Magnetic Materials Automatic Measuring System

MATS-3000SA 1MHz Dynamic Hysteresisgraph

Standard

* State Standard :
GB/T 3658-2008
GB/T 19346-2003 SJ 20966-2006
* International Standard :
IEC 60404-6

Configuration

* Model : MATS-3000SA/1M
* Power source : Power(200VA)
Frequency(10Hz~1MHZ)
* Analyzer : Clarke-Hess,
Model(CH-2335A
* IPC : Advantech IPC-510
G41 mainboard,
E5300 Dicaryon2.6G processor
2G RAM, 500G Hard disk
* Display : Lenovoli1931ewD,
18.5′ digital display
* System : Windows7
* Software : SM Test
* Standard sample : Toroidal ring
with test reports by third-party.

MATS-3000SA/1M

automatically reports the magnetic properties of the soft magnetic materials (FeSiAl / FeSi / ferrite / permalloy / amorphous alloy / nanocrystalline and silicon steel etc.) under 10Hz ~ 1MHz (constant) condition. Accurate measure remanence Br / coercivity Hc / Ps / μa / loss angle δ / μm / μL / μ′ etc. It adopts digital signal processing and synthesis technology. Combine Japanese high-speed broadband bipolar amplifier HSA4014 with Clarke-Hess CH-2335A high accuracy broadband analyzer. Software perfectly match Windows system, enables it to do massive tests and accomplish data management..

Main Features

1. Adopted digital power source and standard power meter. Full-automatic operation.
2. Perfectly match Windows system, easy to operate.
3. Sample shape; Toroidal ring / E&U shape.
4. Closed-circuit samples tested directly with turns. Tested sample / magnetizing turns(N1) / testing turns(N2) formed a no-load transformer.
5. N1 loop connect in series with standard power meter, to get the field peak value by reading the meter`s peak current.
6. N2 connect to the meter`s voltage port, to get the flux density peak value by the meter`s voltage effective value.
7. Adopted voltammetry and digital integration to test dynamic hysteresis graph, total losses Ps, flux density Bm, field strength Hm, rated power Ss, amplitude permeability μa, loss angle δ, remanence Br and coercivity Hc etc, and calculate μ′, μ″, μL, μR, Q and AL etc.
8. Automatically constant test more than 255 points, each point cost 12 sec, multi-point test could choose fixed frequency, fixed Bm or fixed Hm modes etc., to get the dynamic AC magnetizing curve and loss curve.

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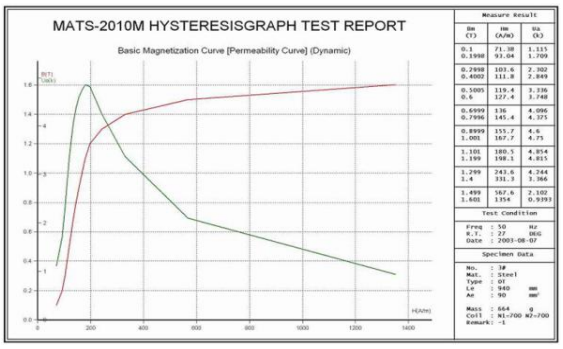
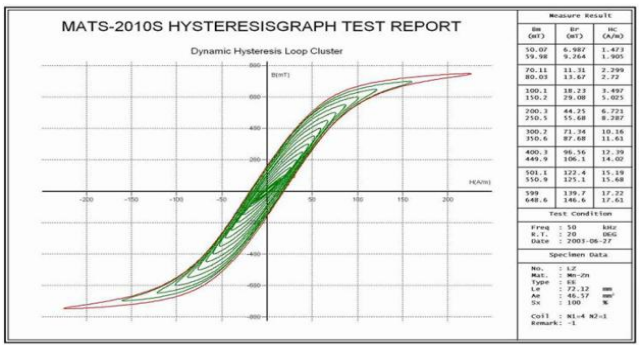
Technical Data

1. Perfectly match Windows 7. English & English-Chinese version optional. Easy to operate.
2. Fixed Bm or fixed Hm optional.
3. Full-automatic operation. Intelligent auto-recognition.
4. Measuring process in real time monitoring, can be suspended at any time.
5. Automatically reports the Ae and Le according to the sample dimension.
6. Adopted data base format, directly print or output test results to Excel.
7. Document function: data save, data delete, remove whole data etc.
8. After multi-points clustering, display B(H) magnetizing curve,
   Ps(B) loss curve and display the coordinate information of a random point on the curve.
9. Gather the B(H) magnetizing curve and Ps(B) loss curve under different conditions on one draft , easy to do comparision.
10. Set high and low limits according to μa, Ps, Bm, Br, Hc and Hm etc. To jusify the results pass or not by the EXCEL coloring function.
11. Support various kinds of printers. Test reports perfectly match the print sheet
12. Print preview, easy to adjust the reports size and edge.
13. Print reports directly or convert the report to graphic file JPG.
14. Built-in e-mail sending function.
15. Test reports include full curve graphic, test results, test conditions and sample parameters.
16. Chinese & English version alterable, able to add clients information.

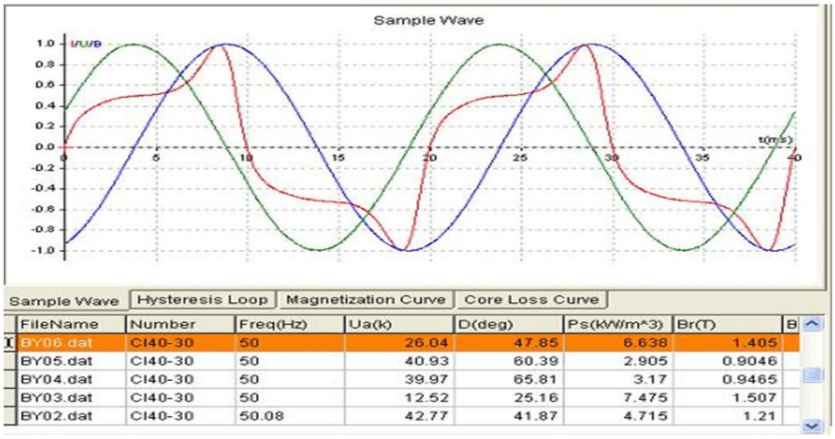
Test Graphs



Magnetization curve (Permeability curve)



Dynamic Hysteresis Loop Cluster



FileName	Number	Freq(Hz)	Ua(k)	D(deg)	Ps(kW/m^3)	Br(T)	B
BY06.dat	CI40-30	50	26.04	47.85	6.638	1.405	
BY05.dat	CI40-30	50	40.93	60.39	2.905	0.9046	
BY04.dat	CI40-30	50	39.97	65.81	3.17	0.9465	
BY03.dat	CI40-30	50	12.52	25.16	7.475	1.507	
BY02.dat	CI40-30	50.08	42.77	41.87	4.715	1.21	

The time functions secondary induced voltage

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Specification

According to GB/T 3658-2008 , under 1kHz ~ 100kHz , metallic powder core parameters:				
Parameter	Ps(%)	μa(%)	Bm(%)	Hm(%)
Uncertainty(k=2)	10	10	3	3
Repeatability (constant temperature)	±5	±5	± 1.5	± 1.5
Remark	1. Samples should be thin toriodal ring shape, inner/outter diameter<1.4. 2. Fixed B, Bm=100mT~200mT, demagnetizing before test, demagnetizing frequency≤test frequency. 3. Uncertainty is "-", means not required.			

According to GB/T 19346-2003 , under 20kHz~100kHz, nanocrystalline parameters :						
Parameter	Ps(%)	Ss(%)	μa(%)	δ(%)	Bm(%)	Hm(%)
Uncertainty(k=2)	5	5	3	-	1	2
Repeatability (constant temperature)	± 3	± 2.5	± 2	± 2	± 0.5	± 1
Remark	1. Samples should be thin toriodal ring shape, inner/outter diameter<1.5. 2. Fixed B, Bm=100mT~200mT, demagnetizing before test, demagnetizing frequency≤test frequency. 3. Uncertainty is "-", means not required.					

According to SJ 20966-2006 , under 20Hz~100kHz, test ferrites toriodal ring parameters :						
Parameter	Ps(%)	μa(%)	δ(%)	Bm(%)	Br(%)	Hc(%)
Uncertainty(k=2)	5	3	-	1	-	-
Repeatability (constant temperature)	± 3	± 2	± 2	± 0.5	± 1	± 1
Remark	1. Samples should be thin toriodal ring shape, inner/outter diameter ≈1.67 2. Fixed B, Bm=100mT~200mT, demagnetizing before test, demagnetizing frequency≤test frequency. 3. Uncertainty is "-", means not required.					

MATS-3000SA/1M	CH2335A high accuracy broadband analyzer
Output power : 200VA sine wave Frequency : 10Hz ~ 1MHz Frequency step rate : 1Hz Frequency accuracy : < 0.1% × current value Frequency error : < 0.05% Output voltage : 50Vrms , 0Hz ~ 500kHz 40Vrms , 10Hz ~ 40Hz; 500kHz ~ 1MHz Voltage accuracy : program control,1mV(lock Bm) Output current : 4Arms, 40Hz to 500kHz Current accuracy : program control,1mA(lock Hm) Voltage distortion : <0.5% Voltage stability : better than 0.1%	Current sampling : 1uA ~ 15A (I peak) 4 shifts Voltage sampling : 1mV ~ 1000Vrms (effective value) 4 shifts Sampling accuracy : Test signal is 5% ~ 100%of full-range 10Hz ~ 250kHz ±0.1% 250kHz ~ 500kHz ±0.2% 500kHz ~ 1.0MHz ±0.4%