

Ferrite Meter MF300F+

Measure Ferrite Content of Austenitic & Duplex Steel

An Overview

Industrial processing and chemical plants work at high temperatures and pressures, with often aggressive media and stainless steel is often the material of choice for these applications. If the ferrite content of the steel is too low, then welding of stainless material may crack at elevated temperature or with high stress or vibration. Alternatively, if the ferrite content is too high, the weld may be weaker and corrode.

To address the need to measure the amount of ferrite in a sample the Welding Research Council introduced the *Ferrite Number* (FN) as a standardised value which related to the ferrite content of an equivalently magnetic weld metal.

The volume percentage of ferrite can be estimated as about 70% of the FN but the relationship depends upon the type and origin of the stainless steel used and the measurement technique.

The Diverse Ferrite meter MF300F+ measures the Ferrite number (FN) of austenitic and duplex stainless steel weld material. It has a probe that is sensitive to ferrite content in a 10 mm area to a depth of approximately 1 mm. The instrument is calibrated using the secondary world standards held at The Welding Institute. All 16 standards are used in the calibration giving an instrument with a measurement range from 0 to 115 FN. Transfer standards are supplied with the instrument allowing performance to be verified at any time.

Features of MF300F+ Ferrite Meter

- *Non-destructive test of the ferrite content in a range of 0.1 to 115 FN equivalent to 0.1 to 83% Fe in austenitic and duplex steel.*
- *Robust and portable*
- *Standard or peak measurement of Ferrite Number*
- *Estimate of ferrite percentage (70% of FN)*
- *Automatic zero on demand*
- *Supplied with 5 transfer standards allowing veracity of instrument to be checked*
- *Storage of 52 measurements, downloaded to PC with RS232/USB option*
- *Use with high temperature samples (air-cooled probe option)*
- *Simple measurement with small sample area.*
- *Units selectable between WRC-FN and %Fe.*
- *Calibration with standards traceable to TWI secondary standards*
- *Supplied in carry case*



Applications

- *Measure ferrite content of stainless steel*
- *Measure ferrite content of alloy*
- *Measure ferrite content of weld deposits*

Options

- *RS232/USB*
- *Charger and rechargeables*
- *Air-cooled probe*

About the MF300F+

MF300F+ is the latest instrument in the popular range of magnetic meters from Diverse. The robust slimline probe benefits from a novel magnetic design with excellent coupling to the measurement sample. This results in sensitivity to a small well defined volume and excellent response over the full range of ferrite samples.

An air-cooled version of the probe allows Ferrite measurement of hot samples.



The latest software supports calibration over the whole range of secondary ferrite sample held by the TWI. Transfer samples are supplied with a range of FN allowing user verification of the calibration.

A new peak mode has been included. Storage of up to 52 measurements is included on the standard instrument. Communication with a PC, via RS232 or USB, is provided as an option including downloading of the measurement log.

Calibration/Standards

The Diverse MF300F+ is calibrated using standards that are traceable to internationally accepted secondary standards. The International Institute of Welding in the UK (IIW) developed secondary standards that have been tested by The Welding Institute,(TWI) according to methods described in DIN EN ISO 8249 and ANSI/AWS A4.2.

The master calibration of the instrument is made against these standards. The transfer calibration standards supplied with the MF300F+ are simulations of the magnetic effect of ferrite number and are each calibrated for this effect against the IIW standards.

Specification

Units	Ferrite Number FN Ferrite percentage F%
Range	0 - 115 FN 0 - 83% F%
Resolution	0.1 FN 0.1F%
Accuracy (10°C-30°C)	
FN 0 - 10	± 0.5 FN
FN 10 - 30	± 5% of the reading
FN 30 - 100	± 10% of the reading
Accuracy (30°C-300°C)	
FN 0 - 10	± 1 FN
FN 10 - 30	± 10% of the reading
FN 30 - 100	± 20% of the reading
Transfer standards	Five standards, range typically 3 FN to 115 FN
Zero	Automatic on demand
Mode	Average or peak
Storage	52 records
PC Download	RS232 or USB
Probe	Pencil style, 15mm diameter length 120mm
Operating temperature	Standard 0°C-40°C Air cooled 0°C-300°C
Humidity	Non-condensing
Weight in case	1.25 kg
Case dimensions	210 x 100 x 45 mm

Measurement Method

The MF300F+ measures using magnetic induction. A magnetic field is induced from a rare earth magnet into the sample via a complex magnetic path. The magnetic field strength is measured and this value is then used to compute the ferrite content.

Ordering Options

Standard Ferrite meter	MF300F+
Ferrite meter with air-cooled probe	MF300F+AC
Serial software	RS232/USB
Ferrite meter with thickness option	MF300F+TH

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