

HyApproval

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List of applicable regulations, codes and standards

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1 Introduction

This document presents a list of regulations, codes and standards, which may be applicable to a European hydrogen refuelling station. This list is established according to the current best knowledge of the HyApproval partners, and based on public available information. Reference is made to chapter 7 in the HyApproval Handbook, for further background information on application, use and interpretation of the regulations, codes and standards.

It is the reader responsibility to check completeness of this list for its specific application.

This document has been prepared by Erling Håland in DNV.

2 List of applicable regulations, codes and standards

Hydrogen properties, specifications, and safety:

- 67/548/EEC - European Directive on dangerous substances
- ISO 14687:1999 - International standard on product specification
- ISO/TR 15916:2004 - International standard on safety considerations

Hydrogen production, Natural gas reforming:

- 94/9/EC - European Directive on equipment for use in explosive atmosphere
- 97/23/EC - European Directive on pressurized equipment
- ISO 16110-1 - International standard (*under development*)
- ISO/CD 16110-2 - International standard (*under development*)

Hydrogen production, Electrolysis:

- 94/9/EC - European Directive on equipment for use in explosive atmosphere
- 97/23/EC - European Directive on pressurized equipment
- ISO/DIS 22734-1 - International standard (*under development*)
- ISO/CD 22734-2 - International standard (*under development*)

Liquid hydrogen storage:

- 94/9/EC - European Directive on equipment for use in explosive atmosphere
- 97/23/EC - European Directive on pressurized equipment
- NFPA 55 - U.S. standard (superseding NFPA 50B)
- EIGA IGC 06/02 - European industry code of practise
- CGA H-3 - U.S. industry code of practise
- EN 1252-1:1998 - European standard on material requirements for cryogenic vessels
- EN 1626:1999 - European standard on valves for cryogenic service
- EN 1797 - European standard on gas/material compatibility of cryogenic vessels
- EN 13648 - European standards on protection against excessive pressure

Gaseous hydrogen storage:

- 94/9/EC - European Directive on equipment for use in explosive atmosphere
- 97/23/EC - European Directive on pressurized equipment
- NFPA 55 - U.S. standard (superseding NFPA 50A)
- EIGA IGC 15/06 - European industry code of practise
- EN 4126 - European standards on protection against excessive pressure, gaseous
- ISO 20012 - International standard on separation distances (*under development*)

Liquid hydrogen dispensing facilities:

- 94/9/EC - European Directive on equipment for use in explosive atmosphere
- 97/23/EC - European Directive on pressurized equipment
- ISO 13984:1999 - International standard

Gaseous hydrogen dispensing facilities:

- 94/9/EC - European Directive on equipment for use in explosive atmosphere
- 97/23/EC - European Directive on pressurized equipment
- ISO 17268:2006 - International standard
- EIGA IGC 121/04 - European industry code of practise on distribution piping systems
- ISO 20012 - International standard on separation distances (*under development*)

Hydrogen transport and distribution:

- 94/55/EC - European Directive on transport of dangerous goods by road
- 96/49/EC - European Directive on transport of dangerous goods by rail
- 1999/36/EC - European Directive on transportable pressure equipment
- ISO 11114-1:1997 - International standard on cylinders for gaseous hydrogen transport
- ISO 11114-4:2005 - International standard on cylinders for gaseous hydrogen transport
- CGA G-5.4 - U.S. standard on hydrogen supply pipeline interface
- ASME B31.3 - U.S. standard on hydrogen pipeline interface

ASME B31.12 - U.S. standard on hydrogen pipeline interface (*under development*)

Explosive atmosphere:

- 94/9/EC - European Directive on equipment for use in explosive atmosphere
- 1999/92/EC - European Directive on workers at work in explosive atmosphere
- ISO/TR 15916:2004 - International standard on safety considerations
- EN 13160-1:2003 - European standard on detection systems
- IEC (EN) 61779 - International (European) standards on detection systems
- ISO 26142 - International standard on detection systems (*under development*)
- EN 1127-1:1997 - European standard on protection systems
- EN 13237:2003 - European standard on protection systems
- prEN 15233 - European standard on protection systems (*under development*)
- EN 12874:2001 - European standard on mitigation measures
- EN 13980:2002 - European standard on mitigation measures
- EN 14373:2005 - European standard on mitigation measures
- EN 14460:2006 - European standard on mitigation measures
- EN 14797:2006 - European standard on mitigation measures
- EN 14986:2007 - European standard on mitigation measures
- NFPA 221 - U.S. standard on mitigation measures
- CGA G-5.5 - U.S. industry code of practise on mitigation measures
- EN 1839:2003 - European standard on explosion limits
- EN 13673-1:2003 - European standard on explosion pressure
- EN 13673-2:2005 - European standard on explosion pressure
- EN 13463:2001 - European standard on non-electrical equipment
- IEC (EN) 60079 - International (European) standards on electrical equipment
- EN 14522:2005 - European standard on auto ignition
- prEN 15198 - European standard on ignition assessment (*under development*)
- EIGA IGC 75/07 - European industry code of practise on safety distances
- ISO 20012 - International standard on separation distances (*under development*)
- EIGA IGC 134/05 - European industry code of practise on safety of workers in ATEX

Safety of workers at work:

- 89/391/EEC - European Directive (general)
- 89/654/EEC - European Directive (health, safety, and environment)
- 89/655/EEC - European Directive (work equipment)
- 1999/92/EC - European Directive (explosive atmosphere)
- 98/24/EC - European Directive (chemical agents)
- EIGA IGC 23/00 - European industry code of practise
- EIGA IGC 134/05 - European industry code of practise on safety of workers in ATEX

Pressure protection:

- 97/23/EC - European Directive
- 1999/36/EC - European Directive on transportable pressure equipment
- ISO (EN) 4126 - International (European) standards on non-electrical equipment
- EN 13648 - European standards on non-electrical equipment

Environmental protection:

- 91/271/EEC - European Directive on waste water
- EIGA IGC 122/00 - European industry code of practise on environmental impacts
- EIGA IGC 137/06 - European industry code of practise on aspects of decommissioning

Electrical/electronic/programmable electronic safety systems:

- IEC (EN) 61508 - International standards on E/E/PES safety lifecycle activities
- IEC (EN) 61511 - International standards on safety instrument systems

Equipment certification and conformity:

- 93/68/EEC - European Directive
- 73/23/EEC - European Directive on low voltage equipment
- 89/336/EEC - European Directive on electromagnetic equipment
- 94/9/EC - European Directive on equipment for use in explosive atmosphere
- 98/37/EC - European Directive on machinery
- EN Standards - A wide range of EN Harmonized Standards are available