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Standard Terminology of Symbols and Definitions Relating to Magnetic Testing¹

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INTRODUCTION

In preparing this glossary of terms, an attempt has been made to avoid, where possible, vector analysis and differential equations so as to make the definitions more intelligible to the average worker in the field of magnetic testing. In some cases, rigorous treatment has been sacrificed to secure simplicity, but it is believed that none of the definitions will prove to be misleading.

It is the intent of this glossary to be consistent in the use of symbols and units with those found in ANSI/IEEE 260-1978 and USA Standard Y 10.5-1968.

¹ This terminology is under the jurisdiction of ASTM Committee A06 on Magnetic Properties and is the direct responsibility of Subcommittee A06.92 on Terminology and Definitions.

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Part 1—Symbols Used in Magnetic Testing

Symbol	Term	Symbol	Term
α	cross-sectional area of B coil	$\mathcal{F}$	magnetomotive force
A	cross-sectional area of specimen	ff	form factor
A'	solid area	H	magnetic field strength
B	{ magnetic flux density magnetic induction	ΔH	excursion range of magnetic field strength
ΔB		H_b	biasing magnetic field strength
B_b		H_{CB}	coercive field strength
B_d		H_{cJ}	intrinsic coercive field strength
B_{dm}		H_d	demagnetizing field strength
$B_d H_d$		H_Δ	incremental magnetic field strength
$(B_d H_d)_m$		H_g	air gap magnetic field strength
B_Δ		H_L	ac magnetic field strength (from an assumed peak value of magnetizing current)
B_i		H_m	maximum magnetic field strength in a hysteresis loop
B_m		H_{max}	maximum magnetic field strength in a flux-current loop
B_{max}		H_p	ac magnetic field strength (from a measured peak value of exciting current)
B_r		H_t	instantaneous magnetic field strength (coincident with B_{max})
B_{rs}		H_z	ac magnetic field strength force (from an assumed peak value of exciting current)
B_s		I	ac exciting current (rms value)
cf		I_c	ac core loss current (rms value)
CM		I_{dc}	constant current
d		I_m	ac magnetizing current (rms value)
D_B		J	magnetic polarization
df		K	coupling coefficient
D_m		ℓ	flux path length
E		ℓ_1	effective flux path length
E_1		ℓ_g	gap length
E_2		$\mathcal{L}$ (also ϕN)	flux linkage
E_f		$\mathcal{L}_m$	mutual flux linkage
f			