



**HYDROGEN SUPPLY AND TRANSPORTATION USING LIQUID ORGANIC HYDROGEN CARRIERS  
(HYSTOC)**

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**WP2 - Requirement Specifications for LOHC infrastructure**

**D2.2**

**Review of regulations and Codes & Standards**

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Document Type	
<i>PRO</i>	Technical/economic progress report (internal work package reports indicating work status)
<i>DEL</i>	Technical reports identified as deliverables in the Description of Work
<i>MoM</i>	Minutes of Meeting
<i>MAN</i>	Procedures and user manuals
<i>WOR</i>	Working document, issued as preparatory documents to a Technical report
<i>INF</i>	Information and Notes

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## **1 SUMMARY**

### **1.1 Description of the deliverable content and purpose**

This document has been made to ensure that all needed equipment and operations are made according laws and regulations.

## **2 Legislation and standards for installing equipment for HySTOC in Finland**

There are different levels of legislation and standards concerning hydrogen installations. Directives have to be transposed to national legislation in every EU-country and are therefore mandatory in Finland. The directives and respective Finnish laws on which the directives have been implemented have been listed below.

### Directives

- 1 Machinery Directive 98/37/EC (CE)
  - 2 Low voltage directive; 73/23/EEC
  - 3 Electromagnetic compatibility directive; 89/336/EEC
  - 4 Simple pressure vessels directives; 2009/105/EC
  - 5 ATEX 95 equipment directive 94/9/EC,
  - 6 ATEX 137 workplace directive 2014/34/EU
  - 7 Directive 2010/75/EU (integrated pollution prevention and control)
  - 8 REGULATION (EC) No 1907/2006 REACH
  - 9 Regulation (EC) No 2006/2004 and Directive 2009/22/EC ADR and Directive 2008/68/EC of the European Parliament and of the Council of 24 September 2008 on the inland transport of dangerous goods.
  - 10 Directive 96/82/EY the control of major-accident hazards involving dangerous substances
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Finnish legislation

- 1 Kuluttajaturvallisuuslaki 920/2011 (Consumer safety law)
  - 2 Sähköturvallisuuslaki 410/1996 (muutokset 634/1999 893/2001 913/2002) (Electrical safety law)
  - 3 Sähköturvallisuuslaki 16.12.2016/1135 (Electrical safety law)
  - 4 Painelaitelaki 869/1999 (Pressure vessel law)
  - 5 Sähköturvallisuuslaki 410/1998, 917/1996 (Electrical safety law)
  - 6 Työturvallisuuslaki 738/202 (Occupational safety law)  
and  
Laki vaarallisten kemikaalien ja räjähteiden turvallisuudesta 390/2005 (Act on the Safety Handling of Hazardous Chemicals and Explosives)
  - 7 Ympäristönsuojelulaki 527/2014 (Environment protection law)
  - 8 Kemikaalilaki 9.8.2013/599 (Chemical law)
  - 9 Valtioneuvoston asetus vaarallisten aineiden kuljetuksesta tiellä 13.3.2002/194 (Governmental regulation on transportation of dangerous goods)  
  
and  
  
Vaarallisten aineiden kuljetusta koskevia säädöksiä ja määräyksiä (Master list of European and national ADR regulation information by Finnish Transport Safety Agency Trafi)
  - 10 Laki vaarallisten kemikaalien ja räjähteiden käsittelyn turvallisuudesta 390/2005 (Act on the safe handling and storage of dangerous chemicals and explosives)
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### **3 Finnish legislation**

#### **3.1 Pressure vessel legislation**

Above is a list of national laws and standards, which must be taken account when installing pressure equipment in Finland.

Painelaitelaki 869/1999

Kauppa ja teollisuusministeriön päätös painelaiteturvallisuudesta 953/1999

Regulation of Trade and industry ministry on pressure equipment safety

Manufacturer of the equipment must deliver user manual in Finnish and in Swedish

Kauppa ja teollisuusministeriön päätös yksinkertaisista painelaitteista 917/1999

Regulation of Trade and industry ministry on simple pressure equipment

Asetus kattilalaitosten käytön valvojien pätevyyskirjoista 891/1999

Regulation on validation of administrators of pressure vessels

Kauppa ja teollisuusministeriön päätös painelaitteista 938/1999

Regulation of Trade and industry ministry on pressure equipment

Finnish Safety and Chemicals Agency (Tukes) is a licensing and supervisory authority in Finland. When installing Pressure equipment in Finland the equipment has to be inspected by a notified body before it can be used.

Practical measures for the project

The equipment has to be inspected according to law 938/1999 by a notified body. This inspection is to insure declaration of conformity. In order to pass the inspection it is important to have documentation of all parts and building methods used no the construction of the equipment. After the inspection CE marking must be attached to the equipment. Pressure vessels have to be re-inspected every four years. However for testing purposes before the system is brought in the market it is enough that all the parts are CE marked.



### **3.2 Atex legislation**

National legislation:

Sähköturvallisuuslaki 410/1998, 917/1996 (Electrical safety law)

Työturvallisuuslaki 738/202, (Occupational Safety and Health law)

Valtioneuvoston asetus räjähdysvaarallisten ilmaseosten työntekijöille aiheuttaman vaaran torjunnasta

(VNa 576/2003) (Government decree on combating the dangers of explosive atmospheres for workers)

The laws above refer to standards below:

SFS 6000 (2012) Pienjännitesähköasennukset (73/23/EEC)

SFS-EN 60079 Räjähdyksvaaralliset tilat Osa 10-1: Tilaluokitus Räjähdyksvaaralliset tilat (Ex classification 94/9/EC)

SFS-EN 60079-10-2 Räjähdyksvaaralliset tilat Osa 10-2 Tilaluokitus (Ex classification)

SFS-EN 60079-0 Yleiset vaatimukset (general requirements of equipment)

SFS-EN 60079-14 Räjähdyksvaaralliset tilat Sähköasennusten suunnittelu tarkastukset , suunnittelu ja asentaminen (Planning of electrical installations)

SFS-EN 60079-17 Räjähdyksvaaralliset tilat Ex tilojen tarkastukset ja kunnossapito (maintenance and inspection of Ex areas)

SFS 604-2 (2009) Räjähdyksvaaralliset tilat Osa 2 Sähköasennukset tarkastus ja huolto, Ex spaces electrical installations maintenance and inspections.

#### **Practical measures for the project**

When installing equipment on Ex area in Finland has to have a document called Räjähdyssuojausasiakirja (explosion protection document) has to be made before installation.

According to SFS-EN standards it is not necessary to EX-classify spaces that have been planned so that it impossible for flammable air mixture to form. This can be achieved by planning the ventilation of space higher than what the worst possible leak rate of flammable gas enrich. If this method is used there has to be automatic leak detection installed.



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Räjähdyssuojasiasiakirja (explosion protection document) has to have:

- 1) A floor plan of the space with exits
- 2) Names of the persons who are responsible of the equipment
- 3) Description of the equipment
- 4) Description of the ventilation and cleaning
- 5) Description of the air mixture which might cause an explosion
- 6) List of potential ignition sources
- 7) Results of risk assessment and explanation of methods used for risk assessment
- 8) Classification of Ex areas explained with picture and text form
- 9) Explanation of used safety measures on technical and organization level
- 10) List of tools used in Ex areas
- 11) List of persons responsible of implementing safety measures and updating the explosion protection document.

Electrical installations in Ex- area must be documented:

Document of the commissioning inspection with measurement results and Ex- approval documents of the individual Ex equipment.

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### 3.3 Chemical legislation

National legislation:

Laki vaarallisten kemikaalien ja räjähteiden käsittelyn turvallisuudesta 390/2005 (Law about handling of dangerous chemicals)

Valtioneuvoston asetus vaarallisten kemikaalien teollisen käsittelyn ja varastoinnin valvonnasta 685/2015 (Law about storing of dangerous chemicals)

675/1993 Kemikaaliasetus (Chemical law)

#### Practical measures for the project

Finnish Safety and Chemicals Agency (Tukes) grants permit to operate a plant producing or storing large amounts of dangerous substances. The maximum limit of storing hydrogen with just notification to Tukes is 100 kg, which is enough for the project. The limit of storing flammable liquids, which can cause hazard in high temperatures and pressures, is 1 ton with notification to Tukes. With a simple permit, it is allowed to store 10 tons.

There is a permit already in place on all of the sites used in the project. Tukes has to be notified of the new equipment and internal rescue plan has to be updated for case of emergency.

### 3.4 Environmental legislation

Testing sites in Kokkola, hydrogen plant and Bioruukki in Espoo have to have an environmental permit according to Finnish national law 527/2014, which they currently have. However, for testing purposes it is not needed to apply a new permit. Notification of the authorities is required.

### 3.5 Building legislation

National laws:

Maankäyttö- ja rakennuslaki 132/1999 (Land use and building Act)

Kokkolan kaupungin Rakennusjärjestys (Building regulations of Kokkola)

#### Practical measures for the project

According to law 5.2.1999/132 the project has to obey the local building regulations, which means that a notification has to be made to city of Kokkola before building structures.

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