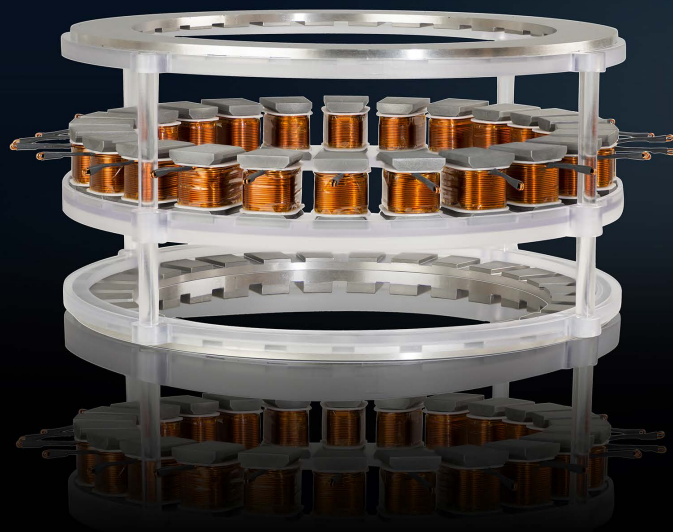


Somaloy[®] 7P

Material data



Every particle counts

Höganäs 
POWDER THAT EMPOWERS[®]

The Next Generation of Sustainable Soft Magnetic Composites (SMC)

Somaloy 700 7P represents a breakthrough in the development of SMC, designed to meet the increasing demands for efficient, low-loss materials with minimal environmental impact.

Key Benefits:

Enhanced Performance: It offers lower core losses across a wide frequency range. It is ideal for a wide range of active applications such as electric motors. The material's high permeability and induction contribute further to improved system efficiency.

Sustainability: The water-based coating addresses sustainability in electrification, and the low losses contributes to lower emissions in the use-phase.

Tunability and Improved Mechanical Strength: Through optimized part-curing, the transverse rupture strength (TRS) can be doubled, ensuring durability and reliability in demanding applications.

Processing: It can be used with die wall lubrication, maximizing density and minimizing core losses.

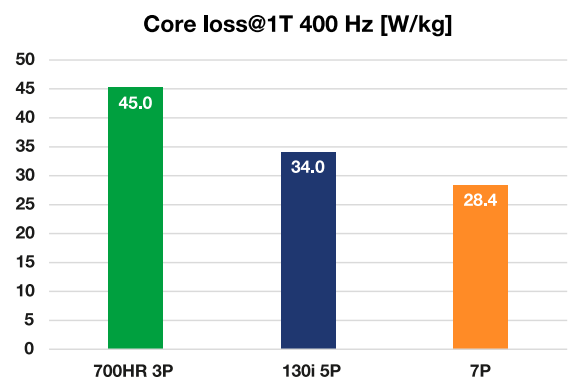
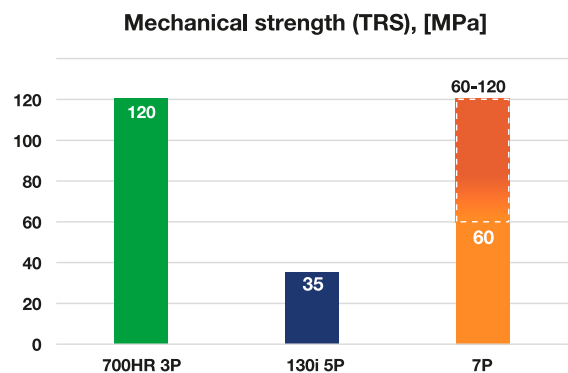
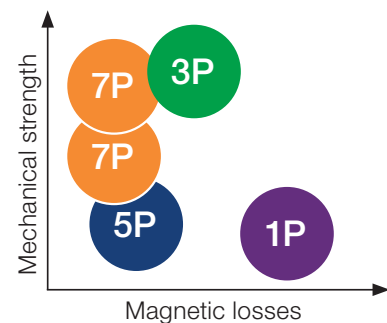
Thermal Properties: It demonstrates excellent thermal conductivity and thermal aging properties.

Get Somaloy 700 7P for:

- » Innovative water-based coating
- » Improved base power
- » Low carbon footprint
- » Lowest losses while enabling mechanical robustness
- » Improved thermal durability enabling higher operating temperatures

Find out more

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



Somaloy® 7P

Product portfolio

Somaloy material	Density [g/cm ³]	TRS ambient [MPa]	B@ 10000 A/m [T]	μ _{max}	Core losses @ 1T [W/kg]		
					Cross-section 5x5 mm		
					100 Hz	400 Hz	1000 Hz
Somaloy 700 7P							
0.3% + 7.3 g/cm³	7.30	55	1.44	420	13.9	65	206
0.3-0.4% + 7.4 g/cm³	7.40	60	1.50	440	13.5	62	89
0.3% + 7.5 g/cm³	7.50	60	1.55	500	13.1	29	84
0.5% + 7.4 g/cm³	7.40	60	1.49	420	13.5	62	195

Measured according to CEI/IEC 60404-6 on ring sample (OD40 ID30 H5mm)

Somaloy[®] 700 7P

7.3 g/cm³

General			
Base name: Somaloy 700 7P (0.3% + 7.3)	Additive(s): 0.3% 7P Lube	Compaction: Density: 7.3 g/cm ³ Die temperature: 100°C	Heat treatment: Atmosphere: Nitrogen + 1% O ₂ Temperature: 620°C

Mechanical properties			Standards
Transverse rupture	[MPa]	55/55	ISO 3325
Compressive Strength/Yield	[MPa]	179	ASTM E9-19
Young's modulus	[GPa]	165	Calculated Value
Poisson's ratio	-	0.27	Calculated Value
Impact Energy	[J]	1.1	ISO 148, ISO 5754

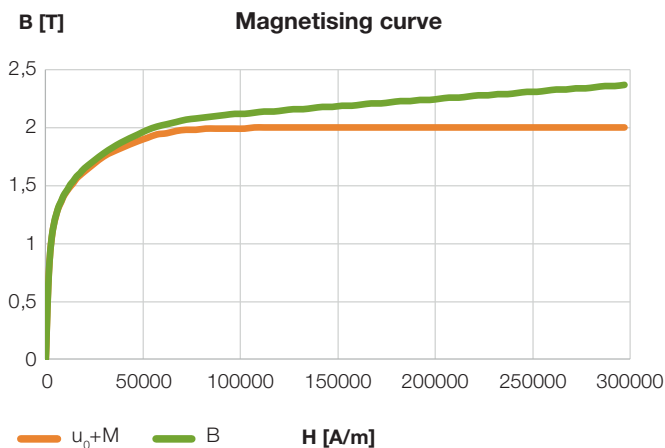
Magnetic properties			Standards
B@4000A/m	[T]	1.16	IEC 60404-4
B@10000A/m	[T]	1.44	IEC 60404-4
H _c	[A/m]	137	IEC 60404-4
μ _r -max	-	420	IEC 60404-4

Physical properties			Standards
Density	[g/cm ³]	7.30	SS-ISO 2738
Thermal expansion	[K-1]	11 e-06	ASTM E 228/MPIF 35
Thermal conductivity	[W/(m·K)]	42	ISO 22007-2

Powder properties			Standards
Apparent density	[g/cm ³]	3.42	ISO 3923/1
Flow	[s/50g]	26	ISO 4490
Green density	[g/cm ³]	7.3	ISO 3927
Green strength	[MPa]	12	ISO 3995
Springback	[%]	0.13	ISO 4492, ISO 2740
Heat treated dim. change	[%]	-0.07	ISO 4492, ISO 2740
Total dim. change	[%]	0.06	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	0	19860	1.62	1.65
143	0.06	0.06	29802	1.75	1.78
270	0.12	0.12	38436	1.82	1.87
379	0.19	0.19	52067	1.91	1.98
486	0.25	0.25	62067	1.95	2.03
676	0.35	0.35	77067	1.98	2.08
801	0.42	0.42	87067	1.99	2.10
935	0.48	0.48	102067	1.99	2.12
1157	0.58	0.58	122067	2.00	2.15
1408	0.68	0.68	142067	2.00	2.18
1603	0.75	0.75	162067	2.00	2.20
1953	0.85	0.85	182067	2.00	2.23
2587	0.98	0.98	202067	2.00	2.25
3542	1.11	1.11	222067	2.00	2.28
5165	1.23	1.24	242067	2.00	2.30
7133	1.33	1.34	262067	2.00	2.33
10038	1.43	1.44	287067	2.00	2.36
15818	1.56	1.58	297067	2.00	2.37

Core loss

[W/kg]	50 Hz	100 Hz	200 Hz	400 Hz	600 Hz	800 Hz	1000 Hz
0.5T	1.1	2.2	4.5	9.6	15	21	27
1.0T	3.5	7.2	15	32	51	72	94
1.5T	6.7	14	29	65	107	155	206

Measured according to CEI/IEC 60404-6 on ring sample (OD40 ID30 H5mm)

Somaloy[®] 700 7P

7.4 g/cm³

General			
Base name: Somaloy 700 7P (0.3-0.4%+7.4)	Additive(s): 0.3-0.4% 7P Lube	Compaction: Density: 7.4 g/cm ³ Die temperature: 100°C	Heat treatment: Atmosphere: Nitrogen + 1% O2 Temperature: 620°C

Mechanical properties			Standards
Transverse rupture	[MPa]	60/60	ISO 3325
Compressive Strength/Yield	[MPa]	179	ASTM E9-19
Young's modulus	[GPa]	172	Calculated Value
Poisson's ratio	-	0.28	Calculated Value
Impact Energy	[J]	1.1	ISO 148, ISO 5754

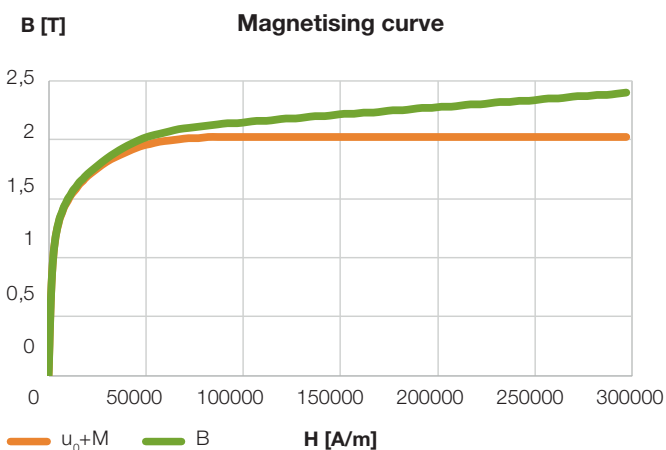
Magnetic properties			Standards
B@4000A/m	[T]	1.22	IEC 60404-4
B@10000A/m	[T]	1.50	IEC 60404-4
H _c	[A/m]	137	IEC 60404-4
μ _r -max	-	440	IEC 60404-4

Physical properties			Standards
Density	[g/cm ³]	7.40	SS-ISO 2738
Thermal expansion	[K-1]	11 e-06	ASTM E 228/MPIF 35
Thermal conductivity	[W/(m·K)]	37	ISO 22007-2

Powder properties			Standards
Apparent density	[g/cm ³]	3.42	ISO 3923/1
Flow	[s/50g]	26	ISO 4490
Green density	[g/cm ³]	7.4	ISO 3927
Green strength	[MPa]	13	ISO 3995
Springback	[%]	0.14	ISO 4492, ISO 2740
Heat treated dim. change	[%]	-0.08	ISO 4492, ISO 2740
Total dim. change	[%]	0.06	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	0	17835	1.65	1.67
145	0.06	0.06	20127	1.69	1.71
269	0.13	0.13	29883	1.81	1.84
379	0.2	0.2	38399	1.88	1.93
541	0.29	0.3	52029	1.96	2.03
739	0.41	0.41	62029	1.99	2.07
930	0.51	0.51	77029	2.01	2.11
1000	0.55	0.55	92029	2.02	2.14
1390	0.72	0.72	102029	2.02	2.15
1795	0.86	0.86	122029	2.02	2.18
2529	1.02	1.03	137029	2.02	2.20
3765	1.19	1.19	147029	2.02	2.21
5044	1.28	1.29	167029	2.02	2.23
7014	1.38	1.39	202029	2.02	2.28
8831	1.45	1.46	232029	2.02	2.32
9952	1.48	1.5	257029	2.02	2.35
12583	1.55	1.57	282029	2.02	2.38
15874	1.62	1.64	297029	2.02	2.40

Core loss

[W/kg]	50 Hz	100 Hz	200 Hz	400 Hz	600 Hz	800 Hz	1000 Hz
0.5T	1.0	2.1	4.3	9.1	14	20	26
1.0T	3.3	6.8	14	30	48	68	89
1.5T	7.0	14	28	62	102	146	193

Measured according to CEI/IEC 60404-6 on ring sample (OD40 ID30 H5mm)

Somaloy[®] 700 7P

7.5 g/cm³

General			
Base name: Somaloy 700 7P (0.3% + 7.5)	Additive(s): 0.3% 7P Lube	Compaction: Density: 7.5 g/cm ³ Die temperature: 100°C	Heat treatment: Atmosphere: Nitrogen + 1% O ₂ Temperature: 620°C

Mechanical properties			Standards
Transverse rupture	[MPa]	60/60	ISO 3325
Compressive Strength/Yield	[MPa]	171	ASTM E9-19
Young's modulus	[GPa]	180	Calculated Value
Poisson's ratio	-	0.28	Calculated Value
Impact Energy	[J]	0.9	ISO 148, ISO 5754

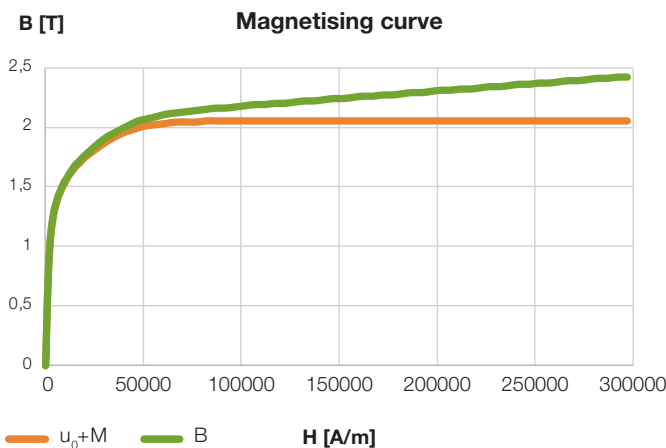
Magnetic properties			Standards
B@4000A/m	[T]	1.27	IEC 60404-4
B@10000A/m	[T]	1.55	IEC 60404-4
H _c	[A/m]	135	IEC 60404-4
μ _r -max	-	500	IEC 60404-4

Physical properties			Standards
Density	[g/cm ³]	7.50	SS-ISO 2738
Thermal expansion	[K-1]	11 e-06	ASTM E 228/MPIF 35
Thermal conductivity	[W/(m·K)]	35	ISO 22007-2

Powder properties			Standards
Apparent density	[g/cm ³]	3.42	ISO 3923/1
Flow	[s/50g]	26	ISO 4490
Green density	[g/cm ³]	7.5	ISO 3927
Green strength	[MPa]	11	ISO 3995
Springback	[%]	0.16	ISO 4492, ISO 2740
Heat treated dim. change	[%]	-0.09	ISO 4492, ISO 2740
Total dim. change	[%]	0.07	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	0	17531	1.7	1.72
143	0.07	0.07	19790	1.74	1.76
265	0.14	0.14	29697	1.86	1.9
363	0.2	0.2	38289	1.94	1.98
565	0.33	0.33	51952	2.01	2.07
739	0.43	0.43	66952	2.04	2.12
1052	0.61	0.61	81952	2.05	2.15
1356	0.75	0.75	101952	2.05	2.18
1636	0.85	0.85	121952	2.05	2.2
1988	0.96	0.96	141952	2.05	2.23
2460	1.06	1.07	156952	2.05	2.25
3136	1.17	1.17	176952	2.05	2.27
4175	1.28	1.28	191952	2.05	2.29
6550	1.42	1.43	211952	2.05	2.32
8387	1.49	1.5	231952	2.05	2.34
10757	1.56	1.57	251952	2.05	2.37
13748	1.63	1.65	281952	2.05	2.41
15538	1.67	1.69	296952	2.05	2.42

Core loss

[W/kg]	50 Hz	100 Hz	200 Hz	400 Hz	600 Hz	800 Hz	1000 Hz
0.5T	1.0	2.0	4.1	8.7	14	19	25
1.0T	3.2	6.5	14	29	46	64	84
1.5T	6.3	13	27	60	97	138	184

Measured according to CEI/IEC 60404-6 on ring sample (OD40 ID30 H5mm)

Somaloy[®] 700 7P

7.4 g/cm³ (B)

General			
Base name: Somaloy 700 7P (0.5% + 7.4)	Additive(s): 0.5% 7P Lube	Compaction: Density: 7.4 g/cm ³ Die temperature: 100°C	Heat treatment: Atmosphere: Nitrogen + 1% O ₂ Temperature: 620°C

Mechanical properties			Standards
Transverse rupture	[MPa]	60/60	ISO 3325
Compressive Strength/Yield	[MPa]	179	ASTM E9-19
Young's modulus	[GPa]	172	Calculated Value
Poisson's ratio	-	0.28	Calculated Value
Impact Energy	[J]	1.0	ISO 148, ISO 5754

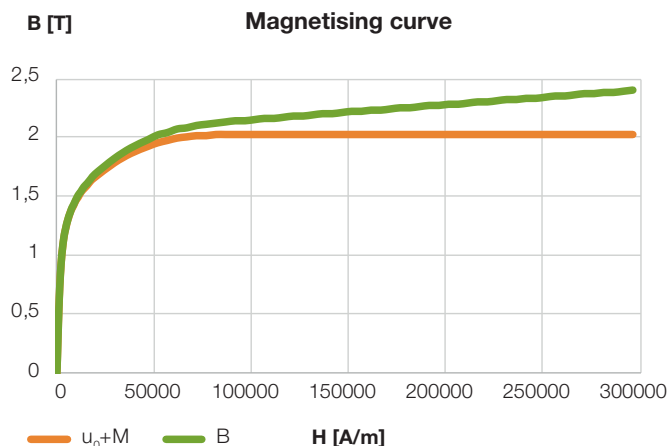
Magnetic properties			Standards
B@4000A/m	[T]	1.19	IEC 60404-4
B@10000A/m	[T]	1.49	IEC 60404-4
H _c	[A/m]	136	IEC 60404-4
μ _r -max	-	420	IEC 60404-4

Physical properties			Standards
Density	[g/cm ³]	7.40	SS-ISO 2738
Thermal expansion	[K ⁻¹]	11 e-06	ASTM E 228/MPIF 35
Thermal conductivity	[W/(m·K)]	37	ISO 22007-2

Powder properties			Standards
Apparent density	[g/cm ³]	3.38	ISO 3923/1
Flow	[s/50g]	26	ISO 4490
Green density	[g/cm ³]	7.5	ISO 3927
Green strength	[MPa]	11	ISO 3995
Springback	[%]	0.16	ISO 4492, ISO 2740
Heat treated dim. change	[%]	-0.08	ISO 4492, ISO 2740
Total dim. change	[%]	0.08	ISO 4492, ISO 2740

Magnetising curve

Data adjusted for use in Finite Element modelling

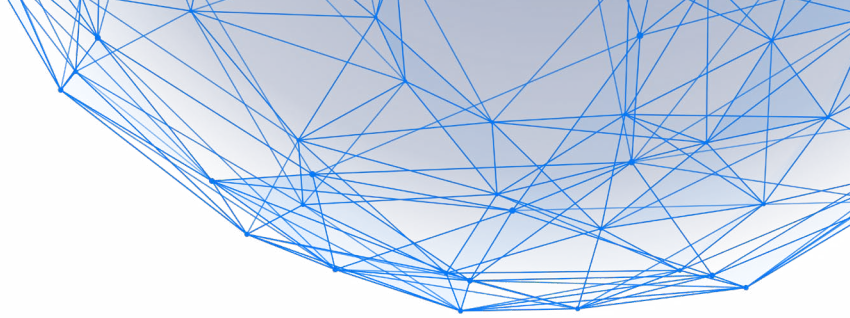


H[A/m]	μ ₀ M[T]	B[T]	H[A/m]	μ ₀ M[T]	B[T]
0	0	0	19780	1.66	1.69
151	0.06	0.06	29625	1.78	1.82
279	0.13	0.13	38162	1.86	1.91
386	0.19	0.19	52018	1.95	2.02
545	0.28	0.28	62018	1.99	2.07
726	0.38	0.38	77018	2.01	2.11
851	0.45	0.45	92018	2.02	2.14
1052	0.55	0.55	102018	2.02	2.15
1283	0.65	0.65	122018	2.02	2.18
1550	0.75	0.75	142018	2.02	2.20
1877	0.85	0.85	162018	2.02	2.23
2468	0.98	0.99	177018	2.02	2.25
3100	1.08	1.09	202018	2.02	2.28
4455	1.22	1.22	222018	2.02	2.3
6862	1.36	1.36	247018	2.02	2.33
9756	1.46	1.47	267018	2.02	2.36
13935	1.56	1.58	287018	2.02	2.38
15664	1.59	1.61	297018	2.02	2.40

Core loss

[W/kg]	50 Hz	100 Hz	200 Hz	400 Hz	600 Hz	800 Hz	1000 Hz
0.5T	1.0	2.1	4.3	9.1	14	20	26
1.0T	3.3	6.8	14	30	48	68	89
1.5T	6.5	14	29	62	103	147	195

Measured according to CEI/IEC 60404-6 on ring sample (OD40 ID30 H5mm)



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.

