



Consolidated Laboratories, Inc.

732 ArrowGrand Circle
Covina, California 91722
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REPORT NO. 13990

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June 5, 2008

TEST REPORT

SAF-T-FLO
Chemical Injection
4071 E. La Palma Ave., Suite #L
Anaheim, CA 92807

Subject: Crack Pressure and Flow Tests on Four (4) Specimens of SAF-T-FLO Check Valves and Thirteen (13) Specimens of SAF-T-FLO Chemical Injection Quills

This will certify that the above units were subjected to the Crack Pressure and Flow Tests of the referenced documents in this Laboratory in the manner and with results as described below:

1. **REFERENCES**

- 1.1 Purchase Order No. 08-1165 dated 5/6/2008 from SAF-T-FLO, Chemical Injection
- 1.2 E-Mail dated Thursday, April 03, 2008, from Josh Carne of SAF-T-FLO


2. **PURPOSE** -- The purpose of this program was to subject the Check Valves to the Crack Pressure Test of Reference 1.2 and Verbal Instructions from Josh Carne of SAF-T-FLO and the Chemical Injection Quills to the Flow Test of Reference 1.2 and Verbal Instructions from Josh Carne of SAF-T-FLO. The units were to be visually inspected for physical damage and returned to SAF-T-FLO for further evaluation at the completion of the test.

3. **SUMMARY** -- The units were subjected to the Crack Pressure and Flow Tests as required. The procedures and results of the test are shown on the laboratory instruction/data sheets and plots, which are reproduced as subsequent pages of this report. Examination of the units after completion of the test disclosed no visible evidence of damage or deterioration as a result of the test conditions. The units were considered to have met the requirements of the Crack Pressure and Flow Tests, as conducted in this Laboratory, and were returned to SAF-T-FLO for further evaluation at the completion of the test.


Test By: **L. C. Lyne**

Report By: **D. D. Huff**

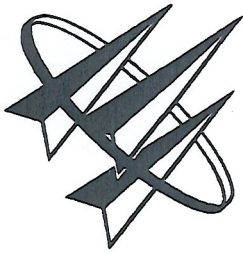
Prepared By: _____


Dale D. Huff, Test Engineer

Approved By: _____


M. L. Hitchcock, General Manager





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4. **TEST EQUIPMENT** -- The following items of test equipment, calibrated in accordance with ISO 10012-1 and ANSI/NCSL Z 540-1, by Consolidated Laboratories or a commercial facility, utilizing reference standards (or interim standards) whose calibrations have been certified as being traceable to the National Institute of Standards and Technology, were used to conduct the tests. Certifications of all calibrations performed are retained on file in the Consolidated Laboratories Calibration Department, and are available for inspection upon request by customer representatives.
- Flowmeter: Waugh Turbine Model FL-24SB-2, S/N 20671, ID/N 524. Calibrated on 3-26-07 for a flow of 4.875 - 81.350 GPM of H₂O at 70°F, ±.5% of rate.
 - Flowmeter: Cox Instruments Model AN-12, S/N 27115, ID/N 574. Calibrated on 8-17-06 for a flow of 1.124 - 24.160 GPM of H₂O at 70°F, ±1% of rate.
 - Flow Rate Indicator (Digital): Anadex Model CPM-701, ID/N 518. Frequency Range from 2 - 100,000 x 1 Hz, ±1 Hz. Gate time adj. 0.0003 - 10.0000 secs. Digital read-out in 0.1 GPM increments. Calib. due 9-18-08, 12 mos.
 - Flow Rate Indicator (Digital): Anadex Model CPM-701, S/N 154814, ID/N 594. Frequency Range from 2 - 100,000 x 1 Hz, ± 1 Hz. Gate time adj. 0.0003 - 10.0000 secs. Digital read-out in 0.1 GPM increments. Calib. due 10-29-08, 6 mos.
 - Pressure Gauge: U.S. Gauge, 6" Test Gauge, ID/N 108, 0 - 160 x 1 PSIG, ±.25%. Calib. due 9-13-08, 6 mos.
 - Pressure Gauge: U.S. Gauge, 6 in., ID/N 184. Range from 0 - 15 x .05 PSIG, ±.5%. Calib. due 10-27-08, 6 mos.





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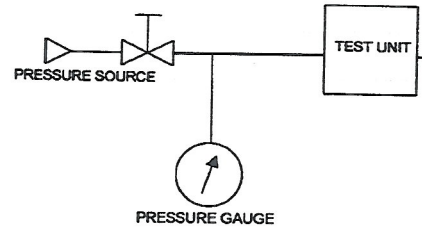
LAB DATA SHEET

Part No. _____ S/N _____ Sample 1 - 4 Job 13990
Description Check Valves Co. SAF-T-FLO
Test 1.0

TEST: <u>CRACK PRESSURE</u>		Start	Cptd
To Spec: <u>E-Mail dated 4/3/08; Verbal Instructions</u>	Date	<u>5/20/08</u>	<u>5/20/08</u>
	Test By	<u>JH</u>	<u>JH</u>
	Photo	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Test Medium: Water (H₂O)

- Install the unit under test in a suitable test setup, equivalent to that of the figure at right, capable of reading the inlet pressure with the outlet unrestricted. Connect the inlet of the unit to the pressure source. Gradually increase the pressure to the inlet until the test medium flows from the outlet. Repeat the procedures on each specimen and record the pressure at which flow begins (Crack Pressure) in the table below.



Model	Crack Pressure (PSIG)
3/8" Check Valve	<u>9.15 / 10.55</u>
3/8" Saf-T-Seal Tip (Duckbill ckv)	<u>< 0.10</u>
1/2" Check Valve	<u>4.3 / 4.65</u>
1/2" Saf-T-Seal Tip (Duckbill ckv)	<u>0.25</u>

- List test equipment used on the Test Equipment List, attached, and record the ID/N's below.

Test Equipment ID/N's: 184

Comments: PRESSURES RECORDED FOR CHECK VALVES ARE FOR FIRST DROPS AND STEADY DRIBBLE.



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PHOTO 1 & 2

TEST REPORT

CRACK PRESSURE TEST SETUP





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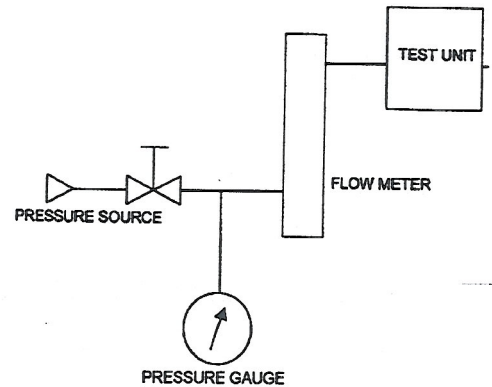
LAB DATA SHEET

Part No. _____ S/N _____ Sample 1 - 13 Job 13990
 Description Chemical Injection Quills Co. SAF-T-FLO
 Test 2.0

TEST: <u>FLOW</u>	Start	Cptd
To Spec:	Date <u>5/20/68</u>	<u>5/20/68</u>
<u>E-Mail dated 4/3/08;</u>	Test By <u>JD</u>	<u>JD</u>
<u>Verbal Instructions</u>	Photo	

Test Medium: Water (H₂O)

- Attach suitable plumbing to the inlet fitting of each Injection Quill, equivalent to the figure at right, such that the test medium can be admitted to establish a flow through the assembly. A pressure gauge will be required on the inlet of the test item to measure inlet pressure. A flow meter will also be required on the inlet of the test item, with the outlet open to atmosphere, to measure flow through the assembly. Apply an inlet pressure of 30 PSIG (20 PSIG for Model Nos. EB-132-B-P-6-0 and EB-146-B-P-6-0) and record the flow through the assembly. Repeat the procedure with an inlet pressure of 60, 90, 120 and 150 (or maximum attainable) PSIG (40, 60, 80 and 100 PSIG for Model Nos. EB-132-B-P-6-0 and EB-146-B-P-6-0). Repeat the procedures on each specimen and record the results in the table below.

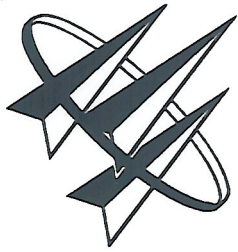


Model Number	FLOW (GPM) @				
	30 PSIG	60 PSIG	90 PSIG	120 PSIG	150 PSIG
IQ-75-V-5-6-P-H	3.05	8.09	9.73	11.21	12.53
IQ-75-CV-5-6-P-H	1.50	3.71	5.85	8.05	10.29
EB-112-CP-6-0	7.55	10.75	13.14	15.07	16.97
EB-112-CP-6-CV	3.22	6.35	9.00	11.25	13.27
BCK-50-V-5-6-P-H	2.82	6.22	7.57	8.78	9.83
EB-130-B-P-6-0	19.09	27.35	33.51	37.86	40.80*
EB-130-B-P-6-CV	3.38	7.00	11.16	15.62	20.80
EB-145-B-P-6-0	3.63	7.64	9.14	10.33	11.47
EB-145-B-P-6-CV	1.57	3.32	5.45	7.67	8.99
EB-132-B-P-6-CV	6.67	13.80	21.80	31.70	39.60**
EB-146-B-P-6-CV	4.25	10.25	14.12	17.82	21.30
	20 PSIG	40 PSIG	60 PSIG	80 PSIG	100 PSIG
EB-132-B-P-6-0	31.35	44.90	55.25	63.27	70.35
EB-146-B-P-6-0	11.10	15.70	18.68	20.95	23.08

- List test equipment used on the Test Equipment List, attached, and record the ID/N's below.

Test Equipment ID/N's: 108, 574, 594, 524, 518

Comments: * READINGS @ 144 PSIG ** READINGS @ 145 PSIG



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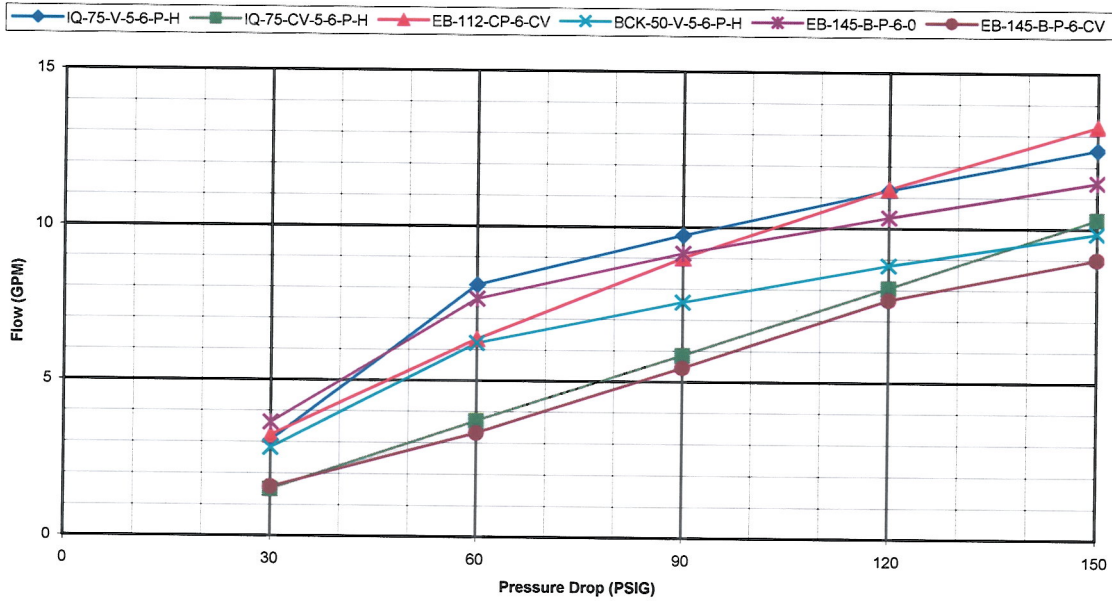
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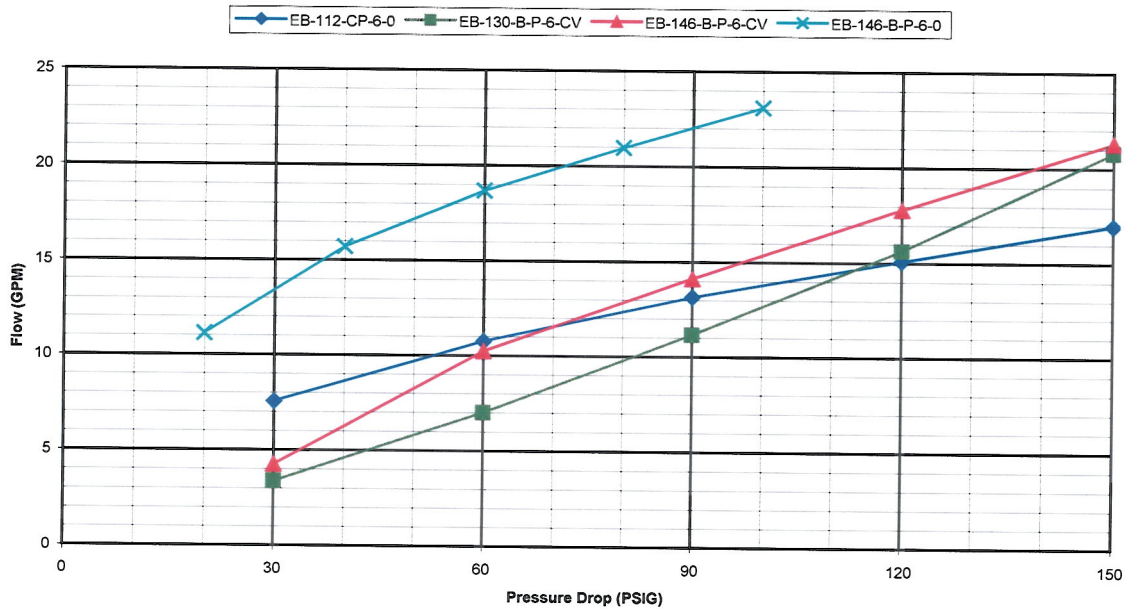
EXCEL CHARTS OF FLOW VS PRESSURE DROP

(5/20/08)

FLOW vs PRESSURE DROP



FLOW vs PRESSURE DROP





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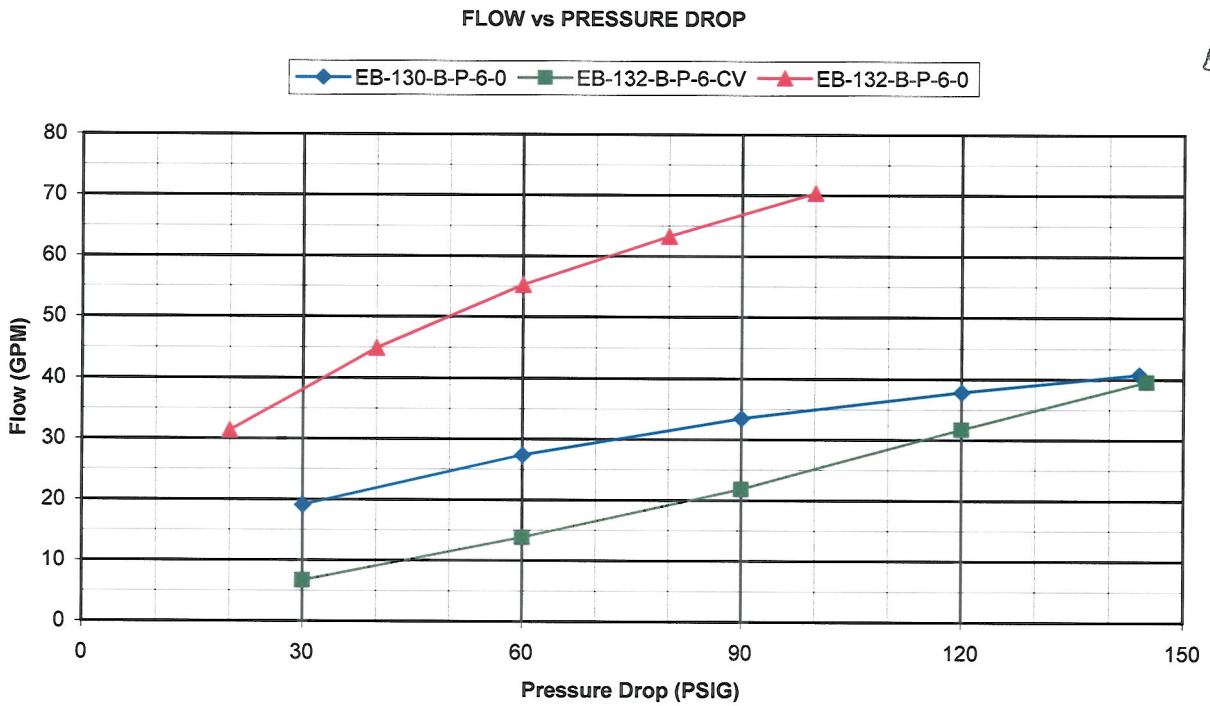
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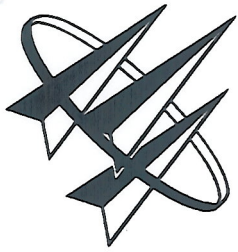
EXCEL CHART OF FLOW VS PRESSURE DROP

(5/20/08)



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PHOTO 3 & 4

TEST REPORT

FLOW TEST SETUP

