

ISO/TS 21396:2017-12 (E)

Rubber - Determination of mass concentration of tire and road wear particles (TRWP) in soil and sediments - Pyrolysis-GC/MS method

| Contents | | Page |
|-----------------------|---|-------------|
| Foreword | | iv |
| Introduction | | v |
| 1 | Scope | 1 |
| 2 | Normative references | 1 |
| 3 | Terms and definitions | 1 |
| 4 | Principle | 2 |
| 5 | Reagents | 2 |
| 6 | Apparatus | 3 |
| 7 | Specimen preparation laboratory | 5 |
| 8 | Measuring range | 5 |
| 9 | Limit of detection | 5 |
| 10 | Procedure | 6 |
| 10.1 | General | 6 |
| 10.2 | Sample collection | 6 |
| 10.3 | Deuterated internal standard preparation | 6 |
| 10.4 | Calibration curve preparation | 7 |
| 10.4.1 | Stock solutions | 7 |
| 10.4.2 | Calibration curves | 7 |
| 10.5 | Sample preparation | 8 |
| 10.5.1 | Oven drying | 8 |
| 10.5.2 | Sieving and homogenization | 8 |
| 10.6 | Sample measurement | 8 |
| 10.6.1 | Sample mass | 8 |
| 10.6.2 | Internal standard addition | 9 |
| 10.6.3 | Pyrolysis-gas chromatograph/mass spectrometer measurement | 9 |
| 11 | Analysis | 9 |
| 11.1 | TRWP detection limit | 9 |
| 11.2 | Quantity of tyre polymer in the sample | 9 |
| 11.3 | Mass concentration of TRWP | 10 |
| 12 | Performance characteristics | 10 |
| 12.1 | General | 10 |
| 12.2 | Specific performance characteristics | 10 |
| 12.3 | Method detection limit | 10 |
| 13 | Test report | 10 |
| Annex A (informative) | Recipe for calibration curves and stock solutions | 12 |

| | |
|--|-----------|
| Annex B (informative) Curie-point pyrolyser | 14 |
| Annex C (informative) Representative calibration curves and pyrograms | 15 |
| Annex D (normative) Calculation of TRWP detection limits | 20 |
| Annex E (normative) Calculation of results using dimer markers | 21 |
| Bibliography | 23 |