

THE NETHERLANDS  
(N E D E R L A N D)

## EC TYPE-APPROVAL CERTIFICATE

Communication concerning:

- ~~EC type-approval~~<sup>(1)</sup>
  - extension of EC type-approval<sup>(1)</sup>
  - ~~refusal of EC type-approval~~<sup>(1)</sup>
  - ~~withdrawal of EC type-approval~~<sup>(1)</sup>
- } of a type of  
hydrogen component

with regard to Regulation (EC) number 79/2009, as implemented by Regulation (EU) number 406/2010.

**EC type-approval number** : e4\*79/2009\*406/2010\*0031\*03Reason for extension : New possible ways of marking:

- HARD STAMP
- ROLL STAMP
- LASER MARKING

## SECTION I

- 0.1. Make (trade name of manufacturer) : Swagelok Company
- 0.2. Type : Swagelok fitting series
- 0.3. Means of identification of type, if marked on the component<sup>(2)</sup> : - FK fitting series  
- SAE/MS Straight Thread (ST)  
- MP fitting series  
- NPT fitting series  
- Cone and Thread (CW)  
- VCO o-ring Face Seal fitting series
- 0.3.1. Location of that marking : Body of the fitting (see drawing)
- 0.5. Name and address of manufacturer : Swagelok Company  
29500 Solon Road  
44139 Solon, Ohio  
United States of America



**Approval number: e4\*79/2009\*406/2010\*0031\*03**

- 0.7. In the case of components and separate technical units, location and method of affixing of the EC approval mark : N.A.
- 0.8. Name(s) and address(es) of assembly plant(s) : Swagelok Company  
29500 Solon Road  
44139 Solon, Ohio  
United States of America
- 0.9. Name and address of manufacturer's representative (if any) :

SECTION II

1. Additional information (where applicable) : see Addendum
2. Technical service responsible for carrying out the tests : Kiwa Nederland B.V.  
P.O.Box 137  
7300AC Apeldoorn  
The Netherlands
3. Date of test report : 01-12-2021
4. Number of test report : 190800488\_P000051942
5. Remarks (if any) : see Addendum
6. Place : Zoetermeer
7. Date : 10 December 2021
8. Signature :

Attachments:  
- Test report.  
-



R.F.R. Clement

<sup>(1)</sup> Delete where not applicable.

<sup>(2)</sup> If the means of identification of type contains characters not relevant to describe the vehicle, component or separate technical unit types covered by this information document, such characters shall be represented in the documentation by the symbol '?' (e.g. ABC??123??).

ADDENDUM

to EC type-approval certificate number: e4\*79/2009\*406/2010\*0031\*03

relating to EC component type-approval of a hydrogen component or system

1. Additional information
  - 1.1. ~~Hydrogen system designed to use liquid hydrogen/Hydrogen system designed to use compressed (gaseous) hydrogen/Hydrogen component designed to use liquid hydrogen/Hydrogen component designed to use compressed (gaseous) hydrogen~~<sup>(1)</sup>
2. Specifications and test results
  - 2.1. ~~Containers designed to use compressed (gaseous) hydrogen~~
    - 2.1.1. ~~Container material specifications~~

Material specifications	Applicable to material						Details
	Steel	Aluminium-alloy	Plastic-liner	Fibre	Resin	Coating	
Material manufacturer	√	√	√	√	√		
Type of material	√	√	√	√	√		
Material identification	√	√	√	√	√		
Heat treatment definition	√	√					
Chemical composition	√	√					
Cold or cryoforming procedure	√						
Welding procedure definition	√	√					

- 2.1.2. ~~Container material test results~~

Material test	Applicable to material						Specified material value	Test value
	Steel	Aluminium-alloy	Plastic-liner	Fibre	Resin	Coating		
Tensile test	√	√	√					
Charpy impact test	√							
Bend test	√	√						
Macroscopic examination	√							



Material test	Applicable to material						Specified material value	Test value
	Steel	Aluminium-alloy	Plastic-liner	Fibre	Resin	Coating		
Corrosion test		√						
Sustained load cracking test		√						
Softening temperature test			√					
Glass transition temperature test					√			
Resin shear strength test					√			
Coating test						√		
Hydrogen compatibility test	√	√	√	√	√			

2.1.3. Container test results

Container test	Specified design value	Test result
Burst Test		
Ambient Temperature Pressure Cycle Test		
LBB Performance Test		
Bonfire test		
Penetration Test		
Chemical Exposure Test		
Composite Flaw Tolerance Test		
Accelerated Stress Rupture Test		
Extreme Temperature Pressure Cycle Test		
Impact Damage Test		
Leak Test		
Permeation Test		
Boss Torque Test		
Hydrogen Gas Cycling Test		

3. Restriction of use of the device (if any) : None

4. Remarks : None

<sup>(1)</sup> Delete where not applicable.

