

ISO 1352:2021-12 (E)

Metallic materials - Torque-controlled fatigue testing

| Contents | | Page |
|------------------------------|--|-------------|
| Foreword | | v |
| 1 | Scope | 1 |
| 2 | Normative references | 1 |
| 3 | Terms and definitions | 1 |
| 4 | Symbols and abbreviated terms | 3 |
| 5 | Principle of test | 4 |
| 6 | Test plan | 5 |
| 7 | Shape and size of specimen | 5 |
| 7.1 | Form | 5 |
| 7.2 | Dimensions | 7 |
| 7.2.1 | Specimens of circular cross-section | 7 |
| 7.2.2 | Specimens with tubular cross-section | 8 |
| 8 | Preparation of specimens | 8 |
| 8.1 | General | 8 |
| 8.2 | Machining procedure | 8 |
| 8.3 | Sampling and marking | 9 |
| 8.4 | Surface conditions of specimen | 9 |
| 8.5 | Dimensional checks | 10 |
| 8.6 | Storage and handling | 10 |
| 9 | Apparatus | 10 |
| 9.1 | Testing machine | 10 |
| 9.1.1 | General | 10 |
| 9.1.2 | Torque cell | 10 |
| 9.1.3 | Gripping of specimen | 11 |
| 9.1.4 | Alignment check | 11 |
| 9.1.5 | Axial force | 11 |
| 9.2 | Heating system | 12 |
| 9.3 | Instrumentation for test monitoring | 12 |
| 9.3.1 | Recording system | 12 |
| 9.3.2 | Cycle counter | 12 |
| 9.3.3 | Checking and verification | 13 |
| 10 | Test procedure | 13 |
| 10.1 | Mounting of specimen | 13 |
| 10.2 | Frequency of testing | 13 |
| 10.3 | Heating for the isothermal elevated temperature test | 13 |
| 10.4 | Application of torque | 13 |
| 10.5 | Calculation of nominal torsional (shear) stress | 13 |
| 10.6 | Recording of temperature and humidity | 14 |
| 10.7 | Failure and termination criteria | 14 |
| 10.7.1 | Failure | 14 |
| 10.7.2 | Termination | 14 |
| 11 | Measurement uncertainty | 14 |
| 12 | Test report | 15 |
| Annex A (informative) | Presentation of results | 16 |

| | |
|---|-----------|
| Annex B (informative) Verification of alignment of torsional fatigue testing machines | 20 |
| Annex C (informative) Measuring uniformity of torsional strain (stress) state | 22 |
| Annex D (informative) Estimation of measurement uncertainty | 25 |
| Bibliography | 27 |