

TECHNICAL DESCRIPTION, PERMEDYN™ S1 and S2

Permedyn™ S1 and S2 are isotropic, soft magnetic pure iron materials primarily intended for DC applications. The materials exhibit extremely high maximum permeability and saturation magnetization. Field of applications include pole-pieces in electromagnets, low reluctance, flux feedback housing for magnetostrictive/MSM actuators, plunger in electrodynamic actuators etc.

Magnetic Components AB has the production capabilities of manufacturing ranging from prototypes to regular mass-production.

Static magnetic parameters

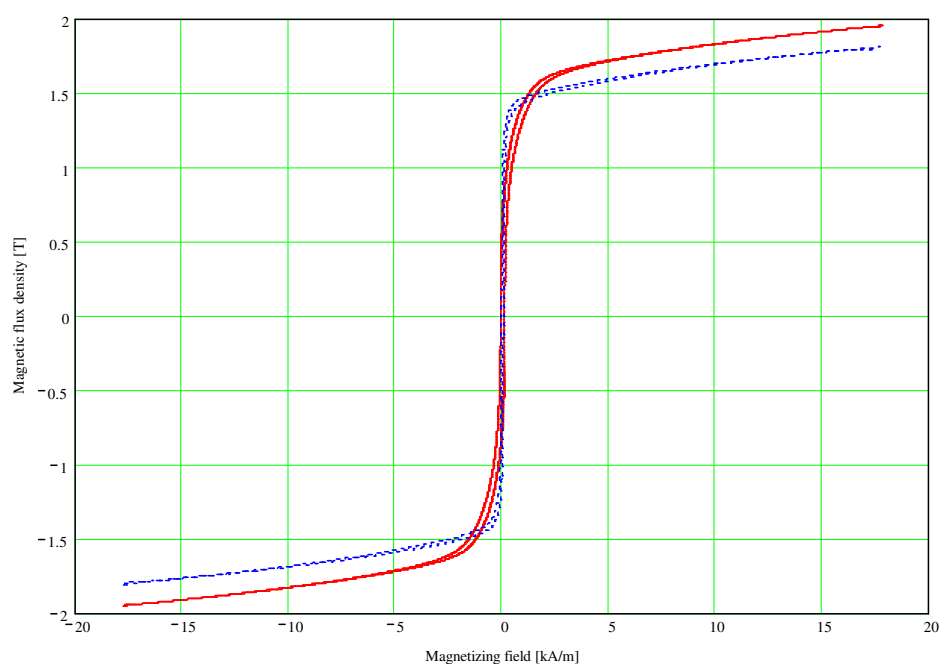



Figure 1. The magnetization loop of materials S1 (red full line) and S2 (blue dotted line), i.e. Magnetic flux density [T] as a function of the Magnetizing field [kA/m].

Table 1. Typical values of magnetic parameters deduced from the static magnetization curve.

Description	Symbol	S1 typical value	S2 typical value	Unit
Maximum relative permeability	μ_{\max}	2950	7960	-
Maximum differential permeability	μ_{diff}	14300	19900	-
Saturation magnetization (16 kA/m)	B_{sat}	1.9	1.8	T
Coercive force	H_c	89	73	A/m
Magnetic remanence [T]	B_r	0.67	0.98	T

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All magnetic measurements have been conducted on toroid-shaped samples with inner diameter 45 mm, outer diameter 55 mm and thickness 5 mm.

Structural and thermal properties

Table 2. Typical values of structural and thermal properties.

Description	Symbol	S1 and S2 typical values	Unit
Density	ρ	7800	kg/m ³
Yield stress, tension	R_{eL}	400	MPa
Yield stress, compression	R_{eL}	400	MPa
Young's modulus	E	210	GPa
Heat capacity	C	440	J/(kg·K)
Thermal conductivity	λ	35	W/(m·K)
Maximum working temperature	T	650	°C

Forms of supply

Linlan Permedyn can produce pieces of S1/S2 material with any geometry as long as the maximum dimensions, hereunder described, is not exceeded.

- Parallelepiped 70 mm*80 mm*1000 mm.
- Rod with square cross-sectional area 76 mm*76 mm*1000 mm.
- Rod with circular cross-sectional area ϕ 80 mm*1000 mm.