

DIN 51852-3:2024-05 (E)

Coolants for internal combustion engines - Test methods - Part 3: Direct determination of element contents from additives and impurities by optical emission spectral analysis with inductively coupled plasma (ICP OES)

Contents	Page
Foreword	4
1 Scope	5
2 Normative references	6
3 Terms and definitions.....	6
4 Principle.....	6
5 Apparatus	6
5.1 Optical emission spectrometer with inductively coupled plasma (ICP OES).....	6
5.2 Laboratory apparatus.....	8
6 Reagents.....	9
7 Sampling.....	10
8 Setting the reference curves	10
8.1 Reference solutions.....	10
8.2 Calibration solutions and calibration control solutions.....	12
8.3 Setting the calibration lines.....	12
8.4 Verification of the calibration	13
9 ICP OES spectrometer settings.....	13
10 Sample preparation.....	13
10.1 General	13
10.2 Sample measurement	14
11 Procedure	14
12 Evaluation.....	14
13 Expression of results.....	15
14 Precision	15
14.1 General	15
14.2 Repeatability, r	15
14.3 Reproducibility, R	15
15 Test report.....	16
Bibliography.....	17

Tables

Table 1 — Concentration ranges.....	5
Table 2 — Overview of recommended analysis lines and potential interferences — wear/contamination	7
Table 3 — Recommended wavelengths for the measurement of the element as an internal standard.....	8

Table 4 — Possible elements in a multi-element standard stock solution	9
Table 5 — Example for preparing the reference solutions	10
Table 6 — Analyte concentrations in the reference solutions	11
Table 7 — Repeatability and reproducibility— Analyte	16