



**THE
NATIONAL
BOARD**

OF BOILER AND

PRESSURE VESSEL

INSPECTORS

TESTING

LABORATORY

May 23, 2014

Suresh Balachandran
Valvtechnologies, Incorporated
5904 Bingle Road
Houston, TX 77092

SUBJECT: Capacity Certification, Valve Type: Z*1135R55P1 (1.06" Bore)**
NB Cap Cert No.: VLC-M59127

Dear Mr. Balachandran:

We have reviewed the test numbers, referenced below, which were performed on May 9, 2014 at the **National Board Testing Laboratory** for the purpose of obtaining capacity certification of the subject valve type. These tests were conducted in accordance with the provisions of paragraph PG-69.3 of Section I of the ASME Code with a test medium of steam.

This is a power operated valve which was manually opened and tested for flow rate only. Four tests were performed and an average slope of 37.47 PPH/PSIA was determined. All four tests had a measured slope within the +/-5% acceptance criteria. Based upon this testing, Valvtechnologies, Inc. can use a rated slope of no higher than 33.7 PPH/PSIA (37.47 x 0.9) for capacity rating of this design.

Valvtechnologies, Incorporated is hereby granted capacity certification and authorization to apply the "NB" mark to the valve type listed in the scope of certification. This authorization is valid for the above location and only while the organization holds a current ASME "V" Certificate of Authorization and is fully implementing its quality system as accepted by the National Board.

SCOPE OF CERTIFICATION

Valve Type: Z***1135R55P1 (1.06" Bore)

Organization Type: Manufacturer

Certified Rating Valve: Slope: 33.7 PPH/PSIA

Size: 1" x 1 1/2"

Pressure Range: 15 through 1500 psig

Certification Expiration Date: May 9, 2020

7437 PINGUE DRIVE

WORTHINGTON, OHIO

43085

U.S.A

PHONE
614.888.8320

FAX
614.848.3474

EMAIL
prinfo@nationalboard.org

WEB SITE
nationalboard.org

Sincerely,

Thomas P. Beirne, P.E.
Technical Manager, Pressure Relief Dept.

Reference Test Numbers: 37151S, 37152S, 37153S, 37154S

FILE: AC: 140523 VLC-M59127

Sent via Email

Provisional Testing at NBBI Testing Lab

SCANNED
5/12/14

Steam Test Report—Timed Weight Method

Valvetechtechnologies

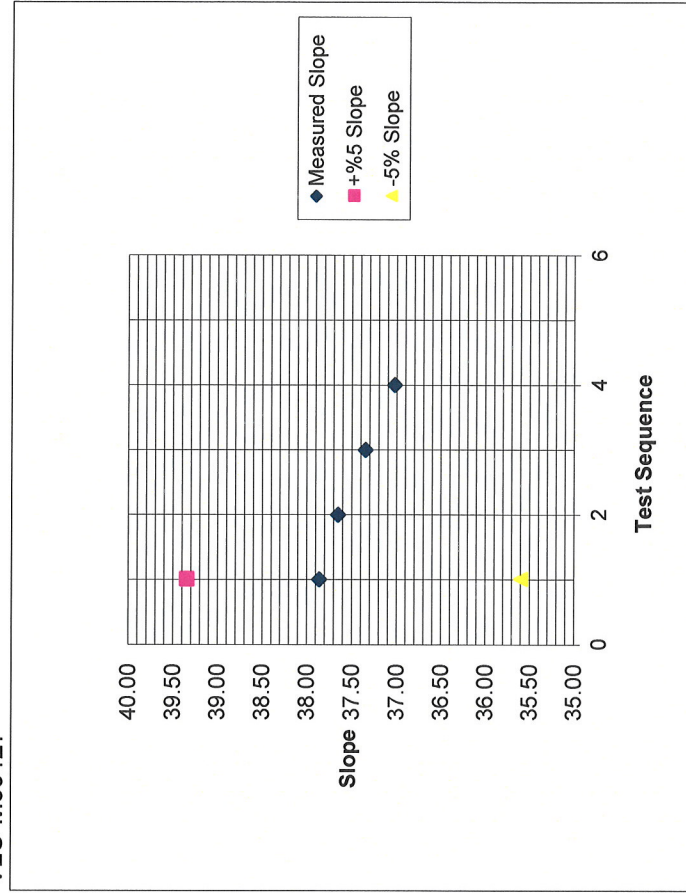
Provisional Test Series

Valve Type Z***1135R55P1

VLC-M59127

Test No.	Orif. Size	Inches	PSIG	Slope PPH/PSIA	Within Range?
37151S	1.051	1.051	50	37.86	Yes
37152S	1.051	1.051	100	37.65	Yes
37153S	1.051	1.051	150	37.35	Yes
37154S	1.051	1.051	200	37.02	Yes

Average Slope	37.47	PPH/PSIA
+5% Slope	39.35	PPH/PSIA
-5% Slope	35.60	PPH/PSIA
90% Slope	33.7	PPH/PSIA



Notes:

- Valves tested for initial capacity certification per paragraph PG-69.3 of Section I, ASME Boiler and Pressure Vessel Code.

I certify that the data on the attached test data sheet(s) was obtained under my supervision in accordance with the provisions of ANSI/ASME PTC 25, the applicable sections of the ASME Boiler and Pressure Vessel Code, and the National Board Testing Laboratory Quality Control Manual. To the best of my knowledge and belief the objects tested were of the same type and design as indicated.

[Signature] DATE 5-9-14
Authorized Observer

Test Personnel:

T. Brown
R. Viers

Company Representatives

National Board Testing Laboratory

Steam Test - Timed Weight Method

Valve ID Data		Revision 3.5	apps\Labview Programs\DATA\Steam Tests\37151S.xls
1	Test Number	37151S	
2	Test Sponsor	Valvetechnologies, Incorporated	
3	Company Type	Manufacturer	Houston, TX
4	Test Date	5/9/2014	VLC
5	Valve Type	Z5C41135R55P1-002AA-002	
6	Manufacturer	Valvetechnologies, Incorporated	
7	Cap. Cert. ID No.	59127	
8	Set Pressure	50 psig	
9	Inlet Size	1 FI	
10	Outlet Size	1 1/2 FI	
11	Stamped Capacity	Not Stamped	
12	Code Section	I	
13	Serial Number		
14	Date Code	13	
Operational Data and Measured Dimensions			
15	Warn Pressure		psig
16	Set Pressure		psig
17	Reset Set Pressure		psig
18	Blowdown		psi
19	Reset Blowdown		psi
20	Bore Diameter	1.051	inch
21	Lift	NA	inch
Measured Data			
22	Flow Area	0.86755	in ²
23	Vessel Pressure	50.0	psig
24	P _b	14.21	psia
25	Calorimeter Temp.	268.1	°F
26	Time of Run	4.0	minutes
27	Weight	162.2	lbm
28	Leakage	0.0	PPH
Calculated Data			
29			
30	Vessel Pressure	64.2	psia
31	Enthalpy, calorimeter	1,177.7	BTU/lbm
32	Saturation Temp., Vessel	297.2	°F
33	Saturation Volume, Vessel	6.7325	ft ³ /lbm
34	Steam Quality, Vessel	99.8	%
35	Vessel Temp. (Theoretical)	297.2	°F
36	Vessel Volume	6.7217	ft ³ /lbm
37	Degrees Superheat	N/A	°F
38	Capacity Correction	0.9992	
39	Measured Capacity	2431.0	PPH
40	Slope	37.860	PPH/PSIA
41	Coefficient	0.84737	
42	Rated Capacity For Measured Set	N/A	PPH
43			
44			in ²

National Board Testing Laboratory

Steam Test - Timed Weight Method: Test Summary


Test Summary for test 37151S:

V:\apps\Labview Programs\DATA\Steam Tests\151S.xls

1. Valve tested for Provisional Testing as a Manufacturer.

I certify that the data on the attached test data sheets was obtained under my supervision in accordance with the provisions of ASME PTC 25, the applicable sections of the ASME Boiler and Pressure Vessel Code, and the National Board Testing Laboratory Quality Control Manual. To the best of my knowledge and belief the objects tested were of the same type and design as indicated.


Authorized Observer: Robert Viers


Date

Test Personnel

Company Representatives

Tim Brown
Robert Viers

National Board Testing Laboratory

Steam Test - Timed Weight Method

Valve ID Data		Revision 3.5	apps\Labview Programs\DATA\Steam Tests\37152S.xls
1	Test Number	37152S	
2	Test Sponsor	Valvetechnologies, Incorporated	
3	Company Type	Manufacturer	Houston, TX
4	Test Date	5/9/2014	VLC
5	Valve Type	Z5C41135R55P1-002AA-002	
6	Manufacturer	Valvetechnologies, Incorporated	
7	Cap. Cert. ID No.	59127	
8	Set Pressure	100 psig	
9	Inlet Size	1 FI	
10	Outlet Size	1 1/2 FI	
11	Stamped Capacity	Not Stamped	
12	Code Section	I	
13	Serial Number		
14	Date Code	13	
Operational Data and Measured Dimensions			
15	Warn Pressure		psig
16	Set Pressure		psig
17	Reset Set Pressure		psig
18	Blowdown		psi
19	Reset Blowdown		psi
20	Bore Diameter	1.051	inch
21	Lift	NA	inch
Measured Data			
22	Flow Area	0.86755	in ²
23	Vessel Pressure	100.1	psig
24	P _b	14.21	psia
25	Calorimeter Temp.	298.4	°F
26	Time of Run	4.0	minutes
27	Weight	286.1	lbm
28	Leakage	0.0	PPH
Calculated Data			
29			
30	Vessel Pressure	114.3	psia
31	Enthalpy, calorimeter	1,192.1	BTU/lbm
32	Saturation Temp., Vessel	337.6	°F
33	Saturation Volume, Vessel	3.9046	ft ³ /lbm
34	Steam Quality, Vessel	100.0	%
35	Vessel Temp. (Theoretical)	341.2	°F
36	Vessel Volume	3.9278	ft ³ /lbm
37	Degrees Superheat	3.5	°F
38	Capacity Correction	1.0030	
39	Measured Capacity	4304.3	PPH
40	Slope	37.654	PPH/PSIA
41	Coefficient	0.84276	
42	Rated Capacity For Measured Set	N/A	PPH
43			
44			in ²

National Board Testing Laboratory

Steam Test - Timed Weight Method: Test Summary

Test Summary for test 37152S:

V:\apps\Labview Programs\DATA\Steam Tests\S.xls

1. Valve tested for Provisional Testing as a Manufacturer.

I certify that the data on the attached test data sheets was obtained under my supervision in accordance with the provisions of ASME PTC 25, the applicable sections of the ASME Boiler and Pressure Vessel Code, and the National Board Testing Laboratory Quality Control Manual. To the best of my knowledge and belief the objects tested were of the same type and design as indicated.



Authorized Observer: Robert Viers



Date

Test Personnel

Company Representatives

Tim Brown
Robert Viers

National Board Testing Laboratory

Steam Test - Timed Weight Method

Valve ID Data		Revision 3.5	apps\Labview Programs\DATA\Steam Tests\37153S.xls
1	Test Number	37153S	
2	Test Sponsor	Valvetechnologies, Incorporated	
3	Company Type	Manufacturer	Houston, TX
4	Test Date	5/9/2014	VLC
5	Valve Type	Z5C41135R55P1-002AA-002	
6	Manufacturer	Valvetechnologies, Incorporated	
7	Cap. Cert. ID No.	59127	
8	Set Pressure	150 psig	
9	Inlet Size	1 FI	
10	Outlet Size	1 1/2 FI	
11	Stamped Capacity	Not Stamped	
12	Code Section	I	
13	Serial Number		
14	Date Code	13	
Operational Data and Measured Dimensions			
15	Warn Pressure		psig
16	Set Pressure		psig
17	Reset Set Pressure		psig
18	Blowdown		psi
19	Reset Blowdown		psi
20	Bore Diameter	1.051	inch
21	Lift	NA	inch
Measured Data			
22	Flow Area	0.86755	in ²
23	Vessel Pressure	149.9	psig
24	P _b	14.21	psia
25	Calorimeter Temp.	304.8	°F
26	Time of Run	4.0	minutes
27	Weight	408.8	lbm
28	Leakage	0.0	PPH
Calculated Data			
29			
30	Vessel Pressure	164.1	psia
31	Enthalpy, calorimeter	1,195.1	BTU/lbm
32	Saturation Temp., Vessel	365.6	°F
33	Saturation Volume, Vessel	2.7665	ft ³ /lbm
34	Steam Quality, Vessel	99.9	%
35	Vessel Temp. (Theoretical)	365.6	°F
36	Vessel Volume	2.7639	ft ³ /lbm
37	Degrees Superheat	N/A	°F
38	Capacity Correction	0.9995	
39	Measured Capacity	6129.2	PPH
40	Slope	37.348	PPH/PSIA
41	Coefficient	0.83592	
42	Rated Capacity For Measured Set	N/A	PPH
43			
44			in ²

National Board Testing Laboratory


Steam Test - Timed Weight Method: Test Summary

Test Summary for test 37153S:

V:\apps\Labview Programs\DATA\Steam Tests\S.xls

1. Valve tested for Provisional Testing as a Manufacturer.

I certify that the data on the attached test data sheets was obtained under my supervision in accordance with the provisions of ASME PTC 25, the applicable sections of the ASME Boiler and Pressure Vessel Code, and the National Board Testing Laboratory Quality Control Manual. To the best of my knowledge and belief the objects tested were of the same type and design as indicated.


Authorized Observer: Robert Viers

5-9-14
Date

Test Personnel

Company Representatives

Tim Brown
Robert Viers

National Board Testing Laboratory

Steam Test - Timed Weight Method

Valve ID Data		Revision 3.5	apps\Labview Programs\DATA\Steam Tests\37154S.xls
1	Test Number	37154S	
2	Test Sponsor	Valvetechnologies, Incorporated	
3	Company Type	Manufacturer	Houston, TX
4	Test Date	5/9/2014	VLC
5	Valve Type	Z5C41135R55P1-002AA-002	
6	Manufacturer	Valvetechnologies, Incorporated	
7	Cap. Cert. ID No.	59127	
8	Set Pressure	200 psig	
9	Inlet Size	1 FI	
10	Outlet Size	1 1/2 FI	
11	Stamped Capacity	Not Stamped	
12	Code Section	I	
13	Serial Number		
14	Date Code	13	
Operational Data and Measured Dimensions			
15	Warn Pressure		psig
16	Set Pressure		psig
17	Reset Set Pressure		psig
18	Blowdown		psi
19	Reset Blowdown		psi
20	Bore Diameter	1.051	inch
21	Lift	NA	inch
Measured Data			
22	Flow Area	0.86755	in ²
23	Vessel Pressure	200.0	psig
24	P _b	14.21	psia
25	Calorimeter Temp.	312.7	°F
26	Time of Run	4.0	minutes
27	Weight	529.0	lbm
28	Leakage	0.0	PPH
Calculated Data			
29			
30	Vessel Pressure	214.2	psia
31	Enthalpy, calorimeter	1,198.9	BTU/lbm
32	Saturation Temp., Vessel	387.6	°F
33	Saturation Volume, Vessel	2.1415	ft ³ /lbm
34	Steam Quality, Vessel	99.9	%
35	Vessel Temp. (Theoretical)	387.6	°F
36	Vessel Volume	2.1393	ft ³ /lbm
37	Degrees Superheat	N/A	°F
38	Capacity Correction	0.9995	
39	Measured Capacity	7930.9	PPH
40	Slope	37.024	PPH/PSIA
41	Coefficient	0.82868	
42	Rated Capacity For Measured Set	#VALUE!	PPH
43			
44			in ²

National Board Testing Laboratory


Steam Test - Timed Weight Method: Test Summary

Test Summary for test 37154S:

V:\apps\Labview Programs\DATA\Steam Tests\S.xls

1. Valve tested for Provisional Testing as a Manufacturer.

I certify that the data on the attached test data sheets was obtained under my supervision in accordance with the provisions of ASME PTC 25, the applicable sections of the ASME Boiler and Pressure Vessel Code, and the National Board Testing Laboratory Quality Control Manual. To the best of my knowledge and belief the objects tested were of the same type and design as indicated.


Authorized Observer: Robert Viers

5-9-14
Date

Test Personnel

Company Representatives

Tim Brown
Robert Viers



Application for National Board Certification of a Pressure Relief Device Design and Authorization to use the "NB" Mark

SINCE 1919

Part 1 General Information

We are making application to the National Board of Boiler and Pressure Vessel Inspectors to obtain National Board certification and permission to use the National Board "NB" mark on the device design described below.

Company Name: Valv technologies Inc.
Address: 5904 Bingle Road
Houston TX 77072

hereby applies for device certification as the ☒ Manufacturer of ☒ Pressure Relief Valves
☐ Assembler ☐ Rupture Disk Devices
☐ Other Devices

of device type ZXXX113SR55P1 (1.06" Bore)
(Manufacturer's Series or Catalog Number or Identification)

Designed by Valv technologies
(Manufacturer's Name)

and described in Part 2 on the reverse side of this application (Manufacturers Only).

This certification is to be considered for:

Certified Medium: ☒ Steam ☐ Air ☐ Gas ☐ Liquid (Note Liquid fluid scope PRVs, are certified separate from compressed fluid scope PRVs)
or list: _____

Construction Code Sections: ☒ ASME Section I
☐ ASME Section III; Subsection ☐ NB ☐ NC ☐ ND, or ☐ NE
☐ ASME Section IV
☐ ASME Section VIII, Division 1
☐ ASME Section VIII, Division 3

Code Cases: _____

and is a(n) ☒ Initial Device Certification, ☐ Transfer of Auth. ☐ Design Type Scope Change, or
☐ Five Year Certification Renewal - NB Cert No. _____
Exp. Date _____

We certify that devices of the above noted type will be manufactured or assembled in accordance with the Construction Code and our National Board accepted quality system.

Stephen S. L. (Company Representative Signature) OCT 18, 2010 (Date)

National Board Office Use

Company I.D. 28020 Company Code VLC Design Id Number: M59127
Application Reviewed By: M. Fulton Date: 1-4-2013
Design Reviewed and Accepted By: J. Bell Date: 4/16/12
Certification Fee received on: Invoiced (For Initial and Renewals only)

Rev. 1

National Board Application for Certification

Application Id:

Part 2 Scope of Design (To be completed by Manufacturers Only)A. Device Manufacturer: Valvtechnologies Inc. Type/Model: Z***1135R55P1Plant Location: 5904 Bingle Road Houston TX 77092

B. Device Type:

- (1) Reclosing Types: - ☐ Safety Valve ☐ Safety Relief Valve ☐ Relief Valve ☐ Pilot Operated Pressure Relief Valve
☐ Temperature Actuated Pressure Relief Valve ☐ Vacuum Relief Valve ☒ Power Actuated Pressure Relief Valve
 Other _____

- (2) Non-Closing Types: - ☐ Rupture Disk Device ☐ Buckling Pin Device ☐ Breaking Pin Device

- (3) Special Service Conditions - ☒ None ☐ Low Pressure Steam Heating Boilers ☐ Non-Refrigerated Liquified Compressed Gases
☐ Organic Fluid Vaporizers ☐ Forced Flow Steam Generator or High-Temperature Water Boiler

C. Set Pressure Definition:

- Popping ☐ Start-to-Leak ☐ Initial Audible Discharge ☐ Bubble ☐ 1st Steady Stream ☐ First Heavy Flow
☐ Burst Pressure ☐ Buckling Pressure ☐ Breaking Pressure Other Power Actuated
 (Describe Physical Observations by Seeing, Hearing, Feeling)

D. Blowdown Characteristic:

- ☒ Fixed ☐ Adjustable ☐ Adjustable and Fixed for Mod. Pilot ☐ N/A
 Adjustable by: ☐ Single Ring ☐ Dual Ring ☐ Other _____
 (Describe)

E. Flow Area Configuration:

- ☒ Nozzle/Full Lift ☐ Curtain Area ☐ Restricted Lift ☐ MNFA

F. Scope of Nominal Size and Set Pressure Ranges: (For additional sizes, attach supplemental sheet)

Inlet Size	Outlet Size	Flow Area*	Orifice designator diameter	Lift	Set Pressure Range	Media	Code Section
1"	1-1/2"	0.882 in ²	1.06"		15-1500 psi	Steam	

*For Rupture Disk devices, list minimum net flow area.

G. Materials of Construction

Part Key: H=Body/Holder; B= Bonnet; Y= Yoke

Key	Type	Grade	Key	Type	Grade	Key	Type	Grade
H	SA-216	WCB						

H. Design Drawing/Specification Number and Revision Level 102538

(Note: Please attach current parts list with material specifications and drawings)

I. Design Options: Describe in space provided those options and variations which will be included (i.e. bellows, seat configuration, lifting lever option, etc.) _____

J. Test Medium: ☒ Steam ☐ Air ☐ Gas ☐ Liquid ☐ Water

- K. Certification Method: ☐ Flow Capacity Rating by; ☐ Coeff. of Discharge K, ☒ Slope ☐ Flow Factor,
☐ 3 Valve Average ☐ Single Valve Method
 or ☐ Single Size Resistance Factor Rating; ☐ K_{RG}, or ☐ K_{RGL}, or ☐ K_{RLL}
 or ☐ 3 Size Resistance Factor Rating ☐ K_{RG}, or ☐ K_{RGL}, or ☐ K_{RLL}

L. Certification Rating Value with unit of measure: 33.7 PPH/PSIA
 (Value) (Units)

↑ TBD
 Test Value 5/9/14