



DET NORSKE VERITAS

TYPE TEST CERTIFICATE

MANDATORY TESTS

ASTM F1387-99 (Re-approved: 2005 & 2012)

FLUID CONTROLS PVT. LTD.

OFFICE: J.V.PATEL, ITI COMPOUND, B. MADHURKAR MARG, MUMBAI – 400 013, INDIA.
FACTORY: T-169, MIDC, BHOSARI, PUNE – 411 026, INDIA.

The under mentioned surveyor did visit the facilities of the above manufacturer of mechanically attached fittings, between 12th July 2013 to 19th November 2014 for the performance appraisal of tests mentioned below and conducted on under mentioned sizes of fittings as per the norms of ASTM F1387-99 (Re-approved: 2005 & 2012).

Material Grade of Fittings: Stainless Steel ASTM A276 or equivalent & A182 SS316.
Material Grade of Tube : ASTM A269 TP SS 316/316L Seamless.

1. Test Parameters used:

- Temperature during testing: Ambient ($25 \pm 10^{\circ}\text{C}$).
- Test pressure retained within $\pm 5\%$ PSIG.
- Test medium demineralised water/SAE grade 10W oil for hydraulic tests.
- Metallurgical tests done at NABL approved laboratory.

2. Size of mechanically attached fittings used for performance appraisal of tests (Size of the fittings with respect to Tube OD x Wall Thickness (WT)):

Size
1/4" OD x 0.035" WT
1/4" OD x 0.049" WT
3/8" OD x 0.035" WT
3/8" OD x 0.049" WT
1/2" OD x 0.049" WT
1/2" OD x 0.065" WT
3/4" OD x 0.065" WT
3/4" OD x 0.083" WT
1" OD x 0.083" WT
1" OD x 0.095" WT

3. Following tests are conducted as per ASTM F1387-99 (Re-approved: 2005 & 2012) and witnessed along with review of relevant documents.

Test
Selection of test samples
Verification of material properties
Performance Test (A1)
Examination of Specimen (A2)
Pneumatic Proof Test (A3)
Hydrostatic Proof Test (A4)
Impulse Test (A5)
Flexure Fatigue Test (A6)
Tensile Test (A7)
Hydrostatic Burst Test (A8)
Repeated Assembly Test (A9)
Rotary Flexure Test (A10)

All the above tests have been found satisfactory. The details of the applicable test pressures with reference to various tests mentioned above have been witnessed and attested by DNV in the report of the manufacturer.

The above mentioned fittings meet the requirement of ASTM F1387-99 (Re-approved: 2005 & 2012) with reference to the Mandatory Tests mentioned in the specification and conducted herein.



Anand Deshpande
Surveyor of **DET NORSKE VERITAS AS**



DNV

DET NORSKE VERITAS

DNV Id.NO.:55024106
Report No:PUN/14/AD/169169/FS
Date:22/11/2014

TYPE TEST CERTIFICATE
SUPPLEMENTARY TESTS
ASTM F1387-99 (Re-approved: 2005 & 2012)
FLUID CONTROLS PVT. LTD.

OFFICE: J.V.PATEL, ITI COMPOUND, B. MADHURKAR MARG, MUMBAI – 400 013, INDIA.
FACTORY: T-169, MIDC, BHOSARI, PUNE – 411 026, INDIA.

The under mentioned surveyor did visit the facilities of the above manufacturer of mechanically attached fittings, between 24th May 2012 to 19th November 2014 for the performance appraisal of tests mentioned below and conducted on under mentioned sizes of fittings as per the norms of ASTM F1387-99 (Re-approved: 2005 & 2012).

Material Grade of Fittings: Stainless Steel ASTM A276 or equivalent & A182 SS316.
Material Grade of Tube : ASTM A269 TP SS 316/316L Seamless.

1. Test Parameters used:

- a. Temperature during testing: Ambient (25±10⁰C).
- b. Test pressure retained within ±5% PSIG.
- c. Test medium demineralised water/SAE grade 10W oil for hydraulic tests.
- d. Metallurgical tests done at NABL approved laboratory.

2. Size of mechanically attached fittings used for performance appraisal of tests (Size of the fittings with respect to Tube OD x Wall Thickness (WT)):

Size
1/4" OD x 0.035" WT
1/4" OD x 0.049" WT
3/8" OD x 0.035" WT
3/8" OD x 0.049" WT
1/2" OD x 0.049" WT
1/2" OD x 0.065" WT
3/4" OD x 0.065" WT
3/4" OD x 0.083" WT
1" OD x 0.083" WT
1" OD x 0.095" WT

3. Following tests are conducted as per ASTM F1387-99 (Re-approved: 2005 & 2012) and witnessed along with review of relevant documents.

Test
Selection of test samples
Verification of material properties
Performance Test (A1)
Examination of Specimen (A2)
Pneumatic Proof Test (A3)
Hydrostatic Proof Test (A4)
Thermal Cycling Test (S2)
Stress Corrosion Test (S4)
Vibration Test (S8)

All the above tests have been found satisfactory. The details of the applicable test pressures with reference to various tests mentioned above have been witnessed and attested by DNV in the report of the manufacturer.

The above mentioned fittings meet the requirement of ASTM F1387-99 (Re-approved: 2005 & 2012) with reference to the Mandatory Tests mentioned in the specification and conducted herein.



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Anand Deshpande
Surveyor of **DET NORSKE VERITAS AS**