

# Technical Material Specification Mechanical

## Valves in mixture of Natural Gas/Hydrogen up to 100% Hydrogen gas services

Department

Mechanical Engineering (Ing. L.Nijland)

Report

Technical Material Specification Mechanical

Valves in mixture of Natural Gas/Hydrogen up to 100% Hydrogen gas services

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## 1 Scope and application

This specification is a supplement to Gasunie specification MSW-03-E/1 version 10 and provides the additional requirements for ball valves in a mixture of natural gas with hydrogen gas up to 100% hydrogen gas.

The following condition applies:

medium: mixture of natural gas with hydrogen gas up to 100% hydrogen gas.

If not specifically stated otherwise, then the amended sections replace the appropriate section in the referenced standard. Sections not mentioned remain unaltered.

Additional requirements, which are not stated in the referenced standard are indicated with **"addition"** in the left margin.

Sections of the referenced standard which are not valid, are indicated with **"deletion"** in the left margin.

Requirements which are stated in the referenced standard that need to be replaced are indicated with **"substitution"** in the left margin.

Section numbers in italics correspond with section numbers of the reference document.

## 2 References

This specification is subject to the requirements of the documents mentioned in this clause. If the documents in this specification are mentioned with a date, this specific edition is applicable.

### 2.1 Gasunie specification

In this specification reference is made to the following Gasunie specification.

MSW-03-E/1 Ball and plug valves, version 10.

### 2.2 Standards

In this specification reference is made to the standards mentioned in this subclause. Any supplements and errata notices that are also applicable.

NEN-EN 14141

Valves for natural gas transportation in pipelines-  
Performance requirements and tests (2013).

## 3 Abbreviations and Symbols

### 3.1 Definitions

In this specification the following definitions will be applicable:

|                         |                                                                                                                                                                                                                                                                                                                                |
|-------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Rapid gas decompression | rapid pressure-drop in a high pressure gas-containing system which disrupts the equilibrium between external gas pressure and the concentration of gas dissolved inside any polymer, with the result that excess gas tries to escape from the solution at points throughout the material, causing expansion (NEN-EN-ISO 23936) |
| Explosion decompression | Same definition as RGD                                                                                                                                                                                                                                                                                                         |

### 3.2 Abbreviations

In this specification the following abbreviations will be applicable:

|     |                         |
|-----|-------------------------|
| RGD | Rapid Gas Decompression |
| ED  | Explosive Decompression |

## 4 Additional requirements to MSW-03-E/1 version 10

### Scope and Application

Addition: On medium: "mixture of natural gas with hydrogen gas up to 100% hydrogen gas."

#### 4.2.2 Shipping

Addition: Valves shall be packed and protected such that they can be stored for at least 3 months in outdoor marine environment.

#### Annex B:

substitution: Annex B, figure 3 & 4 note 2: "The bleeding...at an upward angle" by "the position of the body drain exhaust opening shall be in a such way that the flow is in an unrestricted, upwards position."

substitution: Annex B, figure 5, note 3: "Atmospheric vent with a check valve, openings pressure < 0,5 bar" by "Atmospheric vent"

Addition: Annex B, figure 5: "The position of the body drain exhaust opening shall be in a such way that the flow is in an unrestricted, upwards position."

substitution: Annex B, figure 6, note 1: "Atmospheric vent with a check valve, openings pressure < 0,5 bar" by "Atmospheric vent"

## 5. Amendments/supplements to NEN-EN 14141 (2013)

### Title

Substitute: "Valves for natural gas" by "Valves for natural gas, mixture of natural gas with hydrogen gas up to 100% hydrogen gas"

### 4.3. Protection of exposed stems and shafts

Substitute: "The top one shall be an atmospheric vent with a check valve to prevent water ingress and other pollutions (see annexes B and C of the specification MSW-03-E/1)." By "the top one shall be an atmospheric vent (see annexes B and C of the specification MSW-03-E/1)."

Addition: The atmospheric vent connection in the extension shall be as follows:  
≤DN 150 shall be ½"  
≥DN 200 shall be 1"

### 4.6 Additional requirements

Addition: The stem sealing shall at least be a double barrier type design.

### 5.1 Design

Addition: All connections to the valve body and auxiliaries shall be welded connections except for the drain exhaust. The drain exhaust shall be a thread connection.

### 5.1.5 Sealant injections systems

Addition: The sealing injection system is mandatory for seats and stem sealing applicable for diameters ≥DN100

### 5.1.7 Vent, drain and sealant valves

Addition: The position of the body drain exhaust opening shall be in a such way that the flow is in an unrestricted, upwards position.

### 5.3.1 Material compatibility

Substitute: "natural gas" by "mixture of natural gas with hydrogen gas up to 100% hydrogen gas."

Substitute: "Non-metallic parts of valves to be used at pressure of PN 100 (Class 600) and above shall be resistant to explosive decompression (ED)." by "Non-metallic parts of valves to be used in a mixture of natural gas with hydrogen gas up to 100% hydrogen gas services shall be resistant to RGD."

Addition: The valve manufacturer shall demonstrate to Gasunie that the seal material is compatible with the mixture of natural gas with hydrogen up to 100% hydrogen gas to which it is exposed over the design conditions.

End of specification