

# HyApproval

## WP2 – Handbook Compilation

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### **List of applicable regulations, codes and standards**

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# Table of Contents

<b>1</b>	<b>INTRODUCTION .....</b>	<b>3</b>
<b>2</b>	<b>LIST OF APPLICABLE REGULATIONS, CODES AND STANDARDS ..</b>	<b>4</b>

## **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