

ISO 13707:2000-12 (E)

Petroleum and natural gas industries - Reciprocating compressors

| Contents | | Page |
|--------------------|---|-------------|
| Foreword | | vi |
| Introduction | | vii |
| 1 | Scope | 1 |
| 2 | Normative references | 1 |
| 3 | Terms and definitions | 3 |
| 4 | Statutory requirements | 8 |
| 5 | Basic design | 8 |
| 5.1 | General | 8 |
| 5.2 | Permissible speeds | 10 |
| 5.3 | Permissible discharge temperature | 10 |
| 5.4 | Rod and gas loads | 11 |
| 5.5 | Critical speeds | 11 |
| 6 | Compressor components | 12 |
| 6.1 | Compressor cylinders | 12 |
| 6.2 | Valves and unloaders | 16 |
| 6.3 | Pistons, piston rods and piston rings | 17 |
| 6.4 | Crankcases, crankshafts, connecting rods, bearings and crossheads | 18 |
| 6.5 | Distance pieces | 19 |
| 6.6 | Packing cases and pressure packing | 20 |
| 6.7 | Nameplates and rotation arrows | 22 |
| 7 | Materials | 22 |
| 7.1 | General | 22 |
| 7.2 | Pressure-containing parts | 24 |
| 7.3 | Castings | 24 |
| 7.4 | Forgings | 25 |
| 7.5 | Fabricated cylinders and cylinder heads | 25 |
| 7.6 | Repairs to castings and forgings | 27 |
| 7.7 | Welding | 28 |
| 7.8 | Low temperature service | 29 |
| 8 | Lubrication | 29 |
| 8.1 | Compressor frame lubrication | 29 |
| 8.2 | Cylinder and packing lubrication | 31 |
| 9 | Accessories | 32 |
| 9.1 | Drivers | 32 |
| 9.2 | Couplings and guards | 35 |
| 9.3 | Reduction gears | 35 |
| 9.4 | Belt drives | 36 |
| 9.5 | Mounting plates | 36 |
| 9.6 | Intercoolers and aftercoolers | 38 |
| 9.7 | Air intake filters | 39 |
| 9.8 | Special tools | 40 |

| | | |
|-------------|--|------------|
| 10 | Controls and instrumentation | 40 |
| 10.1 | General | 40 |
| 10.2 | Control systems | 41 |
| 10.3 | Instrument and control panels | 42 |
| 10.4 | Instrumentation | 42 |
| 10.5 | Alarms and shut-downs | 44 |
| 10.6 | Electrical systems | 46 |
| 10.7 | Vibration and position detectors | 46 |
| | | |
| 11 | Piping and appurtenances | 47 |
| 11.1 | General | 47 |
| 11.2 | Frame lubrication oil piping | 52 |
| 11.3 | Forced-feed lubricator tubing | 52 |
| 11.4 | Coolant piping | 52 |
| 11.5 | Intrument piping | 53 |
| 11.6 | Process piping | 53 |
| | | |
| 12 | Pulsation and vibration control | 53 |
| 12.1 | General | 53 |
| 12.2 | Design approaches | 54 |
| 12.3 | Pulsation suppression devices | 59 |
| 12.4 | Supports for pulsation suppression devices | 61 |
| | | |
| 13 | Inspection and testing | 61 |
| 13.1 | General | 61 |
| 13.2 | Inspection | 62 |
| 13.3 | Testing | 64 |
| | | |
| 14 | Preparation for shipment | 66 |
| | | |
| 15 | Vendor's data | 67 |
| 15.1 | General | 67 |
| 15.2 | Proposals | 68 |
| 15.3 | Contract data | 70 |
| | | |
| | Annex A (informative) Data sheets and check-list | 73 |
| | Annex B (informative) Required capacity, manufacturer's rated capacity and no negative tolerance | 102 |
| | Annex C (informative) Piston rod and runout | 103 |
| | Annex D (informative) Repairs to grey or nodular iron castings | 107 |
| | Annex E (informative) Examples of typical logic diagram showing critical functions | 108 |
| | Annex F (informative) Vendor drawing and data requirements | 115 |
| | Annex G (informative) Figures and schematics | 130 |
| | Annex H (informative) Materials for major component parts | 136 |
| | Annex I (informative) Distance piece vent, drain and buffer systems to minimize process gas leakage | 137 |
| | Annex J (informative) Reciprocating compressor nomenclature | 143 |
| | Annex K (informative) Inspector's check-list | 146 |
| | Annex L (informative) Typical mounting plate arrangement | 148 |
| | Annex M (informative) Pulsation and vibration control studies | 150 |

| | |
|---|------------|
| Annex N (informative) Guideline for compressor gas piping design and preparation for an acoustic simulation analysis | 153 |
| Annex O (informative) Guidelines for sizing low pass acoustic filters | 157 |
| Annex P (informative) Compressor components -- compliance with NACE MR0175 | 160 |
| Annex Q (informative) Alarm and shut-down systems | 162 |
| Bibliography | 164 |