

FERITSCOPE® DMP®30

Gauge for measurement of the ferrite content
in austenitic and duplex steel



FERITSCOPE® DMP®30

Description

The FERITSCOPE® DMP®30 determines the delta-ferrite content of austenitic and Duplex steels using the magnetic inductive test method. All magnetizable structure sections are captured i. e., in addition to delta-ferrite also strain-induced martensite, for example, or other ferritic phases. A specific advantage of the magnetic induction method for measuring the ferrite content is that a sigma phase, i. e., a Fe-Cr precipitation, which has formed due to excess ferrite content and unfavorable cooling conditions, for example, is recognized correctly as a non-ferritic structural component. In comparison, erroneous interpretation of ferrite content is likely in a metallographic section where a sigma phase is not easily distinguished from a ferritic structure. Areas of application are onsite measurements, e.g. of austenitic platings as well as weld seams in stainless steel pipes, containers, boilers or other products made of austenitic or duplex steel.

Universally

- Suitable for measurements according to the Basler Standard
- Already from a plating thickness of 3 mm (118 mils) the ferrite content can determine without substrate influence
- Various probe models are connectable to the gauges, appropriate to your individual applications; Measurement range, trueness and repeatability are dependent on the connected probe. You will find this data in the respective probe data sheet.
- Uniform, simple and convenient operation
- Only one calibration required for entire relevant measurement range from 0.1 to approx. 90 FN; calibration to reference value or by customer-specific calibration standards; adherence to the measurement accuracy specified in standards ANSI / AWS A4.2M / A4.2:1997
- Calibrations for various applications are storable in and recallable from the connected probe
- USB and Bluetooth® interface
- Compact and robust gauge with aluminium case, protection type IP64 and Gorilla® Glass display protector
- Battery rechargeable in the gauge or by a separate charger

Applications

- Determination of delta-ferrite content of austenitic and duplex steel
- Determination of deformation martensite in austenitic materials
- Finding weld seams in polished surfaces
- Capturing a ferrite content profile along the weld seam

Metrological Features

Measurement acquisition

- Default: After each placement of the probe onto the surface, a measured reading is automatically recorded
- Scan mode: While probe is moving over the surface the measured readings are automatically recorded according to the defined time interval and number of measurements.

Indication of measurement acquisition

- Audible by a short beep, can be disabled
- Visual by colored illuminated stripe (green: measured value recorded)
- Haptic feedback by gauge vibration, can be disabled
- Limit violation: 2 short beeps, red illuminated stripe and gauge vibration
- Measured reading between the limits: 1 short beep, green illuminated stripe and gauge vibration

Measurement performance

Measurement speed, measurement range, trueness etc. depend on connected probe, you will find these data in the respective probe data sheet

Grouping measured readings

Block (group) size can be set between 1 and 1000 single readings

Storage of measured readings

Can be disabled

Measurement unit/Measurand

FN or Fe%

Limit Monitoring

Can be disabled; limit values can be set

Offset value/ correction value

Can be set, is deducted automatically from the measured reading.

Resolution of the displayed values

- Low (up to 1 decimal place)
- Medium (up to 2 decimal places)
- High (up to 3 decimal places)

Measurement modes

■ Single Reading

After each placing of the probe, the measured reading is displayed and stored automatically in the gauge.

■ Free Running

After placing the probe on the surface the continuous display of the measured readings appears without automatic storage, useful for quick checking of ferrite content distribution in weld seams

■ Scan

The Scan mode allows a defined acquisition of the measured readings while the probe is moving over the surface. You can set the number of single readings and the time interval for the measurement acquisition in the gauge. Useful to determine the ferrite content over surface areas.

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Calibration

The measuring system (gauge and connected probe) needs reference values as relation for determining the ferrite content. This adjustment is carried out by a calibration (normalization). Calibrations with customer-specific calibration standards or correction factors (included manual) can be used to take influences of the specimen shape (strong curvature), plating and substrate thicknesses into account. Furthermore, the gauge contains a function for semi-automatic calibration.

Calibration method

Adjustment of the measuring system (gauge and connected probe) to a zero point (base) and adjustment to up to three ferrite content values by using calibration standards. On recalibration, individual calibration steps can be skipped.

Store calibrations

The storage location for a calibration depends of the connected probe.

- Digital probe: up to 100 calibrations can be stored in the connected digital probe; probe identifiable by the USB-C female jack and by the probe name, always beginning with the letter D
- Analog probe: connection via DMP®-F-probe-Adapter plugged into the gauge; a total of up to 100 calibrations can be stored in the DMP®-F-Probe-Adapter; only the calibrations that were created with the probe connected to the DMP®-F-Probe-Adapter are available in the gauge in each case.
Probe identifiable by the 10-pin male jack and by the probe name, always beginning with the letter F or containing the letter F.

Calibration check

Checking the calibration state of the selected calibration and the measuring accuracy of the measuring system. You can check whether the mean value of the check measurement matches the reference value of the calibration standard within the scope of measurement uncertainty (in accordance with ISO/IEC Guide 98-3).

Lock calibrations

You can lock selected calibrations.

Ways of air reference value acquisition

During measurement, the air reference value is used to reference the zero point determination. Regular measurement of the air reference value is necessary to achieve high measurement accuracy. This is done automatically in the measurement mode Single Reading when the probe is lifted off from the surface.

- Default in Probe: air value acquisition as factory predefined in probe (Dynamic/Static)
- Dynamic: automatic acceptance of the air value always when the probe is lifted from the surface, default mode
- Static: no automatic acceptance of the air value always when the probe is lifted from the surface. In this case, the air reference value must be measured manually at regular intervals. This may be useful for measurements in small cavities or pipes where the minimum lift-off distance of the probe cannot be maintained within cavity/pipe.

General Features

Measurement views

- Simple: the measured reading with the set measurement unit is displayed only; additionally with display of the limit values if set
- Statistics: the measured reading with tabular measurement statistics

Languages

Many different display languages, beside German and English several other European and Asian languages

Date & Time

- settable
- Date and time formats settable (DD.MM.YY or MM/DD/YY and 12 h or 24 h)

Storage space

- Number of batches: $\leq 2\,500$
- Total number of measured readings: $\leq 250\,000$
- Number of blocks per batch: $\leq 10\,000$
- Number of measured readings per block: $\leq 10\,000$

Evaluation

- Batch statistics, evaluation of all stored measured readings of one batch
- Block statistics, evaluation over the grouped measured readings, evaluation per block
- Graphical presentation of measured readings, histogram of all measured readings of one batch, from 5 readings

Data transmission

- via USB
- via Bluetooth® only with Fischer-Bluetooth stick
- Data export via Tactile Suite® to Excel® (online, offline)
- Data retrieval by Tactile Suite®: batches, single readings, batch statistics and block statistics

Test method

on basis of DIN EN ISO 2178 / ASTM D7091 magnetic induction test method

Connectable probes

- Digital probes with USB-C female jack, probe names always beginning with the letter D
- Via DMP®-F-Probe-Adapter probe FGAB1.3-Fe with 10-pin male jack

At factory each individual probe is adjusted at several reference points with the greatest care to ensure the highest possible degree of trueness.

Energy management

- **Power supply:** Li-Ion rechargeable battery, model RRC1130
Nominal voltage: 3.8 V=
Nominal capacity: 3880 mAh, 14.7 Wh
max. charge voltage: 4.35 V=
max. charge current: 2.4 A
- **Energy saving** for longest battery life
 - Automatic gauge switch-off after a preset time period without operation (key use, data transfer or measurement acquisition)
 - Automatic dimming of the display brightness after a preset time period

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■ Battery operating period

> 24 h with continuous measurement and about +20 °C (+68 °F) ambient temperature

■ Battery charging time

Temperature during charging: 0 ... +45 °C (+32 ... +113 °F)

about 6 h by default

about 3 h for fast charging

Protection class

IP64, dust-protected, splash-water proof

IP64 refers to the ability to withstand dust and clear water. No protection in salt water and other liquids, especially soapy water, alcohol and/or heated liquid.

Admissible climatic conditions during storage and transport

We recommend to store and transport battery and gauge separately

- Gauge with/without Li-Ion rechargeable battery
- Indoor only
- Ambient temperature: -20 ... +60 °C (-4 ... +140 °F)
- Relative humidity: 5 ... 60 %RH at 20 °C (+68 °F), non-condensing

Admissible climatic conditions during operation

- Ambient temperature: 0 ... +40 °C (+32 ... +104 °F)
- Relative humidity: 5 ... 85 %RH at 25 °C (+77 °F), non-condensing
- Altitude of location: up to 2000 m (6561.7 ft) (above sea level)
- Pollution degree: 3

Visual indications

- Graphic display with Corning® Gorilla® Glas 3 as robust cover glass
- Automatic flip view (can be disabled) allows optimum reading in different measuring positions
- Colored illumination stripe to signal measurement acquisition, limit violation and battery charging status

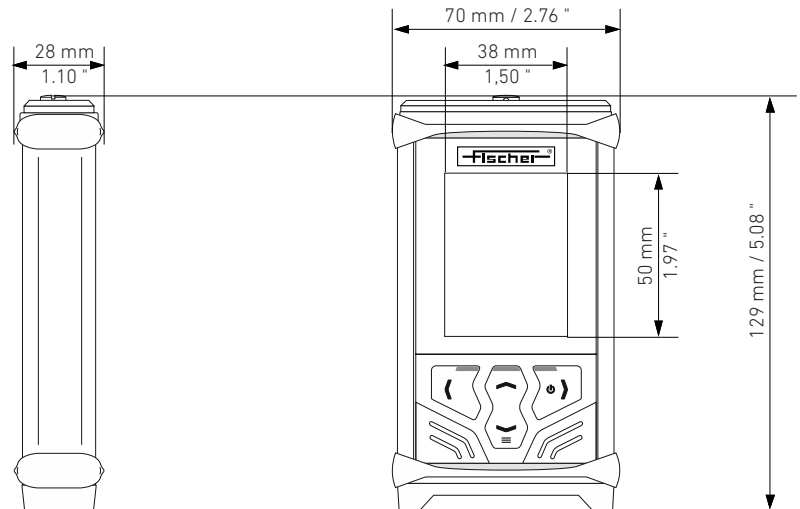
Connections

- 2 USB female jacks, type C
 - USB 3.1, 900 mA/5 V=, at gauge bottom: for connecting digital Fischer probe ■ for fast charging the Li-Ion rechargeable battery in the gauge
 - USB 3.1, 500 mA/5 V=, at gauge top: for charging the Li-Ion rechargeable battery in the gauge ■ for connection to a PC for data transfer ■ max. cable length: 3 m (118 ")
- USB socket, type A, at gauge top
 - Specific for inserting Fischer-Bluetooth stick for data transfer via Bluetooth®
Fischer-Bluetooth stick (scope of supply): Bluetooth® v 4.0. LE, transmit power up to -27 dBm

Weight

Gauge with rechargeable battery: 276 g (0.61 lb)

Dimensions



Scope of supply

Gauge, Li-Ion rechargeable battery, USB cable type C to type A (1,5 m/59.06 "), safety information and quick guide, lanyard, gauge case, Fischer-Bluetooth stick

Order Information

Gauge

- Order number: 1007334

Accessories/Spare parts

- Manufacturer's Certificate M according to DIN 55350-18: in conjunction with probe only, see probe data sheet
- Evaluation and archiving software Tactile Suite®: free of charge download, you will find download link in quick guide and manual
- DMP®-F-Probe-Adapter: 1007336
for connecting analog probes with 10-pin connection plug
- Gauge support stand: 1008201
- USB cable: 1008215
plug type C to A, 1 m (39.4 ")
- Fischer-Bluetooth stick: 1008864
Bluetooth® v 4.0. LE, transmit power up to -27 dBm
- Li-Ion rechargeable battery, model RRC1130: 1008303
- Charger for Li-Ion rechargeable battery, model RRC1130: 1008304
- Gauge foot: 1005837
- Battery compartment cap: 1007162

You must order the probe D-PCB separately. Call us, we are gladly support you.

Suitable calibration standards can be found in the respective probe data sheets.

FERITSCOPE® DMP®30

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