Type Test Reports

- 1) ASTM F1387-99 For Tube Fittings (SS 316)
- 2) ASTM F1387-99 For Tube Fittings (UNS 32750)
- 3) ASTM F1387-99 For Tube Fittings (6Mo-UNS 31254)
- 4) ASTM F1387-99 For Tube Fittings (UNS N04400)
- 5) Torsion, High Impact Shock & Fire Test as per ASTM F-1387-99 For Tube Fittings
- 6) CE-PED Certificate For Fittings
- 7) CE-PED Certificate For Valves
- 8) ATEX Certificate For Fittings & Valves
- 9) Interchangeability Compliance Report with Swagelok Tube Fittings
- 10) Interchangeability Compliance Report with Parker Tube Fittings
- 11) Fire Safe Test Certificate For Valves by GLIS (SS316 & UNS S32205)
- 12) Fire Safe Test Certificate For Valves by DNV-GL (ASTM A105)
- 13) Burst Pressure Test Of Fittings By CSA Group (USA)
- 14) MSS SP-99-2016a Type Test Certificate For Instrument Valves & Manifolds
- 15) Helium Leak Test Reports For Fittings & Valves
- 16) Lloyd's Type Approval Certificate For Tube Fittings



DNV Report No.:

Ref:- PUN/14/JJ/219 Rev. 1 Revision issued for addressing the latest standard edition highlighted as \triangle . No changes / amendments to tests or acceptance criteria.

DET NORSKE VERITAS AS

PERFORMANCE TESTING COMPLIANCE REPORT

MANUFACTURER:

M/s Panam Engineers Limited

TESTS CONDUCTED AT:

Survey No 192, Near Sujal Agro, NH - 8, At Post Piludra,

Dist – Sabarkantha, Gujarat 383120

COMPLIANCE STANDARD: As per ASTM F1387 - 99 (Reapproved 2012 △)

PRODUCTS COVERED:

Grip-type Mechanically Attached Tubing Fittings (Separable) -

(consists of Body, Nut, Front & Rear Ferrule radially compressed on Tube) -

Type IV as per Clause 4.1.4 of ASTM F1387 -Sizes: 1/4" OD, 3/8", 1/2" OD, 3/4" OD, 1" OD

MATERIAL GRADE:

Grade B - Stainless Steel (316) as per Clause 4.2.2 of ASTM F1387

Test Certificates Reviewed, Confirmed with Positive Material Identification (PMI)

TESTS WITNESSED:

ASTM Test ID	Test Description	No. of Samples Tested per Size	PANAM Clause No.	
A2	Examination of Specimen	28	1.5	
A3	Pneumatic Proof Test	28	1.4.1	
A4	Hydrostatic Proof Test	28	1.4.2	
A5	Impulse Test	6	1.4.3	
A6	Flexure Fatigue Test	6	1.4.4	
A7	Tensile Test	6	1.4.5	
A8	Burst Test (Hydrostatic Test)	4	1.4.6	
A9	Repeated Assembly	6*	1.4.7 Included in 1.4.3 & 1.4.	
A10	Rotary Flexure Test	6	1.4.8	
S2	Thermal Cycling Test	10	1.4.9.3	
S3	Elevated Temperature Soak Test	5	1.4.9.1	
S4	Stress Corrosion Test	5	1.4.9.4	
S8	Vibration Test	5	1.4.9.2	

^{*: 3} each after Impulse and Flexure Fatigue Test

CONCLUSION:

We hereby confirm that the fittings satisfactorily met the performance requirements as per the procedure laid out in the compliance standard.

Place and Date: Pune, 2014-12-08

Inspection Surveyor to Det Norske Veritas AS

It is agreed that save as provided below Det Norde Veritas, its subsidiaries, bodies, officers, directors, employees and agents shall have no liability for any loss, damage or expense allegedly caused directly or indirectly by their motalac or negligeness, breach of warranty, or any other act, omission or error by them, including gross negligence or willful misconduct by any such persons with the exception of gross negligence or willful misconduct by the act of or relied on decisions made or information given by or on behalf of Det Norde Veritas or its subsidiaries or relies on any decision made or information given by or on behalf of them and in consequence suffers a loss, damage or expense proved to be due to their medigines, omission default, then Det Norde Veritas or its subsidiaries or relies on any decision made or information given by or on behalf of them and in consequence suffers a loss, damage or expense proved to be due to their medigines, omission default, then Det Norde Veritas or its subsidiaries or relies on any decision made or information made or information in the sections above, the amount of compensation shall under no curumstances exceed the amount of the fee, if any, charged for that particular service, decision, addies or Indeer no curumstances whitesoers with the medicular dividuals who have personally caused the loss, damage or expense be held liable. "In the event that any provision in this section shall be invalid under the law of any jurisdiction, the validity of the remaining provisions shall not in any way be affected.

DET NORSKE VERITAS AS, VERITASVEIEN 1, N-1322 HØVIK, NORWAY TEL.INT: +47 67 57 99 00, TELEFAX: +47 67 57 99 11

Form no. OP C5-RI-7-F3, rev. 1, 98.03.01



DNV Report No.: Ref:- PUN/15/JJ/133

DET NORSKE VERITAS AS

PERFORMANCE TESTING COMPLIANCE REPORT

MANUFACTURER:

M/s Panam Engineers Limited

TESTS CONDUCTED AT:

Survey No 192, Near Sujal Agro, NH - 8, At Post Piludra,

Dist-Sabarkantha, Gujarat 383120

COMPLIANCE STANDARD: As per ASTM F1387 – 99 (Reapproved 2012)

PRODUCTS COVERED:

Grip-type Mechanically Attached Tubing Fittings (Separable) -

(consists of Body, Nut, Front & Rear Ferrule radially compressed on Tube) -

Type IV as per Clause 4.1.4 of ASTM F1387 -Sizes: ¼" OD, 3/8", ½" OD, ¾" OD, 1" OD

MATERIAL GRADE:

Grade B - Super Duplex Stainless Steel (UNS 32750)

as per Clause 4.2.2 of ASTM F1387

Test Certificates Reviewed, Confirmed with Positive Material Identification (PMI)

TESTS WITNESSED:

ASTM Test ID	Test Description	No. of Samples Tested per Size	PANAM Clause No.	
A2	Examination of Specimen	28	1.5	
A3	Pneumatic Proof Test	28	1.4.1	
A4	Hydrostatic Proof Test	28	1.4.2	
A5	Impulse Test	6	1.4.3	
A6	Flexure Fatigue Test	6	1.4.4	
A7	Tensile Test	6	1.4.5	
A8	Burst Test (Hydrostatic Test)	4	1.4.6	
A9	Repeated Assembly	6*	1.4.7 Included in 1.4.3 & 1.4.4	
A10	Rotary Flexure Test	6	1.4.8	
S2	Thermal Cycling Test	10	1.4.9.3	
S3	Elevated Temperature Soak Test	5	1.4.9.1	
S4	Stress Corrosion Test	5	1.4.9.4	
S8	Vibration Test	5	1.4.9.2	

^{*: 3} each after Impulse and Flexure Fatigue Test

CONCLUSION:

We hereby confirm that the fittings satisfactorily met the performance requirements as per the procedure laid out in the compliance standard.

Place and Date: Pune, 2015-10-26

Jaison Jose Inspection Surveyor to Det Norske Veritas AS

It is agreed that save as provided below Det Norske Veritas, its subsidiaries, bodies, officers, directors, employees and agents shall have no liability for any loss, damage or expense allegedly caused directly or indirectly by their mistake or negligence, breach of warranty, or any other act, omission or error by them, including gross negligence or wild imisconduct by any such person with the exception of gross negligence or will indirectly be presented by the present products or sensor excurtate or officers of Det Norske Vertas. This as explained in such as a factor daynow early when Det Norske Vertas has a contract or a that party who has acted or relied on decisions made or information given by or on behalf of Det Norske Vertas. The present in the present present in the present present in the present presen

DET NORSKE VERITAS AS, VERITASVEIEN 1, N-1322 HØVIK, NORWAY TEL.INT: +47 67 57 99 00, TELEFAX: +47 67 57 99 11

Form no. OP C5-RI-7-F3, rev. 1, 98.03.01

ASTM F1387 - 99 For Tube Fittings (6Mo-UNS 31254)



DNV Report No.: Ref:- PUN/15/JJ/132

DET NORSKE VERITAS AS

PERFORMANCE TESTING COMPLIANCE REPORT

MANUFACTURER:

M/s Panam Engineers Limited

TESTS CONDUCTED AT:

Survey No 192, Near Sujal Agro, NH - 8, At Post Piludra,

Dist-Sabarkantha, Gujarat 383120

COMPLIANCE STANDARD: As per ASTM F1387 - 99 (Reapproved 2012)

PRODUCTS COVERED:

Grip-type Mechanically Attached Tubing Fittings (Separable) -

(consists of Body, Nut, Front & Rear Ferrule radially compressed on Tube) -

Type IV as per Clause 4.1.4 of ASTM F1387 -Sizes: 1/4" OD, 3/8", 1/2" OD, 3/4" OD, 1" OD

MATERIAL GRADE:

Grade B - Super Austenitic Stainless Steel (6Mo - UNS 31254)

as per Clause 4.2.2 of ASTM F1387

Test Certificates Reviewed, Confirmed with Positive Material Identification (PMI)

TESTS WITNESSED:

ASTM Test ID	Test Description	No. of Samples Tested per Size	PANAM Clause No.	
A2	Examination of Specimen	28	1.5	
A3	Pneumatic Proof Test	28	1.4.1	
A4	Hydrostatic Proof Test	28	1.4.2	
A5	Impulse Test	6	1.4.3	
A6	Flexure Fatigue Test	6	1.4.4	
A7	Tensile Test	6	1.4.5	
A8	Burst Test (Hydrostatic Test)	4	1.4.6	
A9	Repeated Assembly	6*	1.4.7 Included in 1.4.3 & 1.4.	
A10	Rotary Flexure Test	6	1.4.8	
S2	Thermal Cycling Test	10	1.4.9.3	
S3	Elevated Temperature Soak Test	5	1.4.9.1	
S4	Stress Corrosion Test	5	1.4.9.4	
S8	Vibration Test	5	1.4.9.2	

^{*: 3} each after Impulse and Flexure Fatigue Test

CONCLUSION:

We hereby confirm that the fittings satisfactorily met the performance requirements as per the procedure laid out in the compliance standard.

Place and Date: Pune, 2015-10-26

Jaison Jose Inspection Surveyor to Det Norske Veritas AS

It is agreed that save as provided below Det Norske Verstas, its subsidiaries, bodies, officers, directors, employees and agents shall have no liability for any loss, damage or expense allegedly caused directly or indirectly by their mistake or negligence, breach of warranty, or any other act, omission or error by them, including gross negligence or will diffusionable by any such person with the exception of gross negligence or will all misconduct by the governing bedies or senior excutate or officers of Det Norske Verstas. This applies regardless of whether the loss, damage or expense which whom Det Norske Verstas or as contrast or a shirt party who has acted or relied on decisions made or information given by or on behalf of Det Norske Verstas or as subsidiaries or relies on any decision made or information given by or on behalf of them and in consequence saffers a loss, damage or expense proved to be due to their negligence, omission default, then Det Norske Verstas or its subsidiaries may be held liable in accordance with the sections above, the amount of compensation shall under no circumstances exceed the amount of the fee, if any, charged for that particular service, decision, advice or information. Under no circumstances whitesoer we all the individuals who have personnally caused the loss, damage or expense be held liable. "In the event that any prevision in this section shall be invalid under the law of any jurisdiction, the validity of the remaining provisions shall not in any way be affected.

DET NORSKE VERITAS AS, VERITASVEIEN 1, N-1322 HØVIK, NORWAY TEL.INT: +47 67 57 99 00, TELEFAX: +47 67 57 99 11

Form no. OP C5-RI-7-F3, rev. 1, 98.03.01

ASTM F1387 - 99 For Tube Fittings (UNS N04400)



DNV Report No.: Ref:- PUN/16/JJ/506

DET NORSKE VERITAS AS

PERFORMANCE TESTING COMPLIANCE REPORT

MANUFACTURER:

M/s Panam Engineers Limited

TESTS CONDUCTED AT:

Survey No 192, Near Sujal Agro, NH - 8, At Post Piludra,

Dist-Sabarkantha, Gujarat 383120

COMPLIANCE STANDARD: As per ASTM F1387 - 99 (Reapproved 2012)

PRODUCTS COVERED:

Grip-type Mechanically Attached Tubing Fittings (Separable) -

(consists of Body, Nut, Front & Rear Ferrule radially compressed on Tube) -

Type IV as per Clause 4.1.4 of ASTM F1387 -

Sizes: ¼" OD, 3/8", ½" OD, ¾" OD, 1" OD (For Pressure Class, refer Manufacturer's test reports for different rated pressures within the size range.)

MATERIAL GRADE:

Grade C - Nickel-Copper Alloy (UNS N04400)

as per Clause 4.2.2 of ASTM F1387

Test Certificates Reviewed, Confirmed with Positive Material Identification (PMI)

TESTS WITNESSED:

<u>:D:</u>			
Test Description	No. of Samples Tested per Size	PANAM Clause No.	
Examination of Specimen	28	1.5	
Pneumatic Proof Test	28	1.4.1	
Hydrostatic Proof Test	28	1.4.2	
Impulse Test	6	1.4.3	
Flexure Fatigue Test	6	1.4.4	
Tensile Test	6	1.4.5	
Burst Test (Hydrostatic Test)	4	1.4.6	
Repeated Assembly	6*	1.4.7 Included in 1.4.3 & 1.4.4	
Rotary Flexure Test	6	1.4.8	
Thermal Cycling Test	10	1.4.9.3	
Elevated Temperature Soak Test	5	1.4.9.1	
Stress Corrosion Test	5	1.4.9.4	
Vibration Test	5	1.4.9.2	
	Test Description Examination of Specimen Pneumatic Proof Test Hydrostatic Proof Test Impulse Test Flexure Fatigue Test Tensile Test Burst Test (Hydrostatic Test) Repeated Assembly Rotary Flexure Test Thermal Cycling Test Elevated Temperature Soak Test Stress Corrosion Test	Test Description No. of Samples Tested per Size Examination of Specimen 28 Pneumatic Proof Test 28 Hydrostatic Proof Test 28 Impulse Test 6 Flexure Fatigue Test 6 Tensile Test 6 Burst Test (Hydrostatic Test) 4 Repeated Assembly 6* Rotary Flexure Test 6 Thermal Cycling Test 10 Elevated Temperature Soak Test 5 Stress Corrosion Test 5	

^{*: 3} each after Impulse and Flexure Fatigue Test

CONCLUSION:

We hereby confirm that the fittings satisfactorily met the performance requirements as per the procedure laid out in the compliance standard.

Place and Date: Pune, 2016-02-11

Jaison Jose Inspection Surveyor to Det Norske Veritas AS

It is agreed that save as provided below Det Norske Veritas, its subsidiaries, bodies, officers, directors, employees and agents shall have no liability for any loss, damage or expense allegedly caused directly or indirectly by their mistake or negligence, breach of warranty, or any other act, omission or error by them, including gross negligence or will misconduct by the governing bodies or senior executive officers of Det Norske Veritas in Fan agriles regardless of whether the loss, damage or expense as affected anyone with whom Det Norske Veritas as a contract or a third party who has a cited or relied on decisions made or information given by or on behalf of Det Norske Veritas or riles on any decision made or information given by or on behalf of them and in consequence suitle ras a loss, damage or expense power of a feature. However, if any person uses the services of Det Norske Veritas or riles subsidiaries or relies on any decision made or information given by or on behalf of them and in consequence suitle ras a loss, damage or expense power to be due to their negligence, omitted or default, then Det Norske Veritas or rolling poly by any of compensation to such person a sum representing his proved loss. "In the event Det Norske Veritas or its subsidiaries may be held liable in accordance with the extense above, the amount of compensation shall under no circumstances exceed the amount of the fee, if any, charged for this particular severite, decision, adapted or information." Under no circumstances whatever shall the individuals who have personally caused the loss, damage or expense be feel liable." In the

DET NORSKE VERITAS AS, VERITASVEIEN 1, N-1322 HØVIK, NORWAY TEL.INT: +47 67 57 99 00, TELEFAX: +47 67 57 99 11

Form no. OP C5-RI-7-F3, rev. 1, 98.03.01

DNV-GL

Certificate No.: GLIS/AHD/PANAM/NV/18-01

TYPE TEST COMPLIANCE REPORT

MANUFACTURER: M/s. Panam Engineers Limited

TESTS CONDUCTED AT: Survey No 192, Near Sujal Agro, NH - 8, At Post Piludra,

Dist - Sabarkantha, Gujarat 383120

COMPLIANCE STANDARD: As per ASTM F1387 - 99 (Reapproved 2012)

PRODUCTS COVERED: Grip-type Mechanically Attached Tubing Fittings (Separable) –

(Consists of Body, Nut, Front & Rear Ferrule radially compressed on

Tube) -

Type IV as per Clause 4.1.4 of ASTM F1387 –Sizes: ¼" OD, 3/8", ½" OD,

3/4" OD, 1" OD

MATERIAL GRADE: Grade B - Stainless Steel (316), as per Clause 4.2 of ASTM F1387.

Test Certificates Reviewed, Confirmed with Positive Material Identification

(PMI)

TESTS WITNESSED:

ASTM Test ID	Test Description	No. of Samples Tested per Size	PANAM Clause No.	
-	Specimen checked	-	1.5	
S5	Torsion Test	0 5	1.4.11.3	
S6	High Impact Shock test	0 5	1.4.11.4	
S7	Fire Test	05	1 4 12 1	

CONCLUSION:

We hereby confirm that the fittings satisfactorily met the performance requirements as per the procedure laid out in the compliance standard.

Nik Arp Vas

For Germanischer Lloyd Industrial Services GmbH.

Place: Prantij, Himmatnagar

Date: 27.10.2018

Inspection Engineers-Inspection Services

Equinox Busniess Park, 6th Floor, Tower 3, L.B.S Marg, Off. Bandra Kurla Complex, Kurla (W) Mumbai – 400 070

DNV GL Headquarters, Veritasveien 1, P.O.Box 300, 1322 Hovik, Norway. Tel: +47 67 57 99 00. www.dnvgl.com

Germanischer Lloyd Industrial Services GmbH India Branch trading as DNV G Company Registration No F03285

DNV-GL

ACKNOWLEDGEMENT OF RECEIPT - EU

Acknowledgement Number: 14195-2019-CE-IND

Issue 0

This Acknowledgement consists of 2 pages

This is to confirm that the Technical File for the following product(s):

Instrumentation Fittings and Valves

With the type designation(s):

See page 2

Manufactured by:

Panam Engineers Limited 6 Survey No 192, Near Sujal AGRO NH - 8, AT Post Piludra, Dist - Sabarkantha, Gujarat 383120, INDIA

has been received and stored according to the conformity assessment procedure described in Article 13, 1.(b).(ii), the Council Directive 2014/34/EU of 26 February 2014, category 2 non-electrical equipment.

Further details are given overleaf.

Jurisdiction:

DNV GL Presafe AS is appointed by the Norwegian Directorate for Civil Protection as Notified Body (No. 2460) under the terms of Article 21 of the Council Directive 2014/34/EU of 26 February 2014.

Date of issue: 2019-03-20 Validity end date: 2022-03-20

Ståle Sandstad For DNV GL Presafe AS

The document has been digitally signed. See <u>www.dnvql.com/digitalsignatures</u> for info



This document may only be reproduced in its entirety and without any change.

DNV GL Presafe AS, Veritasveien 3, 1363 Høvik, Norway, Tel +47 67 57 88 00, www.dnvgl.com

ATEX Certificate For Fittings & Valves

DNV-GL

Acknowledgement Number

14195-2019-CE-IND

Issue 0

Product description

The following types are covered by the Acknowledgement:

Product Description	Type Designations	Category	Product Group
Instrumentation Fittings and Valves	Instrumentation Tube/ Pipe fittings, Needle Valves, Check Valves, Ball Valves, 2, 3 & 5-Way Valve Manifolds, Pressure relief Valves, Pressure Regulators, Double block & bleed valves	2	Non-electrical Ex equipment

Technical documentation:

The following documentation has been received and stored:

Document No	Document Name
PEL/ATEX/ INSTRUMENTATION	TCF AS PER DIRECTIVE ATEX/2014/34/EU FOR PANAM
FITTINGS & VALVES - REV: 00	ENGINEERS LIMITED INSTRUMENTATION FITTINGS & VALVES

Terms and conditions

The product liability rests with the manufacturer, his representative or, in the absence of a representative, the importer, in accordance with the General Product Safety Directive 2001/95/EC The following conditions may render this acknowledgement invalid:

- Changes in the design or construction of the product.
- Changes or amendments to the referenced directive(s).
- Changes or amendments in the standards which form the basis for documenting compliance with the essential requirements of the directive(s).

Conformity declaration and marking of product

In order to fully meet with the requirements of the Directive and legally affix the CE mark, the manufacturer must take all measures necessary to ensure that the manufactured product comply with the technical documentation and with the requirements of the Directive and finally draw up an EU declaration of conformity.

Acknowledgement History:

Issue	Description Issue date	
0	Original acknowledgement	2019-03-20

END OF ACKNOWLEDGEMENT

This document may only be reproduced in its entirety and without any change.

DNV GL Presafe AS, Veritasveien 3, 1363 Høvik, Norway, Tel +47 67 57 88 00, www.dnvgl.com



DNV Report No.: Ref:- PUN/14/JJ/225

DET NORSKE VERITAS AS

INTERECHANGEABILITY COMPLIANCE REPORT

MANUFACTURER: M/s Panam Engineers Limited

TESTS CONDUCTED AT: Survey No 192, Near Sujal Agro, NH-8, At Post Piludra, Sabarkantha, Gujarat 383120

SCOPE OF TEST: To establish interchangeability of Tubing Fittings manufactured by Manufacturer with

Tubing Fittings of similar size and rating of a different Make.

The other make used for this test purpose is M/s Swagelok (Identified with

SWAGELOK marking on the fitting components.

PRODUCTS COVERED: Grip-type Mechanically Attached Tubing Fittings (Separable)

(consists of Body, Nut, Front & Rear Ferrule radially compressed on Tube)

MATERIAL GRADE: Stainless Steel (316), Test Certificates Reviewed, Confirmed with PMI

FITTINGS USED FOR TESTING:

Panam Part No	Description	Quantity
PMC-04-04-SS	1/4"OD X 1/4"NPT Male Connector	5
PMC-06-06-SS	3/8"OD X 3/8"NPT Male Connector	5
PMC-08-08-SS	1/2"OD X 1/2"NPT Male Connector	5
PMC-12-12-SS	3/4"OD X 3/4"NPT Male Connector	5
PMC-16-16-SS	1"OD X 1"NPT Male Connector	5
PU-04-SS	1/4"OD Union	5
PU-06-SS	3/8"OD Union	5
PU-08-SS	1/2"OD Union	5
PU-12-SS	3/4"OD Union	5
PU-16-SS	1"OD Union	5
PTC-04-SS	1/4"OD Tube Cap	5
PTC-06-SS	3/8"OD Tube Cap	5
PTC-08-SS	1/2"OD Tube Cap	5
PTC-12-SS	3/4"OD Tube Cap	5
PTC-16-SS	1"OD Tube Cap	5

TEST METHOD: The above Fittings were assembled in different configuration of both the makes (i.e.

Panam and Swagelok) with identically rated fitting as indicated in the attached interchangeability test report. The Fittings were then assembled with suitably rated tube and each fitting was subjected to a hydrostatic test to applicable pressure as per

the attached report for 5 minutes.

CONCLUSION: M/s Panam Fittings were found compatible with M/s Swagelok Fittings while fitment

with respect to tube gripping and threads matched identically.

Pressure testing was satisfactory with no visible signs of leakage or pressure drop.

ATTACHMENTS: Interchangeability Test Report of M/s Panam Engineers Limited.

laison lose

Place and Date: Pune, 2014-12-08

Inspection Surveyor to Det Norske Veritas AS

It is agreed that some an provided below Ded Nicrake Virtuals AC, the substitutions, burden, officers, direction, employees and agents shalf have no leakibly for any loss, damage or expenses altegacing cases of dentify or indicately by their mission or energitation, burden, or district the provided of the secondary of the secondary or any secondary or any secondary of the secondary or any secondary or any secondary or any secondary or any secondary of the secondary or any secon

DET NORSKE VERITAS AS, VERITASVEIEN 1, N-1322 HØVIK, NORWAY TEL.INT: +47 67 57 99 00, TELEFAX: +47 67 57 99 11 Form No.: 40.91a Issue: January 98

Interchangeability Compliance Report with Parker Tube Fittings



DNV Report No.: Ref:- PUN/16/JJ/542

DET NORSKE VERITAS AS

INTERECHANGEABILITY COMPLIANCE REPORT

MANUFACTURER:

M/s Panam Engineers Limited

TESTS CONDUCTED AT:

Survey No 192, Near Sujal Agro, NH-8, At Post Piludra, Sabarkantha, Gujarat 383120

SCOPE OF TEST:

To establish interchangeability of Tubing Fittings manufactured by M/s Panam Engineers Limited with Tubing Fittings of similar size and rating of a different Make. The other make used for this test purpose is M/s PARKER (Identified with PARKER

marking on the fitting components.

PRODUCTS COVERED:

Grip-type Mechanically Attached Tubing Fittings (Separable)

(consists of Body, Nut, Front & Rear Ferrule radially compressed on Tube)

MATERIAL GRADE:

Stainless Steel (316), Test Certificates Reviewed

FITTINGS USED FOR TESTING:

Panam Part No	Description	Quantity
PMC-04-04-SS	1/4"OD X 1/4"NPT Male Connector	5
PMC-06-06-SS	3/8"OD X 3/8"NPT Male Connector	5
PMC-08-08-SS	1/2"OD X 1/2"NPT Male Connector	5
PMC-12-12-SS	3/4"OD X 3/4"NPT Male Connector	5
PMC-16-16-SS	1"OD X 1"NPT Male Connector	5
PU-04-SS	1/4"OD Union	5
PU-06-SS	3/8"OD Union	5
PU-08-SS	1/2"OD Union	5
PU-12-SS	3/4"OD Union	5
PU-16-SS	1"OD Union	5
PTC-04-SS	1/4"OD Tube Cap	5
PTC-06-SS	3/8"OD Tube Cap	5
PTC-08-SS	1/2"OD Tube Cap	5
PTC-12-SS	3/4"OD Tube Cap	5
PTC-16-SS	1"OD Tube Cap	5

TEST METHOD:

The above Fittings were assembled in different configuration of both the makes (i.e. Panam and Parker) with identically rated fitting as indicated in the attached interchangeability test report. The Fittings were then assembled with suitably rated tube and each fitting was subjected to a hydrostatic test to applicable pressure as per the attached report for 5 minutes.

CONCLUSION:

M/s Panam Fittings were found compatible with M/s Parker while fitment with respect to tube gripping and threads matched identically.

Pressure testing was satisfactory with no visible signs of leakage or pressure drop.

ATTACHMENTS:

Interchangeability Test Report of M/s Panam Engineers Limited.

A Sega * S

Place and Date: Pune, 2016-11-30

Jaison Jose Inspection Surveyor to Det Norske Veritas AS

FOILE, 2010-11-30

It appells the are provided with Cell forsized virities AS, its subsidiaries, budget, officers, descript, employees and agents that have to intelling for any less, distinguish employee intellinguish cell resolution in employees and agents to the action and to any less, distinguish employees indepells or expense in employee and employees and empl

DET NORSKE VERITAS AS, VERITASVEIEN 1, N-1322 HØVIK, NORWAY TEL.INT: +47 67 57 99 00, TELEFAX: +47 67 57 99 11



Certificate No: GLIS/AHD/2013-14/CR-208

GLIS. Ref. No: 101-010-51004-226

FIRE SAFE TEST CERTIFICATE

This certificate is issued to

PANAM ENGINEERS.

R628, TTC Industrial Area M.I.D.C. Rabale, Navi Mumbai. St.:Maharashtra.

to certify that at their request the undersigned surveyor to GLIS-India, attended their works at R628, TTC Industrial Area M.I.D.C. Rabale, Navi Mumbai on 06th February- 2014, for the purpose of witness of fire safe test of DBB valves. The scopes of Inspection & Approval are as bellow.

FIRE SAFE TEST STANDARD

: API 6FA, IV Edition, 2010

SPECIFICATION

TECHNICAL SPECIFICATION

Design Standard

Construction Size Class

Valve Serial No.

Valve Drg. No.

MATERIAL OF CONSTRUCTION

Body Ball Stem

Seats Gasket

: BS 5351/ANSI B 16.34/ANSI B 16.5 : DOUBLE BLOCK AND BLEED VALVE

: 2" (DN 50) : 1500# ,2500# : 14010001890.

: PDBB-DSS-FB-50-1500-FF

: ASTM A 182 GRF60/ UNS 32205 : ASTM A 182 GRF60/ UNS 32205 : ASTM A 182 GRF60/ UNS 32205

: PEEK :PEEK / Grafoil

Conclusion: DBB Valve Sr. no. 14010001890 punched on flange had successfully passed fire safe test as per procedure outlined in API 6FA, IV Edition, 2010 and witnessed by undersigned GLIS-India Surveyor on February 06th 2014. Temperature report, Test report and other calculation sheets are enclosed herewith after endorsement by us.

GLIS-India, is to be notified of any changes in Design of this Certificate that may affect the validity of this certificate.

Other Sizes Qualified

: 2" & Below, 2-1/2", 3", 4"

Other Pressure Class Qualified

: 1500# & 2500#

Date of Issue

: 06th February, 2014

Issued at: Ahmedabad

06.02.2014.

B. Jaykumar USTRIAL SERVICES

Place

Date

General Manager

Branch Office:Director,Gulf Lloyds Industrial Services-India.

184/A, Jayant Park Society, Nr. Yuganda Society, Memnagar, Ahmedabad - 380052, Gujarat, India.

Telefax : (91)79-22773522, <u>gulfiloyds india@gmail.com.glis.india@yahoo.com</u> Office : الخدمات الصناعية اللوينز الخل Bur Dubai, Dubai,Contact no: +971 55 9098935 ,Email id : <u>gulfloyd@cim.ac</u> اعية اللويدز الخل: Office



Certificate No: GLIS/AHD/PE/2013/CR-120

GLIS. Ref. No: 101-010-51003-120

FIRE SAFE TEST CERTIFICATE

This certificate is issued to

M/s.PANAM ENGINEERS.

R628, TTC INDUSTRIAL AREA MIDC, RABALE, NAVI MUMBAI.

to certify that at their request the undersigned surveyor to Gulf Lloyds -India attended their works at Navi Mumbai, on 30th May-2013, for the purpose of witness of fire safe test of DBB valves. The scopes of Inspection & Approval are as below.

: API 6FA, Edition ,2008

STANDARD SPECIFICATION

TECHNICAL SPECIFICATION

Design Standard : BS 5351 / ANSI B16.34/ANSI B16.5 Construction : DOUBLE BLOCK & BLEED VALVE

Size : 2" (DN 50) Class : 1500# Valve Serial No. : 13060122050

Valve Drg. No. : PDBB-SS-FB-50-1500-FF

MATERIAL OF CONSTRUCTION

: SS316 Ball : \$\$316 Stem : \$\$316 Seats : PEEK Gasket & Packing : PEEK/Grafoil

Conclusion: Ball Valve Sr. no. 13060122050 punched on flange had successfully passed fire safe test as per procedure outlined in API 6FA, Edition ,2008 and witnessed by undersigned GLIS Surveyor on 30th May- 2013. Temperature report, Test report and other calculation sheets are enclosed herewith with endorsement by us.

Note: GLIS-India, is to be notified of any changes in design of this Valve that may affect the validity of this certificate.

Other Sizes Qualified : 2", 2 1/2", 3" & 4". Other Pressure Class Qualified : 1500# & 2500#.

Date of Issue: 30th May, 2013

Issued at:

30.05.2013. Ahmedabad

Date General Manager

BranchOffice: Director, GulfLoyds Industrial Services-India.. 184/A.Jayunt fark Society, Nr. Yugand Soc. Memnogar ..Ahmedabad — 380052, Gujarat, India. Telefax : (91)79-27493158, <u>gulffloyds, india@gmail.com, glis, india@yahoo.com</u> Head Office : (الخدمات الصناعية اللويذ الخلوج)

Bur Dubai, Dubai, Contact no: +971 54 9099935 ,Email id : gulfloyds@eim.ae

www.panam.in

Page: I of I

DNV·GL

Certificate No.: GLIS/AHD/PANAM/NV/18-02

FIRE SAFE TEST CERTIFICATE

This certificate is issued to

M/s. Panam Engineers Limited

Survey No 192, Near Sujal Agro, NH – 8, At Post Piludra, Dist – Sabarkantha, Gujarat 383120

We hereby certify that the fire safe test on below valve has been conducted at the Panam Engineers Limited works and witnessed by DNV-GL surveyor according to requirement of API 607 7th ED:2016

STANDERD SPECIFICATION:

API 607 7TH ED:2016

TECHNICAL SPECIFICATION

Construction

Design STD :

API 6D:24th ED/API 698/ASME B16.34/ASME B16.5 3 Piece Design Full Bore Flanged End Double Block

and Bleed Ball Valves

 Size
 : 50MM (2")

 Class
 : 600#

 Production No.
 : 1810P37531

Valve Drg. No. : PDBB-BNB-FB-CS-01-15-600-RF-8NF-8N Rev No.00

MATERIAL OF CONSTRUCTION

Body : ASTM A 105(NACE)

Trims : ASTM A 276/ASTM A479 316L

Seats : PTFE

Stud & Nut : ASTM A193 Gr.B7 & ASTM A194 Gr.2H

Date of Test : 29.10.2016

QUALIFIED RANGE OF VALVE

Qualified Size : 2" and Below, 2 1/2", 3", 4"

Qualified Pressure Rating : 600#, 800#, 900#

Conclusion: This certificate is issued according to The above valve complies to the fire safe requirement as per API 607: 2016 7th Edition.

DNVIGL

52-0B1

This Certificate is in conjunction with Inspection Report No.-DNVGL/AHD/PANAM/18-02.

Place: Prantij, Himmatnagar

Date: 27.10.2018

For Sermanischer Lloyd Industrial Services GmbH.

Nikhil Vasva spection Engineers- Inspection Services

Equinox Busniess Park, 6th Floor, Tower 3, L.B.S Marg, Off. Bandra Kurla Complex, Kurla (W) Mumbai - 400 070

DNV GL Headquarters, Veritasveien 1, P.O.Box 300, 1322 Høvik, Norway. Tel: +47 67 57 99 00. www.dnvgl.com

Germanischer Lloyd Industrial Services GmbH India Branch trading as DNV GL Company Registration No FO3285



CSA Group

Laboratory Test Data - Hydrostatic Test

Testing performed in CSA Group Cleveland office laboratories: 8503 E. Pleasant Valley Rd. Independence, OH 44131 ORIGINAL TEST DATA

This report shall not be reproduced, except in full, without the approval of CSA Group.

Date	2017-11-27	Project	70162731		FC Code	807201
Contact	Umang Vekari Marketing Mar	*	Company	Panam Engin Mumbai, Ind		
Standard(s):	Reference to ASTM F1387-99 (R2012) A7 Hydrostatic Proof Test & A8 Hydrostatic Burst Test					
Page number	I of 15	Reviewed by: Title	encreet Muning	Signature:	10	

The results relate only to the items tested





Test Description:

- Place the test specimens into a burst chamber and secure them into place in accordance with the manufacturer's recommended procedures. Fill the test specimens with water or hydraulic fluid, bleeding air out. One end must be free to move.
- 2. Equip the chamber with calibrated pressure gages to permit visual readings of actual pressure being applied.
- 3. Perform the hydrostatic test at ambient temperature.
- 4. Proof Pressure Test: Initially pressurize the test specimens to 0.690 MPa (100 psi) +/- 5 %. There shall be no evidence of leakage. If there is no evidence of leakage, gradually increase the pressure at an average rate not to exceed 172 MPa/min (25,000 psig/min) to 150 +/- 5 % of the rated pressure of the tube. Maintain this pressure for an additional period of 1 min. If leakage occurs, discontinue the test. If there is no evidence of leakage, during both pressurized periods, the test specimens have passed the hydrostatic proof test.
- 5. Burst Pressure Test: Subject the test specimens to a gradual increase of pressure at an average rate not to exceed 127MPa/min (25,000psig/min; 416 psig/sec) to four times the rated pressure of the specimen assembly and hold for minimum of 1min. If tube burst occurs below four times the rated pressure of the specimen assembly, discontinue the test. The affected tubing test specimen has failed the test. If leakage occurs below four times the rated pressure of the specimen assembly, the affected fitting test specimen has failed the burst test.
- The fitting and tubing test specimens have passed the hydrostatic burst test when four times the rated pressure of the specimen assembly has been attained.

Assembly #	1
Part #/Brand#	201
Description	1/4 x .035

Results:

Tube MAWP (PSI)	Tube Pressure 1.5X (PSI)	Tube MAWP 4X (PSI)	Rate (PSI/SEC)	Actual Burst Pressure (PSI)	Pass/Fail Both
5,130	7,695	20,520	416	28,417	PASS
Pass/Fail 1 minute hold	PASS	PASS			19.54-5163
Comment:	Burst			Torque in FT Lbs.	Cap 20 Body 20

Item	Manufacturer	Asset No.	Last Cal.	Next Cal.
CSA Hydraulic Chamber	Hydro-pac	CH-92		
Pressure Transducer	Viatran	Z000001141	2017/09/18	2018/09/18
Pressure Gauge	Astraguage	PG-187	2017/02/26	2018/02/26



CSA Group

Laboratory Test Data - Hydrostatic Test

Testing performed in CSA Group Cleveland office laboratories: 8503 E. Pleasant Valley Rd. Independence, OH 44131
ORIGINAL TEST DATA

This report shall not be reproduced, except in full, without the approval of CSA Group.

Date	2017-11-27	Project	70162731		FC Code	807205
Contact	Umang Vekari Marketing Ma	*	Company	Panam Engir Mumbai, Ind		
Standard(s):	9	Reference to ASTM F1387-99 (R2012) A7 Hydgostatic Proof Test & A8 Hydrostatic Burst Test				
Page number	5 of 15		gest Wancer	Signature:	Jm)	





Test Description:

- Place the test specimens into a burst chamber and secure them into place in accordance with the manufacturer's recommended procedures. Fill the test specimens with water or hydraulic fluid, bleeding air out. One end must be free to move.
- 2. Equip the chamber with calibrated pressure gages to permit visual readings of actual pressure being applied.
- 3. Perform the hydrostatic test at ambient temperature.
- 4. Proof Pressure Test: Initially pressurize the test specimens to 0.690 MPa (100 psi) +/- 5 %. There shall be no evidence of leakage. If there is no evidence of leakage, gradually increase the pressure at an average rate not to exceed 172 MPa/min (25,000 psig/min) to 150 +/- 5 % of the rated pressure of the tube. Maintain this pressure for an additional period of 1 min. If leakage occurs, discontinue the test. If there is no evidence of leakage, during both pressurized periods, the test specimens have passed the hydrostatic proof test.
- 5. Burst Pressure Test: Subject the test specimens to a gradual increase of pressure at an average rate not to exceed 127MPa/min (25,000psig/min; 416 psig/sec) to four times the rated pressure of the specimen assembly and hold for minimum of 1min. If tube burst occurs below four times the rated pressure of the specimen assembly, discontinue the test. The affected tubing test specimen has failed the test. If leakage occurs below four times the rated pressure of the specimen assembly, the affected fitting test specimen has failed the burst test.
- The fitting and tubing test specimens have passed the hydrostatic burst test when four times the rated pressure of the specimen assembly has been attained.

Assembly #	5
Part #/Brand#	205
Description	1/2 x .065

Results:

Tube MAWP (PSI)	Tube Pressure 1.5X (PSI)	Tube MAWP 4X (PSI)	Rate (PSI/SEC)	Actual Burst Pressure (PSI)	Pass/Fail Both
5,090	7,635	20,360	416	25,027	PASS
Pass/Fail 1 minute hold	PASS	PASS			
Comment:	Burst			Torque in FT Lbs.	Cap 30 Body 25

Item	Manufacturer	Asset No.	Last Cal.	Next Cal.
CSA Hydraulic Chamber	Hydro-pac	CH-92		
Pressure Transducer	Viatran	Z000001141	2017/09/18	2018/09/18
Pressure Gauge	,Astraguage	PG-187	2017/02/26	2018/02/26



CSA Group

Laboratory Test Data - Hydrostatic Test

Testing performed in CSA Group Cleveland office laboratories: 8503 E. Pleasant Valley Rd. Independence, OH 44131 ORIGINAL TEST DATA

This report shall not be reproduced, except in full, without the approval of CSA Group.

Date	2017-11-27	Project	70162731		FC Code	807207
Contact Umang V		ya Company P		Panam Engineers Ltd		
Contact	Marketing Mar	nager	Company	Mumbai, India		
Standard(s):	Reference to ASTM F1387-99 (R2012) A7 Hydrostatic Proof Test & A8 Hydrostatic Burst Test					
Page number	7 of 15	Reviewed by: Title	let Marager	Signature:	Josef	-
		The result	relate only to the ite	ems tested		





Test Description:

- Place the test specimens into a burst chamber and secure them into place in accordance with the manufacturer's recommended procedures. Fill the test specimens with water or hydraulic fluid, bleeding air out. One end must be free to move.
- 2. Equip the chamber with calibrated pressure gages to permit visual readings of actual pressure being applied.
- 3. Perform the hydrostatic test at ambient temperature.
- 4. Proof Pressure Test: Initially pressurize the test specimens to 0.690 MPa (100 psi) +/- 5 %. There shall be no evidence of leakage. If there is no evidence of leakage, gradually increase the pressure at an average rate not to exceed 172 MPa/min (25,000 psig/min) to 150 +/- 5 % of the rated pressure of the tube. Maintain this pressure for an additional period of 1 min. If leakage occurs, discontinue the test. If there is no evidence of leakage, during both pressurized periods, the test specimens have passed the hydrostatic proof test.
- 5. <u>Burst Pressure Test:</u> Subject the test specimens to a gradual increase of pressure at an average rate not to exceed 127MPa/min (25,000psig/min; 416 psig/sec) to four times the rated pressure of the specimen assembly and hold for minimum of 1min. If tube burst occurs below four times the rated pressure of the specimen assembly, discontinue the test. The affected tubing test specimen has failed the test. If leakage occurs below four times the rated pressure of the specimen assembly, the affected fitting test specimen has failed the burst test.
- The fitting and tubing test specimens have passed the hydrostatic burst test when four times the rated pressure of the specimen assembly has been attained.

Assembly #	7	
Part #/Brand#	207	
Description	3/8 x .049	

Results:

Tube MAWP (PSI)	Tube Pressure 1.5X (PSI)	Tube MAWP 4X (PSI)	Rate (PSI/SEC)	Actual Burst Pressure (PSI)	Pass/Fail Both
4,790	7,185	19,160	416	21,958	PASS
Pass/Fail 1 minute hold	PASS	PASS	Train State		
Comment:	Burst			Torque in FT Lbs.	Cap 70 Body 70

rest equipment useu				
Item	Manufacturer	Asset No.	Last Cal.	Next Cal.
CSA Hydraulic Chamber	Hydro-pac	CH-92		
Pressure Transducer	Viatran	Z000001141	2017/09/18	2018/09/18
Pressure Gauge	Astraguage	PG-187	2017/02/26	2018/02/26



CSA Group

Laboratory Test Data - Hydrostatic Test

Testing performed in CSA Group Cleveland office laboratories: 8503 E. Pleasant Valley Rd. Independence, OH 44131
ORIGINAL TEST DATA

This report shall not be reproduced, except in full, without the approval of CSA Group.

Date	2017-11-27	Project	70162731		FC Code	807213
Contact	Umang Vekariya	ı	Company	Panam Engi	neers Ltd	
Contact	Marketing Mana	arketing Manager		Mumbai, Inc	dia	
Standard(s):	Reference to ASTM F1387-99 (R2012) A7 Hygrostatic Proof Test & A8 Hydrostatic Burst Test					
Page number	13 of 15		rest Manger	Signature:	12	
		The result	s relate only to the it	ems tested		





Test Description:

- Place the test specimens into a burst chamber and secure them into place in accordance with the manufacturer's recommended procedures. Fill the test specimens with water or hydraulic fluid, bleeding air out. One end must be free to move.
- 2. Equip the chamber with calibrated pressure gages to permit visual readings of actual pressure being applied.
- 3. Perform the hydrostatic test at ambient temperature.
- 4. Proof Pressure Test: Initially pressurize the test specimens to 0.690 MPa (100 psi) +/- 5 %. There shall be no evidence of leakage. If there is no evidence of leakage, gradually increase the pressure at an average rate not to exceed 172 MPa/min (25,000 psig/min) to 150 +/- 5 % of the rated pressure of the tube. Maintain this pressure for an additional period of 1 min. If leakage occurs, discontinue the test. If there is no evidence of leakage, during both pressurized periods, the test specimens have passed the hydrostatic proof test.
- 5. <u>Burst Pressure Test</u>; Subject the test specimens to a gradual increase of pressure at an average rate not to exceed 127MPa/min (25,000psig/min; 416 psig/sec) to four times the rated pressure of the specimen assembly and hold for minimum of 1min. If tube burst occurs below four times the rated pressure of the specimen assembly, discontinue the test. The affected tubing test specimen has failed the test. If leakage occurs below four times the rated pressure of the specimen assembly, the affected fitting test specimen has failed the burst test.
- The fitting and tubing test specimens have passed the hydrostatic burst test when four times the rated pressure of the specimen assembly has been attained.

Assembly #	13
Part #/Brand#	213
Description	1 x .095

Results:

Tube MAWP (PSI)	Tube Pressure 1.5X (PSI)	Tube MAWP 4X (PSI)	Rate (PSI/SEC)	Actual Burst Pressure (PSI)	Pass/Fail Both
3,630	5,445	14,520	416	16,651	PASS
Pass/Fail 1 minute hold	PASS	PASS			
Comment:	Burst			Torque in FT Lbs.	Cap 270 Body 250

Item	Manufacturer	Asset No.	Last Cal.	Next Cal.
CSA Hydraulic Chamber	Hydro-pac	CH-92		
Pressure Transducer	Viatran	Z000001141	2017/09/18	2018/09/18
Pressure Gauge	Astraguage	PG-187	2017/02/26	2018/02/26

DNV·GL

TYPE TEST COMPLIANCE REPORT

Date: 2018-08-08 Certificate No.: BDA/2018/470B

M/s Panam Engineers Limited MANUFACTURER:

Survey No 192, Near Sujal Agro, NH-8, At & Post:Piludra, Sabarkantha, Gujarat 383120 TESTS CONDUCTED AT:

SCOPE OF TEST: To establish Type Test of Instrument Valves manufactured by M/s PanamEngineers

Limited with Different type of Instrument Valves Size and Rating [Needle Valve, Ball Valve, Check Valve, Manifold Valve, Block and bleed valve, Gauge Root Valve, Relief Valves].

MSS SP-99-2016a For Instrument Valves& COMPLIANCE STANDARD:

PEL Test Procedure Doc. No. WI/5.7.1.5/2-40, Rev. 00, Dated:03/10/2013, Total Page 04.

Stainless Steel (316 / 316L), Test Certificates Reviewed MATERIAL GRADE:

INSTRUMENT VALVES USED FOR TESTING:

Refer Attached Annexure A to Type Testing Compliance Report No. BDA/2018/470B, Dated: 2018-08-08.

The above Instrument Valves were assembled in different configuration of Panam with TEST METHOD:

Identically rated Instrument Valves as indicated in the attachedtest report. The Instrument Valves were then assembled with suitably rated and each Instrument Valves was Subjected to a hydrostatic Proof test [Shell, Seat] Pneumatic test [Shell, Seat] &Burst Test [Except Relief Valve] to applicable pressure as per the attached report for 1 minutes.

M/s Panam Instrument Valves were Pressure testing was satisfactory with no visible signs of CONCLUSION:

leakage or pressure drop.

1] Quality Certificate / Mill Certificate No. PEL/MTC-TYPE TEST/18-19, Dated: 16/07/2018, Page No. 1 to 7 of M/s Panam Engineers Limited.
2] Pressure Test Report [Witness] No. PEL/TEST REPORT/18-19, Dated: 20/07/2018 ATTACHMENTS:

Page No. 1 to 03 of M/s Panam Engineers Limited.

3] Final Inspection Report [Witness] No. PEL/FIR-007-18-19, Dated: 27/07/2018,

Page No. 1 to 27 of M/s Panam Engineers Limited.

For DNV GL Business Assurance India

(Narpat R. Ravalji / Nikunj Patel) Surveyor

Issued at Vadodara on 2018-08-08

Except for the obligations under section 12.1 or in case of fraud or fraudulent misrepresentation or other similar circumstances for which a party may not lawfully limit its liability under this Agreement's applicable law, DNV GL's BA total maximum liability (and whether in contract, tort including without limitation negligence, breach of statutory duty, under any indemnity or otherwise howsoever) arising out of or in relation to this Agreement and the performance or non-performance of any Work or Deliverables shall be limited to a sum equal to ten times the remuneration paid to DNV GL BA under this Agreement, up to a maximum aggregate sum of USD 300,000 (threehundredthousand).

OP-IND-15-5-i7-INSP-i1-f 008, Rev. 0, 2017-02

© DNV GL 2014. DNV GL and the Horizon Graphic are trademarks of DNV GL AS.

1203, BUTTERCUP, HIRANANDANI MEADOWS, GLADYS ALWARES ROAD, POKHARAN 2, THANE (WEST) - 400 610. TEL - 21739269 • 26795611.

Cell - 9820067369 • 9820067669 Email: stechndt@gmail.com

SCIENTIFIC TECHNICAL NDT SERVICES

HELIUM LEAK TESTING REPORT.

CLIENT

: Panam Engineers, Rabale, Navi Mumbai.

Report No.: 1062/18-19.

CUSTOMER

: ISRO Propulsion Complex

Date: 22 & 23.03.2019.

Ref P.O.No.

: IPRC-PUR-2018E023270201

P.O.Date: 31.12.2018

Description

: As per Annexure (Item Description / MOC / Panam Part No.)

EQUIPMENT

: Make/Model MSLD - Pfeiffer Vacuum Adixen ASM 310 - Made in France

TECHNIQUE USED

: Detector Probe (Sniffer Probe)

TRACER GAS

: Helium Gas Purity 99.995%.

PRESSURE

THEODOTAL

: Helium 0.15 kg/cm²

O'LEIDIVITION DONE

CALIBRATION DONE : 1.3 x 10-7 mbar/ l/ sec.

REF. PROCEDURE

: ASME Sec V, Article 10, Appendix IV, Test pressure of 0.1 MPa(g)

with a leak rate not exceeding 1E-06 std cm3/s.

ACCEPTANCE

: 1.0 x 10-6 mbar-cc/sec.

PRESSURE GUAGE

: 0 - 1 Kg Serial No: UCS 51 & 52

Test Conducted by

: K. Shivaji. Level II

OBSERVATION

: As per the annexure attached



Test Witnessed by

M.S.Naim, QCD, PANAM Engineers

- * Specilised Services in NDT: Ultrasonic Flaw Detection Ultrasonic Thickness Gauging Survey Magnetic Particle Inspection
 - Eddy Current Testing Digital Hardness Testing Dye Penetrant Testing Radiography Inspection In-situ Metallography
 - Positive Material Identification (PMI) Helium Leak Testing DF Thickness Material Segregations Pre & Post Heat Treatment
- · Boroscopy, Fibroscopic & Videoscopic · Ferrite Measurement · Surface Roughness · Metallurgical & Engineering Consulting
- * Approved by well known inspection Agencies and Reputed Users.

1203, BUTTERCUP, HIRANANDANI MEADOWS, GLADYS ALWARES ROAD, POKHARAN 2, THANE (WEST) - 400 610.

TEL - 21739269 • 26795611. Cell - 9820067369 • 9820067669 Email: stechndt@gmail.com

SCIENTIFIC TECHNICAL NDT SERVICES

CLIENT: Panam Engineers, Rabale, Navi Mumbai.

CUSTOMER: ISRO Propulsion Complex

Ref P.O.No.: IPRC-PUR-2018E023270201

Report No.: 1062/18-19.

Date: 22 & 23.03.2019.

P.O.Date: 31.12.2018.

_							
NO.	ITEM DESCRIPTION	мос	PANAM PART NO		Observed Reading	Leak Rate	Remark
4	00111			m.bar cc/sec	(B) m.bar cc/sec	(B-A)	Remark
1	SS Union:8mm		PU-M08-SS	5.0 x 10 ⁻⁸	5.0 x 10 ⁻⁸	No Changes	Acceptable
2	SS Union:12.7mm (1/2")		PU-08-SS	5.0 x 10 ⁻⁸	5.0 x 10 ⁻⁸	No Changes	Acceptable
3	Adapters:1/4" Male NPT X 8mm Tube		PMA-M08-4N-SS	5.0 x 10 ⁻⁸	5.0 x 10 ⁻⁸	No Changes	Acceptable
4	Adapters:1/2" Male NPT X 8mm Tube		PMA-M08-8N-SS	5.0 x 10 ⁻⁸	5.0 x 10 ⁻⁸	No Changes	Acceptable
5	Adapters:3/8" Male NPT X 8mm Tube	SS316	PMA-M08-6N-SS	5.0 x 10 ⁻⁸	5.0 x 10 ⁻⁸	No Changes	Acceptable
6	Adapters:1/8" Male NPT X 8mm Tube	SS316	PMA-M08-2N-SS	5.0 x 10 ⁻⁸	5.0 x 10 ⁻⁸	No Changes	Acceptable
7	Adapters:1/4" Male NPT X 12.7mm Tube (1/2")	SS316	PMA-08-4N-SS -	5.0 x 10 ⁻⁸	5.0 x 10 ⁻⁸	No Changes	Acceptable
8	Adapters:1/2" Male NPT X 12.7mm Tube (1/2")	SS316	PMA-08-8N-SS	5.0 x 10 ⁻⁸	5.0 x 10 ⁻⁸	No Changes	Acceptable
9	Adapters:3/8" Male NPT X 12.7mm Tube (1/2")	SS316	PMA-08-6N-SS	5.0 x 10 ⁻⁸	5.0 x 10 ⁻⁸	No Changes	Acceptable
10	Adapters:1/8" Male NPT X 12.7mm Tube (1/2")	SS316	PMA-08-2N-SS	5.0 x 10 ⁻⁸	5.0 x 10 ⁻⁸	No Changes	
11	SS Male Elbow:1/2" Male NPT X 8mm Tube	SS316	PME-M08-8N-SS	5.0 x 10 ⁻⁸	5.0 x 10 ⁻⁸	No Changes	
12	SS Male Elbow:3/8" Male NPT X 8mm Tube	SS316	PME-M08-6N-SS	5.0 x 10 ⁻⁸	5.0 x 10 ⁻⁸	No Changes	
13	SS Male Elbow:1/8" Male NPT X 8mm Tube	SS316	PME-M08-2N-SS	5.0 x 10 ⁻⁸	5.0 x 10 ⁻⁸	No Changes	
			PME-08-4N-SS	5.0 x 10 ⁻⁸	5.0 x 10 ⁻⁸	No Changes	
15	SS Male Elbow:1/2" Male NPT X 12.7mm Tube (1/2")	SS316	PME-08-8N-SS	5.0 x 10 ⁻⁸	5.0 x 10 ⁻⁸	No Changes	Acceptable
16	SS Male Elbow:3/8" Male NPT X 12.7mm Tube (1/2")	SS316	PME-08-6N-SS	5.0 × 10 ⁻⁸	5.0 x 10 ⁻⁸	No Changes	
17	SS Male Elbow:1/8" Male NPT X 12.7mm Tube (1/2")	SS316	PME-08-2N-SS	5.0 x 10 ⁻⁸	5.0 x 10 ⁻⁸	No Changes	
18	SS Reducing Union:12.7mm (1/2*) X 6mm Tube	SS316	PRU-M06-08-SS	5.0 x 10 ⁻⁸	5.0 x 10 ⁻⁸	No Changes	Acceptable
19	SS Reducing Union:12.7mm (1/2*) X 8mm Tube	SS316	PRU-M08-08-SS	5.0 x 10 ⁻⁸	5.0 x 10 ⁻⁸	No Changes	Acceptable
20	SS Reducing Union:12.7mm (1/2*) X 12mm Tube	SS316	PRU-M12-08-SS	5.0 x 10 ⁻⁸	5.0 x 10 ⁻⁸	No Changes	Acceptable
21	SS Union Tee:12.7mm (1/2*)	SS316	PUT-08-SS	5.0 x 10 ⁻⁸	5.0 x 10 ⁻⁸	No Changes	
22	SS Union Tee:8mm	SS316	PUT-M08-SS	5.0 x 10 ⁻⁸	5.0 x 10 ⁻⁸	No Changes	
23	Conversion Adapters:1" Male NPT X 8mm Tube	SS316	PMA-M08-16N-SS	5.0 x 10 ⁻⁸	5.0 x 10 ⁻⁸	No Changes	
24	Adapters:1"Male NPT X 12.7mm Tube (1/2")	SS316	PMA-08-16N-SS	5.0 x 10 ⁻⁸	5.0 x 10 ⁻⁸	No Changes	
25	End closer:6mm cap	SS316	PTC-M06-SS	5.0 x 10 ⁻⁸	5.0 x 10 ⁻⁸	No Changes	
26	End closer:6mm plug	SS316	PTP-M06-SS	5.0 x 10 ⁻⁸	5.0 x 10 ⁻⁸	No Changes	
27	End closer:8mm cap	SS316	PTC-M08-SS	5.0 x 10 ⁻⁸	5.0 x 10 ⁻⁸	No Changes	
28	End closer:8mm plug		PTP-M08-SS	5.0 x 10 ⁻⁸	5.0 x 10 ⁻⁸	No Changes	
29	End closer:12.7mm cap (1/2*)	SS316	PTC-08-SS	5.0 x 10 ⁻⁸	5.0 x 10 ⁻⁸	No Changes	
30	End closer:12.7mm plug (1/2")	SS316	PTP-08-SS	5.0 x 10 ⁻⁸	5.0 x 10 ⁻⁸	No Changes	

Authorized Signatory

Test Witnessed by

M.S.Naim, QCD, Panam Engineers

- * Specilised Services in NDT: Ultrasonic Flaw Detection Ultrasonic Thickness Gauging Survey Magnetic Particle Inspection
 - Eddy Current Testing Digital Hardness Testing Dye Penetrant Testing Radiography Inspection In-situ Metallography
- Positive Material Identification (PMI) Helium Leak Testing DF Thickness Material Segregations Pre & Post Heat Treatment
- Boroscopy, Fibroscopic & Videoscopic Ferrite Measurement Surface Roughness Metallurgical & Engineering Consulting
- * Approved by well known inspection Agencies and Reputed Users.





REPORT NO.	MI/PEL/2019/01/204
DATE	09-01-2019
PAGE NO.	01 of 02

HELIUM LEAK TEST REPORT (TRACER GAS / VACUUM METHOD) - CONTINUATION SHEET

MEA	MEASUREMENT OF SYSTEM SENSITIVITY AT THE START OF THE HELIUM LEAK TEST:									
01	Background Reading displayed on HLT during Test with Standard Leak Valve Closed.	A	6.2 x 10 ⁻¹⁰	atm-cc/sec						
02	Leak Rate of Calibrated Leak	В	1.3 x 10 ⁻¹⁰	atm-cc/sec						
03	Leak Rate Displayed on HLT (Sensing Calibrated Leak Connected on Test Component / Standard Leak Valve Opened)	С	7.5 x 10 ⁻¹⁰	atm-cc/sec						
04	Response Time	Т	< 10	Seconds						
05	Duration for Stable Reading		> 10	Seconds						
06	Initial System Calibration Factor (ICSF)	ICSE = {B/(C-A)}	1							

HELIUM LEAK TEST RESULTS FOR STAINLESS STEEL NIPPLE (SIZE - 1/2" NPT MALE, 2" LONG) TAG NO. 01:

01	Background Reading before start of Helium Leak Test	X	6.2 x 10 ⁻¹⁰	atm-cc/sec
02	Maximum Leak Rate Observed after 10 Min Hold Time.	W	8.2 x 10 ⁻¹⁰	atm-cc/sec
03	Actual Maximum Leak Rate	(W-X) x ICSF	2.0 x 10 ⁻¹⁰	atm-cc/sec
04	Allowable / Acceptable Helium Leak Rate		4.00 x 10 ⁻⁹	atm-cc/sec

HELIUM LEAK TEST RESULTS FOR STAINLESS STEEL NIPPLE (SIZE - 1/2" NPT MALE, 2" LONG) TAG NO. 02:

		,,		
01	Background Reading before start of Helium Leak Test	X	6.2 x 10 ⁻¹⁰	atm-cc/sec
02	Maximum Leak Rate Observed after 10 Min Hold Time.	W	8.2 x 10 ⁻¹⁰	atm-cc/sec
03	Actual Maximum Leak Rate	(W-X) x ICSF	2.0 x 10 ⁻¹⁰	atm-cc/sec
04	Allowable / Acceptable Helium Leak Rate	-	4.00 x 10 ⁻⁹	atm-cc/sec

RESULT: - THE OBSERVED HELIUM LEAK RATE ARE WITHIN THE SPECIFIED LIMITS OF 4.0 X 10⁻⁹ atm-cc/sec. HELIUM LEAK TEST OF STAINLESS STEEL NIPPLE, SIZE – ½" NPTM, 2" LONG (QTY – 02 NOS.) FOUND SATISFACTORY.







LT PERFORMED BY (ASNT -LT- Level-2)	WITNESSED / APPROVED BY
MANOJ INDUSTRIES, NAVI MUMBAI	M/S. PANAM ENGINEERS LTD., MUMBAI

Encl

1. Calibration Certificate for Vacuum Type Helium Calibrated Leak.

2. ASNT Level II Certificate of Mr. Subhash Boiwar

D-17/5, Sahyadri CHS, Plot 50, Sector 8, Sanpada, Navi Mumbai – 400 705 Contact Number : 9820119880 / 9820718901



purvainspection.com

Repor	t No:	PITS/07/	001		Report Date :		04-07-2019			
Client	:	LPSC, IS	RO		Testing Equipment : LEYE		LEYBOLD QUADRO			
Manut	facturer :	PANAM EN	IGINEERS LT)	Calibrated Leak :		17480			
tem :		Needle Val			Code / Standard	:	ISRO specification	on		
OR	eference:	PO NO. TL Dated :-12	.05-201803191 -02-2019	70101-LO	Qualification :		He Leak Rate <1. at body-bonnet j	0x10 ⁻⁴ std cc/ s pint,gland seal, se	eat	
	Leak Detector a	nd Probe Ca	alibration							
1	Stand	dard Leak Va	alue	Obe	served Leak Value		Instr	ument Sensitivity		
	2.87x 10	9 std	cc/s	~ 2.7 x	x 10 ⁻⁹ std cc/s		CF = 1.0	Response	<5s	
2	Test Pressur	e : 5 Kg/c	m2 He			Soaking Time : 10 Minutes				
3							Lea	ak Rate (std co	c/s)	
PR SR NO.	Serial No	Size	Material	Class	Туре		Body/Bonnet Joint	Seat	Gland Sea	
1	1906P19894	3/8" BSPP (MXF)	ASTM A 479 - 316	MAX WP - 50BAR	Needle Valve - PNV-SB-S-06-MF-	G	< 10 ⁻⁸	1.2 x 10 ⁻⁸	< 10 ⁻⁸	
2	1906P19897	3/8" BSPP (MXF)	ASTM A 479 - 316	MAX WP - 50BAR	Needle Valve - PNV-SB-S-06-MF-	G	< 10 ⁻⁸	1.1 x 10 ⁻⁸	< 10 ⁻⁸	
Final I	Remarks :				ed was within acco			orr I/s)		
1	Testing Age	ncy NG SER		Manufaci	urer	Insp	ection Authority	(Client	

+91 9904004187 +91 9824004187



info@purvainspection.com dhaval@purvainspection.com



3 New Tirupati Society, Nr. Radhaswami Satsang Ranip, Ahmedabad 382480



M		T		1 NI		d	REPORT NO.	MI/PEL/2019/01/	205
			J INDUS'. BAI - 400 705		V	3 ,	DATE	09-01-2019	
NA		UM	BAI - 400 705			Ì	PAGE NO.	01 of 02	
HE	HUMI	FΔK	TEST REPORT (DETECT	OR	PRORF M	FTHO	D / SNIFFFR	METHOD)	
Customer			nam Engineers Ltd., Mumbai - Ind		I NODE IV		D / SIMILI EI	INILITIOD	
Inspecting Authority			nam Engineers Ltd., Mumbai - Ind						
Customer / Project :			India Ltd.	iiu					
	5		SS STEEL NEEDLE VALVE				•		
Product / Epmt Descripti	ion N	MATERI	AL – AISI 316, SIZE : ½" NPT - FEM	IALE			Qty.:	02 Nos.	
Job Number.	N	M/s. Oil	India Ltd., PO Number 7120597/J	FS Dto	d. 12/10/2018				
Drawing No.	P	anam I	Needle Valve Part Number : PNV-L	JB-S-0	8-FF				
Material of Construction	: S	Stainles	s Steel AISI 316						
Thickness :	N	Not App	licable						
Reference Standards / Documents :	А	ASME S	ection V Article 10, Edition 2010.						
Scope	н	Helium I	Leak Testing of Needle Valve (Size	- ½" 1	NPT Female).				
Helium Leak Test Proc. N	lo. A	As per S	tandard Helium Leak Testing Proce	edure.					
Examination Stage	А	After Fir	nal Assembly and Pneumatic Testin	ng.		Heliu	m Test Mode	DETECTOR PROBE N	METHOD.
Acceptable Limit	1	X 10 ⁻⁶	std-cc/sec			Date	of Examination	09.01.2019	
HELIUM LEAK DETECTOR									
Make			ALCATEL ADIXEN, FRANCE		Model			ASM 310	
Helium Leak Detector Se	rial Numbe	er:	HLD1501032	Helium Leak Detector					
HELIUM LEAK DETECTOR	CALIBRAT	ION DE	TAILS:						
Manufacturer	M	M/s. Laco Technologies, USA M				er:		CM511.081111v0/4	
Calibrated Stad. Leak Sr.	No. 14				Calibration C	ertificate	Number:	970455	
Calibration Date :	ibration Date : 10/04/2018				Next Calibrat	ion Due	Date :	10/04/2019	
Depletion Rate		1% per		\dashv	Temp. Coefficient			0.1 per Deg C.	
CALIBRATION OF HELIUN						LEAK RATE VALUE			UNIT
Leak rate of calibrated Le		IECTOR	<u> </u>				1.08 x 10 ⁻⁸ a		mbar ltr / sec
			ing about Doubtion rate of 0.1%				1.08 x 10° at 25° C.		
			ing above Depletion rate of 0.1% y		D 0		1.087 x 10 ⁻⁸ at 32°C.		mbar ltr / sec
			ing above Temp Coefficient of 0.1				1.08 / x 10 ° at 32 °C. 1.0 X 10 ° 8 to 1.17 X 10 ° at 32 °C		mbar ltr / sec
			rection as per calibration certificat			-		mbar ltr / sec	
			or Sensing Calibrated Leak in Vacu	ium Co	ondition				mbar ltr / sec
Machine sensitivity as rec							5.0 x 10)-12	mbar ltr / sec
SYSTEM / SNIFFER PROB		_							
Manufacturer	M,	/s. Lacc	Technologies, USA	Mod	del Number :			CM519.0630DA0/4	
Calibrated Stad. Leak Sr.	No. 14	1828		Cali	bration Certifi	cate Nun	nber:	970468	
Calibration Date :	12	2/04/20	18	Nex	ct Calibration (Due Date	:	12/04/2019	
Depletion Rate :	No	ot Appli	cable	Tem	np. Coefficient	:		0.1 per Deg C.	
SYSTEM CALIBRAION DE							LEAK RATE		UNIT
Leak rate of Sniffer Calibr			0-			3.5 x 10		Pressure of 50 psig	mbar ltr / sec
			ing above Temp Coefficient of 0.1			2.44	3.6 x 10 ⁻⁵ at 3		mbar ltr / sec
			rection as per calibration certificat or Sensing Calibrated Leak by HLD				5 X 10 ⁻⁵ to 4.21 X 1 ⁻⁵ @ Helium Inlet	Pressure of 50 psig	mbar ltr / sec
Response Time :		1 Minut		Jillie	FIODE.	3.4 x 10	e neduli ille	Tressure of 50 balk	111001 101 / 500
Note: Above noted Response tir	me is derived	after kee	ping Sniffer Probe Calibrated Leak with Val e test Hold time of 12 hrs similar to the U-Tul	be Heat	t Exchanger Helium	Leak Detec		at 50 psig pressure) is kept	in similar volume o
T C	HELEN	NA /00 0	ACCESSORIES /				1000/ 1/-1/-		
Tracer Gas			95% Pure or 4.5 Grade Gas)	_	racer Gas Cond	entratio			
Test Pressure Helium Filling Date	20 kg/d 09/01/			-	oaking Time ime & Atm. Ro	om Tem	Minimum 30 Minutes. emp 4.30 PM & 30 Deg C		
Helium Test Date	09/01/			_	ime & Atm. Ro				
	WLT		THO			/ 4.11			tinuation She

D-17/5, Sahyadri CHS, Piot 50, Sector-8, Sanpada, Navi Mumbai – 400 705, Tel : 9820119880, E-mail : prasoma@yahoo.com



REPORT NO.	MI/PEL/2019/01/205
DATE	09-01-2019
PAGE NO.	01 of 02

HELIUM LEAK TEST REPORT (DETECTOR PROBE METHOD / SNIFFER METHOD) – CONTINUATION SHEET TYPICAL SKETCH OF PANAM NEEDEL VALVE:



NOTE: PLASTIC HOOD WRAPED ON TEST LOCATION AND KEPT UPTO MIN. 30 MINUTES AFTER PRESSURING WITH HELIUM GAS.

Location Area.	AREAS UNDER INSPECTION	Initial Background Reading before start of Helium Leak Test (std-cc/sec) (std-cc/sec) Helium Leak Rate Reading observed during Leak Testing (std-cc/sec)		Observed Leak Rate (100% Helium Pressure)) (std-cc/sec)	Acceptable Helium Leak Rate (std-cc/sec)	RESULT
		A	В	(B-A)		
1	Body, Bonnet, Stem and End Joints Etc. – SR. NO. 01	2.7 X 10 ⁻⁶	2.9 x 10 ⁻⁶	$0.2 \times 10^{-6} = 2.0 \times 10^{-7}$	1 x 10 ⁻⁶	Acceptable
2	Body, Bonnet, Stem and End Joints Etc. – SR. NO. 02	2.7 X 10 ⁻⁶	3.1 x 10 ⁻⁶	$0.4 \times 10^{-6} = 4.0 \times 10^{-7}$		

RESULT: - HELIUM LEAK TEST OF NEEDLE VALVE ARE WITHIN ACCEPTABLE LIMIT OF 1.0 x 10⁻⁶ ATM-CC/SEC.





LT PERFORMED BY (ASNT-LT- Level-2) WITNESSED / APPROVED BY

MANOJ INDUSTRIES, NAVI MUMBAI M/S. PANAM ENGINEERS LTD., MUMBAI

Encl:

- 1. Calibration Certificate for Vacuum Type Helium Calibrated Leak.
- 2. Calibration Certificate for Sniffer Type Helium Calibrated Leak.
- 3. ASNT Level II Certificate of Mr. Subhash Boiwar.

D-17/5, Sahyadri CHS, Plot 50, Sector-8, Sanpada, Navi Mumbai – 400 705, Tel: 9820119880, E-mail: prasoma@yahoo.com

M		J INDUS	TRIE	S	REPORT NO.	MI/PEL/2019/09/	146	
		IBAI - 400 705		5,	DATE	23-09-2019		
NA.		- 400 705			PAGE NO.	01 of 02		
HELL	IIM I FAK	TEST REPORT (DETECT	OR PROBE N	ETHOD	/ SNIEEE	METHOD)		
Customer		nam Engineers Ltd., Mumbai - Inc		LIIIOD	/ Sittle L	(WETHOD)		
Inspecting Authority		nam Engineers Ltd., Mumbai - Inc						
Customer / Project :		ohne Engineering LLC. – Russia	ala .					
customer / Project .		ESS STEEL MALE CONNECTOR						
Product / Epmt Description	scription MATERIAL – AISI 316, SIZE : 12MM OD X 1/2" NPTM			Qty.:	316 Nos.			
Job Number.	M/s. Kr	ohne Engineering LLC. – Russia, PC	Number 2601/1-7	716 Dtd. 12/	08/2018	•		
Drawing No.	MALE	CONNECTOR Part Number : PMC-N	112-8N-SS					
Material of Construction:	Stainles	ss Steel AISI 316						
Thickness:		plicable						
Reference Standards /								
Documents :	ASMES	Section V Article 10, Edition 2010.						
Scope	Helium	Leak Testing of MALE CONNECTO	R 12MM OD X 1/2" I	NPTM				
Helium Leak Test Proc. No.	As per S	Standard Helium Leak Testing Proc	edure.					
Examination Stage	After Fi	nal Assembly and Pneumatic Testi	ng.	Helium	Test Mode	DETECTOR PROBE METHOD.		
Acceptable Limit	1 X 10-4	std-cc/sec		Date of Examination 23-09-201		23-09-2019	-09-2019	
HELIUM LEAK DETECTOR EG	QUIPMENT DE	TAILS:						
Make		ALCATEL ADIXEN, FRANCE	Model			ASM 310		
Helium Leak Detector Seria	l Number :	HLD1501032	Helium Leak	Leak Detector Part Number :		BSAA0000MM9A		
HELIUM LEAK DETECTOR CA	ALIBRATION D	ETAILS:						
Manufacturer	M/s. CIN	CINNATI TEST SYSTEMS,INC.	Model Numl	ber:		9GPHKF25		
Calibrated Stad. Leak Sr. No	o		Calibration C	Certificate N	ste Number: G010622			
Calibration Date :	28/07/20	019	Next Calibra	tion Due Da	ite:	26/07/2020		
Depletion Rate	0.1% per	Year	Temp. Coeff	icient		4.0% per Deg C.		
CALIBRATION OF HELIUM L	EAK DETECTO	R			LEAK RATE	VALUE	UNIT	
Leak rate of calibrated Leak					1.3 x 10 ⁻⁹ at	21.8°C.	mbar ltr / se	
		ring above Depletion rate of 0.1%	vear		1.224 x		mbar ltr / se	
		ring above Temp Coefficient of 0.1			1.318 x 10 ⁻⁹		mbar ltr / se	
							1	
		tor Sensing Calibrated Leak in Vac	ium Condition		1.4 x 10°		mbar ltr / se	
Machine sensitivity as recor SYSTEM / SNIFFER PROBE O					5.0 x 1	0.,,	mbar ltr / se	
Manufacturer								
	IVI/S. CIN	CINNATI TEST SYSTEMS,INC.	Model Number :			9GPHKF25		
						G010622		
Calibrated Stad. Leak Sr. No	-		Calibration Certif		er:			
Calibrated Stad. Leak Sr. No Calibration Date :	28/07/20	019	Calibration Certif		er:	26/07/2020		
Calibrated Stad. Leak Sr. No Calibration Date : Depletion Rate :	28/07/20 0.1% per			Due Date :		26/07/2020 4.0% per Deg C.		
Calibrated Stad. Leak Sr. No Calibration Date : Depletion Rate : SYSTEM CALIBRAION DETA	28/07/20 0.1% per	Year	Next Calibration	Due Date :	LEAK RATE	26/07/2020 4.0% per Deg C.	UNIT	
Calibrated Stad. Leak Sr. No Calibration Date : Depletion Rate : SYSTEM CALIBRAION DETA Leak rate of Sniffer Calibrat	28/07/20 0.1% per ILS: ed Leak @ 21.6	Year 5 Deg C	Next Calibration Temp. Coefficien	Due Date :	LEAK RATE	26/07/2020 4.0% per Deg C. EVALUE t Pressure of 50 psig	mbar ltr / se	
Calibrated Stad, Leak Sr. No Calibration Date : Depletion Rate : SYSTEM CALIBRAION DETA Leak rate of Sniffer Calibrat Calculated Leak Rate arriver	28/07/20 0.1% per ILS: ed Leak @ 21.6 d after conside	Year 5 Deg C ring above Temp Coefficient of 0.1	Next Calibration Temp. Coefficien	Due Date : t 3.5 x 10 ⁻⁵	LEAK RATE @ Helium Inle 3.6 x 10 ⁻⁵ at	26/07/2020 4.0% per Deg C. EVALUE t Pressure of 50 psig 32 Deg C.	mbar ltr / se	
Calibrated Stad, Leak Sr. No Calibration Date: Depletion Rate: SYSTEM CALIBRAION DETA Leak rate of Sniffer Calibrat Calculated Leak Rate arrive Uncertainty after age and to	28/07/20 0.1% per ILS: ed Leak @ 21.6 d after conside emperature co	Year 5 Deg C ring above Temp Coefficient of 0.1 rrection as per calibration certifica	Next Calibration Temp. Coefficien 1% per Deg C. tte ± 10%	3.5 x 10 ⁻⁵	LEAK RATE @ Helium Inle 3.6 x 10 ⁻⁵ at (10 ⁻⁵ to 4.21 X	26/07/2020 4.0% per Deg C. • VALUE t Pressure of 50 psig 32 Deg C. 10°5 at 32 Deg C.	mbar ltr / se mbar ltr / se mbar ltr / se	
Calibrated Stad, Leak Sr. No Calibration Date : Depletion Rate : SYSTEM CALIBRAION DETA Leak rate of Sniffer Calibrat Calculated Leak Rate arriver Uncertainty after age and to Leak rate displayed on Heliu Response Time :	28/07/20 0.1% per ILS: ed Leak @ 21.6 d after conside emperature co um Leak Detect < 1 Minu is derived after ke	Year 5 Deg C ring above Temp Coefficient of 0.1. rrection as per calibration certificator Sensing Calibrated Leak by HLC tte. eping Sniffer Probe Calibrated Leak with Va te text Hold time of 12 hrs similar to the U-Ta	Next Calibration Temp. Coefficien 1% per Deg C. ste ± 10% Sniffer Probe. due of 3.8 x 10-5 mbar-ltr	3.5 x 10 ⁻⁵ 3.45 x 3.4 x 10 ⁻⁵ 3.45 x 10 ⁻⁵ 3.45 x 10 ⁻⁵	LEAK RATE @ Helium Inle 3.6 x 10 ⁻⁵ at (10 ⁻⁵ to 4.21 X @ Helium Inle m Reservoir (fille)	26/07/2020 4.0% per Deg C. VALUE t Pressure of 50 psig 32 Deg C. 10° at 32 Deg C. t Pressure of 50 psig	mbar ltr / se mbar ltr / se mbar ltr / se mbar ltr / se	
Calibrated Stad. Leak Sr. No Calibration Date : Depletion Rate : SYSTEM CALIBRAION DETA Leak rate of Sniffer Calibrat Calculated Leak Rate arrives Uncertainty after age and tr Leak rate displayed on Heliu Response Time : Note: Above noted Response time Polythene bag to be used for HLD Ex	28/07/20 0.1% per ILS: ed Leak @ 21.6 d after conside emperature co im Leak Detect < 1 Minu is derived after ke changer Test for th	Year 5 Deg C rrection as per calibration certificator Sensing Calibrated Leak by HLD te. sping Sniffer Probe Calibrated Leak with Va e test Hold time of 12 hrs similar to the U-Ta ACCESSORIES	Next Calibration Temp. Coefficien 1% per Deg C. ste ± 10% Sniffer Probe. due of 3.8 x 10-5 mbar-ltt sbe Heat Exchanger Helluru / EQUIPMENT DETA	3.5 x 10 ⁻⁵ 3.4 x 10 ⁻⁵ 3.4 x 10 ⁻⁵ //sec with Heliun Leak Detection	LEAK RATI @ Helium Inle 3.6 x 10 ⁻⁵ at (10 ⁻⁵ to 4.21 X @ Helium Inle um Reservoir (filler n Test Condition.	26/07/2020 4.0% per Deg C. VALUE t Pressure of 50 psig 32 Deg C. 10 ⁻⁶ at 32 Deg C. t Pressure of 50 psig f at 50 psig pressure) is kept	mbar ltr / se mbar ltr / se mbar ltr / se mbar ltr / se	
Calibrated Stad. Leak Sr. No Calibration Date : Depletion Rate : SYSTEM CALIBRAION DETA Leak rate of Sniffer Calibrat Calculated Leak Rate arriver Uncertainty after age and to Leak rate displayed on Helic Response Time : Note: Above noted Response time Polythene bag to be used for HLD Es	28/07/20 0.1% per 0.1% per ILS: ed Leak @ 21.6 d after conside emperature co im Leak Detect < 1 Minu is derived after ke changer Test for th	Year 5 Deg C ring above Temp Coefficient of 0.1. rrection as per calibration certificator Sensing Calibrated Leak by HLC tte. eping Sniffer Probe Calibrated Leak with Va te text Hold time of 12 hrs similar to the U-Ta	Next Calibration Temp. Coefficien 1% per Deg C. tte ± 10% 0 Sniffer Probe. tlue of 3.8 x 10-5 mbar-It- the Heat Exchanger Hellium F EQUIPMENT DETA Tracer Gas Con	3.5 x 10 ⁻⁵ 3.4 x 10 ⁻⁵ 3.4 x 10 ⁻⁵ //sec with Heliun Leak Detection	LEAK RATE @ Helium Inle 3.6 x 10 ⁻⁵ at 10 ⁻⁵ to 4.21 X @ Helium Inle im Reservoir (fillee in Test Condition.	26/07/2020 4.0% per Deg C. VALUE t Pressure of 50 psig 32 Deg C. 10° at 32 Deg C. t Pressure of 50 psig at 50 psig pressure) is kept im.	mbar ltr / se mbar ltr / se mbar ltr / se mbar ltr / se	
Calibrated Stad. Leak Sr. No Calibration Date : Depletion Rate : SYSTEM CALIBRAION DETA Leak rate of Sniffer Calibrat Calculated Leak Rate arrives Uncertainty after age and te Uncertainty after age and te Leak rate displayed on Heliu Response Time : Note: Above noted Response time Polythene bag to be used for HLD Ex	28/07/20 0.1% per ILS: ed Leak @ 21.6 d after conside emperature co im Leak Detect < 1 Minu is derived after ke changer Test for th	Year 5 Deg C rrection as per calibration certificator Sensing Calibrated Leak by HLD te. sping Sniffer Probe Calibrated Leak with Va e test Hold time of 12 hrs similar to the U-Ta ACCESSORIES	Next Calibration Temp. Coefficien 1% per Deg C. ste ± 10% Sniffer Probe. due of 3.8 x 10-5 mbar-ltt sbe Heat Exchanger Helluru / EQUIPMENT DETA	3.5 x 10 ⁻⁵ 3.4 x 10 ⁻⁵ 3.4 x 10 ⁻⁵ 3.4 x 10 ⁻⁵ //sec with Heliun teak Detection	LEAK RATI @ Helium Inle 3.6 x 10 ⁻⁵ at (10 ⁻⁵ to 4.21 X @ Helium Inle um Reservoir (filler n Test Condition.	26/07/2020 4.0% per Deg C. EVALUE T Pressure of 50 psig 32 Deg C. 10° at 32 Deg C. T Pressure of 50 psig at 50 psig pressure) is kept I at 50 psig pressure) is kept III.	mbar ltr / se mbar ltr / se mbar ltr / se mbar ltr / se	

D-17/5, Sahyadri CHS, Plot 50, Sector-8, Sanpada, Navi Mumbai – 400 705, Tel : 9820119880, E-mail : prasoma@yahoo.com



MGINER OCK TO THE PROPERTY OF THE PROPERTY OF





REPORT NO.	MI/PEL/2019/09/146	
DATE	23-09-2019	
PAGE NO.	02 of 02	

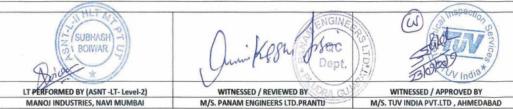
HELIUM LEAK TEST REPORT (DETECTOR PROBE METHOD / SNIFFER METHOD) – CONTINUATION SHEET TYPICAL SKETCH OF PANAM FLANGE ADAPTOR:



NOTE: PLASTIC HOOD WRAPED ON TEST LOCATION AND KEPT UPTO MIN. 10 MINUTES AFTER PRESSURING WITH HELIUM GAS.

			(std-cc/sec)		Leak Rate (std-cc/sec)	
		A	В	(B-A)		
1 B	Body and End Joints Etc.	1.1 X 10 ⁻⁶	1.3 x 10 ⁻⁶	$0.2 \times 10^{-6} = 2.0 \times 10^{-7}$	1 x 10 ⁻⁴	Acceptab

RESULT: - HELIUM LEAK TEST OF MALE CONNECTOR ARE WITHIN ACCEPTABLE LIMIT OF 1.0 x 10⁻⁴ ATM-CC/SEC.



Encl:

- 1. Calibration Certificate for Vacuum Type Helium Calibrated Leak.
- 2. Calibration Certificate for Sniffer Type Helium Calibrated Leak.
- 3. ASNT Level II Certificate of Mr. Subhash Boiwar.

D-17/5, Sahyadri CHS, Plot 50, Sector-8, Sanpada, Navi Mumbai - 400 705, Tel: 9820119880, E-mail: prasoma@yahoo.com

	NO	J INDUS	TRI	22	REPORT NO.	MI/PEL/2019/09/	147	
			1 1611	4159	DATE	23-09-2019		
NAV	MUM	IUMBAI - 400 705 PAGE NO. 01 of 02						
HELI	UM LEAK	TEST REPORT (DETECT	TOR PROBE	METHO) / SNIFFEI	R METHOD)		
Customer		nam Engineers Ltd., Mumbai - Inc			•			
Inspecting Authority	M/s. Pa	nam Engineers Ltd., Mumbai - Inc	dia					
Customer / Project :	M/s. Kr	ohne Engineering LLC. – Russia						
Product / Epmt Description	MATER	STAINLESS STEEL FLANGE ADAPTOR MATERIAL – AISI 316, Qty.: SIZE: 12MM OD X 1/2" X 2500 # , RTJ			Qty.:	72 Nos.		
Job Number.		ohne Engineering LLC. – Russia, Po	O Number 2601/	1-716 Dtd. 12	2/08/2018			
Drawing No.	FLANGE	ADAPTOR Part Number : PFLA-M	112-F08-2500-RTI-	SS				
Material of Construction:		s Steel AISI 316						
Thickness:	Not Apr						-	
Reference Standards / Documents :		ection V Article 10, Edition 2010.						
Scope .	Helium	Leak Testing of FLANGE ADAPTOR	12MM OD X 1/2	' X 2500 # . R	TJ			
Helium Leak Test Proc. No.		Standard Helium Leak Testing Pro						
Examination Stage		After Final Assembly and Pneumatic Testing. Helium Test Mode		DETECTOR PROBE N	METHOD			
			iiig.	Date of Exam		23-09-2019		
Acceptable Limit	mit 1 X 10 ⁻⁴ std-cc/sec DETECTOR EQUIPMENT DETAILS:			Date of Examination		23-09-2019		
Make	QUIPWENT DE		Model			ASM 310		
Helium Leak Detector Seria	l Number :	ALCATEL ADIXEN, FRANCE HLD1501032		ak Detector			5AA0000MM9A	
HELIUM LEAK DETECTOR C								
Manufacturer	M/s. CIN	CINNATI TEST SYSTEMS,INC.	Model Nu	mber :		9GPHKF25		
Calibrated Stad. Leak Sr. No	_		Calibratio	n Certificate	Number :	G010622		
Calibration Date :	28/07/20	019	Next Calib	ration Due [Date :	26/07/2020		
Depletion Rate	0.1% per		Temp. Cod			4.0% per Deg C.		
CALIBRATION OF HELIUM L			10			UNIT		
Leak rate of calibrated Leak					1.3 x 10 ⁻⁹ at	21 8°C	mbar ltr / se	
		ring above Depletion rate of 0.1%	vear		1.224 x		mbar ltr / se	
		ring above Temp Coefficient of 0.			1.318 x 10 ⁻⁵		mbar ltr / se	
		tor Sensing Calibrated Leak in Vac			1.4 x 10°		mbar ltr / se	
			uum condition	_				
Machine sensitivity as recor SYSTEM / SNIFFER PROBE O					5.0 X 1	0	mbar ltr / se	
Manufacturer		CINNATI TEST SYSTEMS,INC.	Model Numbe			9GPHKF25		
Calibrated Stad. Leak Sr. No.	-	CHARTITEST STSTEMS,INC.	-			G010622		
Calibration Date :	28/07/20	210	Calibration Certificate Number : Next Calibration Due Date :		26/07/2020			
					•			
Depletion Rate : SYSTEM CALIBRAION DETA	0.1% per	rear	Temp. Coeffici	ent	LEAK RATI	4.0% per Deg C.	UNIT	
		5 Deg C		3.5 x 10		t Pressure of 50 psig	mbar ltr / se	
Leak rate of Sniffer Calibrated Leak @ 21.6 Deg C Calculated Leak Rate arrived after considering above Temp Coefficient of 0.19		1% per Deg C.		3.6 x 10 ⁻⁵ at		mbar ltr / se		
	Calculated Leak Rate arrived after considering above Temp Coefficient of 0.1% Uncertainty after age and temperature correction as per calibration certificate			3.45		10°5 at 32 Deg C.	mbar ltr / se	
Leak rate displayed on Heliu	um Leak Detec	tor Sensing Calibrated Leak by HLI				t Pressure of 50 psig	mbar ltr / se	
Response Time : Note: Above noted Response time Polythene bag to be used for HLD Ex	< 1 Minu is derived after ke xchanger Test for the	eping Sniffer Probe Calibrated Leak with V ne test Hold time of 12 hrs similar to the U-T	ube Heat Exchanger He	lium Leak Detect	lium Reservoir (fille	d at 50 psig pressure) is kept	in similar volume o	
Tracer Gas	HELLINA /00	ACCESSORIES 995% Pure or 4.5 Grade Gas)	/ EQUIPMENT DE		100% Heliu	ım.		
Tracer Gas		993/0 Pure Or 4.5 Grade Gas)	Tracer Gas C					
	7 kg/cm²		Soaking Time Minimum 10 Minutes. Time & Atm. Room Temp 14.00 PM & 36 Deg C					
Test Pressure Helium Filling Date	7 kg/cm ² 23/09/2019		Time & Atm.					

D-17/5, Sahyadri CHS, Plot 50, Sector-8, Sanpada, Navi Mumbai – 400 705, Tel : 9820119880, E-mail : prasoma@yahoo.com









MANOJ INDUSTRIES, NAVI MUMBAI - 400 705

REPORT NO.	MI/PEL/2019/09/147	
DATE	23-09-2019	
PAGE NO.	02 of 02	

HELIUM LEAK TEST REPORT (DETECTOR PROBE METHOD / SNIFFER METHOD) – CONTINUATION SHEET TYPICAL SKETCH OF PANAM FLANGE ADAPTOR:



NOTE: PLASTIC HOOD WRAPED ON TEST LOCATION AND KEPT UPTO MIN. 10 MINUTES AFTER PRESSURING WITH HELIUM GAS.

Location Area.	AREAS UNDER INSPECTION	Initial Background Reading before start of Helium Leak Test (std-cc/sec)	Helium Leak Rate Reading observed during Leak Testing (std-cc/sec)	Observed Leak Rate (100% Helium Pressure)) (std-cc/sec)	Acceptable Helium Leak Rate (std-cc/sec)	RESULT
		A	В	(B-A)		
1	Body and End Joints Etc.	1.1 X 10 ⁻⁶	1.2 x 10 ⁻⁶	$0.1 \times 10^{-6} = 1.0 \times 10^{-7}$	1 x 10 ⁻⁴	Acceptable

RESULT: - HELIUM LEAK TEST OF FLANGE ADAPTOR ARE WITHIN ACCEPTABLE LIMIT OF 1.0 x 10⁻⁴ ATM-CC/SEC.



Encl:

- 1. Calibration Certificate for Vacuum Type Helium Calibrated Leak.
- 2. Calibration Certificate for Sniffer Type Helium Calibrated Leak.
- 3. ASNT Level II Certificate of Mr. Subhash Boiwar.

D-17/5, Sahyadri CHS, Plot 50, Sector-8, Sanpada, Navi Mumbai – 400 705, Tel : 9820119880, E-mail : prasoma@yahoo.com

M	NO	J INDUS		S.	REPORT NO.	MI/PEL/2019/09/	143	
		IBAI - 400 705		9	DATE	23-09-2019		
NAV	NUN	- 400 703			PAGE NO.	01 of 03		
HELI	UM LEAK	TEST REPORT (DETEC	TOR PROBE M	ETHOD	/ SNIFFER	R METHOD)		
Customer	M/s. Pa	nam Engineers Ltd., Mumbai - In	dia					
Inspecting Authority	M/s. Pa	anam Engineers Ltd., Mumbai - In	dia					
Customer / Project :	M/s. Kr	ohne Engineering LLC. – Russia						
Product / Epmt Description	SIZE: 1/2" X 2500 # RTJ X 12MM OD X 1/4				Qty.:	14 Nos.		
Job Number.	M/s. Kr	ohne Engineering LLC. – Russia, P	O Number 2601/1-7	716 Dtd. 12/	08/2018			
Drawing No.	MONO	FLANGE TYPE SINGLE BLOCK AND	BLEED Part Number :	PSBB-NB-S	S-01-15-2500-	RTJ-M12-4NF-H		
Material of Construction:	Stainles	ss Steel AISI 316						
Thickness:	Not Ap	plicable						
Reference Standards / Documents :	ASME S	Section V Article 10, Edition 2010.						
Scope		Leak Testing of MONOFLANGE	TYPE SINGLE BLOCK /	AND BLEED,	SIZE : 1/2" X	2500 # RTJ X 12MM	OD X 1/4"NPTI	
Helium Leak Test Proc. No.	VENT.	Standard Helium Leak Testing Pro	cedure			-		
Examination Stage		inal Assembly and Pneumatic Test	_	Helium	Test Mode	DETECTOR PROBE N	AETHOD.	
		std-cc/sec	ung.	_			TETTIOD.	
Acceptable Limit			,	Date of Examination 23		23-03-2019	23-03-2019	
HELIUM LEAK DETECTOR EC	QUIPMENT DE		Model			1,544,340		
Make	I atombon	ALCATEL ADIXEN, FRANCE HLD1501032	Model	Datastas D	art Number :	ASM 310 BSAA0000MM9A		
Helium Leak Detector Seria HELIUM LEAK DETECTOR CA			nelium Leak	Detector P	art Number :	BSAAOOOOIVIIVISA		
			Model Numi			9GPHKF25		
Manufacturer	-	ICINNATI TEST SYSTEMS,INC.					-	
Calibrated Stad. Leak Sr. No.	-			ration Certificate Number :		G010622		
Calibration Date :	28/07/2	019	Next Calibra					
Depletion Rate	0.1% pe	r Year	Temp. Coeff	icient				
CALIBRATION OF HELIUM L	EAK DETECTO	R			LEAK RATE VALUE		UNIT	
Leak rate of calibrated Leak					1.3 x 10 ⁻⁹ at 21.8°C.		mbar ltr / see	
Calculated Leak rate arrived	after conside	ring above Depletion rate of 0.1%	year		1.224 x 10 ⁻⁹ m		mbar ltr / see	
Calculated Leak Rate arrive	after conside	ering above Temp Coefficient of 0	.1% per Deg C.		1.318 x 10 ⁻⁹	at 36°C.	mbar ltr / see	
Leak rate displayed on Helit	ım Leak Detec	tor Sensing Calibrated Leak in Vac	cuum Condition		1.4 x 10 ⁻⁹	at 36°C	mbar ltr / see	
Machine sensitivity as recor					5.0 x 10 ⁻¹² m		mbar ltr / see	
SYSTEM / SNIFFER PROBE (
Manufacturer		NCINNATI TEST SYSTEMS,INC.	Model Number :	ber:		9GPHKF25		
Calibrated Stad. Leak Sr. No	_	my or our out of the control of the		ificate Number :		G010622		
		010		Next Calibration Due Date :		26/07/2020		
Calibration Date :								
Depletion Rate :	0.1% pe	r Year	Temp. Coefficien	emp. Coefficient LEAK RATE		4.0% per Deg C.		
SYSTEM CALIBRAION DETAILS: Leak rate of Sniffer Calibrated Leak @ 21.6 Deg C		6 Dag C				et Pressure of 50 psig	mbar ltr / se	
Calculated Leak Rate arrived after considering above Temp Coefficient of 0.1% p		1% per Deg C.	3.			mbar ltr / se		
Uncertainty after age and temperature correction as per calibration certificate :			per peg er		10 ⁻⁵ at 32 Deg C.	mbar ltr / se		
		ctor Sensing Calibrated Leak by HL		3.4 x 10	@ Helium Inle	et Pressure of 50 psig	mbar ltr / se	
Response Time :	< 1 Mine			for on the control	Barranata inii	4 - 1 50 1 1	la delle uele	
Note: Above noted Response time Polythene bag to be used for HLD E	is derived after ke schanger Test for t	eeping Sniffer Probe Calibrated Leak with \ the test Hold time of 12 hrs similar to the U-	Value of 3.8 x 10-5 mbar-lt Tube Heat Exchanger Helius S / EQUIPMENT DETA	m Leak Detection	on Test Condition.	a at 50 psig pressure) is kept	in similar volume	
Tracer Gas	HEIIIM /99	.995% Pure or 4.5 Grade Gas)	1		100% Helin	um.		
110001 000		are or me or are out		oncentration 100% Heliu				
Test Pressure	7 kg/cm ²		Soaking Time		Minimum 10 Minutes. m Temp 11.30 PM & 36 Deg C			
Test Pressure Helium Filling Date	7 kg/cm ² 23/09/2019		Soaking Time Time & Atm. R	oom Temp				

D-17/5, Sahyadri CHS, Plot 50, Sector-8, Sanpada, Navi Mumbai – 400 705, Tel : 9820119880, E-mail : prasoma@yahoo.com



July Dept. Stage





MANOJ INDUSTRIES,

REPORT NO.	MI/PEL/2019/09/145
DATE	23-09-2019
PAGE NO.	02 of 03

HELIUM LEAK TEST REPORT (DETECTOR PROBE METHOD / SNIFFER METHOD) – CONTINUATION SHEET TYPICAL SKETCH OF PANAM MONOFLANGE TYPE SINGLE BLOCK AND BLEED:



NOTE: PLASTIC HOOD WRAPED ON TEST LOCATION AND KEPT UPTO MIN. 10 MINUTES AFTER PRESSURING WITH HELIUM

Location Area.	AREAS UNDER INSPECTION	Initial Background Reading before start of Helium Leak Test (std-cc/sec)	Helium Leak Rate Reading observed during Leak Testing (std-cc/sec)	Observed Leak Rate (100% Helium Pressure)) (std-cc/sec)	Acceptable Helium Leak Rate (std-cc/sec)	RESULT
		A	В	(B-A)		
1	Body, Bonnet, Stem and End Joints Etc SR. NO. 1909P31148	1.1 X 10 ⁻⁶	1.2 x 10 ⁻⁶	$0.1 \times 10^{-6} = 1.0 \times 10^{-7}$	1 x 10 ⁻⁴	Acceptable
2	Body, Bonnet, Stem and End Joints Etc SR. NO. 1909P31149	1.1 X 10 ⁻⁶	1.3 x 10 ⁻⁶	$0.2 \times 10^{-6} = 2.0 \times 10^{-7}$	1 x 10 ⁻⁴	Acceptable
3	Body, Bonnet, Stem and End Joints Etc SR. NO. 1909P31150	1.1 X 10 ⁻⁶	1.2 x 10 ⁻⁶	$0.1 \times 10^{-6} = 1.0 \times 10^{-7}$	1 x 10 ⁻⁴	Acceptable
4	Body, Bonnet, Stem and End Joints Etc SR. NO. 1909P31151	1.1 X 10 ⁻⁶	1.2 x 10 ⁻⁶	$0.1 \times 10^{-6} = 1.0 \times 10^{-7}$	1 x 10 ⁻⁴	Acceptable
5	Body, Bonnet, Stem and End Joints Etc SR. NO. 1909P31152	1.1 X 10 ⁻⁶	1.3 x 10 ⁻⁶	$0.2 \times 10^{-6} = 2.0 \times 10^{-7}$	1 x 10 ⁻⁴	Acceptable
6	Body, Bonnet, Stem and End Joints Etc SR. NO. 1909P31153	1.1 X 10 ⁻⁶	1.4 x 10 ⁻⁶	$0.3 \times 10^{-6} = 3.0 \times 10^{-7}$	1 x 10 ⁻⁴	Acceptable
7	Body, Bonnet, Stem and End Joints Etc SR. NO. 1909P31154	1.1 X 10 ⁻⁶	1.2 x 10 ⁻⁶	/ 0.1 x 10 ⁻⁶ = 1.0 x 10 ⁻⁷	1 x 10 ⁻⁴	Acceptable
8	Body, Bonnet, Stem and End Joints Etc SR. NO. 1909P31155	1.1 X 10 ⁻⁶	1.2 x 10 ⁻⁶	\sim 0.1 x 10 ⁻⁶ = 1.0 x 10 ⁻⁷	1 x 10 ⁻⁴	Acceptable
9	Body, Bonnet, Stem and End Joints Etc SR. NO. 1909P31156	1.1 X 10 ⁻⁶	1.3 x 10 ⁻⁶	$0.2 \times 10^{-6} = 2.0 \times 10^{-7}$	1 x 10 ⁻⁴	Acceptable
10	Body, Bonnet, Stem and End Joints Etc SR. NO. 1909P31157	1.1 X 10 ⁻⁶	1.5 x 10 ⁻⁶	$0.4 \times 10^{-6} = 4.0 \times 10^{-7}$	1 x 10 ⁻⁴	Acceptable
11	Body, Bonnet, Stem and End Joints Etc SR. NO. 1909P31158	1.1 X 10 ⁻⁶	1.4 x 10 ⁻⁶	$0.3 \times 10^{-6} = 3.0 \times 10^{-7}$	1 x 10 ⁻⁴	Acceptable
12	Body, Bonnet, Stem and End Joints Etc SR. NO. 1909P31159	1.1 X 10 ⁻⁶	1.2 x 10 ⁻⁶	$\sim 0.1 \times 10^{-6} = 1.0 \times 10^{-7}$	1 x 10 ⁻⁴	Acceptable
13	Body, Bonnet, Stem and End Joints Etc SR. NO. 1909P31160	1.1 X 10 ⁻⁶	1.3 x 10 ⁻⁶	$\sqrt{0.2 \times 10^{-6}} = 2.0 \times 10^{-7}$	1 x 10 ⁻⁴	Acceptable
14	Body, Bonnet, Stem and End Joints Etc SR. NO. 1909P31161	1.1 X 10 ⁻⁶	1.2 x 10 ⁻⁶	$0.1 \times 10^{-6} = 1.0 \times 10^{-7}$	1 x 10 ⁻⁴	Acceptable

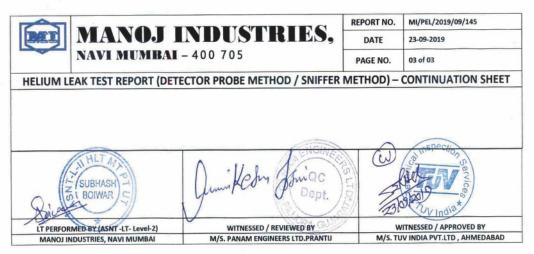
RESULT: - HELIUM LEAK TEST OF MONOFLANGE TYPE SINGLE BLOCK AND BLEED VALVE ARE WITHIN ACCEPTABLE LIMIT OF 1.0 \times 10 4 ATM-CC/SEC.

D-17/5, Sahyadri CHS, Plot 50, Sector-8, Sanpada, Navi Mumbai – 400 705, Tel : 9820119880, E-mail : prasoma@yahoo.com



July Lopt. 19





Enci:

- 1. Calibration Certificate for Vacuum Type Helium Calibrated Leak.
- 2. Calibration Certificate for Sniffer Type Helium Calibrated Leak.
- 3. ASNT Level II Certificate of Mr. Subhash Boiwar.

D-17/5, Sahyadri CHS, Plot 50, Sector-8, Sanpada, Navi Mumbai – 400 705, Tel : 9820119880, E-mail : prasoma@yahoo.com

Llyod's Type Approval Certificate For Tube Fittings



Type Approval Certificate

This is to certify that the undernoted product(s) has/have been tested with satisfactory results in accordance with the relevant requirements of the Lloyd's Register Type Approval System.

This certificate is issued to:

PRODUCER Panam Engineers Ltd.

PLACE OF Survey No. 192, Near Sujal Agro, NH-8, At & Post - Piludra, PRODUCTION Taluka-Prantij, District - Sabarkantha, Gujarat - 383120, India

DESCRIPTION Stainless steel double ferrule compression type tube fittings, inch

and metric sizes

TYPE PANAM Tube Fitting

APPLICATION High pressure tube connections for use in marine, offshore and

industrial piping systems with hydraulic system fluids, fuel oil, lubricating oil, fresh water, salt water, sanitary, gas, steam and

condensate.

STANDARD Lloyd's Register's Rules and Regulations for the Classification of

Ships, Part 5, Chapter 12 - July 2017

ASTM F-1387-99(2012): Standard Specification for Performance of

Piping and Tubing Mechanically Attached Fittings

Certificate No. 17/10025

Issue Date 27 November 2017

Expiry Date 26 November 2022

Sheet 1 of 3

N. Terashita
Vokohama Technical Support Office
Lloyd's Register Group Limited

N. Terashita
Yokohama Technical Support Office

...

Lloyd's Register Group Limited QTA 10F, 2-3-1, Minatomirai, Nishi-Ku, Yokohama , JAPAN

Lloyd's Register Group Limited Is a member of Lloyd's Register Group

Lloyd's Register Group Limited

Lloyd's Register Group Limited, its affiliates and subsidiaries and their respective officers, employees or agents are, individually and collectively, referred to in this clause as the 'Lloyd's Register'. Lloyd's Register assumes no responsibility and shall not be liable to any person for any loss, damage or expense caused by reliance on the information or advice in this document or howsoever provided, unless that person has signed a contract with the relevant Lloyd's Register entity for the provision of this information or advice and in that case any responsibility or liability is exclusively on the terms and conditions set out in that contract.

This is a copy of an electronic document. In the event of any conflict or ambiguity between the copy and the electronic document, which is retained and published by Lloyd's Register, the original electronic and certified version shall always prevail.

Llyod's Type Approval Certificate For Tube Fittings



RATINGS

Imperial Tubing:-	
Tube O.D. (inch)	Nominal pressure ratings (ps
1/8"	8,500 to 10,900
3/16"	5,400 to 10,200
1/4"	4,800 to 10,200
5/16"	4,000 to 8,000
3/8"	3,300 to 6,500
1/2"	2,400 to 6,200
5/8"	2,900 to 6,000
3/4"	2,400 to 5,800
7/8"	2,000 to 4,800
1"	2,400 to 4,700

Metric Tubing:-

rictite i delite.	
Tube O.D(mm)	Nominal pressure ratings (psi)
3	10,800 to 15,300
4	7,900 to 14,400
6	5,000 to 12,700
8	4,700 to 9,300
10	3,700 to 7,300
12	3,000 to 11,100
16	2,500 to 6,800
18	2,800 to 6,700
20	2,500 to 6,000
22	2,300 to 5,400
25	2,000 to 5,200

Pressure-temperature ratings: see the producer's catalogue

OTHER CONDITIONS

- The fittings are to be installed in accordance with the manufacturer's instructions.
- 2) Attention is drawn to Section 1.3.6 of IMO MSC/Circ.1321 Guidelines for Measures to prevent Fires in Engine-Rooms and Cargo Pump-Rooms which describes that compression couplings require careful attention to tightening procedures and torques to avoid leaks or damage to the pipe when subjected to over-tightening and they should not be used in the fuel supply line of the (oil engine) injection pumps and spill system.

Certificate No. 17/10025

Issue Date 27 November 2017

Expiry Date 26 November 2022

Sheet 2 of 3

N. Terashita

N. Terashita Yokohama Technical Support Office Lloyd's Register Group Limited

Lloyd's Register Group Limited QTA 10F, 2-3-1, Minatomirai, Nishi-Ku, Yokohama , JAPAN

Lloyd's Register Group Limited Is a member of Lloyd's Register Group

Lloyd's Register Group Limited, its affiliates and subsidiaries and their respective officers, employees or agents are, individually and collectively, referred to in this clause as the 'Lloyd's Register'. Lloyd's Register assumes no responsibility and shall not be liable to any person for any loss, damage or expense caused by reliance on the information or advice in this document or howsoever provided, unless that person has signed a contract with the relevant Lloyd's Register entity for the provision of this information or advice and in that case any responsibility or liability is exclusively on the terms and conditions set out in that contract.

This is a copy of an electronic document. In the event of any conflict or ambiguity between the copy and the electronic document, which is retained and published by Lloyd's Register, the original electronic and certified version shall always prevail.

Llyod's Type Approval Certificate For Tube Fittings



"This Certificate is not valid for equipment, the design, ratings or operating parameters of which have been varied from the specimen tested. The manufacturer should notify Lloyd's Register Group Limited of any modification or changes to the equipment in order to obtain a valid certificate."

The Design Appraisal Document No. and its supplementary Type Approval Terms and Conditions form part of this Certificate.

Certificate No. 17/10025

Issue Date 27 November 2017

Expiry Date 26 November 2022

Sheet 3 of 3

N. Terashita
N. Terashita
N. Terashita
N. Terashita
N. Terashita
Notolama Technical Support Office
Lloyd's Register
Register
Lloyd's Register Group Limited

N. Terashita Yokohama Technical Support Office Lloyd's Register Group Limited

Lloyd's Register Group Limited QTA 10F, 2-3-1, Minatomirai, Nishi-Ku, Yokohama , JAPAN

Lloyd's Register Group Limited Is a member of Lloyd's Register Group

Lloyd's Register Group Limited, its affiliates and subsidiaries and their respective officers, employees or agents are, individually and collectively, referred to in this clause as the 'Lloyd's Register'. Lloyd's Register assumes no responsibility and shall not be liable to any person for any loss, damage or expense caused by reliance on the information or advice in this document or howsoever provided, unless that person has signed a contract with the relevant Lloyd's Register entity for the provision of this information or advice and in that case any responsibility or liability is exclusively on the terms and conditions set out in that contract.

This is a copy of an electronic document. In the event of any conflict or ambiguity between the copy and the electronic document, which is retained and published by Lloyd's Register, the original electronic and certified version shall always prevail.