IRON CHECK E

Digital Test for Chemical Determination of Iron Content (Patent Number: 2982974)

Various wear processes of two-stroke marine diesel engines, leading to increased iron concentration in cylinder drain oil, represent currently a big challenge for ship operators. Changes in operation of such vessels (slow-steaming practices with a partial load) as well as modified design of two-stroke engines (longer piston strokes) for optimization of fuel oil expenses often result in lower operating temperatures and in effect the phenomenon of “cold corrosion”. The amount of iron present in cylinder drain oil provides direct indication of wear rate of cylinder components. Regular verification of iron concentration gives valuable information about the condition of cylinder components, i.e. helps to determine the level of wear caused either by mechanical abrasion (iron particles) or acid corrosion (iron salts) at an early stage.

For effective management of cylinder lubricant, Martechnic® has designed a new digital test device IRON CHECK E which enables easy on-board trend monitoring of the degree of iron concentration. Optimized semi-automatic test procedures with electronic analysis of cylinder drain oil samples and direct digital display of iron amount provide engineers and users with quick and precise test results.
Through a combination of iron test and BN measurements with Martechnic®’s TWIN CHECK 4.0 test kit proper lubrication of cylinder components and therefore optimal engine performance can be ensured.

Features:

- Measuring range: 15/20-1100 mg/kg (ppm)
- Measuring temperature: 70 ˚C
- Measuring time: about 15 min. for two cylinder drain oil samples
- Measurement method: chroma meter with LED transmitted light source
- Accuracy: +/- 20 mg/kg (ppm) (confirmed repeatability of test results)

Benefits:

- Precise semi-automatic measurement of iron content
- Processing of two samples simultaneously (effective time-saving technique)
- Easy-to-read, digital display of test results
- No need to use color reference chart
- Early warning of corrosion problems in case of regular application

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- Efficient adjustment of lubrication of crosshead engines

The measurement of iron content in cylinder drain oil is based on the chemical reaction of iron present in cylinder lubricant in corroded or abrasive state and special reaction liquid. The color of fluids obtained through the chemical reaction will vary from light blue to dark blue directly depending on the iron concentration in cylinder drain oil samples. The darker the hue of the fluid, the higher level of iron concentration the cylinder lubricant contains.

Once the IRON CHECK E is turned on, it is necessary to simply follow the instructions appearing on the digital display of the test device. The measurement of total iron and corroded iron content is conducted in a similar manner. In the first step, two chambers A and B are automatically heated up to the default temperature of 70˚C. During the heating process, the reaction liquid can be prepared in glass vials. As soon as the heating process is completed, the glass vials are placed into the corresponding chambers of the IRON CHECK E in order to proceed with pre-heating of the reaction liquid. After that once the reaction liquid is ready, the oil sample can be added into the glass vial.

While the chemical reaction occurs, the derived color of the fluid in the glass vials will be automatically assessed by means of the built-in chroma meter with LED transmitted light source. The degree of iron concentration ranging up to 1100 mg/kg (ppm) will be shown on the display. The measured values will be then automatically saved on the internal memory chip.