

# ISO/TR 15916:2004-02 (E)

## Basic considerations for the safety of hydrogen systems

---

<b>Contents</b>		<b>Page</b>
Foreword .....		iv
Introduction .....		v
1	Scope .....	1
2	Normative references .....	1
3	Terms and definitions .....	1
4	Overview of hydrogen applications .....	1
4.1	Basic hydrogen infrastructure .....	1
4.2	Typical hydrogen system components .....	3
4.3	Hydrogen fuel .....	5
4.4	Environmental effects .....	5
5	Safety considerations for the use of gaseous and liquid hydrogen .....	5
5.1	General .....	5
5.2	Hazards involved as a consequence of the properties of hydrogen .....	6
5.3	Factors involved in combustion hazards .....	7
5.4	Factors involved in pressure hazards .....	8
5.5	Factors involved in temperature hazards .....	9
5.6	Factors involved in hydrogen embrittlement hazards .....	9
5.7	Health hazards .....	10
5.8	Team approach and training needed for the safe use of hydrogen .....	10
6	Basic properties of hydrogen .....	10
6.1	General properties .....	10
6.2	Selected thermophysical properties .....	11
6.3	Basic combustion properties .....	12
7	Mitigation and control of risks .....	14
7.1	General mitigation and control of risk .....	14
7.2	Mitigation of design risks .....	16
7.3	Mitigation of flammability and explosion risks .....	21
7.4	Detection considerations .....	23
7.5	Considerations for facilities .....	24
7.6	Considerations for operations .....	29
7.7	Recommended practices for organizations .....	33
Annex A (informative)	Hydrogen properties .....	35
Annex B (informative)	Hydrogen combustion data .....	39
Annex C (informative)	Material data .....	42
Annex D (informative)	Hydrogen-storing compounds .....	47
Annex E (informative)	Terms and definitions .....	48
Bibliography .....		61