

Stainless steel powders

for sintered components



Stainless steel powders for sintered components

Typical data – Sintered Properties at P=600 MPa, t=45 min, dT/dt=0,8 °C/s

Chemistry	410LHC				430LHC			
C, %	0.02				0.02			
Ni, %	–				–			
Fe, %	Base				Base			
Cr, %	12.0				17.0			
Mo, %	–				–			
Si, %	0.8				1			
O, %	0.25				0.25			
N, %	0.03				0.09			
Powder properties								
AD, g/cm³	3.00				2.90			
Flow, s/50g	28				31			
-45 µm	31.0				35.0			
Green properties								
GD 600 MPa	6.44				6.32			
GS 600 MPa	9.6				9.6			
Lubricant	1% Wax				1% Wax			
Sintered properties								
Sintering atmosphere	H2		DA		H2		DA	
Sintering temperature	1,150 °C	1,250 °C	1,150 °C	1,250 °C	1,150 °C	1,250 °C	1,150 °C	1,250 °C
DC d-g, %	0.19	0.19	0.19	0.19	0.17	0.17	0.17	0.17
DC d-s, %	-1.06	-1.61	-0.55	-1.19	-1.76	-3.41	-0.38	-3.14
DC g-s, %	-0.87	-1.43	-0.36	-1.00	-1.59	-3.25	-0.21	-2.97
SD, g/cm³	6.68	6.80	6.61	6.73	6.69	7.02	6.45	7.01
HV10			126	150			192	184
HV5	81	85			71	86		
HRB	41	37	60	70	24	36	81	82
UTS, MPa	297	314	375	430	246	306	402	366
YS, MPa	194	180	283	282	159	182	377	197
Elongation, %	7	12	3	10	9	18	0.3	11
IE, J	22	63	12	37	35	105	5	67
Chemistry (after sintering)								
C, %	0.02	0.02	0.04	0.04	0.00	0.00	0.03	0.01
O, %	0.10	0.13	0.19	0.18	0.20	0.23	0.26	0.23
N, %	0.01	0.01	0.50	0.41	0.00	0.00	0.19	0.07
Other properties								
General Corrosion Resistance	Medium				Medium			
Pitting Corrosion Resistance	Poor				Poor			
Microstructure	Ferritic / Martensitic				Ferritic			
Magnetic Behavior	Magnetic properties acc. to microstructure				Soft Magnetic properties			
Mechanical Behavior	High				Moderate			
Summary	When strength is needed over corrosion resistance at reasonable cost				When magnetic properties is needed with moderate strength and corrosion resistance			
Example of applications	Automotive: shafts, sensor rings, valve components, exhaust clamps				Automotive: exhaust system components, trim parts, brackets, Industrial appliance			

Stainless steel powders for sintered components

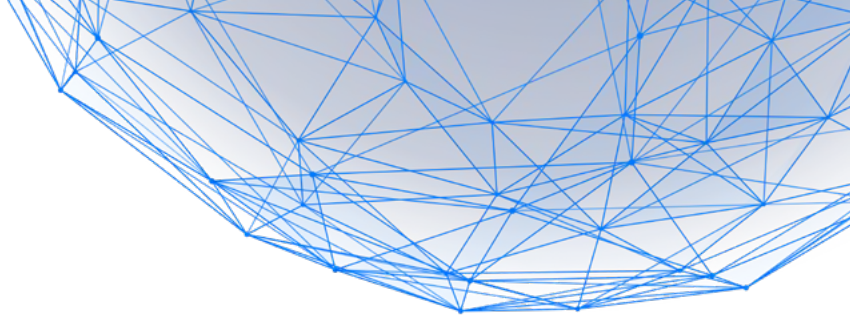
Typical data – Sintered Properties at P=600 MPa, t=45 min, dT/dt=0,8 °C/s

Chemistry	316LHC				316LHD			
C, %	0.02				0.02			
Ni, %	12.7				12.7			
Fe, %	Base				Base			
Cr, %	16.9				16.9			
Mo, %	2.3				2.3			
Si, %	0.8				0.8			
O, %	0.25				0.25			
N, %	0.06				0.06			
Powder properties								
AD, g/cm³	3.00				2.73			
Flow, s/50g	28				31			
-45 µm	35.0				43.0			
Green properties								
GD 600 MPa	6.55				6.53			
GS 600 MPa	6.0				9.3			
Lubricant	1% Wax				1% Wax			
Sintered properties								
Sintering atmosphere	H2		DA		H2		DA	
Sintering temperature	1,150 °C	1,250 °C	1,150 °C	1,250 °C	1,150 °C	1,250 °C	1,150 °C	1,250 °C
DC d-g, %	0.25	0.25	0.24	0.24	0.20	0.20	0.20	0.21
DC d-s, %	-0.91	-1.63	-0.62	-1.33	-1.06	-1.83	-0.80	-1.46
DC g-s, %	-0.67	-1.39	-0.38	-1.09	-0.86	-1.63	-0.60	-1.26
SD, g/cm³	6.65	6.80	6.63	6.77	6.67	6.80	6.63	6.77
HV10			117	119			120	124
HV5	71	70			77	72		
HRB	30	22	54	58	32	26	57	59
UTS, MPa	239	291	325	429	279	311	382	430
YS, MPa	158	145	248	278	175	152	273	272
Elongation, %	8	20	4	11	11	22	6	12
IE, J	37	63	14	42	54	90	26	54
Chemistry (after sintering)								
C, %	0.04	0.01	0.03	0.01	0.04	0.01	0.03	0.02
O, %	0.32	0.20	0.34	0.16	0.25	0.15	0.27	0.19
N, %	0.02	0.00	0.38	0.41	0.29	0.00	0.38	0.32
Other properties								
General Corrosion Resistance	Very High							
Pitting Corrosion Resistance	Very High							
Microstructure	Austenitic							
Magnetic Behavior	Non Magnetic							
Mechanical Behavior	High							
Summary	When strong mechanical properties are needed with outstanding corrosion resistance							
Example of applications	Most commonly used grade for Press and Sinter applications small gears, cams & connectors							

Stainless steel powders for sintered components

Typical data – Sintered Properties at P=600 MPa, t=45 min, dT/dt=0,8 °C/s

Chemistry	304LHD				COLD 100			
C, %	0.02				0.02			
Ni, %	11.2				18.9			
Fe, %	Base				Base			
Cr, %	19.0				18.9			
Mo, %	–				6.4			
Si, %	0.8				0.8			
O, %	0.30				0.25			
N, %	0.04				0.05			
Powder properties								
AD, g/cm³	2.73				2.78			
Flow, s/50g	32				31			
-45 µm	43.0				40.6			
Green properties								
GD 600 MPa	6.46				6.55			
GS 600 MPa	9.7				11.7			
Lubricant	1% Wax				1% Wax			
Sintered properties								
Sintering atmosphere	H2		DA		H2		DA	
Sintering temperature	1,150 °C	1,250 °C	1,150 °C	1,250 °C	1,150 °C	1,250 °C	1,150 °C	1,250 °C
DC d-g, %	0.21	0.20	0.20	0.21	0.18	0.18	0.17	0.18
DC d-s, %	-1.17	-1.85	-0.77	-1.58	-1.74	-3.58	-0.38	-2.99
DC g-s, %	-0.96	-1.65	-0.57	-1.38	-1.57	-3.41	-0.21	-2.82
SD, g/cm³	6.61	6.76	6.56	6.71	6.55	6.91	6.34	6.79
HV10			122	130			100	104
HV5	76	72			79	91		
HRB	35	29	60	65	36	36	41	46
UTS, MPa	286	322	406	471	253	331	197	333
YS, MPa	163	151	293	305	185	216	171	206
Elongation, %	14	23	5	11	6	16	1	11
IE, J	53	75	16	51	28	77	9	55
Chemistry (after sintering)								
C, %	0.04	0.02	0.04	0.03	0.01	0.00	0.04	0.01
O, %	0.28	0.20	0.28	0.22	0.22	0.22	0.27	0.24
N, %	0.02	0.01	0.48	0.47	0.00	0.00	0.28	0.06
Other properties								
General Corrosion Resistance	High				Superior			
Pitting Corrosion Resistance	Medium				Superior			
Microstructure	Austenitic				Austenitic			
Magnetic Behavior	Non Magnetic				Non Magnetic			
Mechanical Behavior	Balanced				Very High			
Summary	When corrosion resistance is needed over strength				When superior corrosion and mechanical behavior are needed			
Example of applications	Automotive: exhaust manifold, Lock parts, pieces in domestic and industrial appliances				Submerged pump components			



Driving positive change through material innovation.

Höganäs' vision is to drive positive change through material innovation and become the preferred partner for sustainable powder materials. Powder technology provides endless opportunities; not only does it empower customers to reduce material and energy consumption, but it also enables the use of new and improved techniques that make final products more efficient and cost-effective. In short, powders are a resource-efficient alternative, ideal for a wide range of industries.

World leader in powders

Höganäs is a company with strong local presence around the world and the market leader in advanced ceramic and metal powders. Contact the nearest Höganäs office today — click or scan the QR code to learn more.

