

ISO/TR 13086-5:2022-06 (E)

Gas cylinders - Information for design of composite cylinders - Part 5: Impact testing of composite cylinders

| Contents | Page |
|---|-------------|
| Foreword..... | iv |
| Introduction..... | v |
| 1 Scope | 1 |
| 2 Normative references | 1 |
| 3 Terms and definitions | 1 |
| 4 Low energy impact | 1 |
| 4.1 General..... | 1 |
| 4.2 Visible indications..... | 2 |
| 4.3 Concepts in standards..... | 2 |
| 4.3.1 General..... | 2 |
| 4.3.2 30 J impact level..... | 2 |
| 4.3.3 488 J impact level..... | 2 |
| 4.3.4 1 200 J impact level..... | 2 |
| 4.3.5 Consequences..... | 3 |
| 4.4 Test concepts..... | 3 |
| 5 High energy impact (accidents) | 4 |
| 5.1 General..... | 4 |
| 5.2 Visible indications..... | 4 |
| 5.3 Design influence..... | 4 |
| 6 Drop impact | 6 |
| 6.1 General..... | 6 |
| 6.2 Test scenarios..... | 6 |
| 6.3 Design influences..... | 7 |
| 7 High velocity impact | 8 |
| 7.1 General..... | 8 |
| 7.2 Test parameters..... | 8 |
| 7.3 Test results analysis..... | 9 |
| 8 Failure considerations | 10 |
| 9 Inspection and examination | 11 |
| 10 Field incidents | 12 |
| 10.1 Bridge hit..... | 12 |
| 10.2 Rollovers..... | 13 |
| 10.3 Rollover with penetration..... | 13 |
| 10.4 Vehicle collision..... | 13 |
| 10.5 Forklift impact..... | 14 |
| 10.6 Other incidents..... | 15 |
| 11 Impact projects | 15 |
| 12 Discussion | 15 |
| 13 Summary | 16 |
| Annex A (informative) Low energy impact testing | 17 |
| Annex B (informative) Drop impact testing (low pressure liquified gas, up to 50 l) | 19 |

Annex C (informative) Drop impact testing (high pressure).....20
Annex D (informative) High velocity impact testing.....21
Annex E (informative) Alternative high velocity impact testing.....22
Bibliography.....24