

AC Flux Leakage Testing



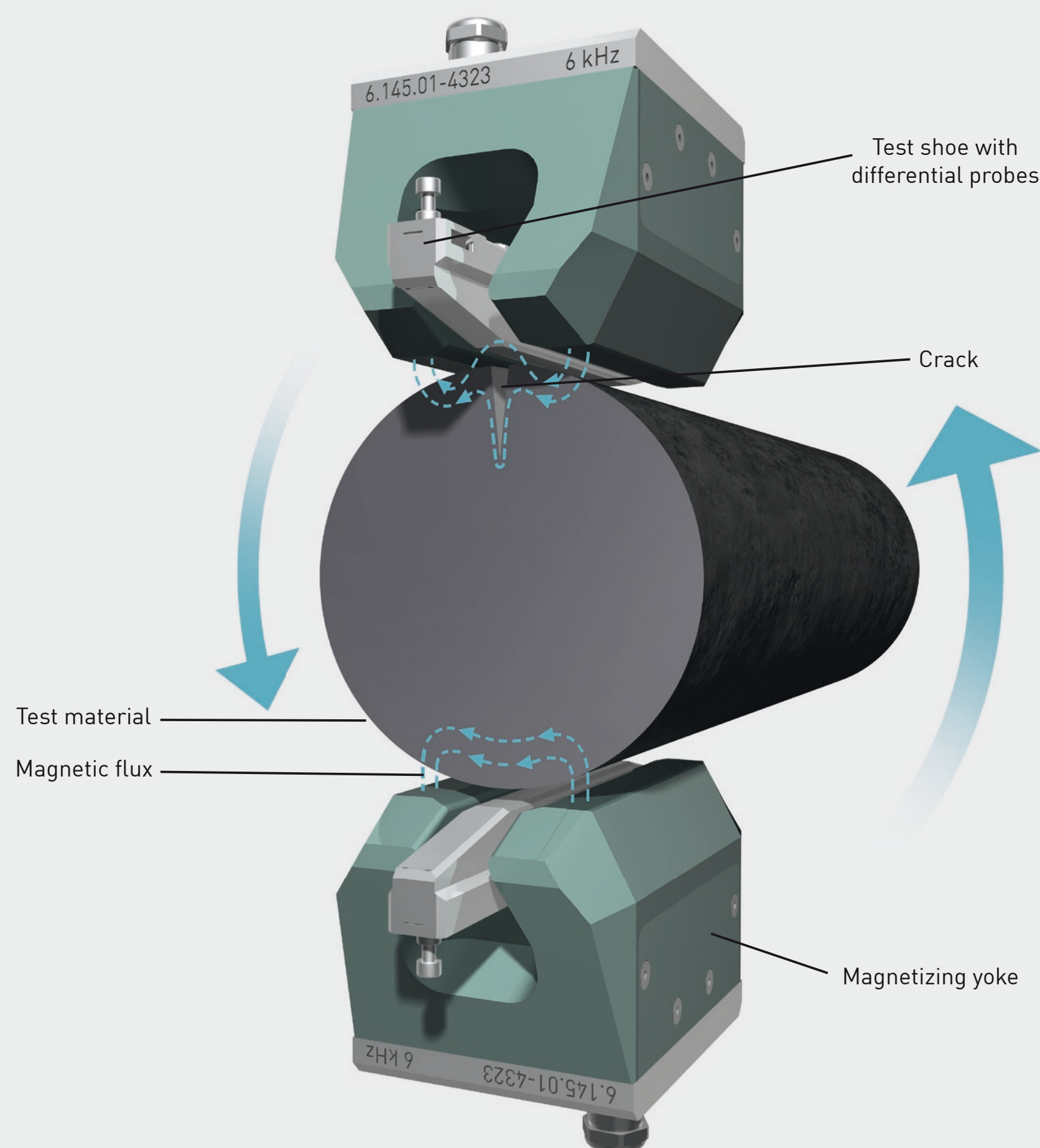
Operating principle of the alternating field flux leakage method

The alternating field flux leakage testing method is one of the non-destructive electromagnetic testing methods. It is the most sensitive one for testing for surface defects in hot-rolled ferromagnetic steel bars. The testing method ensures the detection of longitudinal-oriented, crack-like defects starting at a depth of 0.1 mm. As a result, production errors can be detected at an early stage and product quality can be significantly increased. Testing is done fully automatic, dry and at a high test speed. An additional advantage of the applied alternating current magnetization is that no residual magnetism remains in the bar after testing, therefore eliminating the need for additional demagnetization. Modern sensors, electronics, and software solutions offer a variety of application and evaluation options for the metal-producing and metal-processing industry.

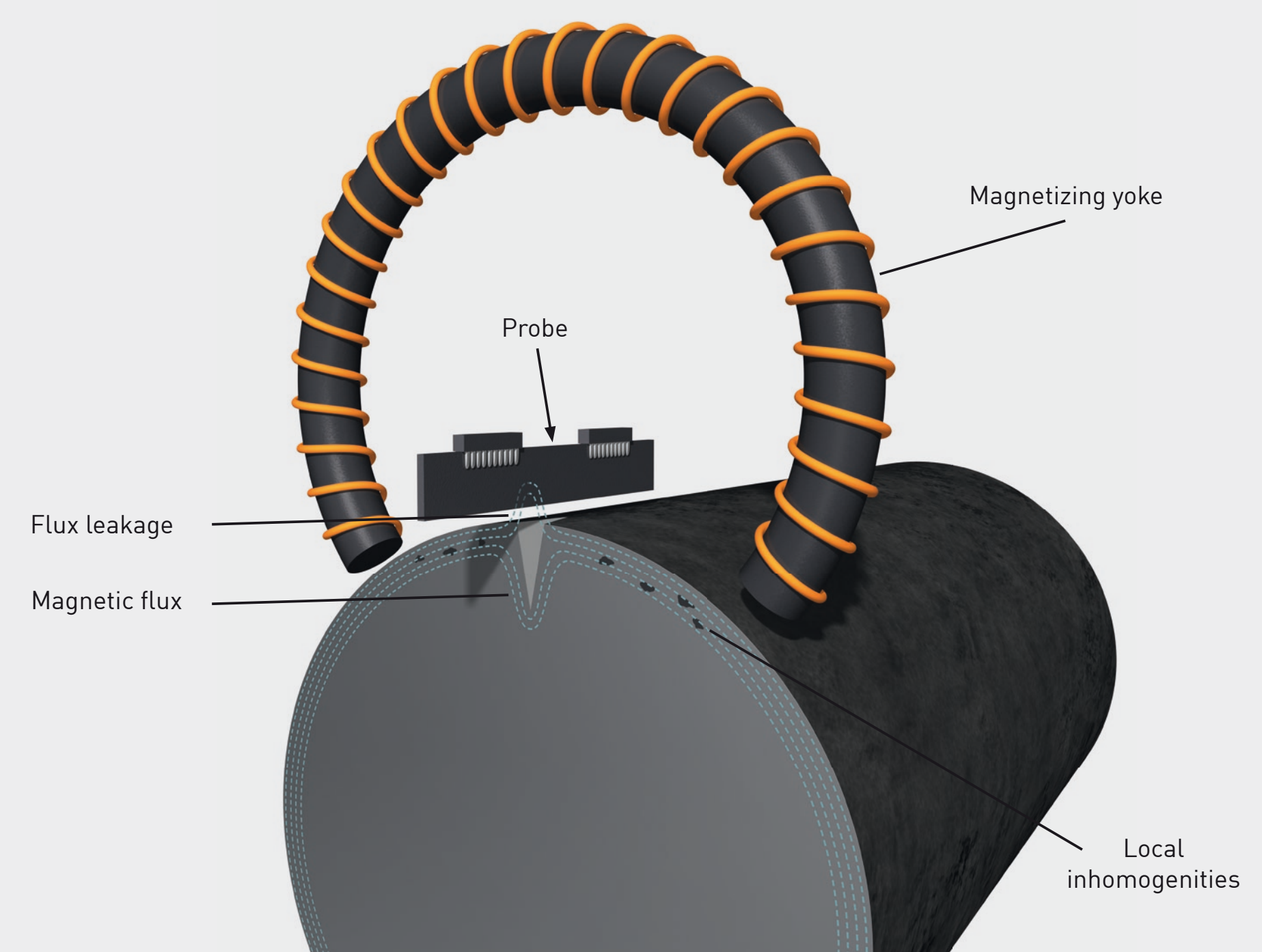
CIRCOFLUX® by FOERSTER

The AC flux leakage testing system CIRCOFLUX from FOERSTER is used for the testing of ferromagnetic black and bright material with a diameter of 10 – 180 mm. Thanks to high testing speeds, the production process is not affected. As a complete system supplier, FOERSTER develops and produces not only individual instruments but also turnkey inspection lines. These are exactly tailored to individual requirements. For example, CIRCOFLUX can be combined with a MAGNATEST to simultaneously verify the material properties. FOERSTER has developed the instrumentation software for simple and fast evaluation of all testing data. This software bundles the results of the individual testing devices in the inspection line in one user-friendly interface and provides a clear presentation. In addition, the parameters for different applications can be stored and retrieved centrally for all test instruments of the line.

Testing with CIRCOFLUX®



- Alternating field or AC flux leakage testing uses two encircling magnetization yokes through which an alternating current flows. These yokes magnetize the test material without contact in the transverse direction.
- The distance between the yoke and the test material is a few millimeters. Between the yoke legs there are test shoes with protected probes that scan the surface with contact.
- The magnetic flux is concentrated on the material surface and is thus particularly sensitive for the detection of smallest surface defects from approx. 0.1 mm in depth.



- In the case of defect-free material, the magnetic flux produces a closed circuit in the material along the surface to a depth of approx. 1 mm. At defects in the surface of the material, the magnetic flux emerges from the material surface above the defect. This is referred to as leakage flux, which is detected by the sensor and can eventually be seen as a signal on the user interface.
- Due to the small dimensions of the single sensor, a very high sensitivity can be achieved even for smallest defects.

Application Examples

- Rolling mills
- Production of ferromagnetic, round steel bars
- Black and bright material

Testing for longitudinal defects

- caused e.g. by:
- Over-fill
 - Stress cracking

CIRCOFLUX® for AC Flux Leakage Testing



CIRCOFLUX® Sensor System Ro 130

