Test Report

Innogaz Low Volume Tapping Tee LVT 4IPS x 1CTS
made of PE4710
Dated: Sep 06th 2016

Introduction

This report describes the tests administered for the release of Electrofusion LOW VOLUME TAPPING TEE Ø 4IPS X 1CTS part of the Innogaz product range, manufactured by

Aliaxis Utilities & Industry Private Limited
Goa, India

Electrofusion Tapping Tees are composed of Eltex TUB 121 Cell Class PE445574C PE3408/4710 and suitable in Gas service line up to 145 psig or water service line up to 232 psig.

General

The fusion procedure and the qualification test were administered at the Test Laboratories of Aktiengesellschaft Technical Plastics Division, Mannheim, Germany with the pipes documented in the result tables.
All tests are based on ASTM F1055 "Standard Specification for Electrofusion Type Polyethylene Fittings for Outside Diameter Controlled Polyethylene Pipe and Tubing".
Fusion procedures based on the Assembly Instruction for Innogaz Electrofusion Fittings and were executed at operating temperatures between -20℉ (- 30℃) to 120℉ (+50℃).
Subsequently, the test samples were subject to the following tests (ASTM F1055)

- Sustained Pressure Test	ASTM F 1055 9.2 (ASTM D1598) temperature 176 ℉ (80 ℃) PE4710 HS 750psi >200h / 640psi >1000h PE2708 HS 670psi >200h / 580psi >1000h
- Minimum Hydraulic Burst Pressure Test	ASTM F 1055 9.1
- Impact Resistance Test	ASTM F 905
- Joint Crush Test (homogeneity of fusion)	ASTM F 1055 9.4

Aliaxis Utilities and Industry Pvt Ltd.
Plot No. L-148 & 149
Verna Industrial Estate, Verna , Goa 402722
Tel. +91-832-6691500 · Fax +91- 832-6691515
Internet: www.aliaxis.in

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Results

Technical Characteristics/ Marking

Marking: Innogaz Logo, Dimension, ASTM F1055 D2513, G, PE3408/4710, SDR11, Batch code, fusion / traceability barcode.

Conclusion

The requirements of the ASTM F1055 are fulfilled.

Dimensional Check

according to the drawing and ASTM F1055

The priority A characteristics (resistance, internal diameter etc.) are according to the drawing and ASTM D2513.

Conclusion

Test passed. The requirement of the ASTM F1055 are fulfilled

Sustained Pressure Test

according to ASTM F1055 9.2 (ASTM D1598)

Saddle / Outlet	Pipe	Assembly and fusion ambient temperature	Test temperature	Pressure [psi]	Time-to-Failure	Result
LVT 4 IPSx1 CTS	PE2406/2708	-20℉	176℉	145	200 h	no failure occurred
LVT 4 IPSx1 CTS	PE2406/2708	-20℉	176℉	145	200 h	no failure occurred
LVT 4 IPSx1 CTS	PE2406/2708	120℉	176℉	145	200 h	no failure occurred
LVT 4 IPSx1 CTS	PE2406/2708	120℉	176℉	145	200 h	no failure occurred
LVT 4 IPSx1 CTS	PE2406/2708	-20℉	176℉	136	1000 h	no failure occurred
LVT 4 IPSx1 CTS	PE2406/2708	-20℉	176℉	136	1000 h	no failure occurred
LVT 4 IPSx1 CTS	PE2406/2708	120℉	176℉	136	1000 h	no failure occurred
LVT 4 IPSx1 CTS	PE2406/2708	120℉	176℉	136	1000 h	no failure occurred
LVT 4 IPSx1 CTS	PE3408/4710	-20℉	176℉	156	200 h	no failure occurred
LVT 4 IPSx1 CTS	PE3408/4710	-20℉	176℉	156	200 h	no failure occurred
LVT 4 IPSx1 CTS	PE3408/4710	120℉	176℉	156	200 h	no failure occurred
LVT 4 IPSx1 CTS	PE3408/4710	120℉	176℉	156	200 h	no failure occurred
LVT 4 IPSx1 CTS	PE3408/4710	-20℉	176℉	151	1000 h	no failure occurred
LVT 4 IPSx1 CTS	PE3408/4710	-20℉	176℉	151	1000 h	no failure occurred
LVT 4 IPSx1 CTS	PE3408/4710	120℉	176℉	151	1000 h	no failure occurred
LVT 4 IPSx1 CTS	PE3408/4710	120℉	176℉	151	1000 h	no failure occurred

Conclusion

All samples met the requirements. No leakages recorded.

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Minimum Hydraulic Burst Pressure Test
according to ASTM F 1055 9.1

Minimum time to failure 60-70s (desired value)

Saddle / Outlet	Pipe	Assembly and fusion ambient temperature	Test temperature	Time-to-Failure	Burst pressure	Result
LVT 4 IPSx1 CTS	PE2406/2708	-20 ℉	73 ℉	62 s	719 psi	ductile pipe failure
LVT 4 IPSx1 CTS	PE2406/2708	-20 ℉	73 ℉	62 s	719 psi	ductile pipe failure
LVT 4 IPSx1 CTS	PE2406/2708	120 ℉	73 ℉	70 s	711 psi	ductile pipe failure
LVT 4 IPSx1 CTS	PE2406/2708	120 ℉	73 ℉	70 s	711 psi	ductile pipe failure
LVT 4 IPSx1 CTS	PE3408/4710	-20 ℉	73 ℉	65 s	804 psi	ductile pipe failure
LVT 4 IPSx1 CTS	PE3408/4710	-20 ℉	73 ℉	65 s	804 psi	ductile pipe failure
LVT 4 IPSx1 CTS	PE3408/4710	120 ℉	73 ℉	65 s	799 psi	ductile pipe failure
LVT 4 IPSx1 CTS	PE3408/4710	120 ℉	73 ℉	65 s	799 psi	ductile pipe failure

Conclusion

All samples met the requirements. No leakages recorded

Impact Resistance Test
according to ASTM F 905

High 78.7 in.
Weight 11 lb

Saddle / Outlet	Pipe	Assembly and fusion ambient temperature	Test temperature	Result
LVT 4 IPSx1 CTS	PE2406/2708	-20℉	70-77℉	no break in the joint
LVT 4 IPSx1 CTS	PE2406/2708	-20℉	70-77℉	no break in the joint
LVT 4 IPSx1 CTS	PE2406/2708	120℉	70-77℉	no break in the joint
LVT 4 IPSx1 CTS	PE2406/2708	120℉	70-77℉	no break in the joint
LVT 4 IPSx1 CTS	PE3408/4710	-20℉	70-77℉	no break in the joint
LVT 4 IPSx1 CTS	PE3408/4710	-20℉	70-77℉	no break in the joint
LVT 4 IPSx1 CTS	PE3408/4710	120℉	70-77℉	no break in the joint
LVT 4 IPSx1 CTS	PE3408/4710	120℉	70-77℉	no break in the joint

Conclusion

All samples met the requirements. No leakages in the joint recorded

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Joint Crush Test
according to ASTM F1055 9.4.1

Saddle / Outlet	Pipe	Assembly and fusion ambient temperature	Test temperature	Result
LVT 4 IPSx1 CTS	PE2406/2708	-20℉	70-77℉	Separation <15%
LVT 4 IPSx1 CTS	PE2406/2708	-20℉	70-77℉	Separation <15%
LVT 4 IPSx1 CTS	PE2406/2708	120℉	70-77℉	Separation <15%
LVT 4 IPSx1 CTS	PE2406/2708	120℉	70-77℉	Separation <15%
LVT 4 IPSx1 CTS	PE3408/4710	-20℉	70-77℉	Separation <15%
LVT 4 IPSx1 CTS	PE3408/4710	-20℉	70-77℉	Separation <15%
LVT 4 IPSx1 CTS	PE3408/4710	120℉	70-77℉	Separation <15%
LVT 4 IPSx1 CTS	PE3408/4710	120℉	70-77℉	Separation <15%

Conclusion

In all cases homogeneous fusion result were achieved. Only minor separations less then 15% of the total fusion zone could be seen.

Joint Crush Test
according to ASTM F1055 9.4.1

Saddle / Outlet	Pipe SDR17	Assembly and fusion ambient temperature	Test temperature	Result
LVT 4 IPSx1 CTS	PE80	-20℉	70-77℉	Separation <15%
LVT 4 IPSx1 CTS	PE80	-20℉	70-77℉	Separation <15%
LVT 4 IPSx1 CTS	PE80	120℉	70-77℉	Separation <15%
LVT 4 IPSx1 CTS	PE80	120℉	70-77℉	Separation <15%
LVT 4 IPSx1 CTS	PE100	-20℉	70-77℉	Separation <15%
LVT 4 IPSx1 CTS	PE100	-20℉	70-77℉	Separation <15%
LVT 4 IPSx1 CTS	PE100	120℉	70-77℉	Separation <15%
LVT 4 IPSx1 CTS	PE100	120℉	70-77℉	Separation <15%

Conclusion

In all cases homogeneous fusion result were achieved. Only minor separations less then 15% of the total fusion zone could be seen. No pipe deformation was occurred.

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