦ *Hardened stainless steel* 1.4112
	20	■ Rotor with notched edges and fixed knives made of stainless steel 316L	➦ *Stainless Steel 316L* 1.4404
	15	■ Adapter for exhauster	➦ *Stainless Steel 316L* 1.4404



Funnels	Figure	Part description	Material P19 19.30x0.00	Material P-19 19.31x0.00 stainless steel
Standard funnel for long and bulk solids	23	■ Funnel tube	➦ *Stainless Steel* 1.4301	➦ *Stainless Steel 316L* 1.4404
	24	■ Seal	➦ *Aluminum* 3.4365	➦ *Stainless Steel 316L* 1.4404
	22	■ Funnel	➦ *Polypropylen* PP	➦ *Stainless Steel 316L* 1.4404
	21	■ Plunger	➦ *Polyoxymethylehn* POM	➦ *Stainless Steel 316L* 1.4404
Protected funnel with sample pusher	27	■ Metal funnel housing	➦ *Stainless Steel* 1.4301	-
	28	■ Plunger	➦ *Polyethylen* PE	-
	29	■ Sample pusher	➦ *Polyoxymethylehn* POM	-
	26	■ Guide block for sample pusher	➦ *Polyoxymethylehn* POM	-
	25	■ Rod of sample pusher	➦ *Stainless Steel* 1.4305	-

4 Overview according to devices

P-0	➦ *1*, ➦ *2*, ➦ *4*, ➦ *5*, ➦ *6*, ➦ *7*
P-1	➦ *2*, ➦ *5*, ➦ *6*, ➦ *10*, ➦ *12*, ➦ *29*, ➦ *30*
P-2	➦ *1*, ➦ *2*, ➦ *5*, ➦ *6*, ➦ *7*, ➦ *17*, ➦ *23*, ➦ *32*
P-5	➦ *1*, ➦ *2*, ➦ *3*, ➦ *4*, ➦ *5*, ➦ *6*, ➦ *7*, ➦ *8*
P-5 premium	➦ *1*, ➦ *2*, ➦ *3*, ➦ *4*, ➦ *5*, ➦ *6*, ➦ *8*
P-6	➦ *1*, ➦ *2*, ➦ *3*, ➦ *4*, ➦ *5*, ➦ *6*, ➦ *7*, ➦ *8*
P-7	➦ *1*, ➦ *2*, ➦ *3*, ➦ *4*, ➦ *5*, ➦ *6*, ➦ *7*, ➦ *8*,
P-7 premium	➦ *1*, ➦ *2*, ➦ *3*, ➦ *4*, ➦ *5*, ➦ *6*, ➦ *7*, ➦ *8*,
P-9	➦ *1*, ➦ *3*, ➦ *4*, ➦ *5*, ➦ *6*, ➦ *10*
P-11	➦ *24*, ➦ *25*, ➦ *26*, ➦ *27*, ➦ *28*
P-13	➦ *3*, ➦ *5*, ➦ *6*, ➦ *11*, ➦ *15*, ➦ *30*, ➦ *31*
P-13 premium	➦ *3*, ➦ *5*, ➦ *6*, ➦ *11*, ➦ *15*, ➦ *30*, ➦ *31*
P-14	➦ *2*, ➦ *5*, ➦ *6*, ➦ *9*, ➦ *11*, ➦ *16*, ➦ *17*, ➦ *18*, ➦ *19*, ➦ *20*, ➦ *21*
P-15	➦ *10*, ➦ *11*, ➦ *12*, ➦ *13*, ➦ *14*
P-16	➦ *5*, ➦ *6*, ➦ *11*, ➦ *14*, ➦ *15*, ➦ *16*, ➦ *22*, ➦ *23*
P-19	➦ *5*, ➦ *6*, ➦ *11*, ➦ *14*, ➦ *15*, ➦ *16*, ➦ *25*, ➦ *33*, ➦ *35*
P-23	➦ *2*, ➦ *3*, ➦ *4*, ➦ *9*
P-29	➦ *11*, ➦ *16*
A-3	➦ *1*, ➦ *15*
A-18	➦ *11*, ➦ *15*
L-24	➦ *11*
L-27	➦ *9*, ➦ *33*, ➦ *34*

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Version: **4.0**
Last update: **25.06.2026**

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