AR 5

Datum jjjj-mm-dd

bindendverklaring

Approval requirement 5

Copper tubes

kiwa

GASTEC Qa

Trust
Quality
Progress

Foreword

This GASTEC QA Approval requirement has been approved by the Board of Experts product certification GASTEC QA, in which relevant parties in the field of gas related products are represented. This Board of Experts supervises the certification activities and where necessary require the GASTEC QA Approval requirement to be revised. All references to Board of Experts in this GASTEC QA Approval requirement pertain to the above mentioned Board of Experts.

This GASTEC QA Approval requirement will be used by Kiwa Nederland BV in conjunction with the GASTEC QA general requirements and the KIWA regulations for certification.

Approved by Board of Experts : xxx

Accepted by Kiwa Nederland B.V. : xxx

Kiwa Nederland B.V.
Wilmersdorf 50
Postbus 137
7300 AC Apeldoorn

Tel. 088 998 33 93
Fax 088 998 34 94
info@kiwa.nl
www.kiwa.nl

Contents

1 Introduction

1.1 General

This GASTEC QA approval requirement in combination with the GASTEC QA general requirements include all relevant requirements, which are adhered by Kiwa as the basis for the issue and maintenance of a GASTEC QA certificate for copper tubes.

This GASTEC QA Approval requirements replace the GASTEC QA Approval Requirements 5 “Copper Tubes”, dated July 2010.

List of changes:

- Reference to NEN-EN 1057 instead of BRL-K760
- Requirements for minimal wall thickness added
- Requirements for resistance to high temperatures added
- Update to the new format for GASTEC QA approval requirements
- These approval requirements have been fully reviewed textually.
- All general requirements have been deleted and included in the GASTEC QA general requirements document
- Change of paragraphs
- Update of list of referenced documents

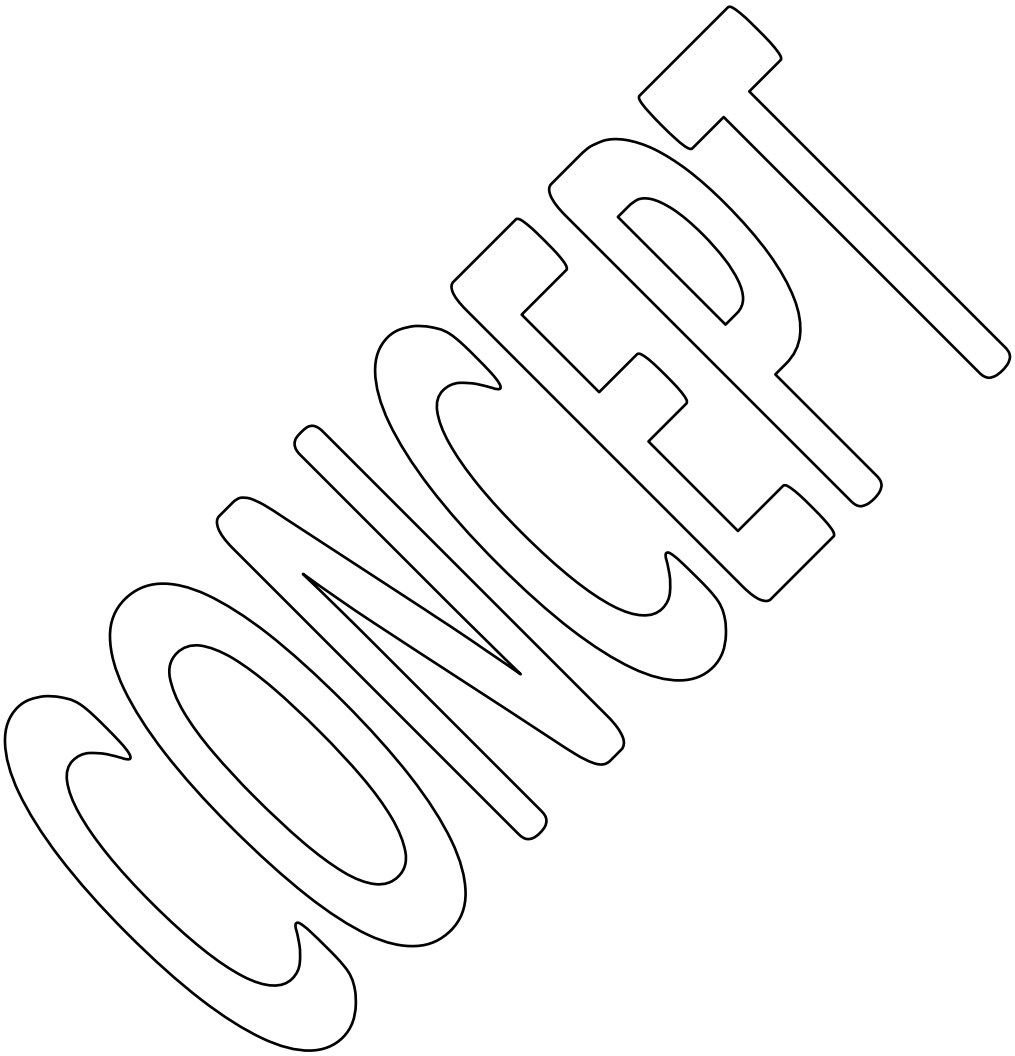
1.2 Scope

These GASTEC QA Approval Requirements specify the requirements for copper tubes with or without an external covering for protection of the tube surface and/or as thermal insulation finish coat. The intended use is for 2nd and 3rd family gases in accordance with EN 437 with a maximum operating pressure of 1 bar.

2 Definitions

In this approval requirement, the following terms and definitions are applicable:

Board of Experts: The Board of Experts Gastec QA.



3 Product requirements

3.1 General

The copper tubes shall comply with the requirements specified in NEN-EN 1057: 2006 + A1: 2010.

3.2 Wall thickness

Contrary to NEN-EN 1057: 2006+ A1:2010, the nominal wall thickness of the copper tube shall be according to table 1.

Nominal outside diameter d (mm)	Nominal wall thickness e (mm)					
	1,0	1,1	1,2	1,5	2	2,5
10	X					
12	X					
15	X					
18	X					
22	X	X	X	X		
28			X	X		
35			X	X		
42			X	X		
54			X	X	X	
64					X	
76,1					X	
88,9					X	
108						X

Table 1

3.3 Requirements for copper tubes with external covering

The copper tubes with external covering shall comply with the requirements specified in KIWA BRL K761/05.

4 Performance requirements and test methods

4.1 Resistance to high temperatures

The steel pipes (including protection/isolation) shall be resistant to a radiation heat of 10 kW/m^2 during 30 minutes. The leakage shall be ≤ 5 l/h after testing.

The test shall be performed at a temperature of 20 °C ± 5 °C. The test samples shall be conditioned at least 24h before testing at a temperature of 30 °C ± 5 °C and a humidity of 60 % ± 20 %.

The test is performed in a horizontally test equipment as shown in figure 1. The leakage shall be measured in accordance to Annex A of EN 1775:2007.

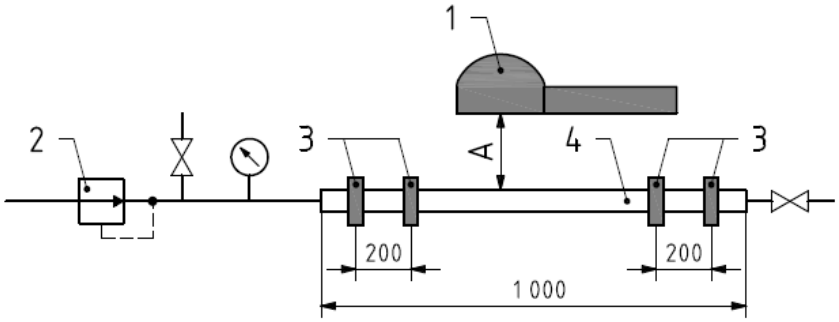


Figure 1

Legend:
1 heat cup
2 measuring system as described in appendix A of NEN-EN 1775:2007
3 mounting brackets
4 test sample
A distance between heat cup and surface of the assembled component (for example the outside of a casing)

The test sample shall be mounted in the test equipment without stress or tension on the test sample, see figure 1.

Before the start of the high temperature test, the sample is tested on leakage at 200 mbar during 5 minutes. Record the leakage value (l/h)

Expose the test sample during 30 minutes to a heat radiation of 10 kW/m^2. The distance between the heating cup and the sample shall be calculated with the data on the calibration file of the heating cup.

Determine the leakage after the high temperature test during 5 minutes at 200 mbar. Record the value (l/h).

5 Marking

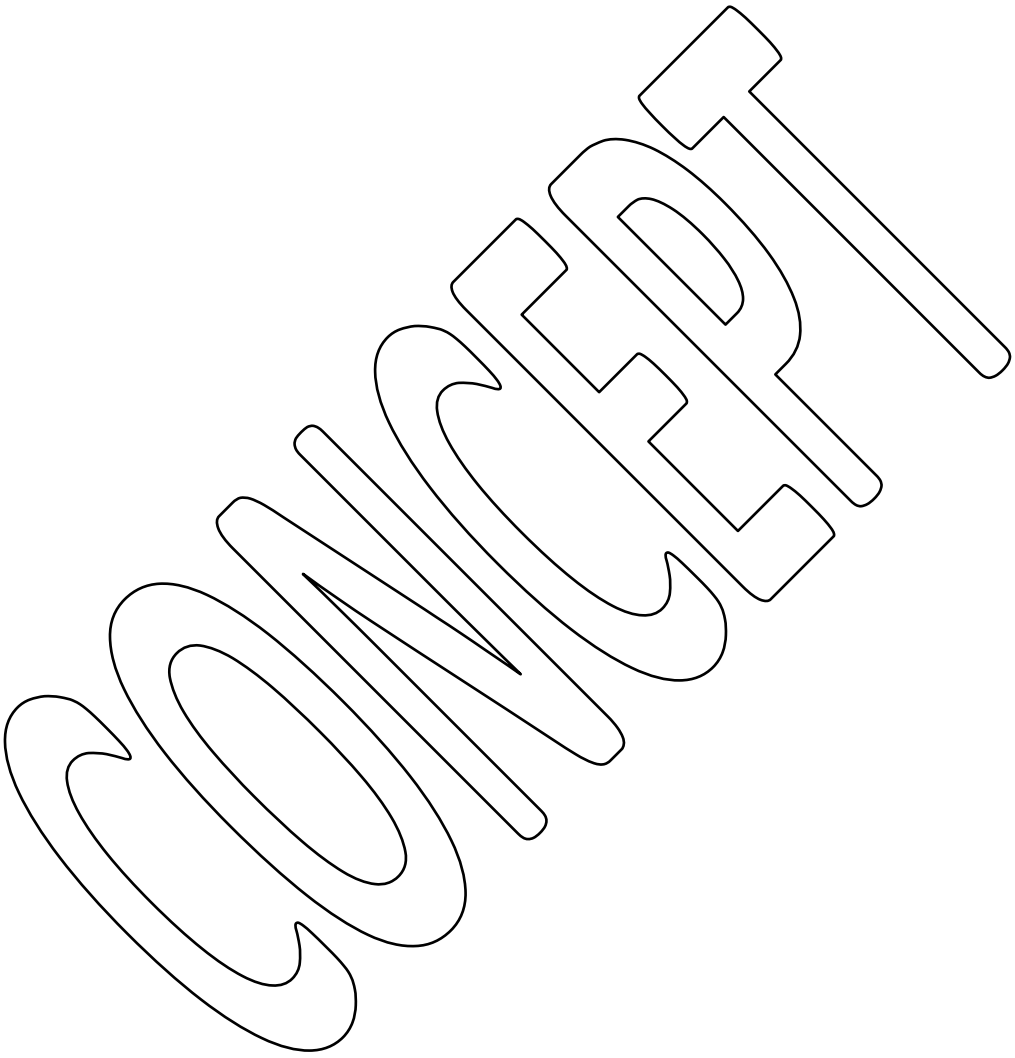
5.1 Marking

In addition to article 12 of NEN-EN 1057 the copper tube shall be permanently marked with:

- the GASTEC QA word mark, logo or punch mark;
- type of covering (if applicable)

6 Quality system requirements

The supplier shall make a risk assessment of the product and production process according to chapter 3.1.1.1 and 3.1.2.1 of the GASTEC QA general requirements. The risk assessments shall be available to Kiwa for review.



7 Summary of tests

This chapter contains a summary of tests to be carried out during:

- The initial product assessment;
- The periodic product verification;

7.1 Test matrix copper tubes

Description of requirement	Clause EN 1057	Test within the scope of		
		Initial product assessment	Product verification	
			Verification	Frequency
Composition	7.1	X	X	1x/ year
Mechanical properties	7.2	X	X	1x/ year
Dimensions and tolerances	7.3	X	X	1x/ year
Freedom from defects	7.4	X	X	1x/ year
Surface quality	7.5	X	X	1x/ year
Bending	7.6	X	X	1x/ year
Drift expanding	7.7	X	X	1x/ year
Flanging	7.8	X	X	1x/ year
Additional GASTEC QA requirements				
Wall thickness	3.2	X	X	1x/ year
Resistance to high temperatures	4.1	X		
Marking	4	X	X	1x/ year

7.2 Test matrix for external covering of copper tubes

Description of requirement	Clause BRL K761/5	Test within the scope of		
		Initial product assessment	Product verification	
			Verification	Frequency
Material	**2.3.2.1**	X	X	once a year
Appearance	**2.3.2.2**	X	X	once a year
Fit	**2.3.2.3**	X	X	once a year
Thickness	**2.3.2.4**	X	X	once a year
Vulnerability	**2.3.2.5**	X		
Processability	**2.3.2.6**	X		
Thermal insulation	**2.3.2.7**	Optional		
Marking	**2.3.3**	X	X	once a year
Additional requirements for PVC Covering				
Aging	**3.2.1**	X		
Loss of plasticizer	**3.2.2**	X	X	once a year
Cold bend test	**3.2.3**	X	X	once a year
Additional requirements for PE Covering				
Melt flow index after ageing	**4.2.1**	X	X	once a year
Elongation at break	**4.2.2**	X	X	once a year
Cold bend test	**4.2.3**	X	X	once a year
Additional requirements for covering made from hard polyurethane foam surrounded by another cover of non-plasticized PVC				
Dimensional stability of the PU-foam	**5.2.1**	X	X	Once a year

8 List of referenced documents and source

8.1 Standards / normative documents

All normative references in this approval requirement refer to the editions of the standards as mentioned in the list below.

EN 437: 2003+A1: 2009	Test gases- test pressure – appliance categories
NEN-EN 1057: 2006 + A1: 2010	Copper and copper alloys – seamless, round copper tubes for water and gas in sanitary and heating application
NEN 1078: 2018	Supply for gas with an operating pressure up to and including 500 mbar - Performance requirements - New estate

8.2 Source

Parts of the text of this approval requirement have been based on NEN 1078.