

Structure Testing of Cast Components

Cast components such as components of brake systems must undergo a material and structure testing for monitoring the material quality. This usually takes place by means of the magneto-inductive and non-destructive testing principle.

The MAGNATEST D testing instrument from FOERSTER uses high-performance harmonic evaluation to enable reliable and sensitive testing e.g. for the cementite content.

A prerequisite for the higher harmonics evaluation is a powerful amplifier, as used in the MAGNATEST D testing instrument. It ensures that the component in the test coil is exposed to a very high alternating magnetic field. The resulting „hysteresis curve“ forms a very sensitive indicator for a variety of material properties.



Fig. 1: MAGNATEST D

Figure 2 shows cast components with different structures and alloys. The aim is to separate them into 4 different groups.

For this purpose, the test pieces are placed in the middle of a test coil that is adapted to the geometry of the test piece (see Fig. 2). For reproducible testing a constant test position is required.

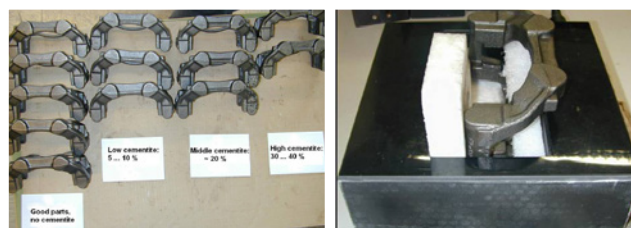


Fig. 2: Cast components and bracket in the test coil

The sensor detects the measurement signal resulting from the magnetic and electrical properties of the test piece. This signal is displayed graphically as a measuring point. As part of the calibration, sorting limits are formed by the statistical evaluation of several measured values. In the series testing, a comparison is made with the specified tolerance limits. The automatic sorting of the workpieces into good and bad parts takes place according to the respective test result.

The test results in Figure 3 show that a sorting of the different castings into four groups is possible.

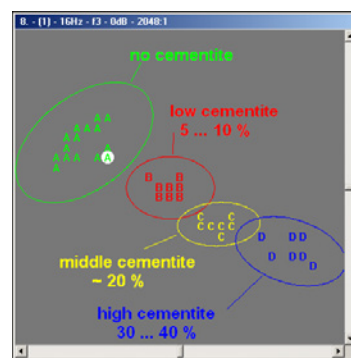


Fig. 3: Graphical presentation of the test results

For the structure testing of cast components, we recommend the testing instrument MAGNATEST D in combination with test coils adapted to the material's geometry. Further information about our products and industry solutions can be found on our homepage at: foerstergroup.com