

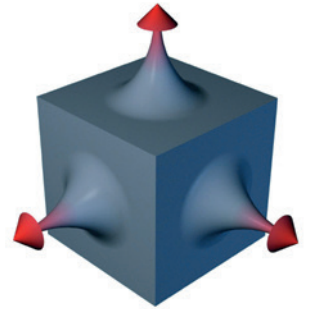


Somaloy® 3P

Material Data

What is the most important property for your application?

Somaloy® is an isotropic, high resistive Soft Magnetic Composite (SMC) material for electromagnetic applications. Somaloy makes it possible to design innovative, compact and powerful components that match your specific application and future demands. The secret is the unique 3D flux properties and net-shaping opportunity.

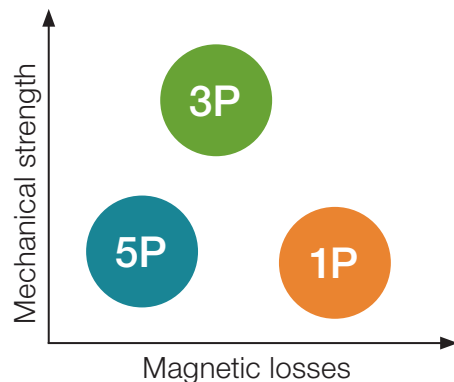


Höganäs develop and provide the Somaloy product range which comprises press-ready powder mixes. Each Somaloy product has properties that can be carefully tailored to ensure optimum performance in your specific component and application. We will help you with material selection that suits your specific needs in your development process.

The Somaloy product family

The Somaloy product family includes 3 groups; 1P, 3P and 5P with different performance levels (P):

- Somaloy 1P Baseline
- Somaloy 3P Mechanical strength, permeability
- Somaloy 5P Lowest losses



- **Cost-efficient**
- **Compact design**
- **High performance**

Comparing SMC data to electric steel-sheets

SMC data is measured on single ring components (OD55/ID45/H5 mm) via square cross-section. The measured SMC sample is a full magnetic core component that can be compared to a punched and stacked electric steel-sheet pack representing the same geometry. Data for electric steel-sheets are normally given for a single sheet, tested with an Epstein frame test. SMC is not tested by this method and thereby data is not directly comparable. Additional design factors aimed for electric steel-sheet stacks does not apply for SMC.

Find out more

Contact your local sales representative or visit www.hoganas.com/electromagnetic

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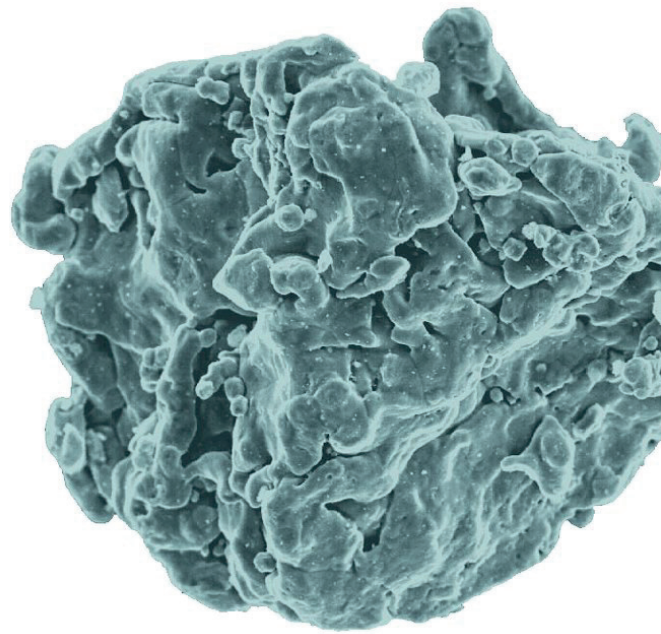
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Detailed material data

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Somaloy powder particle



Somaloy®

Product portfolio

Somaloy material	Density [g/cm ³]	Resistivity [μOhm m]	TRS ambient [MPa]	B@ 10000 A/m [T]	μ _{max}	Core losses @ 1T [W/kg]				
						Cross-section 5x5 mm				15x15 mm
						100 Hz	400 Hz	1000 Hz	2000 Hz	1000 Hz
Large particles #40										
Somaloy 700HR 5P	7.50	700	60	1.57	600	6.6	30	92	241	106
Somaloy 1000 5P	7.52	90	65	1.59	720	6.6	31	103	-	217
Somaloy 700HR 1P	7.45	1000	35	1.53	440	10.0	43	125	307	136
Somaloy 700 1P	7.45	400	40	1.56	540	9.9	43	126	312	152
Somaloy 700HR 3P	7.52	600	120	1.57	770	10.4	45	130	319	147
Somaloy 700 3P	7.57	200	125	1.61	850	10.2	45	132	331	183
Somaloy 1000 3P	7.56	70	140	1.63	950	10.3	46	143	-	288

Somaloy material	Density [g/cm ³]	Resistivity [μOhm m]	TRS ambient [MPa]	B@ 10000 A/m [T]	μ _{max}	Core losses [W/kg]				
						Cross-section 5x5 mm				15x15 mm
						100 Hz 1 T	1 kHz 1 T	5 kHz 0.5 T	10 kHz 0.1 T	1 kHz 1 T
Medium particles #100										
Somaloy 130i 5P	7.44	20000	35	1.47	350	8.0	93	205	24	94
Somaloy 130i 1P	7.35	8000	33	1.40	290	12.0	132	264	29	134
Somaloy 500 1P	7.37	70	50	1.51	500	12.6	156	387	-	305
Fine particles #200										
Somaloy 110i 1P	7.26	7600	34	1.33	220	14.4	153	276	27	155
Somaloy 110i 5P	7.30	18000	42	1.33	220	9.9	108	209	18	109

Typical product data 800 MPa compaction pressure, magnetic data measured according to CEI/IEC 60404

For more information, please contact your local sales representative.

Somaloy® 700HR 3P

800 MPa

General			
Base material: Somaloy 700HR 3P	Additive(s): 0.3% 3P Lube	Compaction: Pressure: 800 MPa Die temperature: 80°C	Heat treatment: Atmosphere: Steam Temperature: 530°C

Mechanical properties		Standards	
Transverse rupture strength/150°C [MPa]	120/120	SS-ISO 3325	
Tensile strength/Yield strength [MPa]	65/65	SS-EN 10002-1, ISO 2740	
Compressive Strength/Yield [MPa]	600/290	ASTM E9-89a	
Young's modulus [GPa]	170	ASTM E 1876-99	
Poisson's ratio	- 0.23	ASTM E 1876-99	
Impact Energy [J]	1.8	SS-EN 10045, SS-EN 25754	

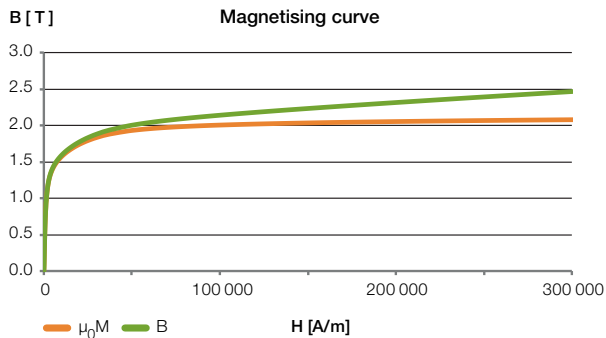
Physical properties		Standards	
Density [g/cm³]	7.52	SS-ISO 2738	
Thermal expansion [K ⁻¹]	11 e-06	ASTM E 228/MPIF 35	
Thermal conductivity [W/m·K]	25	ISO 22007-2	
Resistivity [μΩm]	600	Four point measurements on nom. size OD 55mm ID 45mm Height 5mm	

Magnetic properties		Standards	
B@4000A/m [T]	1.31	IEC 60404-4	
B@10000A/m [T]	1.57	IEC 60404-4	
H _c [A/m]	225	IEC 60404-4	
μ _r -max	770	IEC 60404-4	

Powder properties		Standards	
Apparent density [g/cm³]	3.16	ISO 3923/1	
Flow [s/50g]	35	ISO 4490	
Green density [g/cm³]	7.54	ISO 3927	
Green strength [MPa]	28	ISO 3995	
Springback [%]	0.10	ISO 4492, ISO 2740	
Heat treated dim. change [%]	-0.01	ISO 4492, ISO 2740	
Total dim. change [%]	0.09	ISO 4492, ISO 2740	

Magnetising curve

Data adjusted for use in Finite Element modelling



H[A/m]	μ ₀ M[T]	B[T]	H[A/m]	μ ₀ M[T]	B[T]
0	0.00	0.00	12040	1.62	1.63
62	0.02	0.02	25943	1.81	1.84
101	0.05	0.05	49791	1.94	2.00
175	0.12	0.12	74791	1.99	2.08
240	0.19	0.19	99791	2.01	2.14
456	0.44	0.44	124791	2.03	2.19
699	0.64	0.64	149791	2.04	2.23
1052	0.84	0.84	189791	2.06	2.30
1666	1.05	1.05	229791	2.07	2.36
2796	1.24	1.25	279791	2.08	2.43
5537	1.43	1.44	304791	2.0866	2.47

Core loss

[W/kg]	50/60 Hz	100 Hz	200 Hz	300 Hz	400 Hz	500 Hz	600 Hz	700 Hz	800 Hz	900 Hz	1000 Hz	2000 Hz
0,5T	1.5/1.8	3.1	6.0	10	13	17	21	25	29	33	37	89
1,0T	5.1/6.2	10	21	33	45	58	71	85	99	114	130	319
1,5T	9.5/13	20	41	64	90	118	147	177	209	242	276	705

Measured according to CEI/IEC 60404-6:2003 on ring sample (OD55 ID45 H5 mm).

Loss model

K _h	0.101	K _{ep}	0.000027
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$$P_{tot} = K_h * f * B^{1.75} + K_{ep} * f^2 * B^2 + \frac{B^2 * f^2 * d^2}{1.8 * \rho * resistivity * 1000} \quad [W/kg]$$

K_h Hysteresis loss coefficient
 K_{ep} In particle eddy current coefficient
 d Smallest cross section of component [mm]
 f Frequency [Hz]
 B Field strength [T]
 ρ Density [g/cm³]
 resistivity [μΩm]

Model is verified up to 1.5T and 5000Hz.

Somaloy® 700HR 3P

600 MPa

General

Base material: Somaloy 700HR 3P	Additive(s): 0.3% 3P Lube	Compaction: Pressure: 600 MPa Die temperature: 80°C	Heat treatment: Atmosphere: Steam Temperature: 530°C
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Mechanical properties		Standards	
Transverse rupture strength/150°C [MPa]	130/130	SS-ISO 3325	
Tensile strength/Yield strength [MPa]	55/55	SS-EN 10002-1, ISO 2740	
Compressive Strength/Yield [MPa]	330/240	ASTM E9-89a	
Young's modulus [GPa]	170	ASTM E 1876-99	
Poisson's ratio	-	0.23 ASTM E 1876-99	
Impact Energy [J]	1.9	SS-EN 10045, SS-EN 25754	

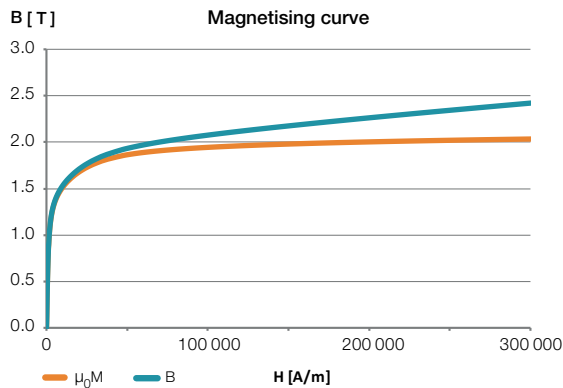
Physical properties		Standards	
Density [g/cm³]	7.40	SS-ISO 2738	
Thermal expansion [K⁻¹]	11 e-06	ASTM E 228/MPIF 35	
Thermal conductivity [W/m·K]	30	ISO 22007-2	
Resistivity [μΩm]	300	Four point measurements on nom. size OD 55mm ID 45mm Height 5mm	

Magnetic properties		Standards	
B@4000A/m [T]	1.30	IEC 60404-4	
B@10000A/m [T]	1.53	IEC 60404-4	
H _c [A/m]	230	IEC 60404-4	
μ _r -max	-	660 IEC 60404-4	

Powder properties		Standards	
Apparent density [g/cm³]	3.16	ISO 3923/1	
Flow [s/50g]	35	ISO 4490	
Green density [g/cm³]	7.43	ISO 3927	
Green strength [MPa]	25	ISO 3995	
Springback [%]	0.11	ISO 4492, ISO 2740	
Heat treated dim. change [%]	0	ISO 4492, ISO 2740	
Total dim. change [%]	0.11	ISO 4492, ISO 2740	

Magnetising curve

Data adjusted for use in Finite Element modelling



H[A/m]	μ ₀ M[T]	B[T]	H[A/m]	μ ₀ M[T]	B[T]
0	0.00	0.00	12156	1.56	1.57
69	0.03	0.03	26248	1.74	1.77
107	0.05	0.05	49836	1.86	1.93
197	0.12	0.12	74836	1.92	2.01
265	0.19	0.19	99836	1.95	2.07
516	0.42	0.42	124836	1.97	2.12
767	0.61	0.61	149836	1.98	2.17
1146	0.80	0.81	189836	2.00	2.24
1778	1.00	1.01	229836	2.02	2.30
2940	1.19	1.20	279836	2.03	2.38
5671	1.38	1.38	304836	2.0363	2.42

Core loss

[W/kg]	50/60 Hz	100 Hz	200 Hz	300 Hz	400 Hz	500 Hz	600 Hz	700 Hz	800 Hz	900 Hz	1000 Hz	2000 Hz
0.5T	1.6/1.9	3.2	7.0	10	14	18	22	26	31	35	40	98
1.0T	5.3/6.4	11	22	34	47	61	75	91	106	123	140	353
1.5T	11/13	22	46	71	98	126	156	188	221	256	293	750

Measured according to CEI/IEC 60404-6:2003 on ring sample (OD55 ID45 H5 mm).

Loss model

K _h	0.104	K _{ep}	0.000032
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$$P_{tot} = K_h * f * B^{1.75} + K_{ep} * f^2 * B^2 + \frac{B^2 * f^2 * d^2}{1.8 * \rho * resistivity * 1000} \quad [W/kg]$$

K_h Hysteresis loss coefficient
K_{ep} In particle eddy current coefficient
d Smallest cross section of component [mm]
f Frequency [Hz]
B Field strength [T]
ρ Density [g/cm³]
resistivity [μΩm]

Model is verified up to 1.5T and 5000Hz.

Somaloy® 700 3P

800 MPa

General			
Base material: Somaloy 700 3P	Additive(s): 0.3% 3P Lube	Compaction: Pressure: 800 MPa Die temperature: 80°C	Heat treatment: Atmosphere: Steam Temperature: 530°C

Mechanical properties		Standards	
Transverse rupture strength/150°C [MPa]	125/125	SS-ISO 3325	
Tensile strength/Yield strength [MPa]	65/65	SS-EN 10002-1, ISO 2740	
Compressive Strength/Yield [MPa]	550/280	ASTM E9-89a	
Young's modulus [GPa]	190	ASTM E 1876-99	
Poisson's ratio	-	0.23 ASTM E 1876-99	
Impact Energy [J]	2	SS-EN 10045, SS-EN 25754	

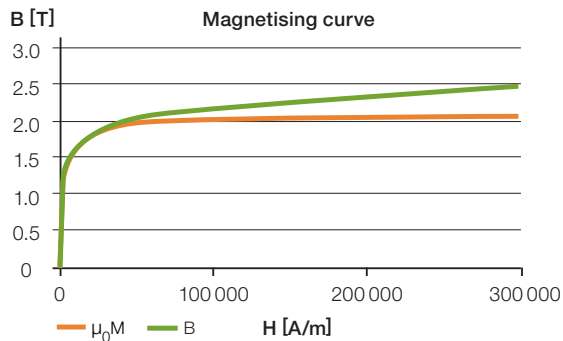
Physical properties		Standards	
Density [g/cm³]	7.57	SS-ISO 2738	
Thermal expansion [K ⁻¹]	11 e-06	ASTM E 228/MPIF 35	
Thermal conductivity [W/m·K]	25	ISO 22007-2	
Resistivity [μΩm]	200	Four point measurements on nom. size OD 55mm ID 45mm Height 5mm	

Magnetic properties		Standards	
B@4000A/m [T]	1.37	IEC 60404-4	
B@10000A/m [T]	1.61	IEC 60404-4	
H _c [A/m]	217	IEC 60404-4	
μ _r -max	-	850 IEC 60404-4	

Powder properties		Standards	
Apparent density [g/cm³]	3.32	ISO 3923/1	
Flow [s/50g]	34	ISO 4490	
Green density [g/cm³]	7.59	ISO 3927	
Green strength [MPa]	24	ISO 3995	
Springback [%]	0.10	ISO 4492, ISO 2740	
Heat treated dim. change [%]	-0.01	ISO 4492, ISO 2740	
Total dim. change [%]	0.09	ISO 4492, ISO 2740	

Magnetising curve

Data adjusted for use in Finite Element modelling



H[A/m]	μ ₀ M[T]	B[T]	H[A/m]	μ ₀ M[T]	B[T]
0	0.00	0.00	11450	1.63	1.65
57	0.02	0.02	25469	1.82	1.85
96	0.05	0.05	49777	1.95	2.01
159	0.11	0.11	74777	2.00	2.09
218	0.18	0.18	99777	2.03	2.15
449	0.48	0.48	124777	2.05	2.20
624	0.64	0.64	149777	2.06	2.25
929	0.84	0.85	189777	2.08	2.32
1466	1.06	1.06	229777	2.09	2.38
2471	1.25	1.25	279777	2.11	2.46
5041	1.44	1.45	304777	2.113	2.50

Core loss

[W/kg]	50/60 Hz	100 Hz	200 Hz	300 Hz	400 Hz	500 Hz	600 Hz	700 Hz	800 Hz	900 Hz	1000 Hz	2000 Hz
0.5T	1.5/1.8	3.0	6.0	10	13	17	21	25	29	33	38	92
1.0T	5.0/6.1	10	21	33	45	58	71	86	101	116	132	331
1.5T	10/12	21	43	67	93	119	148	178	209	242	276	703

Measured according to CEI/IEC 60404-6:2003 on ring sample (OD55 ID45 H5 mm).

Loss model

K _h	0.099	K _{ep}	0.000027
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$$P_{tot} = K_h * f * B^{1.75} + K_{ep} * f^2 * B^2 + \frac{B^2 * f^2 * d^2}{1.8 * \rho * resistivity * 1000} \quad [W/kg]$$

K_h Hysteresis loss coefficient
 K_{ep} In particle eddy current coefficient
 d Smallest cross section of component [mm]
 f Frequency [Hz]
 B Field strength [T]
 ρ Density [g/cm³]
 resistivity [μΩm]

Model is verified up to 1.5T and 5000Hz.

Somaloy® 700 3P

600 MPa

General			
Base material: Somaloy 700 3P	Additive(s): 0.3% 3P Lube	Compaction: Pressure: 600 MPa Die temperature: 80°C	Heat treatment: Atmosphere: Steam Temperature: 530°C

Mechanical properties		Standards	
Transverse rupture strength/150°C [MPa]	130/130	SS-ISO 3325	
Tensile strength/Yield strength [MPa]	65/65	SS-EN 10002-1, ISO 2740	
Compressive Strength/Yield [MPa]	350/260	ASTM E9-89a	
Young's modulus [GPa]	190	ASTM E 1876-99	
Poisson's ratio	- 0.23	ASTM E 1876-99	
Impact Energy [J]	1.8	SS-EN 10045, SS-EN 25754	

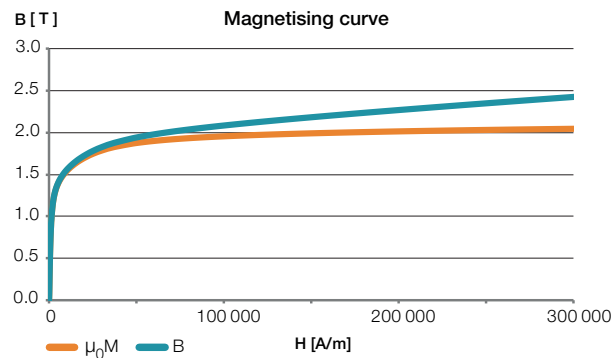
Physical properties		Standards	
Density [g/cm³]	7.40	SS-ISO 2738	
Thermal expansion [K⁻¹]	11 e-06	ASTM E 228/MPIF 35	
Thermal conductivity [W/m²K]	30	ISO 22007-2	
Resistivity [μΩm]	150	Four point measurements on nom. size OD 55mm ID 45mm Height 5mm	

Magnetic properties		Standards	
B@4000A/m [T]	1.34	IEC 60404-4	
B@10000A/m [T]	1.55	IEC 60404-4	
H _c [A/m]	220	IEC 60404-4	
μ _r -max	780	IEC 60404-4	

Powder properties		Standards	
Apparent density [g/cm³]	3.32	ISO 3923/1	
Flow [s/50g]	34	ISO 4490	
Green density [g/cm³]	7.43	ISO 3927	
Green strength [MPa]	21	ISO 3995	
Springback [%]	0.11	ISO 4492, ISO 2740	
Heat treated dim. change [%]	-0.01	ISO 4492, ISO 2740	
Total dim. change [%]	0.10	ISO 4492, ISO 2740	

Magnetising curve

Data adjusted for use in Finite Element modelling



H[A/m]	μ ₀ M[T]	B[T]	H[A/m]	μ ₀ M[T]	B[T]
0	0.00	0.00	11350	1.57	1.58
59	0.02	0.02	25467	1.75	1.79
99	0.05	0.05	49709	1.88	1.94
171	0.11	0.11	74709	1.93	2.02
236	0.18	0.18	99709	1.96	2.08
480	0.45	0.45	124709	1.98	2.14
663	0.61	0.61	149709	1.99	2.18
977	0.80	0.81	189709	2.01	2.25
1496	1.00	1.00	229709	2.03	2.32
2499	1.20	1.20	279709	2.04	2.40
5024	1.38	1.39	304709	2.05	2.43

Core loss

[W/kg]	50/60 Hz	100 Hz	200 Hz	300 Hz	400 Hz	500 Hz	600 Hz	700 Hz	800 Hz	900 Hz	1000 Hz	2000 Hz
0.5T	1.5/1.9	3.1	6.0	10	14	18	22	26	31	36	40	101
1.0T	5.2/6.3	11	22	34	47	61	76	91	108	125	143	367
1.5T	11/13	22	45	70	98	127	157	190	224	261	299	781

Measured according to CEI/IEC 60404-6:2003 on ring sample (OD55 ID45 H5 mm).

Loss model

K _h	0.102	K _{ep}	0.000032
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$$P_{tot} = K_h * f * B^{1.75} + K_{ep} * f^2 * B^2 + \frac{B^2 * f^2 * d^2}{1.8 * \rho * resistivity * 1000} \quad [\text{W/kg}]$$

Model is verified up to 1.5T and 5000Hz.

- K_h Hysteresis loss coefficient
- K_{ep} In particle eddy current coefficient
- d Smallest cross section of component [mm]
- f Frequency [Hz]
- B Field strength [T]
- ρ Density [g/cm³]
- resistivity [μΩm]

Somaloy® 1000 3P

800 MPa

General			
Base material: Somaloy 1000 3P	Additive(s): 0.3% 3P Lube	Compaction: Pressure: 800 MPa Die temperature: 80°C	Heat treatment: Atmosphere: Steam Temperature: 530°C

Mechanical properties		Standards	
Transverse rupture strength/150°C [MPa]	140/140	SS-ISO 3325	
Tensile strength/Yield strength [MPa]	70/70	SS-EN 10002-1, ISO 2740	
Compressive Strength/Yield [MPa]	470/290	ASTM E9-89a	
Young's modulus [GPa]	170	ASTM E 1876-99	
Poisson's ratio	-	0.23	ASTM E 1876-99
Impact Energy [J]	1.9	SS-EN 10045, SS-EN 25754	

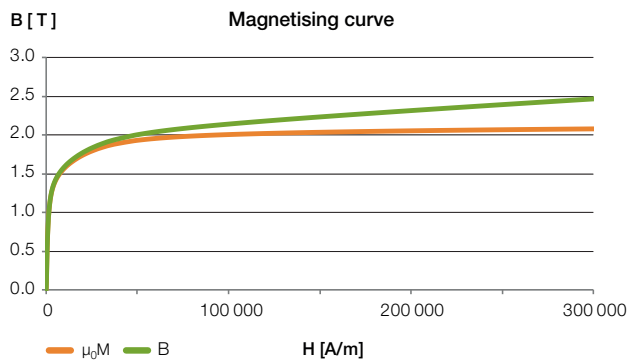
Physical properties		Standards	
Density [g/cm³]	7.56	SS-ISO 2738	
Thermal expansion [K⁻¹]	11 e-06	ASTM E 228/MPIF 35	
Thermal conductivity [W/m²K]	25	ISO 22007-2	
Resistivity [μΩm]	70	Four point measurements on nom. size OD 55mm ID 45mm Height 5mm	

Magnetic properties		Standards	
B@4000A/m [T]	1.42	IEC 60404-4	
B@10000A/m [T]	1.63	IEC 60404-4	
H _c [A/m]	217	IEC 60404-4	
μ _r -max	950	IEC 60404-4	

Powder properties		Standards	
Apparent density [g/cm³]	3.19	ISO 3923/1	
Flow [s/50g]	36	ISO 4490	
Green density [g/cm³]	7.54	ISO 3927	
Green strength [MPa]	24	ISO 3995	
Springback [%]	0.12	ISO 4492, ISO 2740	
Heat treated dim. change [%]	-0.01	ISO 4492, ISO 2740	
Total dim. change [%]	0.11	ISO 4492, ISO 2740	

Magnetising curve

Data adjusted for use in Finite Element modelling



H[A/m]	μ ₀ M[T]	B[T]	H[A/m]	μ ₀ M[T]	B[T]
0	0.00	0.00	11258	1.62	1.63
55	0.02	0.02	25221	1.81	1.84
83	0.04	0.04	49535	1.94	2.00
141	0.10	0.10	74535	1.99	2.08
193	0.17	0.17	99535	2.01	2.14
405	0.47	0.47	124535	2.03	2.18
565	0.63	0.63	149535	2.04	2.23
862	0.84	0.84	189535	2.05	2.29
1355	1.04	1.04	229535	2.06	2.35
2352	1.24	1.24	279535	2.08	2.43
4905	1.43	1.44	304535	2.0809	2.46

Core loss							
[W/kg]	50/60 Hz	100 Hz	200 Hz	300 Hz	400 Hz	500 Hz	600 Hz
0.5T	1.5/1.8	3.0	6.0	10	13	17	22
1.0T	5.0/6.1	10	21	33	46	60	75
1.5T	10/12	21	44	69	96	125	156

Measured according to CEI/IEC 60404-6:2003 on ring sample (OD55 ID45 H5 mm).

Loss model			
K _h	0.098	K _{ep}	0.000027

$$P_{tot} = K_h * f * B^{1.75} + K_{ep} * f^2 * B^2 + \frac{B^2 * f^2 * d^2}{1.8 * \rho * resistivity * 1000} \quad [\text{W/kg}]$$

Model is verified up to 1.5T and 2000Hz.

- K_h Hysteresis loss coefficient
- K_{ep} In particle eddy current coefficient
- d Smallest cross section of component [mm]
- f Frequency [Hz]
- B Field strength [T]
- ρ Density [g/cm³]
- resistivity [μΩm]

Somaloy® 1000 3P

600 MPa

General			
Base material: Somaloy 1000 3P	Additive(s): 0.3% 3P Lube	Compaction: Pressure: 600 MPa Die temperature: 80°C	Heat treatment: Atmosphere: Steam Temperature: 530°C

Mechanical properties		Standards	
Transverse rupture strength/150°C [MPa]	140/140	SS-ISO 3325	
Tensile strength/Yield strength [MPa]	60/60	SS-EN 10002-1, ISO 2740	
Compressive Strength/Yield [MPa]	370/260	ASTM E9-89a	
Young's modulus [GPa]	170	ASTM E 1876-99	
Poisson's ratio	-	ASTM E 1876-99	
Impact Energy [J]	1.9	SS-EN 10045, SS-EN 25754	

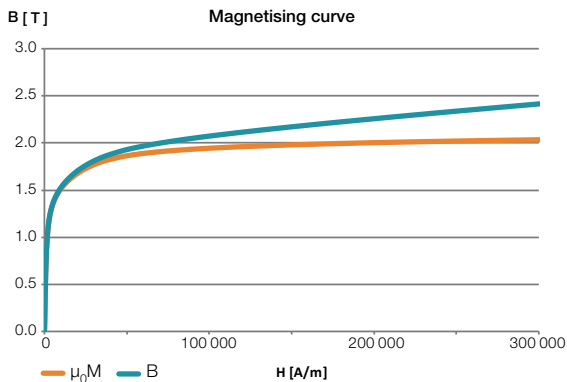
Physical properties		Standards	
Density [g/cm³]	7.42	SS-ISO 2738	
Thermal expansion [K⁻¹]	11 e-06	ASTM E 228/MPIF 35	
Thermal conductivity [W/m²K]	30	ISO 22007-2	
Resistivity [μΩm]	55	Four point measurements on nom. size OD 55mm ID 45mm Height 5mm	

Magnetic properties		Standards	
B@4000A/m [T]	1.38	IEC 60404-4	
B@10000A/m [T]	1.57	IEC 60404-4	
H _c [A/m]	220	IEC 60404-4	
μ _r -max	900	IEC 60404-4	

Powder properties		Standards	
Apparent density [g/cm³]	3.19	ISO 3923/1	
Flow [s/50g]	36	ISO 4490	
Green density [g/cm³]	7.42	ISO 3927	
Green strength [MPa]	21	ISO 3995	
Springback [%]	0.11	ISO 4492, ISO 2740	
Heat treated dim. change [%]	0	ISO 4492, ISO 2740	
Total dim. change [%]	0.11	ISO 4492, ISO 2740	

Magnetising curve

Data adjusted for use in Finite Element modelling



H[A/m]	μ ₀ M[T]	B[T]	H[A/m]	μ ₀ M[T]	B[T]
0	0.00	0.00	10232	1.57	1.58
46	0.02	0.02	24627	1.75	1.79
75	0.04	0.04	49681	1.88	1.94
131	0.09	0.09	74681	1.93	2.02
179	0.16	0.16	99681	1.96	2.08
201	0.19	0.19	124681	1.98	2.13
467	0.58	0.56	149681	1.99	2.18
666	0.79	0.79	189681	2.01	2.25
1024	1.00	1.00	229681	2.02	2.31
1801	1.20	1.20	279681	2.04	2.39
4050	1.39	1.39	304681	2.044	2.43

Core loss

[W/kg]	50/60 Hz	100 Hz	200 Hz	300 Hz	400 Hz	500 Hz	600 Hz
0.5T	1.5/1.9	3.1	7.0	10	14	18	23
1.0T	5.2/6.3	11	22	35	49	64	81
1.5T	11/13	22	46	73	102	134	168

Measured according to CEI/IEC 60404-6:2003 on ring sample (OD55 ID45 H5 mm).

Loss model

K _h	0.101	K _{ep}	0.000032
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$$P_{tot} = K_h * f * B^{1.75} + K_{ep} * f^2 * B^2 + \frac{B^2 * f^2 * d^2}{1.8 * \rho * resistivity * 1000} \quad [W/kg]$$

- K_h Hysteresis loss coefficient
- K_{ep} In particle eddy current coefficient
- d Smallest cross section of component [mm]
- f Frequency [Hz]
- B Field strength [T]
- ρ Density [g/cm³]
- resistivity [μΩm]

Model is verified up to 1.5T and 2000Hz.

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- Sweden** Höganäs AB
Höganäs
Phone +46 42 33 80 00
info@hoganas.com
- Brazil** Höganäs Brasil Ltda
Mogi das Cruzes
Phone +55 11 4793 7729
brazil@hoganas.com
- China** Höganäs (China) Co. Ltd
Shanghai
Phone +86 21 670 010 00
china@hoganas.com
- France** Höganäs France S.A.S.
Limas
Phone +33 474 02 97 50
france@hoganas.com
- Germany** Höganäs GmbH
Düsseldorf
Phone +49 211 99 17 80
germany@hoganas.com
- India** Höganäs India Pvt Ltd
Pune
Phone +91 20 66 03 01 71
india@hoganas.com
- Italy** Höganäs Italia S.r.l.
Rapallo (Genoa)
Phone +39 0185 23 00 33
italy@hoganas.com
- Japan** Höganäs Japan K.K.
Tokyo
Phone +81 3 3582 8280
japan@hoganas.com
- Rep. of Korea** Höganäs Korea Ltd
Seoul
Phone +82 2 511 43 44
korea@hoganas.com
- Russia** Höganäs East Europe LLC
Saint Petersburg
Phone +7 812 334 25 42
russia@hoganas.com
- Spain** Höganäs Ibérica S.A.
Madrid
Phone +34 91 708 05 95
spain@hoganas.com
- Taiwan** Höganäs Taiwan Ltd
Taipei
Phone +886 2 2543 1618
taiwan@hoganas.com
- United Kingdom** Höganäs (Great Britain) Ltd
Tonbridge, Kent
Phone +44 1732 377 726
uk@hoganas.com
- United States** North American Höganäs Co.
Hollsopple: PA
Phone +1 814 479 3500
info@nah.com