

DEPARTMENT OF COMMERCE
BUREAU OF STANDARDS
WASHINGTON

February 11, 1931

TESTS OF MAGNETIC MATERIALS

This letter circular, together with Test Fee Schedule 143 appended, supersedes all previous letter circulars on tests of magnetic materials.

Scope of Magnetic Testing

The regular routine magnetic testing of the Bureau of Standards consists of the determination of normal induction and hysteresis values and the measurement of core loss. Such tests are made for the public primarily for the purpose of checking the accuracy of magnetic testing apparatus or for the settling of disputes arising from disagreement between different laboratories. Routine acceptance tests are undertaken only when satisfactory tests can not be obtained from qualified commercial laboratories, or for other reasons acceptable to the Bureau.

Tests to be made beyond the range indicated in the Fee Schedule or under different conditions, should be arranged for before shipment of the material. Other special tests include the calibration of specially prepared standard specimens for use for more precise checking of magnetic permeameters than can be done with ordinary test specimens. Such calibrations should be arranged for in advance and are made only upon specimens which are found to have a satisfactory degree of uniformity. (See B.S. Journal Research, V. 4, (R.P. 140) February 1930)

Normal Induction and Hysteresis

The points at which normal induction and hysteresis data should be taken depend upon the nature of the material and the use for which it is intended and should be specified in the request for test.

Test specimens must be at least 25.4 cm (10 inches) long and may be of any uniform rectangular cross-section having dimensions not exceeding 1.9 cm by 4.1 cm ($3/4$ inch by $1\ 5/8$ inches) or, round, having a diameter of 1.27 cm ($1/2$ inch). The rectangular section is preferred. In the case of sheet material, it

is recommended that the sampling procedure specified by the American Society for Testing Materials be followed.

Samples of magnet steel must be submitted in the hardened condition.

Core Loss

For this test 10 kilograms (22 pounds) of material, cut with a sharp shear into strips 50 cm (19 11/16 inches) in length and 3 cm (1 3/16 inches) in width, are required. Half of the strips should be cut parallel and half at right angles to the direction of rolling. The strips should be cut to size by the person submitting the material for test. It is recommended that the sampling procedure specified by the American Society for Testing Materials be followed.

Shipping Instructions

Test specimens should be given suitable identification marks, securely packed and shipped, prepaid, to the Bureau of Standards, Washington, D.C.

Requests containing information as to the tests desired, identification of the specimens and the object for which the test results are required should be mailed to the Bureau.

In the case of core loss tests, the value of specific gravity to be assumed should be specified.

Test specimens will be returned by express collect unless the Bureau is specifically requested to retain them.

DEPARTMENT OF COMMERCE
Bureau of Standards

Test Fee Schedule 143. - MAGNETIC MATERIALS

Effective January 1, 1927, superseding all previous schedules for the items covered.

For sizes of samples required, and other information regarding the tests, see Letter Circular 296.

Item	Description	Fee
	143a-c Normal induction and hysteresis with magnetizing forces not exceeding 300 gilberts per cm.	
143a	Determination of normal induction, first value	\$5.00
143b	Determination of normal induction, each additional value on same sample25
143c	Determination of normal hysteresis, the tip of the loop to be taken as a specified value or normal induction and determined under 143a. Each additional point on the loop75
143d	Determination of core loss at 60 cycles per second, maximum induction 10,000 gaussess, in accordance with specifications of the American Society for Testing Materials....	5.00
143z	For special tests not covered by the above schedule, fees will be charged dependent upon the nature of the test	



