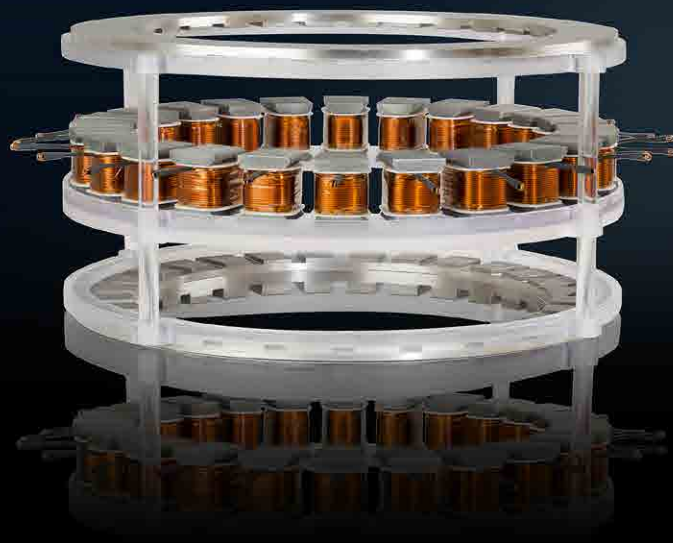


Somaloy[®] 3P

Material data

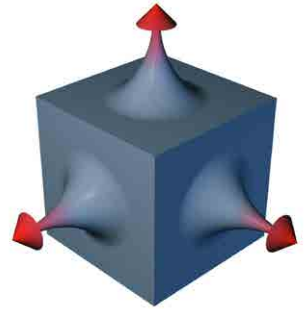


Every particle counts

Höganäs 
POWDER THAT EMPOWERS[®]

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.

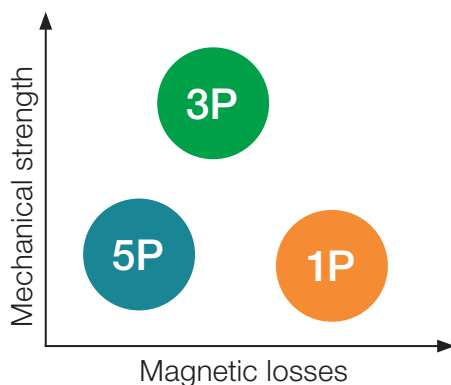


Höganäs develop and provide the Somaloy product range which comprises press-ready powder mixes. Each Somaloy product has properties that can be carefully tailored to ensure optimum performance in your specific component and application. We will help you with material selection that suits your specific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

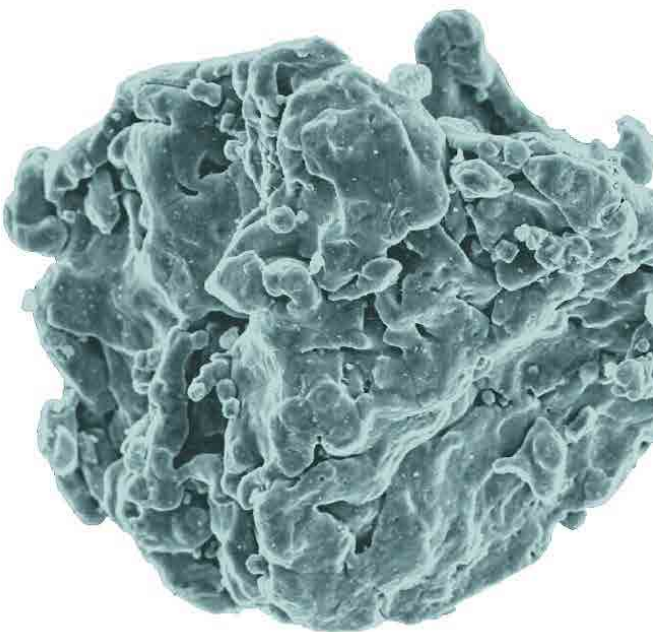
Contact your local sales representative or visit www.hoganas.com/electromagnetic

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Somaloy powder particle

Somaloy®

Product portfolio

Somaloy material	Density [g/cm³]	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/cm³]	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

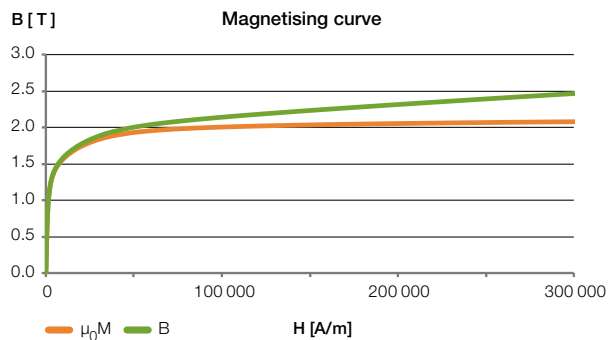
Physical properties		Standards	
Density	[g/cm³]	7.52	SS-ISO 2738
Thermal expansion	[K⁻¹]	11 e-06	ASTM E 228/MPIF 35
Thermal conductivity	[W/m·K]	25	ISO 22007-2
Resistivity	[μΩm]	600	Four point measurements on nom. size OD 55mm ID 45mm Height 5mm

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

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® 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

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

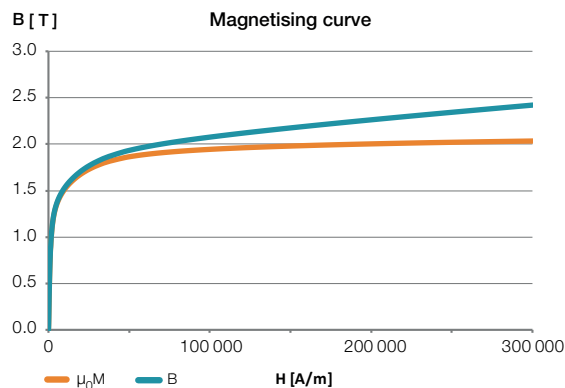
Physical properties		Standards	
Density	[g/cm³]	7.40	SS-ISO 2738
Thermal expansion	[K⁻¹]	11 e-06	ASTM E 228/MPIF 35
Thermal conductivity	[W/m·K]	30	ISO 22007-2
Resistivity	[μΩm]	300	Four point measurements on nom. size OD 55mm ID 45mm Height 5mm

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

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® 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

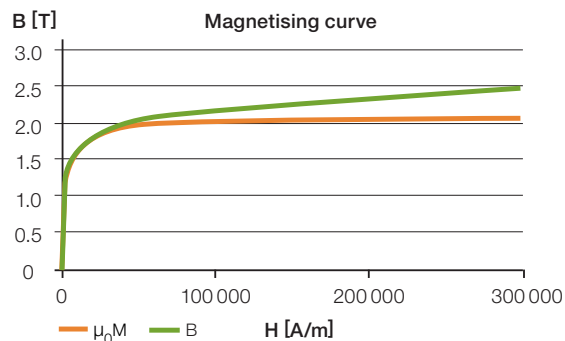
Physical properties		Standards	
Density	[g/cm³]	7.57	SS-ISO 2738
Thermal expansion	[K⁻¹]	11 e-06	ASTM E 228/MPIF 35
Thermal conductivity	[W/m²K]	25	ISO 22007-2
Resistivity	[μΩm]	200	Four point measurements on nom. size OD 55mm ID 45mm Height 5mm

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
----------------	-------	-----------------	----------

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

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® 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

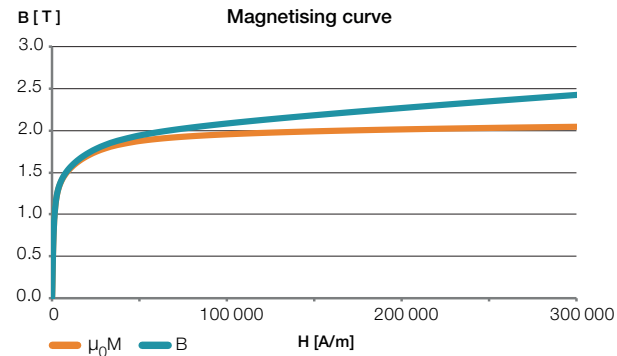
Magnetic properties		Standards	
B@4000A/m	[T]	1.34	IEC 60404-4
B@10000A/m	[T]	1.55	IEC 60404-4
H _c	[A/m]	220	IEC 60404-4
μ _r -max	-	780	IEC 60404-4

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]	150	Four point measurements on nom. size OD 55mm ID 45mm Height 5mm

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
----------------	-------	-----------------	----------

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

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

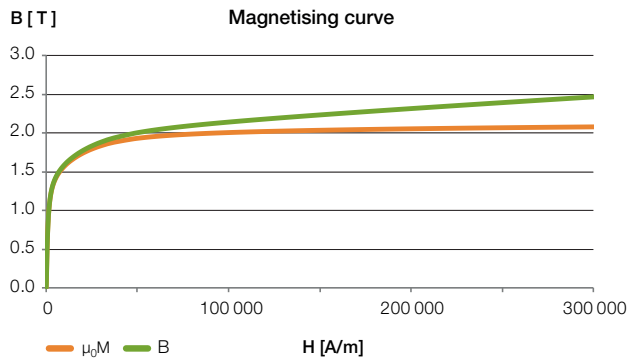
Magnetic properties		Standards	
B@4000A/m	[T]	1.42	IEC 60404-4
B@10000A/m	[T]	1.63	IEC 60404-4
H _c	[A/m]	217	IEC 60404-4
μ _r -max	-	950	IEC 60404-4

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

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	-	0.23	ASTM E 1876-99
Impact Energy	[J]	1.9	SS-EN 10045, SS-EN 25754

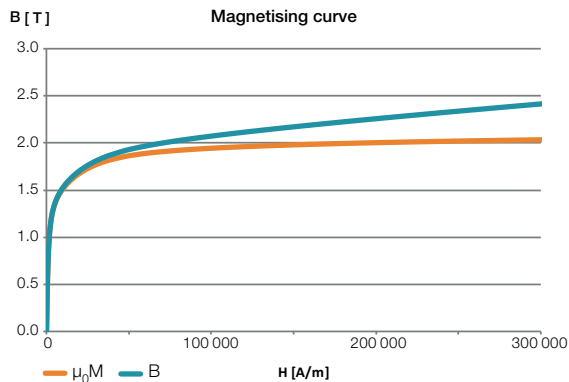
Magnetic properties		Standards	
B@4000A/m	[T]	1.38	IEC 60404-4
B@10000A/m	[T]	1.57	IEC 60404-4
H _c	[A/m]	220	IEC 60404-4
μ _r -max	-	900	IEC 60404-4

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

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

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]
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Driving positive change through material innovation

Höganäs' vision is to drive positive change through material innovation, which in turn will help us in our ambition to become the globally preferred partner for sustainable powder materials. Powder technology provides endless opportunities; not only does it empower our customers to reduce their material and energy consumption, but it also helps them use new and better techniques that make final products more efficient and less expensive. In short, powders are a resource-efficient alternative that are optimal for a range of industries.

World leader in powders

Höganäs is a global company with local presents all over the world. We are a global leader in advanced ceramic and metal powders. Contact your nearest Höganäs office today, click or scan the QR-code:



For more information on soft magnetic composites, please scan the QR code.

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