Hall Tank Company, LLC
"Engineered Products"

PERIODIC INTERSTITIAL TEST PROCEDURE

FOR PLASTEEL ELUTRON DOUBLE WALL JACKETED TANKS.

Third Party Certified test method on file, Specific to the Plasteel Double Wall Jacketed (Elutron) Type Construction was prepared for Plasteel, Inc. by Ken Wilcox Associates, Inc. on March 17, 1994 and titled "EVALUATION OF PLASTEEL INTERSTITIAL MONITOR FOR AIR AND LIQUID LEAKS, VOLUME 1 TEST REPORT".

This document has been revised date October 1, 2012 to add additional tank size with 3" diameter riser pipe for the monitoring sensor in place of the original 2" diameter riser. See Updated Table 5 below. Water Test Times listed in this chart will be used in the Tank Testing Instructions.

Table 5. Gas, Diesel, and Water Leaks - Plasteel Doublewall Jacketed (Elutron) Type Construction

Tank Capacity (gal)	Tank Diameter (In)	Tank Length (ft-in)	Annular Volume (gal)	Test time (hrs)		
				Gas	Diesel	Water
500	48	5-9	3	0.57	6.1	6.62
1000	64	6-3	4	0.76	8.13	8.82
2000	94	5-11	5	0.95	10.16	11.03
3000	94	8-10	6	1.14	12.19	13.23
4000	94	11-9	7	1.33	14.22	15.44
5000	94	14-8	8	1.52	16.26	17.64
6000	94	17-8	9	1.71	18.29	19.85
8000	114	16-0	10	1.9	20.32	22.05
10000	114	20-0	13	2.47	26.42	28.67
12000	114	24-0	15	2.84	30.48	33.09
15000	114	30-0	17	3.22	34.55	37.49
20000*	120	34-5.5	20.6	3.91	41.82	45.42
30000	114	37-1	26	4.93	52.83	57.33
40000	114	50-0	34	6.45	69.09	74.97
50000	114	62-0	41	7.77	83.31	90.41

*This tank has a 3" dia riser for the sensor. All other tanks have a 2" dia riser.

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1. REFER TO AND USE INSTRUCTIONS IN APPENDIX B "INTERSTITIAL VACUUM TEST (IVT)" FROM PLASTEEL TO ESTABLISH A VACUUM OF 10" HG ON THE TANK'S INTERSTICIAL SPACE THROUGH MONITOR PIPE AND HOLD 10" HG FOR 3 HOURS WITHOUT DECREASE ON GAUGE BEFORE PROCEEDING. DRY PRIMARY TANK TEST TIMES LISTED IN APPENDIX B MAY BE REVISED WITH WATER PRIMARY TANK TEST TIMES LISTED IN TABLE 5 LISTED ABOVE. PLASTEEL APPENDIX B MAY BE DOWNLOADED FROM THE INTERNET HERE:
   http://www.plasteel.com/data_finder/assets/install_instruct_app_b.pdf

2. USE PLASTEEL "CERTIFICATE OF COMPLETION – INTERSTITIAL VACUUM TEST (IVT)" TO RECORD AND DOCUMENT THE READINGS. PLASTEEL CERTIFICATE OF COMPLETION MAY BE DOWNLOADED FROM INTERNET HERE:
   http://www.plasteel.com/data_finder/assets/cert_of_completion_ivt.pdf

   TEST CONCLUSIONS: THE TANK HAS PASSED THE LEAK TIGHTNESS TEST WHEN THE FINAL GAUGE READING HAS NOT DECREASED FROM THE INITIAL GAUGE READING OF 10" HG.

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PLASTEEL® UNDERGROUND TANK
APPENDIX B

INTERSTITIAL VACUUM TEST (IVT)

1.0 **Introduction:** This test method has been developed by PLASTEEL INC. to meet the E.P.A. Alternate (Non-Volumetric) Tank Tightness test procedures. The IVT has been verified by a third party to be capable of detecting a 0.1 gal/hr leak rate with a probability of detection of 100% when all of the testing criteria are met. The false alarm rate for a tight tank is less than 5%. It is impossible to maintain a steady vacuum if a leak is present. This test is not necessary to attain the PLASTEEL® tank warranty. This test is offered as a stand alone leak tightness test method.

2.0 **Application:** The IVT is applicable to the PLASTEEL® ELUTRON® (jacketed) Double-wall tank and the PLASTEEL® Composit Double-wall tank. For compartmented tanks, consult the factory for the test time.

3.0 **Authority:** The Jurisdiction Having Authority (JHA) will determine whether the double-wall UST must be subject to a leak tightness test before placing the UST in service.

4.0 **Pre-Delivery Procedure:**

4.1 Read and understand the PLASTEEL® Tank Installation instructions and Appendix B before attempting the interstitial vacuum test. Contact the PLASTEEL® tank manufacturer if you have any questions.

4.2 Consult the PLASTEEL® tank manufacturer before the tank is shipped to ensure that the tank is delivered with the test gauge assembly. This assembly is an optional piece of equipment supplied by the tank manufacturer.

4.3 Prior to shipment from the factory, you may request that the manufacturer deliver the tank with the vacuum established.

4.4 Upon delivery, the delivery document will indicate the correct vacuum gauge reading. Call the factory if the gauge reading does meet the gauge reading specified on the delivery document.

4.5 To maintain the vacuum during the unloading and installation phases, extreme care must be taken to ensure the IVT gauge assembly is not jarred, struck or moved in any manner. Call the factory for instructions if the vacuum has decreased.

5.0 **Test Procedures:**

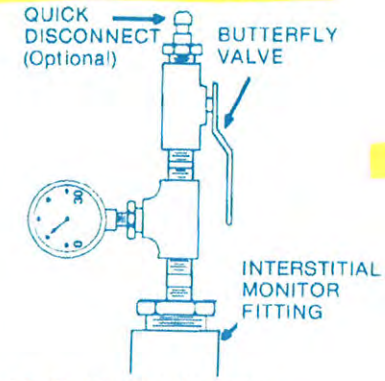

FIGURE 5.0: VACUUM GAUGE TEST ASSEMBLY (TYPICAL). ACCURACY: ASME (ANSI) GRADE B, ± 2%, 0-30"Hg, with 1"Hg GRADUATIONS.

5.1 If the vacuum was established at delivery and has not decreased during the unloading and installation phases, you may by-pass 5.2 and 5.3

5.2 Install the vacuum gauge test assembly (see Fig. 5.0) in the monitor access NPT coupling on the tank top centerline. Ensure that any additional monitor access couplings are properly sealed with threaded plugs.

5.3 Connect the vacuum pump to the test gauge assembly and draw down to 10" hg. Record initial gauge reading, date, and time of day in Part IV of the * Certificate. The initial pump down on the ELUTRON® jacketed tank may require reiteration due to the slow nature of air movement in the interstitial space.

5.4 To ensure a vacuum has been established, the gauge must read 10" hg. for three (3) hours without any decrease on the gauge before proceeding with 5.6. Contact the factory if the vacuum cannot be established per this paragraph.

5.5 Complete sections II and III of the * Certificate of Tightness Test. * SEE "CERTIFICATE OF COMPLETION"

5.6 Refer to the Test Time Table (Figure 6.0) to determine the correct minimum time period for a valid test.

Begin timing the test after completing 5.4. Record the nominal tank capacity, primary tank product and required test hours in Part IV of the Certificate.*

5.7 After the required test time has passed, observe the gauge reading and record the reading, date and time of day in Part IV of the Certificate.*

5.8 Test Conclusions: The tank has passed the leak tightness test when the final gauge reading has not decreased from the initial gauge reading of 10" Hg. If other observations are made, consult the tank manufacturer.

Test Time Tables: The table in Figure 6.0 lists the minimum test period (in hours) to perform a valid IVT with a dry (air only) primary tank. The IVT test may be performed with gasoline, diesel or water in the primary tank. Consult the PLASTEEL® tank manufacturer for the specific test time for these situations.

TEST TIME TABLE: DRY PRIMARY TANK WATER PRIMARY TANK FROM TABLE 5

CAPACITY (GALS.)	JACKETED (HOURS)	WATER (HOURS) SEE KEN WILCOX ASSOCIATES REPORT TABLE 5.	COMPOSIT (HOURS)
500	4.0	6.62	4.5
1,000	4.0	8.82	5.5
2,000	4.0	11.03	8.0
3,000	4.0	13.23	9.0
4,000	4.0	15.44	9.5
5,000	4.0	17.64	10.5
6,000	4.0	19.85	11.0
8,000	4.0	22.05	13.0
10,000	4.0	28.67	14.5
12,000	4.0	33.08	15.5
15,000	4.0	37.49	17.5
20,000	4.0	45.42	20.5
30,000	4.0	57.33	37.5
40,000	4.0	74.97	45.5
50,000	4.0	90.41	53.0

FIGURE 6.0

YOUR Licensed PLASTEEL® tank manufacturer is: HALL TANK COMPANY, LLC
2001 E 5th ST
NORTH LITTLE ROCK, AR 72114-5151
PHONE 501-945-3211

* SEE "CERTIFICATE OF COMPLETION" FORM
INTERSTITIAL VACUUM TEST (IVT)

CERTIFICATE OF COMPLETION

Interstitial Vacuum Test (IVT)

For The
PLASTEEL® Double-Wall Underground Tank

I. Third Party Evaluation: This leak tightness test method has been third party evaluated per the Alternate EPA Test Protocols for Plasteel International. The third party environmental consulting firm that performed the evaluation was:

Ken Wilcox Associates, Inc.
19401 E. 40 Highway, Suite 100
Independence, MO 64055
(816) 795-7997

A copy of the evaluation is on file at each licensed PLASTEEL® tank manufacturer and at:

Plasteel International Inc.
2541 State Street
Carlsbad, CA 92008
(760) 729-1093

II. Tank Description:

Capacity: 20,000 Gallons

Jacketed: YES - ELUTRON

Composite: NO

Compartmented: Yes _____ No _____

U.L. Number _____

Tank Manufacturer:

Name: HALL TANK COMPANY, LLC

Address: 2001 E 5th ST

NORTH LITTLE ROCK, AR 72114-5151
PHONE : 501-945-3211

III. Installation Information:

Tank Owner:

Name: MURPHY OIL USA, INC.

Address: 200 PEACH ST (PO BOX 7300)

EL DORADO, AR 71730-7300

Installation Location:

_____

_____

STATE OF NORTH CAROLINA. USA.

IV. Test Results: The interstitial vacuum test was performed per Appendix B. The following data was recorded:

Nominal Tank Capacity: 20,000
(Gallons)

Primary Tank Product: WATER
(air, gasoline, diesel, water)

Required Test Period: 45.42
(Hours, per Appendix B, Figure 6.0)

Initial Gauge Reading: _____ inches Hg.
Date _____ Time _____ am/pm

Final Gauge Reading: _____ inches Hg.
Date _____ Time _____ am/pm

Total Elapsed Time Period: _____
(Hours)

Pass _____ Fail _____(Initial)

V. Statement of Test: I certify that the PLASTEEL® Double-Wall tank described above has been tested leak tight per Appendix B of the PLASTEEL® Tank Installation Instructions.

Testing Company:

Name: _____

Address: _____

_____

Telephone: _____

_____
Signature

_____
Printed Name

_____
Title

_____
Date

IVT-CERT 699