KIWA TECHNICAL CONSULTING AB

TECHNICAL REPORT

Next-Plastic s.r.o

Review, according to design requirements in EN 17613:2022, of tests performed on product Composite Pipe NP-LPG25 and fittings NP-LPG10-AS/NP-LPG10S

Report No.: 5002536-100

Revision No.: 0

Kiwa Technical Consulting AB

Box 7178 170 07 Solna Sweden Phone: (+46) 10 479 3000 www.kiwa.se

Date	Our project No.
2023-02-24	5002536-100
Approved by Mikael Lorentzon	Department Kiwa Technical Consulting AB Advisory Service
Customer Next-Plastic s.r.o.	Customer reference Lars Selling

Summary

This report review testing documents performed on composite pipe NP-LPG25 with fittings and compare if the testing fulfill requirements of the standard *EN 17613:2022: LPG equipment and accessories – Composite piping for use with LPG in liquid phase and vapor pressure phase – Design and manufacture.*

The conclusion of the review is that the testing documents have been found to comply with the requirements EN 17613:2022 and that the tested products composite pipe NP-LPG25 and fitting NP-LPG10-AS/NP-LPG10S fulfill design requirements of the same standard.

Report title	Subject Group
Review if tests performed on product Composite Pipe NP-LPG25 and fittings NP-LPG10-AS/ NP-LPG10S fulfil design requirements according EN 17613:2022	Testing according EN 17613
	Index terms EN 17613, Composite pipe
Work carried out by Björn Holmqvist	Distribution
Work verified by Mikael Lorentzon	☒ No distribution without permission from the customer or Kiwa Technical Consulting AB. ☐ Limited internal distribution in Kiwa Technical Consulting AB. ☐ Unrestricted distribution.
Date of this revision 2023-02-24	

Table of content ***Page***

1 INTRODUCTION 4
2 EARLIER CERTIFICATE 4
3 SUMMARY OF TEST THAT SHALL BE PERFORMED 4
4 SUMMARY OF PERFORMED TEST 5
5 CONCLUSIONS 6
6 DISCUSSION OF OTHER DESIGN CRITERIA 6
7 TABLE OF REVISIONS 6

1 INTRODUCTION

This report review testing documents performed on pipe NP-LPG25 with fittings and compare if the testing fulfill requirements of the standard *EN 17613:2022: LPG equipment and accessories – Composite piping for use with LPG in liquid phase and vapor pressure phase – Design and manufacture.*

2 EARLIER CERTIFICATE

Kiwa Inspecta has in EU-Type Examination Statement No. 19-1015220-100 rev1, found that the pipe and fittings comply with the requirements in EN16125, EN 1555, AN 13463, EN13445-3 (fittings).

The standard EN 16125, *LPG Equipment and Acessories - Pipework systems and support - LPG in liquid phase and vapour pressure phase* include, in Annex E, specific requirements for composite piping. This Annex E is now removed from EN 16125 and moved to a new standard EN 17613. Because of the similarity between EN 16125 and EN 17613 some test have been reused in fulfilling the test requirements in EN 17613:2022.

3 SUMMARY OF TEST THAT SHALL BE PERFORMED

Below find table 2 in EN 17613:2022

Table 2 — Summary of tests

	Type of test	Clause below	Description	# of samples	Requirements	Standard reference
1	Internal burst pressure	7.2.1		3	Burst pressure > 100 bar	
2	Hydrostatic strength test	7.2.2		3	1 000 hrs @ 80 °C @ 20 bar internal pressure without failure	
3	Fatigue test	7.2.3	Cycle test varied pressure between 3 bar and 30 bar	3	12 000 cycles without failure	EN 14427:2022, 5.2.6
4	Fitting pull-out test	7.2.4	Tensile load	3	5 mins without failure @ 4 000 N	EN 14125:2013, 7.2.11
6	Puncture resistance	7.2.5		3	Withstand > 25 bar pressure test for 5 min after applied tip load of 500 N @ 23 °C	EN 14125:2013, 7.2.7.2 and 7.1.3
7	Permeation test	7.2.6	Mass loss method or Film test method	3	< 0,25 g m^{-2} d^{-1}	ISO 15105-2 for Film Test
8	LPG compatibility	7.2.7	Internal burst test	3	Burst pressure > 100 bar after exposure to test liquid	
9	Static electricity	7.3.3	Dielectric strength	3	> 100 kV electrical breakthrough strength	EN 60243-2

4 SUMMARY OF PERFORMED TEST

Table below show tests performed on pipe NP-LPG25. The tests standards are compared with requirements in EN 17613:2022.

Test	Name	Test institute	Report Date (report)	Test according	Comment
7.2.1	Internal burst pressure	SP	6F021046-1 2016-12-12	PRN 1988	Procedure identical. Burst pressure evaluated according EN 17613.
7.2.2	Hydrostatic strength test	SP	6F021046-2 2016-12-12	EN 12201-2:2011, par. 7.2 table 3	33.4 bar used. Requirement 20 bar in EN 17613
7.2.3	Fatigue test	RISE	20-121847 2022-09-28	EN 14427:2014 par. 5.2.6	EN 17613 refer to ed. 2022. The new edition have more alternative but procedure in ed. 2014 can still be used.
7.2.4	Fitting pull-out test	SP	6F021046-3 2016-12-20	EN 14125:2013 par. 7.2.11	Procedure and requirements in test protocol fulfil requirements in EN 17613 Fittings: NP LPG10-AS/NP LPG10S
7.2.5	Puncture resistance	Rise	20-121847 2022-09-28	EN 14125:2013 par. 7.2.7.2/7.1.3	EN 17613 refer to this standard
7.2.6	Permeation test	Rise	20-121847 2022-09-28	prEN 17613:2020 par. 7.2.6.1	Identical text in ed. 2020 and ed. 2022 for used “Mass loss method” (7.2.6.1).
7.2.7	LPG compatibility	Rise	20-121847 2022-09-28	prEN 17613:2020 par. 7.2.7	Identical text in ed. 2020 and ed. 2022
7.3.3	Dielectric strength	Koncar	045922 2022-09-13	IEC 60243-2:2013, IEC 60243_1:2014	EN 17613 refer to EN 60243 which are identical with IC 60243.

Used test standards that EN 17613 not referred to but is found to comply with requirements

PRN 1988: Swedish Plastic Piping Code

EN 12201: Plastics piping systems for water supply and for drainage sewerage under pressure.

EN 14427: LPG equipment and accessories – Transportable refillable fully wrapped composite cylinders for LPG – Design and construction

EN 14125: Thermoplastic and flexible metal pipework for underground installation at petrol filling stations.

Laboratory

SP Technical Research Institute of Sweden

RISE Research Institute of Sweden

Koncar Electrical Engineering Institute, Ltd. Laboratory Center.

5 CONCLUSIONS

The performing of test in chapter 4 have been compared with procedure and evaluation criteria for tests according table 2 in EN 17613:2022, se chapter 3. The conclusion is that the tests shows that pipe NP-LPG25 and fittings NP LPG10-AS/NP LPG10S fulfill tests requirements in EN 17613:2022.

6 DISCUSSION OF OTHER DESIGN CRITERIA

The presented tests in chapter 2 are taken care of requirement for composite pipes for use with LPG having a maximum allowable pressure up to 25 bar. The tests address requirements concerning strength, strength over time, fatigue, tightness, compatibility for use with LPG and safety against static electricity.

Other design criteria are

- Operating temperature between -20 °C and +40 °C

This design criteria is fulfilled with the requirement to use material standard EN 1555 for composite pipes.

7 TABLE OF REVISIONS

0 Original