

**AR 200**  
July 2022

# Approval requirement 200

Plastics piping systems for the supply of gaseous fuels –  
Polyethylene (PE) - Fittings



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# 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 : June, 1<sup>st</sup>, 2022

Accepted by Kiwa Nederland B.V. : August, 15<sup>th</sup>, 2022

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# 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 fittings (Electro and Spigot fusion fittings and saddles) made from Polyethylene (PE).

This GASTEC QA Approval requirements replace the GASTEC QA approval requirements 200, Fusion fittings and saddles made from Polyethylene (PE), dated May 2019.

List of changes:

- These approval requirements have been fully reviewed textually;
- Specification of the scope in line with EN 1555-3;
- Included paragraph about the use of inserts;
- Test matrix and bibliography has been updated.

The product requirements have not been changed.

## 1.2 Scope

This approval requirement specify the requirements for fusion fittings made of polyethylene (PE) as well as of mechanical fittings for use in plastic piping systems for the supply of gaseous fuels of the 2<sup>nd</sup> and 3<sup>rd</sup> family according to EN 437 with a maximum operating pressure of 10 bar at a reference temperature of 20°C. The operating temperature is between -20 °C and 40 °C.

This approval requirement is applicable for fittings of the following types:

- Electrofusion socket fittings
- Electrofusion saddle fittings
- Spigot end fittings (for butt fusion and electrofusion socket fusion)
- Mechanical fittings

## 2 Definitions

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

**Board of Experts:** The Board of Experts GASTEC QA.

**Maximum operating pressure:** maximum pressure that a component is capable of withstanding continuously in service under normal operating conditions.

**Operating temperature:** Temperature or temperature range for which the product is designed to operate.

# 3 Product requirements

## 3.1 General

The product shall comply with the requirements as specified in EN 1555-3: 2021 "Plastics piping systems for the supply of gaseous fuels – Polyethylene (PE) – Part 3: Fittings".

In addition to these requirements the below mentioned requirements shall be met.

## 3.2 Appearance

If electro fusion fittings are suitable to be welded on SDR 17 or SDR 17.6 pipes the internal and external surfaces of the pipe and the fitting after fusion jointing shall be in accordance to 6.4 of EN 1555-3. Visual examination shall be done on pipe/fitting assemblies with SDR 17.6 pipes.

## 3.3 Decohesive resistance

Contrary to EN 1555-3 table 4, the requirements and test method of the decohesive resistance shall be in accordance to NTA 8828+A1:2019 table 4.

## 3.4 Evaluation of ductility of fusion joint interface

Contrary to EN 1555-3 table 4, the requirements and test method of the evaluation of ductility of fusion joint interface shall be in accordance to NTA 8828+A1: 2019 table 4.

## 3.5 Elastomers

Contrary to EN 1555-3 article 5.2.3, elastomeric sealing components shall conform to the requirements of EN 682, type GAL or GBL.

## 3.6 Inserts

When declared by the manufacturer, it is allowed to use inserts for connecting a fitting. The insert shall be supplied with the fitting or separate available.

The insert shall be rigid and provide support over the entire compression area where:

- The clamping force applies, applicable for mechanical joints;
- The welding pressure applies, applicable for fusion joints.

The insert may not affect the welding process.

The insert shall not be able to displace in longitudinal direction after assembly.

After installation of the insert, the fitting shall show no signs of damage, scratches or cracks.

The material of the insert shall be fit for purpose. The minimal internal bore diameter of the fitting shall be stated by the manufacturer in his installation manual.

## 4 Marking and instructions

### 4.1 Marking

Additional to the marking as required per EN 1555-3, the products shall be durably marked with the GASTEC QA, GASTEC QA word mark or logo.

### 4.2 Instructions

The supplier shall provide instructions in the Dutch language and shall contain information about:

- The use and installation of the product.
- The use of inserts.
- The conditions under which it shall be used.
- How it can be determined if the product is correctly installed.
- The way the product shall be stored.
- Fusion compatibility; a list of compatible PE materials shall be stated

## 5 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.



## 6 Summary of tests

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

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

### 6.1 Test matrix

Description of requirement	Clause (EN 1555-3)	Test within the scope of		
		Initial product assessment	Product verification Verification	Frequency
<b>Material</b>	5			
Compound for fittings	5.1	X	X	1x / year
Material for non-polyethylene parts	5.2	X	X	1x / year
Metal parts	5.2.2	X	X	1x / year
Sealing materials	5.2.3	X	X	1x / year
Other materials	5.2.4	X	X	1x / year
<b>General characteristics</b>				
Appearance	6.1	X	X	1x / year
Colour	6.2	X	X	1x / year
Design	6.3	X		
Appearance of factory made joints	6.4	X		
Electrical characteristics for electro fusion fittings	6.5	X	X	1x / year
<b>Geometrical characteristics</b>	7 (including all sub clauses)	X	X	1x / year
<b>Mechanical characteristics</b>	8			
General	8.1	X		
Requirements	8.2	X		
Hydrostatic strength (20°C, 100 h)	8.2	X		
Hydrostatic strength (80°C, 165 h)	8.2	X		
Hydrostatic strength (80°C, 1000 h)	8.2	X	X	1x / year
Resistance to slow crack growth PE 100RC Strain hardening test	8.2	X		
Decohesive resistance (A)	8.2	X		
Evaluation of ductility of joint fusion interface (B)	8.2	X		
Tensile strength for butt fusion (C)	8.2	X	X	1x / year
Impact resistance (B)	8.2	X	X	1x / year
Pressure drop (B)	8.2	X		
<b>Performance requirements</b>				
Short term internal pressure resistance	8.3	X		
Resistance to tensile load	8.3	X		
<b>Physical characteristics</b>				
Oxidation induction time (OIT)	9.2	X		
Melt mass-flow rate (MFR)	9.2	X		
<b>Performance requirements</b>	<b>10</b>	X		
<b>Technical file</b>	<b>11</b>	X		

<b>Marking</b>	<b>12</b>	X		
General	12.1	X	X	1x / year
Minimum required marking of fittings	12.2	X	X	1x / year
Additional marking	12.3	X	X	1x / year
Fusion system recognition	12.4	X	X	1x / year
Delivery conditions	13	X	X	1x / year
<b>Additional GASTEC QA Approval Requirements 200</b>				
Appearance	3.2	X		
Decohesive resistance	3.3	X		
Evaluation of ductility of fusion joint interface	3.4	X	X	1x / year
Elastomers	3.5	X	X	1x / year
Marking	4.1	X	X	1x / year
Instructions	4.2	X	X	1x / year

# 7 List of referenced documents

## 7.1 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: 2021	Test gases- test pressure – appliance categories
EN 682: 2002 + A1: 2005	Elastomeric seals - Materials requirements for seals used in pipes and fittings carrying gas and hydrocarbon fluids
EN 1555-3: 2021	Plastic piping systems for the supply of gaseous fuels – Polyethylene (PE) – part 3: fittings
NEN 7244	Dutch edition on base of NEN-EN 12007 - Gas supply systems - Pipelines for maximum operating pressure up to and including 16 bar
NEN-EN 12007	Gas supply systems - Pipelines for maximum operating pressure up to and including 16 bar
NTA 8828+A1: 2019	Electrofusion of PE pipes and PE fittings
GASTEC QA General Requirements: 2021	