



fast pipe

Test Certifications

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Last update: October, 20th 2016



TECNOGAS

I percorsi della tecnologia.

ENG



TECNOGAS: OUR EXPERIENCE AT YOUR SERVICE

The following certificates are herewith attached as proof of quality, respect of legislations and care to sustainability and innovation Tecnogas always search for.

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TÜV Certificate

This overall certificate gather all the results gained by FastPipe. It is a relevant achievement that proves safety and reliability of our new product.

CERTIFICATE ■ CERTIFICATO ■ ZERTIFIKAT ■ ZERTIFIKA ■ CERTIFICADO ■ گواهینامه ■ ΠΙΣΤΟΠΟΙΗΤΙΚΟ ■ شهادة ■ 証明 ■ 証明書 ■ 인증서



C E R T I F I C A T E

TYPE APPROVAL

Certificate No. 16-PEM-0010012-TIC/01

We hereby certify that

FAST PIPE
models

Tubo 3/8" sistema Fast Pipe con raccordi di estremità
Tubo 1/4" sistema Fast Pipe con raccordi di estremità

Manufacturer*: **TECNOGAS S.r.l.**
Viale Leonino da Zara 10
35020 Albignasego PD - ITALIA

Assembled in compliance with the assembly and crimping instruction
"Sistema FAST PIPE Installation Instruction rev. del 26.04.2016"

Have the following performance according to the applicable standards:

Permeability, no leakage (< 20 g/m² year) according to
UNI EN 1736:01

Pressure test, no leakage according to SAE J517 FEB 2013 - 12.1.2

as a result of assembly and crimp tests carried out at

TECNOGAS S.r.l. On **28/04/2016**
Via Leonino da Zara 10 – Albignasego PD

and the laboratory tests

See REPORT No. TR-0616-VIF-TIC-PC-0200012-16_02

The process of assembly and crimping

"Sistema FAST PIPE Installation Instruction"

IS APPROVED

Validity 27/04/2019

Note: (*)The manufacturer declares that the products are built using the same materials, components and processes used for the tested prototypes. Any design change, materials, components or production process requires repetition of the tests in order to maintain the validity of the certificate. The certificate is issued for the model tested and based on a voluntary request of the manufacturer. It is not extended to the manufacturing process.



Reggio Emilia, 01/06/2016

Ing. Andrea Vivi
TUV INTERCERT Certification Body



TÜV INTERCERT S.r.l. • Group of TÜV Saarland • Via Cecati 1/1 • 42123 Reggio Emilia ITALY
www.tuvintercert.it

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Giordano Institute - Burst test certificate

Giordano institute tested our new product at 200 bar (2900 psi) with success. FastPipe then has been kept under pressure until burst that, for 1/4" diameter happened over 700 bar. The test was carried out in accordance with the requirements of section 12.1.4 of standard SAE J 517.

**Istituto Giordano S.p.A.**

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R.E.A. c/o C.C.I.A.A. (RN) 156766
Registro Imprese di Rimini n.00 549 540 409

TEST REPORT No. 329994

Place and date of issue: Bellaria-Igea Marina - Italy, 16/12/2015

Customer: TECNOGAS S.r.l. - Via L. Da Zara, 10 - 35020 ALBIGNASEGO (PD) - Italy

Date test requested: 26/11/2015

Order number and date: 68425, 26/11/2015

Date sample received: 27/11/2015

Test date: from 01/12/2015 to 02/12/2015

Purpose of test: burst testing of hoses in accordance with standard SAE J 517

Test site: Istituto Giordano S.p.A. - Blocco 1 - Via Rossini, 2 - 47814 Bellaria-Igea Marina (RN) - Italy

Sample origin: sampled and supplied by the Customer

Identification of sample received: No. 2015/2492

Sample name*

The test sample is called "Fast Pipe".

(*) according to that stated by the Customer.

Comp. AV
Revis. EB

This test report consists of 5 sheets.
This document is the English translation of the test report No. 329994 dated 16/12/2015 issued in Italian; in case of dispute the only valid version is the Italian one. Date of translation: 01/08/2016.

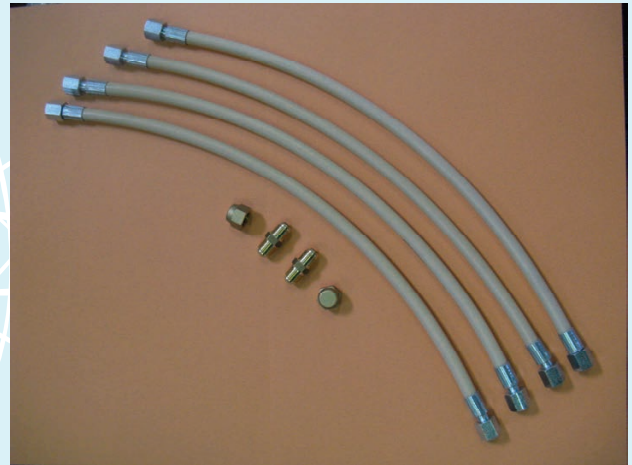
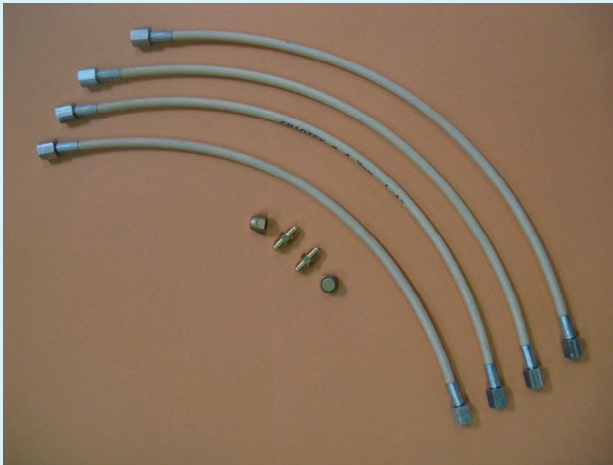
Sheet
1 of 5

CLAUSES: This document relates only to the sample or material tested and shall not be reproduced except in full without Istituto Giordano's written approval.

Description of sample*

The test sample comprises 6 lengths of multilayer hose, formed by polyamide, polyester braid and copolyester, having the following dimensions:

- 3 lengths of hose of internal diameter 4,7 mm and external diameter 9,5 mm with $\frac{1}{4}$ " female SAE end fittings;
- 3 lengths of hose of internal diameter 8,5 mm and external diameter 13,5 mm with $\frac{3}{8}$ " female SAE end fittings.



Photos of the samples in the as-received state

Normative References

The test was carried out in accordance with the requirements of section 12.1.4 of standard SAE J 517.

(*) according to that stated by the Customer.

Test method

The samples were inserted individually into the pressurising hydraulic circuit formed by a hydraulic press, maximum pressure 800 bar and in-house identification code LM053, complete with AEP Transducers 0-1000 bar digital pressure gauge, in-house identification code TER023.

Tests were carried out using water at ambient temperature.

The samples were pressurised for 5 min to 200 bar, i.e. 4 times the manufacturer's declared maximum working pressure, following which the internal hydraulic pressure was gradually increased until failure occurred.



Photo of sample during testing

Test results

The results of the tests carried out on each hose are given in the following tables.

Diameter 4,7 mm		
Sample [No.]	Burst test to 200 bar for 5 min	Burst pressure [bar]
1	No leakage	741
2	No leakage	783
3	No leakage	756

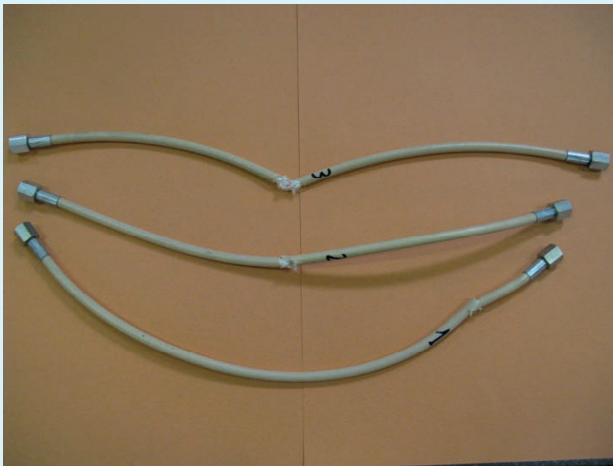


Photo of samples after failure

Diameter 8,5 mm		
Sample [No.]	Burst test to 200 bar for 5 min	Burst pressure [bar]
1	No leakage	463
2	No leakage	457
3	No leakage	461

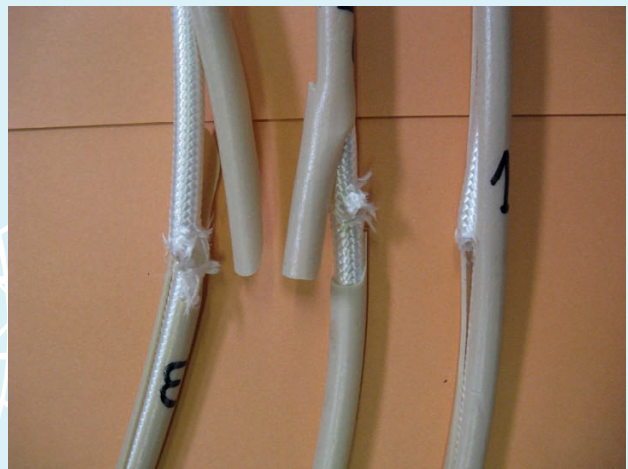
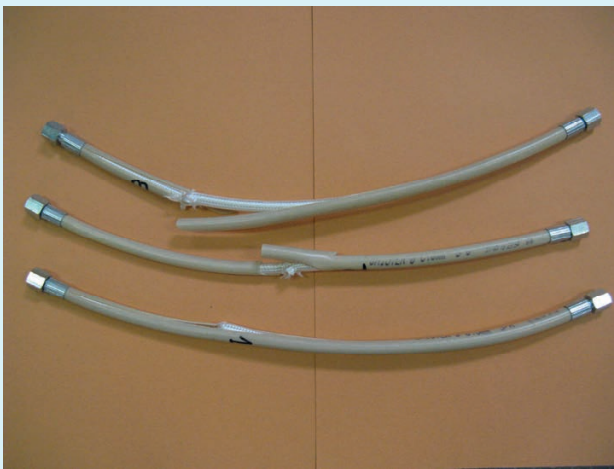


Photo of samples after failure

Test Technician:
Dott. Ing. Luca Bonini

Head of Thermotechnics Laboratory:
Dott. Ing. Eugenio Berlini

Chief Executive Officer
(Dott. Arch. Sara Lorenza Giordano)



Firmato digitalmente da GIORDANO SARA LORENZA

Giordano Institute - Proof test certificate

Giordano institute carried out this proof test of FastPipe in accordance with standard SAE J 517. FastPipe has been kept under pressure (100 bar, that is 125% of the declared maximum working pressure) searching for any kind of leaks. The test has been successful.



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Registro Imprese di Rimini n. 00 549 540 409

TEST REPORT No. 333868

Place and date of issue: Bellaria-Igea Marina - Italy, 20/05/2016

Customer: TECNOGAS S.r.l. - Via L. Da Zara, 10 - 35020 ALBIGNASEGO (PD) - Italy

Date test requested: 19/05/2016

Order number and date: 70003, 19/05/2016

Date sample received: 10/05/2016

Test date: 13/05/2016

Purpose of test: proof test of hoses in accordance with standard SAE J 517

Test site: Istituto Giordano S.p.A. - Blocco 1 - Via Rossini, 2 - 47814 Bellaria-Igea Marina (RN) - Italy

Sample origin: sampled and supplied by the Customer

Identification of sample received: No. 2016/0975

Sample name*

The test sample is called "Fast Pipe".

Description of sample*

The test sample comprises 6 lengths of multilayer hose, formed by polyamide, polyester braid and copolyester, having the following dimensions:

- 3 lengths of hose of internal diameter 4,7 mm and external diameter 9,5 mm with ¼" female SAE end fittings connected by nipples;

(*) according to that stated by the Customer.

Comp. AV
Revis. EB

This test report consists of 4 sheets.
This document is the English translation of the test report No. 333868 dated 20/05/2016 issued in Italian; in case of dispute the only valid version is the Italian one. Date of translation: 01/08/2016.

Sheet
1 of 4

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- 3 lengths of hose of internal diameter 8,5 mm and external diameter 13,5 mm with $\frac{3}{8}$ " female SAE end fittings connected by nipples.



Photo of packaging used to send sample with stamps, signatures and seal



Sample photo

Normative References

The test was carried out in accordance with the requirements of section 12.1.2 of standard SAE J 517.

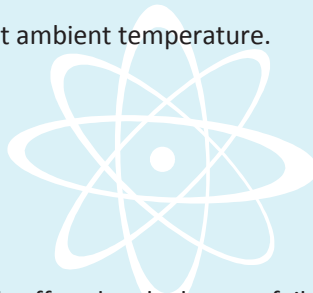
Test method

The test sample was immersed in a tank filled with water and pressurised for an hour to 100 bar, i.e. twice the manufacturer's declared maximum working pressure, checking for any sign of air bubbles.

The pressure source was a nitrogen cylinder with suitable pressure regulator.

Pressure was read by an AEP Transducers 0-350 bar digital pressure gauge, in-house identification code TER022.

The test was carried out with water at ambient temperature.



Test results

At the end of the test the sample had suffered no leakage or failure.

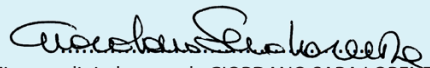


After-test photo of sample

Test Technician:
Dott. Ing. Luca Bonini

Head of Thermotechnics Laboratory:
Dott. Ing. Eugenio Berlini

Chief Executive Officer
(Dott. Arch. Sara Lorenza Giordano)


Firmato digitalmente da GIORDANO SARA LORENZA

CSI Analysis Center - Permeability test certificate

This is probably the most important certificate to proof the deep innovation of our new product. This test certifies the complete impermeability of FastPipe, according to UNI EN 1736-01/2009.



DIVISIONE:
DIVISION: **TESTING-CERTIFICAZIONE**

LABORATORIO:
LABORATORY: **Materiali**

RAPPORTO DI PROVA <i>(Test Report)</i>		Pag. 1
		di/of
		pag. 3
N°	0817\FPM\MATs\16	Data: 02/08/2016
		Date:

IDENTIFICAZIONE E DESCRIZIONE DEL CAMPIONE:
SPECIMEN DESCRIPTION:

PIPE D. int. 4,7 D. est. 9,5 female thread fittings SAE 1/4

DATI IDENTIFICATIVI DEL CLIENTE:
CLIENT:

Tecnogas s.r.l.
Via L. Da Zara, 10
35020 Albignasego (PD)

NORMA DI RIFERIMENTO:
REFERENCE STANDARD:

UNI EN 1736-01

DISTRIBUZIONE ESTERNA:
OUTSIDE DISTRIBUTION:

Tecnogas s.r.l.
sig. Michele Mazzaro

DISTRIBUZIONE INTERNA:
INSIDE DISTRIBUTION:

Copia: Responsabile Divisione

ENTE DI ACCREDITAMENTO:
ACCREDITATION BODY:

Mod. 37 - Rev. B - Società a Sede Unica soggetta ad attività di direzione e coordinamento di IMQ spa



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REA. 1466310
Registro Imprese 352168/8620/18
C.F./P.I.: IT11360160151
Cap. Soc. € 1.040.000



RAPPORTO DI PROVA
(Test Report)

Pag. 2
di/of
pag. 3

N° 0817\FPMMATs\16

Data: 02/08/2016
Date:

GENERAL INFORMATION:

- Date sample reception: 12/11/2015
- Date analysis start: 12/11/2015
- Date Analysis end: 25/11/2015
- Deviation from test methods: NO

IDENTIFICATION OF SAMPLE EXAMINED

PIPE D. int. 4,7 D. est. 9,5 female thread fittings SAE 1/4

SAMPLING:

The initial sampling was carried out by the client.

The sampling for the test was performed by extracting test pieces at random from the samples in our possession.

DECLARATION:

The test results in this report refer exclusively to the tested sample.

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PERFORMED DETERMINATIONS

PERMEABILITY OF PIPES

Permeability Gas R407C, R410A and R32 hose through weight method under the conditions of 32 ° C and pressure equivalent to that of the refrigerant saturation, according to the **UNI EN 1736-01** having test duration 96 hours.

The loss in weight of an equivalent empty tube and maintained under the same conditions must be subtracted from the decrease in weight of the sample.

The test is not performed in case of losses also contained by the closure system adopted.

LR = 20 g / m² / year



RAPPORTO DI PROVA
(Test Report)

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di/of
pag. 3

N° 0817\FPMMATs\16

Data: 02/08/2016
Date:

RESULTS

PERMEABILITY OF PIPES

After 96 hours of conditioning the sample "**PIPE D. int. 4,7 D. est. 9,5 female thread fittings SAE 1/4"** thread fittings had no losses with none of the three tested gas. (<20 g / m2 / year)

For the performed determination, **UNI EN 1736-01** imposes a maximum value of loss 1000 g / m2 / year (for testing at 32°C, with or without thermoplastic barrier). This limitation is the same for the last technical standard release **UNI EN 1736-09** (for testing at 32°C and leakage rate class 3).

DATA
Date

Settore Food Packaging Materials
Food Packaging Materials Sector

Area Testing
Testing Area

02/08/2016

Alberto Taffurelli

Paolo Fumagalli

Documento firmato digitalmente ai sensi del D. Lgs. N. 82 del 7 Marzo 2005 e successive modifiche

Giordano Institute - Fire resistance test certificate

To comply with the current regulations in terms of building technologies, FastPipe has been subjected to a fire reaction test. The result is on page 20.



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RAPPORTO DI CLASSIFICAZIONE N. 336897

CLASSIFICATION REPORT No. 336897

Luogo e data di emissione: Bellaria-Igea Marina - Italia, 07/10/2016

Place and date of issue:

Committente: TECNOGAS S.r.l. - Viale Leonino da Zara, 10 - 35020 ALBIGNASEGO (PD) - Italia

Customer:

Numero e data della commessa: 70997, 20/09/2016

Order number and date:

Oggetto: classificazione al fuoco dei prodotti e degli elementi da costruzione - Parte 1: Classifica-

Purpose: zione in base ai risultati delle prove di reazione al fuoco secondo la norma UNI EN 13501-1:2009

fire classification of construction products and building elements - Part 1: Classification using data from reaction to fire tests in accordance with standard UNI EN 13501-1:2009

Provenienza del campione: campionato e fornito dal Committente

Origin of sample: sampled and supplied by the Customer

Denominazione del prodotto*.

Product name.*

"Tubazione FAST-PIPE".

Definizione del prodotto classificato.

Definition of classified product.

Il prodotto Tubazione FAST-PIPE è definito come "tubazione multistrato isolata per il trasporto di gas refrigeranti".

The product Tubazione FAST-PIPE is defined as a "isolated multilayer pipe for the transport of cooling gases".

(*) secondo le dichiarazioni del Committente.
according to information supplied by the Customer.



LAB N° 0021

Comp. FM Revis. AG	Il presente rapporto di classificazione è composto da n. 5 fogli e n. 1 allegato ed è emesso in formato bilingue (italiano e inglese); in caso di dubbio, è valida la versione in lingua italiana. <i>This classification report is made up of 5 sheets and 1 annex and it is issued in a bilingual format (Italian and English); in case of dispute the only valid version is the Italian one.</i>	Foglio / Sheet 1 / 5
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CLAUSOLE: il presente documento si riferisce solamente al campione o materiale sottoposto a prova e non può essere riprodotto parzialmente, salvo approvazione scritta dell'Istituto Giordano.
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Descrizione del prodotto classificato.*Description of classified product.*

Caratteristica <i>Characteristic</i>	Dichiarata dal Committente <i>Declared by Customer</i>
Tipologia e composizione del materiale <i>Material type and composition</i>	tubazione multistrato isolata per il trasporto di gas refrigeranti <i>isolated multilayer pipe for the transport of cooling gases</i>
Diametro interno <i>Internal diameter</i>	8,5 mm
Diametro esterno <i>External diameter</i>	25 mm
Massa per unità di superficie <i>Mass per unit area</i>	1,25 kg/m ²
Colore <i>Colour</i>	bianco <i>white</i>
Descrizione dei singoli componenti partendo dalla faccia esposta al fuoco <i>Description of individual components from the face exposed to fire</i>	
Strato isolante <i>Insulating layer</i>	isolante anticondensa in polietene espanso di spessore 5 mm e densità 45 kg/m ³ <i>anti-condensation insulation foam polyethylene, thickness 5 mm and density 45 kg/m³</i>
Tubazione di diametro interno 8,5 mm e diametro esterno 11 mm così costituita: <i>Pipe, inner diameter 8,5 mm and outside diameter 11 mm, made up of:</i>	
Strato esterno <i>External layer</i>	copertura della treccia di rinforzo "Niobestere 6040" di spessore 1 mm e densità 1200 kg/m ³ <i>"Niobestere 6040" coverage of reinforcing braid, thickness 1 mm and density 1200 kg/m³</i>
Rinforzo <i>Reinforcing</i>	treccia di rinforzo in poliestere di spessore 0,5 mm e densità 600 kg/m ³ <i>polyester reinforcing braid, thickness 0,5 mm and density 600 kg/m³</i>
Anima interna <i>Inner core</i>	poliammide "Niobeammide 6045" di spessore 1 mm e densità 1300 kg/m ³ <i>"Niobeammide 6045" polyamide, thickness 1 mm and density 1300 kg/m³</i>

In allegato "A" è riportata la documentazione tecnica del prodotto fornita dal Committente.

The product technical documentation provided by the Customer is given in Annex "A".

Parametri del campione rilevati dal laboratorio.

Test sample parameters determined by the laboratory.

Diametro esterno <i>External diameter</i>	25 mm
Colore <i>Colour</i>	bianco <i>white</i>

Riferimenti normativi.Normative references.

La classificazione è stata determinata secondo le prescrizioni della norma UNI EN 13501-1:2009 del 26/11/2009 "Classificazione al fuoco dei prodotti e degli elementi da costruzione - Parte 1: Classificazione in base ai risultati delle prove di reazione al fuoco".

Classification has been assigned in accordance with the provisions of the standard UNI EN 13501-1:2009 dated 26/11/2009 "Fire classification of construction products and building elements - Part 1: Classification using data from reaction to fire tests".

Rapporti e risultati in supporto a questa classificazione.Reports and results in support of this classification.**Rapporti.***Reports.*

Nome del laboratorio <i>Name of laboratory</i>	Nome del Committente <i>Name of Customer</i>	Rapporto n. <i>Report No.</i>	Metodo di prova e data* <i>Test method and date*</i>
Istituto Giordano S.p.A.	TECNOGAS S.r.l.	336895	UNI EN ISO 11925-2:2005
Istituto Giordano S.p.A.	TECNOGAS S.r.l.	336896	UNI EN 13823:2014

(*) UNI EN ISO 11925-2:2005 del 01/06/2005 "Prove di reazione al fuoco - Accendibilità dei prodotti sottoposti all'attacco diretto della fiamma - Parte 2: Prova con l'impiego di una singola fiamma";

UNI EN 13823:2014 del 11/12/2014 "Prove di reazione al fuoco dei prodotti da costruzione - Prodotti da costruzione esclusi i pavimenti esposti ad un attacco termico prodotto da un singolo oggetto in combustione".

UNI EN ISO 11925-2:2005 dated 01/06/2005 "Reaction to fire tests - Ignitability of products subjected to direct impingement of flame - Part 2: Single-flame source test";

UNI EN 13823:2014 dated 11/12/2014 "Reaction to fire tests for building products - Building products excluding floorings exposed to the thermal attack by a single burning item".

Risultati in supporto alla classificazione.*Results in support of this classification.*

Metodo di prova <i>Test method</i>	Prodotto <i>Product</i>	N. prove* <i>No. of tests*</i>	Parametri <i>Parameter</i>	Risultati <i>Results</i>	
				Parametri continui - Media <i>Continuous parameter - Mean</i>	Parametri discreti - Conformità <i>Discrete parameters - Compliance</i>
UNI EN ISO 11925-2:2005 Attacco della fiamma sulla superficie e sul bordo <i>Impingement of flame on the surface and on the edge</i> Applicazione: <i>Exposure:</i> 30 s	"Tubazione FAST-PIPE"	12	Fs ≤ 150 mm	N/A	Sì <i>Yes</i>
			Accensione della carta da filtro <i>Ignition of the filter paper</i>	N/A	Sì <i>Yes</i>
UNI EN 13823:2014	"Tubazione FAST-PIPE"	3	FIGRA0,2MJ (W/s)	317,613	N/A
			FIGRA0,4MJ (W/s)	311,909	N/A
			LFS < bordo <i>LFS < edge</i>	N/A	Sì <i>Yes</i>
			THR600s (MJ)	14,171	N/A
			SMOGRA (m ² /s ²)	67,182	N/A
			TSP600s (m ²)	364,196	N/A
Gocce/particelle incendiate <i>Flaming droplets/particles</i>	N/A	Sì <i>Yes</i>			

N/A = non applicabile.

*N/A = not applicable.***Classificazione e campo di applicazione.***Classification and field of application.***Riferimento di classificazione.***Reference of classification.*

Questa classificazione viene definita in accordo con la norma UNI EN 13501-1:2009.

This classification is assigned in accordance with standard UNI EN 13501-1:2009.



LAB N° 0021

Classificazione.

Classification.

Il prodotto "Tubazione FAST-PIPE", in relazione al suo comportamento di reazione al fuoco, è classificato:

The product "Tubazione FAST-PIPE" in relation to its reaction to fire behaviour is classified:

D

La classificazione aggiuntiva in relazione alla produzione di fumo è:

The additional classification in relation to smoke production is:

s3

La classificazione aggiuntiva in relazione alla cadute di gocce/particelle incendiate è:

The additional classification in relation to flaming droplets/particles is:

d0

La classificazione finale di reazione al fuoco del prodotto da costruzione è:

The final reaction to fire classification of the construction product is:

Classificazione / Classification: D - s3, d0

Limitazioni.

Limitations.

Questo rapporto di classificazione è valido fintanto che la composizione e la struttura del prodotto non cambia.

Questo rapporto di classificazione non rappresenta un'approvazione di tipo o una certificazione di prodotto.

This classification report is valid so long as product composition and structure remain unaltered.

This classification report does not represent type approval or certification of the product.

Nota del laboratorio.

Note from the laboratory.

La classificazione è stata determinata sulla base dei valori ottenuti mediante misurazione, in linea al paragrafo 2.6 della guida ILAC G8:03/2009 "Guidelines on the reporting of compliance with specification", avendo soddisfatto i requisiti sulle misure e sulle apparecchiature definiti nella norma di prova.

The classification has been determined on the basis of the values obtained from measurements, in accordance with paragraph 2.6 of ILAC G8:03/2009 guide "Guidelines on the reporting of compliance with specification", having fulfilled the measurement and equipment requirements defined by the testing standard.

Il Responsabile Tecnico
Chief Test Engineer
(Dott. Ing. Giombattista Traina)

Il Responsabile del Laboratorio
di Reazione al Fuoco
Head of Reaction to Fire Laboratory
(Dott. Ing. Giombattista Traina)

L'Amministratore Delegato
Chief Executive Officer
(Dott. Arch. Sara Lorenza Giordano)

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Firmato digitalmente da GIORDANO SARA LORENZA

Tecnogas Lab - Pressure drop test

Considering the difference between the flange fittings of copper pipes and the custom steel fittings for FastPipe, we have decided to test our product in order to verify the pressure drop of our innovative product. As all the previous ones, this test has been successful too.



Azienda con sistema di qualità certificato SGS ISO 9001/2008



fast pipe

Pressure Drop Test “FastPipe”

Test conditions:

- Phase 1 - FastPipe piping, 4x custom "FastPipe" crimped fittings,
- Phase 2 - Copper piping with flanged terminals.

Test System:

Mono-split air conditioner inverter with the following features:

- Class: A+,
- Gas: R410A,
- Performance: 9000 BTU,
- Operation mode during the test: Heat Pump.

Other technical information:

- Pressure Measurements taken with digital pressure gauges in Class 1,
- related instruments errors:
 - Gas Outward - Before fittings: $E_r = \pm 0.7\%$
 - Gas Outward - After fittings: $E_r = \pm 0,6\%$
 - Gas Inward - Before fittings: $E_r = \pm 0,6\%$
 - Gas Inward - After fittings: $E_r = \pm 0,6\%$

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“FastPipe” fittings test

Pressure drop - Phase 1

Test situation:

- Measurements taken on February 19th, 2016 at Tecnogas S.r.l., Viale L. Da Zara, 10 Albignasego (PD)
- Piping: FastPipe,
- Fittings: 4x custom “FastPipe” crimped fittings.

Data:

Time	Pressure				Temperature		
	Gas Outward (Blue flexible hoses)		Gas Inward (Red flexible hoses)		Outside T°	Split Temperatures	
	Before fittings	After fittings	Before fittings	After fittings		T° Air IN	T° Air OUT
-	bar	bar	bar	bar	°C	°C	°C
8.15	-	-	-	-	-	-	-
9.00	11,52	11,54	11,54	11,50	15,5	20,8	19,3
10.00	23,25	23,26	23,60	23,39	14,4	24,3	36,2
11.00	25,79	25,80	26,10	25,71	15,6	25,7	40,0
12.00	26,05	26,04	26,25	25,81	14,9	26,3	40,3
13.00	26,37	26,37	26,55	26,07	15,3	27,1	40,4
14.00	26,16	26,16	26,44	26,00	15,8	27,1	40,6
15.00	27,10	27,10	27,30	26,80	17,4	27,6	41,8
16.00	26,90	26,90	27,15	26,55	21,1	27,2	41,5
17.00	26,55	26,55	26,85	26,30	17,8	27,5	41,2
18.00	26,60	26,60	26,76	26,20	13,8	27,9	41,1



Refrigerant Gas Direction

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“FastPipe” fittings test

Pressure drop - Phase 2

Test situation:

- Measurements taken on February 19th, 2016 at Tecnogas S.r.l., Viale L. Da Zara, 10 Albignasego (PD)
- Piping: Copper,
- Fittings: Flanged terminals.

Data:

Time	Pressure				Temperature		
	Gas Outward (Blue flexible hoses)		Gas Inward (Red flexible hoses)		Outside T°	Split Temperatures	
	Before fittings	After fittings	Before fittings	After fittings		T° Air IN	T° Air OUT
-	bar	bar	bar	bar	°C	°C	°C
8.15	12,50	12,50	12,52	12,52	12,1	21,8	21,0
9.00	25,86	25,86	25,60	25,60	12,4	24,3	38,9
10.00	26,50	26,50	26,45	26,40	14,6	26,1	40,3
11.00	26,40	26,50	26,60	26,50	14,6	26,2	40,6
12.00	26,10	26,20	26,35	26,25	14,6	25,2	39,2
14.00	26,80	26,80	26,65	26,65	15,9	26,4	40,5
15.00	27,80	27,80	27,65	27,65	17,7	27,3	41,9
16.00	28,00	28,00	27,82	27,72	25,0	28,1	42,5
17.00	27,70	27,70	27,80	27,60	20,8	27,5	42,1
18.00	27,30	27,30	27,15	27,05	14,8	27,7	41,5



Refrigerant Gas Direction

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fast pipe

Your time has never been so
important.



I percorsi della tecnologia.



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