

DIN EN ISO 10439-4:2015-05 (E)

Petroleum, petrochemical and natural gas industries - Axial and centrifugal compressors and expander-compressors - Part 4: Expander-compressors (ISO 10439-4:2015); English version EN ISO 10439-4:2015

Contents

Page

| | |
|---|-----------|
| Foreword | v |
| Introduction | vi |
| 1 Scope | 1 |
| 2 Normative references | 1 |
| 3 Terms, abbreviated terms, and definitions | 1 |
| 4 General | 1 |
| 4.1 Dimensions and units..... | 1 |
| 4.2 Statutory requirements..... | 1 |
| 4.3 Unit responsibility..... | 2 |
| 4.4 Basic design..... | 2 |
| 4.5 Materials..... | 2 |
| 4.6 Casings..... | 2 |
| 4.6.1 Pressure-containing casings..... | 2 |
| 4.6.2 Casing repairs..... | 3 |
| 4.6.3 Material inspection of pressure containing parts..... | 3 |
| 4.6.4 Pressure casing connections..... | 3 |
| 4.6.5 Casing support structures..... | 3 |
| 4.6.6 External forces and moments..... | 3 |
| 4.6.7 Variable nozzles and heat shields..... | 3 |
| 4.7 Rotating elements..... | 4 |
| 4.7.1 General..... | 4 |
| 4.7.2 Shaft sleeve..... | 4 |
| 4.7.3 Shafts..... | 4 |
| 4.7.4 Impellers..... | 5 |
| 4.8 Dynamics..... | 5 |
| 4.8.1 Vibration balancing..... | 5 |
| 4.9 Bearings and bearing housings..... | 6 |
| 4.9.1 General..... | 6 |
| 4.9.2 Hydrodynamic radial bearings..... | 7 |
| 4.9.3 Hydrodynamic thrust bearings..... | 7 |
| 4.9.4 Bearing housings..... | 7 |
| 4.10 Expander-compressor shaft seals..... | 8 |
| 4.11 Integral gearing..... | 8 |
| 4.12 Nameplates and rotation arrows..... | 8 |
| 5 Accessories | 8 |
| 5.1 Drivers..... | 8 |
| 5.2 Couplings and guards..... | 9 |
| 5.3 Lubrication and sealing systems..... | 9 |
| 5.4 Mounting plates..... | 9 |
| 5.5 Controls and instrumentation..... | 9 |
| 5.5.1 Vibration and position monitoring..... | 9 |
| 5.5.2 Hydrodynamic bearings..... | 9 |
| 5.5.3 Magnetic bearings..... | 9 |
| 5.5.4 Overspeed shutdown system..... | 10 |
| 5.5.5 Permanent strainer..... | 11 |
| 5.6 Piping and appurtenances..... | 11 |
| 5.7 Special tools..... | 12 |

| | | |
|----------|---|-----------|
| 6 | Inspection, testing, and preparation for shipment | 12 |
| 6.1 | General | 12 |
| 6.2 | Inspection | 12 |
| 6.3 | Testing | 12 |
| 6.3.1 | General | 12 |
| 6.3.2 | Wheel shaker test | 12 |
| 6.3.3 | Mechanical running test | 12 |
| 6.3.4 | Assembled machine gas leakage test | 14 |
| 6.3.5 | Optional tests | 14 |
| 6.4 | Preparation for shipment | 15 |
| 7 | Supplier's data | 15 |
| 7.1 | General | 15 |
| 7.2 | Proposals | 16 |
| 7.2.1 | Technical data | 16 |
| 7.3 | Contract data | 16 |
| 7.3.1 | General | 16 |
| 7.3.2 | Curves and data sheets | 16 |
| | Annex A (normative) Datasheets | 17 |
| | Annex B (informative) Vendor (Supplier) data and drawing requirements (VDDR) | 23 |
| | Annex C (informative) Nomenclature | 33 |
| | Annex D (informative) Typical materials | 35 |
| | Annex E (informative) Inspector's checklist | 41 |
| | Annex F (informative) Nozzle forces and moments | 46 |
| | Annex G (informative) Lubrication and sealing requirements | 50 |
| | Bibliography | 52 |