

TERMS USED PRIMARILY IN MAGNETOSTATIC (D-C) TESTING

Symbol	Term	Unit	Introduced on Page
B_{cr}	Relaxation induction	gauss	17
B_d	Remanent induction	gauss	16
B_{dm}	Remanence	gauss	12
B_i	Intrinsic induction	gauss	4
B_m	Peak induction of normal hysteresis loop	gauss	10
B_{mi}	Peak intrinsic induction	gauss	13
B_r	Residual induction	gauss	11
B_{rs}	Retentivity	gauss	11
B_s	Saturation induction	gauss	9
$B_d H_d$	Energy product	gauss-oersted	16
$(B_d H_d)_{\max}$	Maximum energy product (between B_{rs} and H_{cs})	gauss-oersted	17
ΔH	Horizontal excursion of incremental loop	oersted	14
H_{Δ}	Incremental magnetizing force	oersted	14
H_c	Coercive force	oersted	11
H_{ci}	Intrinsic coercive force	oersted	13
H_{cr}	Relaxation coercive force	oersted	17
H_{cs}	Coercivity	oersted	11
H_d	Demagnetizing force	oersted	16
H_m	Peak H value of normal hysteresis loop	oersted	10
H_s	Saturation magnetizing force	oersted	9
J	Magnetic polarization	gauss/ 4π	4
W	Energy stored in flux system	erg (joule)	7
W_h	Energy loss in normal hysteresis loop	erg	13
μ	Normal permeability	gauss/oersted	8
μ_0	Initial permeability	gauss/oersted	9
μ_{Δ}	Incremental permeability	gauss/oersted	14
μ_{abs}	Absolute permeability	gauss/oersted	4
μ_d	Differential permeability	gauss/oersted	8
μ_{eff}	Effective permeability of composite flux path	gauss/oersted	5
μ_i	Intrinsic permeability	gauss/oersted	4
μ_m	Maximum normal permeability	gauss/oersted	9
μ_r	Relative permeability	gauss/oersted	4

GENERAL TERMS USED IN MAGNETIC TESTING

Symbol	Term	Unit	Introduced on Page
A	Cross-sectional area	cm ²	3
B	Induction, flux density	gauss	3
ΔB	Vertical excursion of incremental loop	gauss	14
B_{Δ}	Incremental induction	gauss	14
B_b	Biased induction	gauss	15
D_B	Demagnetizing coefficient	numeric	12
d	Lamination thickness	cm	31
$\mathcal{F}$	Magnetomotive force	gilbert	2
H	Magnetizing force, magnetic intensity	oersted	4
H_a	Applied magnetizing force	oersted	12
H_b	Biasing magnetizing force	oersted	14
H_g	Air gap value of magnetizing force	oersted	12
I_b	Biasing current	amp	33
I_{d-c}	Direct current	amp	6
k'	Coefficient of coupling	numeric	7
$\mathcal{L}$	Flux linkage	maxwell-turn	6
$\mathcal{L}_m$	Mutual flux linkage	maxwell-turn	7
L	Inductance (self inductance)	henry	6
L_0	Initial inductance	henry	26
L_{Δ}	Incremental inductance	henry	33
L_i	Intrinsic inductance	henry	7
L_m	Mutual inductance	henry	7
l	Length of flux path	cm	3
l_1	Effective length of flux path	cm	23
M	Magnetization	oersted	5
m	Total weight of an inductor core	g	23
m_1	Active weight of an inductor core	g	25
N	Loop turns of an electrical circuit	numeric	6
N_D	Demagnetizing factor	numeric	12
N_p	Circuit turns of primary winding	numeric	23
N_s	Circuit turns of secondary winding	numeric	23
$\mathcal{P}$	Permeance	reciprocal magnetic ohm	3
$\mathcal{R}$	Reluctance	magnetic ohm	3
S	Lamination factor (stacking factor)	numeric	5
T_c	Curie temperature	deg	5
t	Thickness, over-all buildup of laminated core	cm	35
V	Effective magnetic volume of core	cm ³	23
w	Width of lamination strip	cm	35
Γ_m	Magnetic constant	gauss/oersted	4
δ	Density of magnetic medium	g/cm ³	23
κ	Susceptibility	numeric	4
μ_a	Anhyseretic or ideal permeability	gauss/oersted	34
μ_v	Space permeability	gauss/oersted	4
ν	Reluctivity	oersted/gauss	4
π	3.1416 (circumference/diameter)	numeric	2
ρ	Resistivity	ohm-cm	19
ϕ	Flux	maxwell	2
χ	Mass susceptibility	cm ³ /g	4

TERMS USED PRIMARILY IN MAGNETODYNAMIC (A-C) TESTING

Symbol	Term	Unit	Introduced on Page
$B_{\max}$	Peak induction of SCM flux-current loop	gauss	20
B_r'	Apparent residual induction in dynamic flux-current loop	gauss	20
$c\mathcal{f}$	Crest factor of a symmetrical wave	numeric	26
D	Dissipation factor of an inductor	numeric	18
D_m	Magnetic dissipation factor	numeric	22
D_w	Dissipation factor: $R_w/\omega L_e$	numeric	29
E_1	Exciting voltage	rms v	22
E_Δ	Incremental exciting voltage	rms v	33
E_{avg}	Average value of E_s	v	24
E_f	Flux voltage (1.1107 times E_{avg})	flux v	25
E_{ind}	Induced voltage in exciting winding	rms v	22
E_L	Voltage drop across leakage reactance	rms v	21
E_s	Induced voltage in secondary winding	rms v	24
e_s	Instantaneous value of E_s	v	24
E_t	Terminal voltage	rms v	18
E_w	Voltage drop across winding resistance	rms v	21
f	Cyclic frequency	cps or hertz	17
$\mathcal{f}\mathcal{f}$	Form factor of a symmetrical wave	numeric	24
H'	Apparent magnetizing force in dynamic excitation (from instantaneous current values)	oersted	20
H_Δ'	Apparent incremental magnetizing force (from instantaneous current values)	oersted	33
H_c'	Apparent coercive force in dynamic flux-current loop (from instantaneous current values)	oersted	20
$H'_{\max}$	Maximum value of H'	oersted	20
H_L	A-c magnetizing force from magnetizing current	oersted	26
H_p	A-c magnetizing force from peak exciting current	oersted	28
H_t	Instantaneous H coincident with $B_{\max}$	oersted	29
H_z	Apparent a-c magnetizing force (assumed peak value)	oersted	27
$H_{\Delta,z}$	Incremental apparent magnetizing force	oersted	34
I	A-c exciting current	rms amp	18
ΔI	Total excursion of incremental exciting current	rms amp	31
I_Δ	Incremental exciting current	rms amp	33
I_b	Bias component of CM exciting current (d-c value)	amp	33

Symbol	Term	Unit	Intro- duced on Page
I_c	Core loss component of exciting current	rms amp	22
$I_{c,\Delta}$	Incremental core-loss current	rms amp	33
I_m	Magnetizing component of exciting current	rms amp	22
$I_{m,\Delta}$	Incremental magnetizing current	rms amp	33
I_p	Actual peak value of exciting current	amp	28
i	Instantaneous value of I	amp	20
i_e	Instantaneous value of I coincident with $B_{\max}$	amp	29
L_1	Core inductance	henry	22
L_s	Series inductance of an inductor	henry	27
L_s'	Series equivalent of L_1	henry	30
ωL_1	Core reactance	ohm	22
ωL_s	Series reactance of an inductor	ohm	18
ωL_w	Leakage reactance	ohm	21
$N_p I/l_1$	A-c excitation	rms amp-turn/cm	27
$N_p I_{\Delta}/l_1$	Incremental (a-c) excitation	rms amp-turn/cm	34
P_a	Apparent power	rms v-amp	18
$P_{B;f}$	Specific core-loss power	watt/lb or kg	25
$P_{\Delta B;f}$	Specific incremental core-loss power	watt/lb or kg	34
P_c	Core-loss power	watt	22
$P_{\Delta,c}$	Incremental core-loss power	watt	34
P_e	Eddy current core-loss power	watt	31
P_h	Hysteresis core-loss power	watt	31
P_q	Reactive or wattless core power	var	22
P_r	Residual core-loss power	watt	32
P_w	Copper (winding) loss power	watt	21
P_z	Exciting power, apparent core loss	rms v-amp	22
$P_{\Delta,z}$	Incremental exciting power	rms v-amp	34
$P_{zB;f}$	Specific exciting power	rms v-amp	27
$P_{\Delta z,B;f}$	Specific incremental exciting power	rms v-amp	34
Q	Storage factor of an inductor	numeric	18
Q_m	Magnetic storage factor	numeric	22
R_1	Core-loss resistance	ohm	22
R_s	A-c series resistance of an inductor	ohm	18
R_s'	Series equivalent of R_1	ohm	30
R_w	A-c winding resistance	ohm	21
Y_1	Core admittance	reciprocal ohm, mho	22
Z	Impedance of an inductor	ohm	18
β	Hysteretic angle of an inductor	deg	20
γ	Loss angle of an inductor	deg	29
ϵ	Exponent in equation for P_h	numeric	31
η	Coefficient in equation for P_h	numeric	31
θ	Phase angle of an inductor	deg	18
μ_{0L}	Initial dynamic permeability	gauss/oersted	26
μ_L	A-c permeability from core inductance	gauss/oersted	25

TERMS USED PRIMARILY IN MAGNETODYNAMIC (A-C) TESTING—*Continued*

Symbol	Term	Unit	Introduced on Page
$\mu_{\Delta,L}$	Incremental inductance permeability	gauss/oersted	33
μ_p	A-c permeability from peak exciting current	gauss/oersted	28
μ_{rev}	Reversible permeability	gauss/oersted	34
μ_t	A-c instantaneous permeability	gauss/oersted	28
μ_z	A-c permeability from impedance	gauss/oersted	27
$\mu_{\Delta,z}$	Incremental impedance permeability	gauss/oersted	33
ω	Angular frequency	radian/sec	17