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PROOF AND BURST PRESSURES TEST REPORT
FOR THE
PVC ASSEMBLY
BONDED WITH SUMGAS PFS

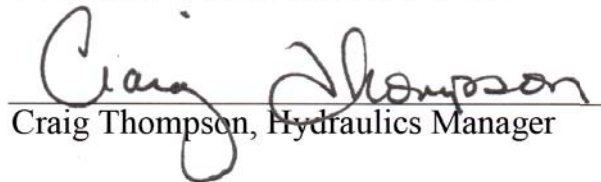
TESTING PERFORMED BY:**NATIONAL TECHNICAL SYSTEMS**

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ABSTRACT

The PVC Assembly bonded with Sumgas PFS was subjected to proof pressure and burst pressure testing in accordance with IBI COMPONENTS APPLIANCES SL customer email from dated 06 Jun 2019. This involved subjecting the test hardware to pressure conditions at ambient temperature. A visual examination of the test hardware after application of the proof pressure environment did not reveal any notable changes or anomalies. During the burst pressure environment, however, leakage was observed from the test hardware at a pressure of 447 psig.



REPORT REVISION RECORD

<u>REV.</u>	<u>DATE</u>	<u>DESCRIPTION OF CHANGE</u>
NA	2019-06-25	ORIGINAL RELEASE

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PROOF AND BURST PRESSURES TEST SUMMARY

Responsible Test Conductor: Carlos X. Aguirre

1.0 TEST HARDWARE

- One (1) PVC Assembly bonded with Sumgas PFS

2.0 TEST REQUIREMENTS WITH TOLERANCES

The purpose of the proof pressure test is to determine whether the test hardware can withstand pressure conditions at ambient temperature; the purpose of the burst pressure test is to determine at what pressure the test hardware can fail.

2.1 Proof Pressure:

With the test hardware installed in the test setup, slowly pressurize the test hardware with distilled water until 135 +5/-0 psig is reached. Maintain 135 psig for three (3) minutes and check for bonding failure, leakage, or other signs of damage.

2.2 Burst Pressure:

Continuing from proof pressure, increase the pressure in 5-psig increments and hold for one (1) minute at each increment. Continue increasing the pressure until the test hardware bursts or fails in such a way that pressure cannot be maintained.

2.3 Tolerance:

- Standard Ambient: 25±10°C, 20 to 80% Relative Humidity, Site Pressure

2.4 Test Specification:

- IBI COMPONENTS APPLIANCES SL



3.0 TEST SETUP

TABLE 1: NTS ORLANDO–FURNISHED MEASUREMENT & TEST EQUIPMENT

(Measuring instruments used in testing are calibrated per ANSI/NCSL Z540-1 and/or ANSI/NCSL Z540.3, and are NIST traceable)

Asset #	Item	Manufacturer	Model #	Range	Calibration Interval	Calibration Due
WC065389	Breakout Box	National Instruments	BNC-2090A	Infinite	NCR	NCR
WC067416	Computer	Dell	E5620	Infinite	NCR	NCR
WC057816	Data Acquisition Card	National Instruments	PCI-6229	±10 VDC	12 months	12/13/2019
WC067424	DC Power Supply	TENMA	72-8695A	0 to 32 VDC, 3 A	NCR	NCR
WC061791	Pressure Transducer	Honeywell	060-F441-01	500 psig, 0.25% FS	12 months	01/08/2020
WC057562	Signal Conditioner	Analog Devices	5B47-T-06	-100 to 400°C, ±1.4°C Rdg	12 months	08/24/2019
WC057564	Signal Conditioner	Omega Engineering	OM5-LTC-T1-C	-100 to 400°C, ±1.4°C Rdg	12 months	08/24/2019
WC057641	Stopwatch	Extech Instruments	365515	24 hours, ±3 sec/day	12 months	02/12/2020
WC061802	Thermo/Hygrometer	Extech Instruments	445702	0 to 50°C, ±1°C, 25 to 95% RH, ±4%	12 months	05/04/2020

NOTE: Calibration dates are formatted *mm/dd/yyyy*. “NCR” means “No calibration required.”**TABLE 2: DAQ SETUP**

Asset #	Channel	Type of Sensor	Function	Unit
WC061791	Ai2	Pressure Transducer	Pressure	psig
WC057564	Ai1	Type T Thermocouple	Water Temperature	°C
WC057562	Ai0	Type T Thermocouple	Air Temperature	°C

TABLE 3: FLUID IDENTIFICATION

Description	Manufacturer	Lot Number
Distilled Water	N/A	N/A

Prior to installing the test hardware in the test setup, all instrument settings were checked and the test setup was validated.

4.0 TEST DESCRIPTION

4.1 Non-NTS Orlando Personnel, Including Organization, Present for All or Part of the Test:

- IBI COMPONENTS APPLIANCES SL

4.2 Powered/Operational State of the Hardware and by Whom:

The test hardware was pressurized with distilled water by NTS Orlando test conductor Carlos X. Aguirre during the test. The test hardware functioned properly during proof pressure testing; leakage was observed at 447 psig during burst pressure.

4.3 Test Activities and Resulting Measurements from Observed/Recorded Data:

Initial Ambient Conditions: Temp (°C): 23 Relative Humidity (%): 40 Pressure: Site Ambient

The test hardware was installed in the test setup as shown in Figures 7 and 8 and subjected to the test activities described in Table 4. Charts 1 and 2 (see Appendix) provide the supporting test data.

TABLE 4: PROOF AND BURST PRESSURES TEST ACTIVITIES

Step #	Activity	Date	Time HH:MM
1	Begin proof pressure.	19 Jun 2019	12:31
2	Complete proof pressure.	19 Jun 2019	12:37
3	Begin burst pressure.	19 Jun 2019	12:37
4	Complete burst pressure.	19 Jun 2019	14:27

For pressure (psig) versus time data, see the Appendix.

4.4 Limitations or Departures from the Test Requirements and Authorizing Source:

None.

5.0 CONCLUSION

A visual examination of the test hardware after application of the proof pressure environment did not reveal any notable changes or anomalies. During the burst pressure environment, however, leakage was observed from the test hardware at a pressure of 447 psig.



Figure 1: Test hardware before testing



Figure 2: Test hardware before testing



Figure 3: Test hardware before testing



Figure 4: Test hardware before testing



Figure 5: Test hardware before testing



Figure 6: Test hardware before testing



Figure 7: Proof and burst pressures test setup – test hardware installed in test setup

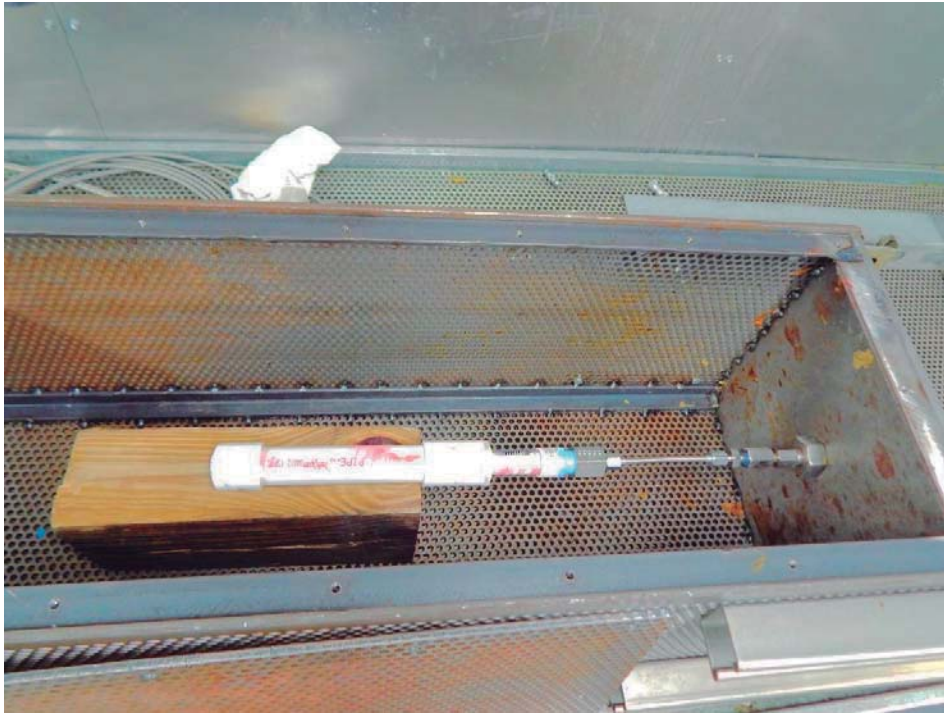


Figure 8: Proof and burst pressures test setup – test hardware installed in test setup

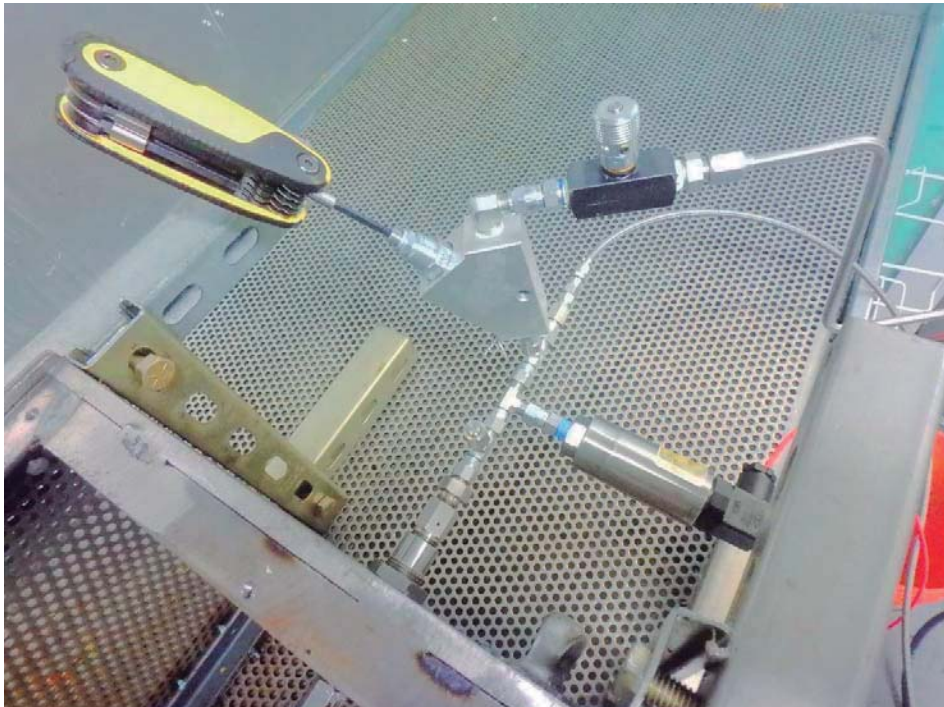


Figure 9: Proof and burst pressures test setup – pressure transducer and relief valve



Figure 10: Proof and burst pressures test setup – air and water vessel

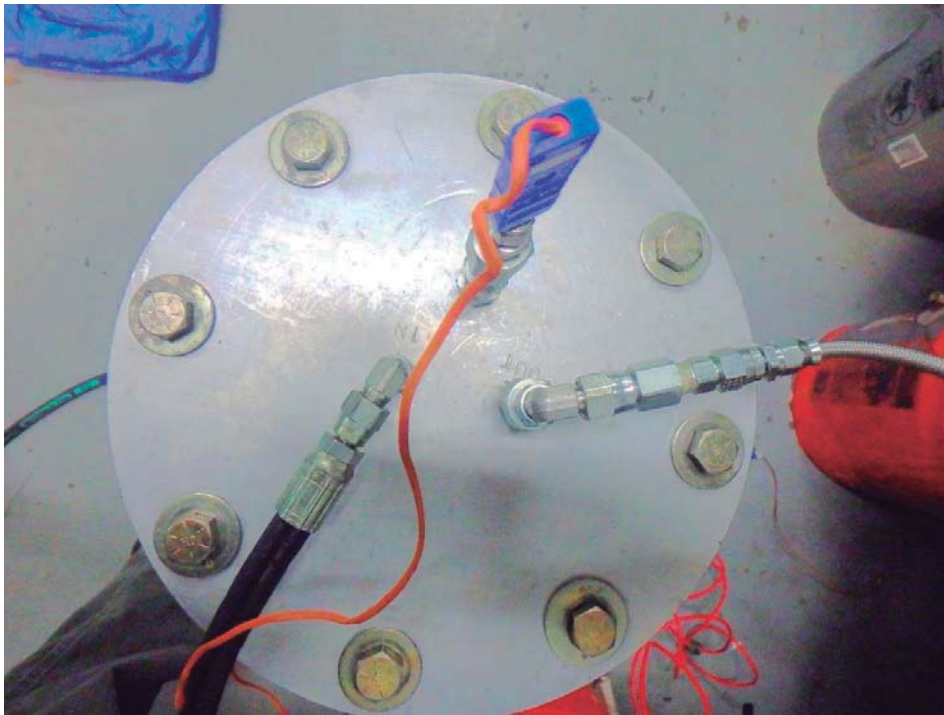


Figure 11: Proof and burst pressures test setup – air and water vessel



Figure 12: Proof and burst pressures test setup – air source



Figure 13: Proof and burst pressures test setup – test setup covered



Figure 14: Test hardware after testing



Figure 15: Test hardware after testing



Figure 16: Test hardware after testing



Figure 17: Test hardware after testing



Figure 18: Test hardware after testing



Figure 19: Test hardware after testing



Figure 20: Test hardware after testing – leak area



Figure 21: Test hardware after testing – leak area



Figure 22: Test hardware after testing – leak area



Figure 23: Test hardware after testing – leak area

Appendix: Data Charts

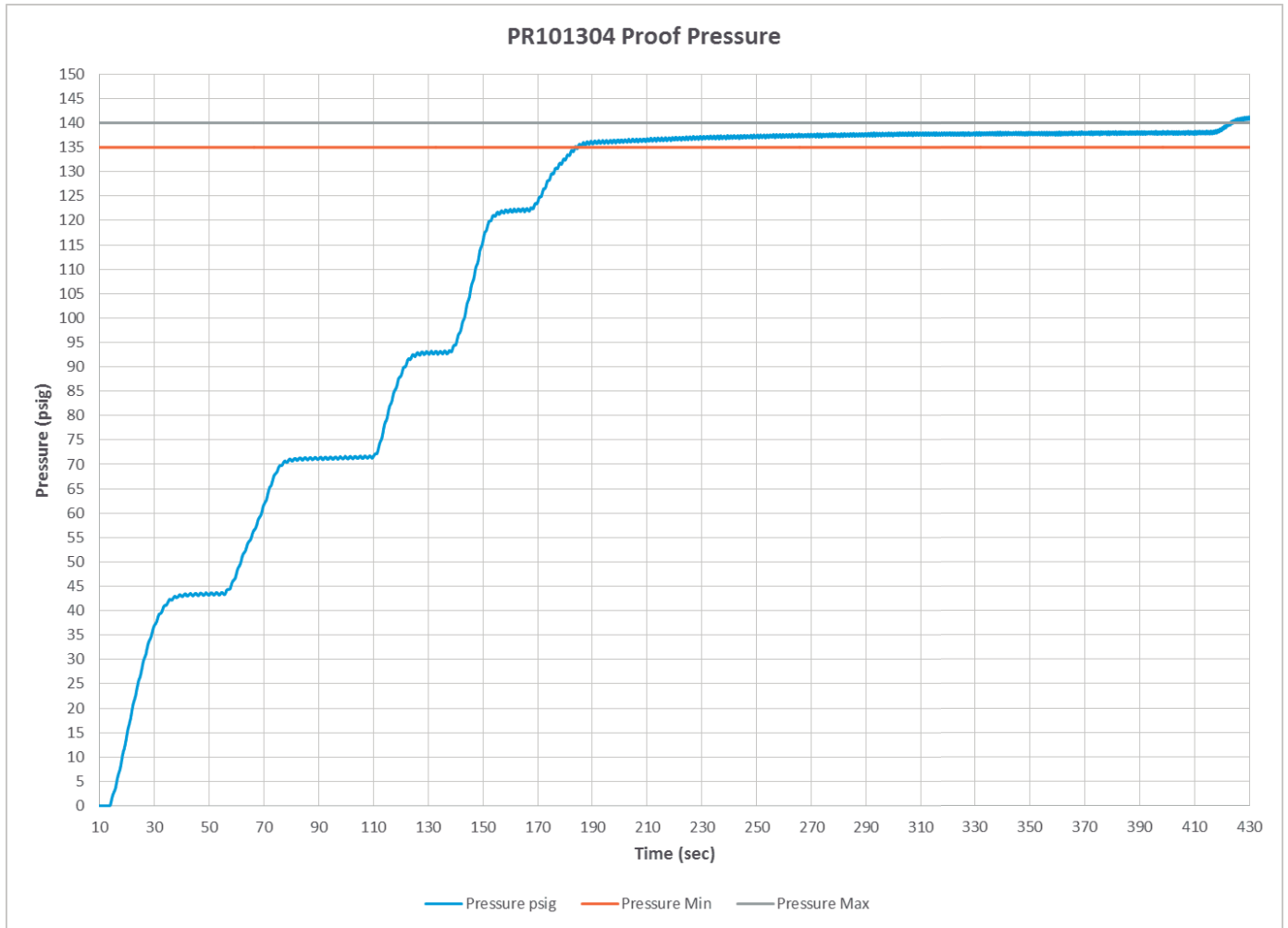


Chart 1: Pressure (psig) – proof pressure

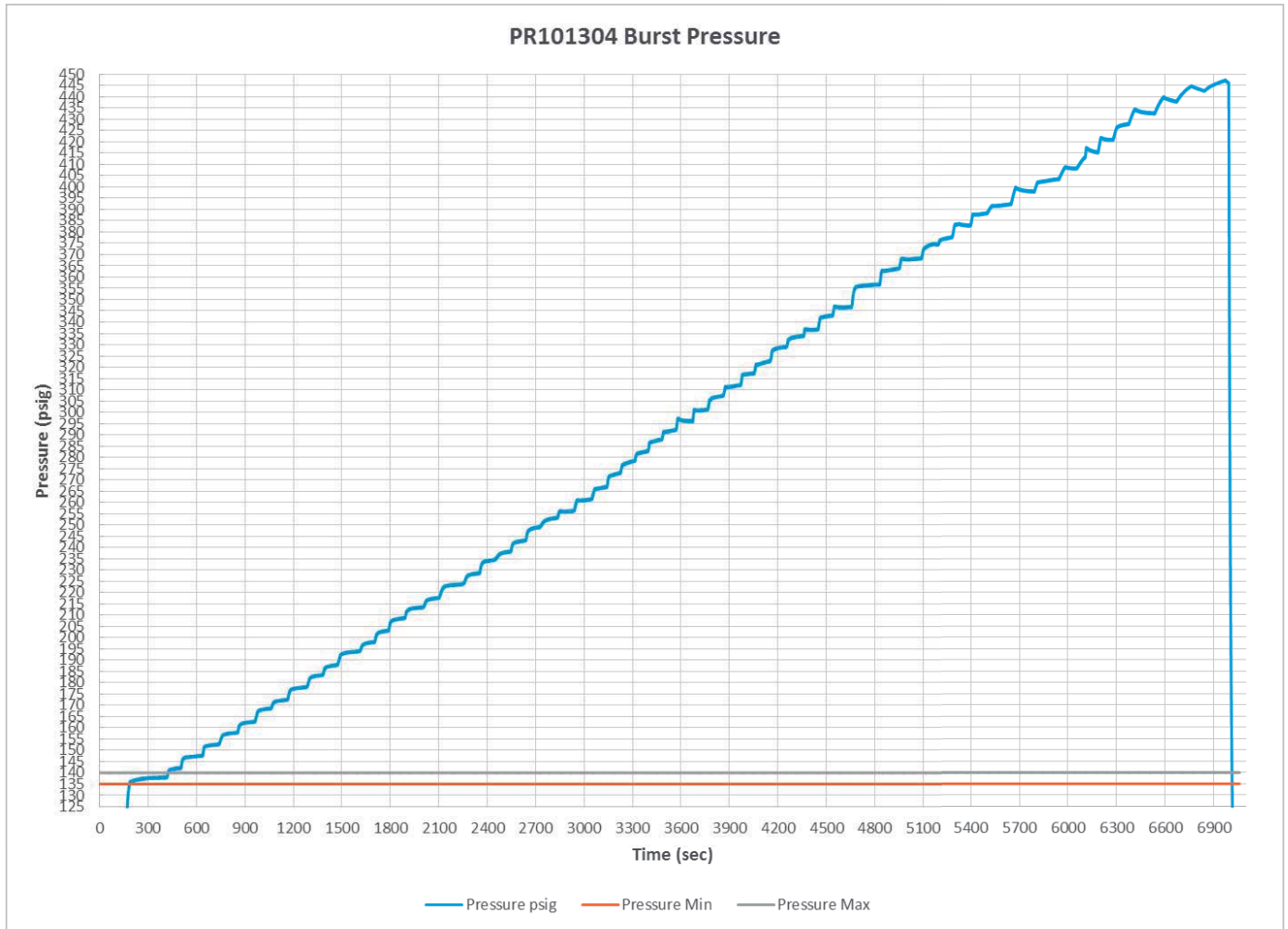


Chart 2: Pressure (psig) – burst pressure