Standard installation
Number of pages in this package 33[including additional pages _0_]
(Fill in when using printed copy as record)

TEST LOCATION:	
[]UL or Affiliate	[x]WTDP []CTDP []TPTDP []TCP []PPP []WMT []TMP []SMT
Company Name	ZHEJIANG DOORENHAUS HARDWARE INDUSTRY CO LTD
Address	#350-1 GUILAN RD QIAODUN TOWN, CANGNAN , ZHEJIANG 325806 CHINA

CLIENT INFORMATION	
Company Name	ZHEJIANG DOORENHAUS HARDWARE INDUSTRY CO LTD
Address	#350-1 GUILAN RD QIAODUN TOWN, CANGNAN , ZHEJIANG 325806 CHINA

AUDIT INFORMATION:		
[x] Description of Tests	Per Standard No. ANSI/BHMA A156.4	Edition 2008
[x] Tests Conducted by +	David Huang (Printed Name)	David Huang (Signature)
[x] UL Staff conducting or witnessing testing (WTDP, TMP, WMT only) [] UL Staff supervising UL Staff in training []Authorized Signatory (CTDP, TPTDP, TCP, PPP, SMT)	Wilson Wang (Printed Name)	Wilson Wang 2012-7-31 (Signature, and include date for CTDP, TPTDP, TCP, PPP, WMT, TMP, SMT)
Reviewed and accepted by qualified Project Handler	Wilson Wang (Printed Name)	Wilson Wang 2012-7-31 (Signature)

TESTS TO BE CONDUCTED:

Test No.	Done +++	Test Name	[] Comments/Parameters []Tests Conducted by ++
1	x	PREPARATION FOR PERFORMANCE TEST:	
2	x	BREAK-IN CYCLE TEST:	
3	x	STATIC TEST 1:	
4	x	STATIC TEST 2 TWO SPEEDS OF CONTROL:	
5	x	**STATIC TEST 3:**	
6	x	**STATIC TEST 5 (Closing Force for Closers with Adjustment Through Range of Sizes):**	

TESTS TO BE CONDUCTED:			
Test No.	Done +++	Test Name	[] Comments/Parameters []Tests Conducted by ++
7	x	STATIC TEST 6 (Door Closer Efficiency):	
8	x	STATIC TEST 7 Checking Cylinder Test:	
9	x	STATIC TEST 8 Backcheck Tests:	
10	x	STATIC TEST 11:	
11	x	INTERMEDIATE CYCLE TEST:	
12	x	INTERIM STATIC TEST:	
13	x	FINAL CYCLE TEST:	
14	x	FINAL STATIC TEST:	

Instructions -
+ - When all tests are conducted by one person, printed name and signature can be inserted here instead of including printed name and signature on each page containing data. Must indicate number of pages in the data package.
++ - When test conducted by more than one person, printed name and signature of person conducting the test can be inserted next to the test name instead of including printed name and signature on each page containing data. Must indicate number of pages in the data package.
+++ - Use of this field is optional and may be employed differently.

Special Instructions -

Unless specified otherwise in the individual Methods, the tests shall be conducted under the following ambient conditions. Confirmation of these conditions shall be recorded at the time the test is conducted.

Ambient Temperature, C ±	Relative Humidity, % ±	Barometric Pressure, mBar ±

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Tested by:	David Huang	*David Huang*		Date	2012-4-24-7-31
	Printed Name	Signature			

WITNESS TEST DATA PROGRAM (WTDP) INFORMATION:

Environment:	
Accommodations and Environmental conditions, including proper power source meet the requirements of the test standard or UL default criteria (ISO/IEC 17025 Clause 5.3.1, 5.3.2. 5.3.3, 5.3.4)	**[ ]**Yes **[ ]**No **[x]**N/A
Personnel:	
Lab Management shall authorize personnel to operate particular types of equipment used in testing. (ISO/IEC 17025 5.2.5)	**[x]**Yes **[ ]**No
Equipment:	
Testing is being conducted within the test equipment calibration dates. (See Test Instrument Information Page and ISO/IEC 17025 5.5.1, 5.5.2, 5.5.4, 5.5.5, 5.5.8,)	**[x]**Yes **[ ]**No
Calibrations for testing equipment is traceable to SI Units. Refer to 00-OP-C0032 (Calibration Certificate Analysis). (ISO/IEC 17025 5.6.2.2)	**[x]**Yes **[ ]**No
Critical Consumables:	
Critical consumables are compliant with test standard requirements. (ISO/IEC 17025 Clause 4.6)	**[ ]**Yes **[ ]**No **[x]**N/A
Sample Identification:	
Identification of items to be tested has been made (e.g. model no., Serial No., etc.) (See Test Sample Identification page and ISO/IEC 17025 Clause 5.8.2)	**[x]**Yes **[ ]**No
Summary:	
The test facility **[** was **]**~~[was not]~~ deemed to have the environment and capabilities necessary to perform the tests included in this data package.	

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[ ] The CAS Staff or Field Services Member, as indicated below, (a competent L1, L2 or L3 in a similar CCN/Standard for a similar test method) was utilized to conduct the witnessing of tests on behalf of the project handler. (Please complete the table below to document the rationale and approval.)

Name of UL Staff conducting WTDP	CCN/Standard to be witnessed	Test(s) to be witnessed	L1, L2 or L3 Competency	Similar CCN/Standard Competency	L3 Reviewer Approval & Date (Similar CCN/Standard)

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TEST EQUIPMENT INFORMATION

Inst. ID No.	Instrument Type	Test Number +, Test Title or Conditioning	Function /Range	Last Cal. Date	Next Cal. Date
1	Weight Scale	All Test	0.01Kg/100Kg	2011-12-16	2012-12-15
2	Tape Measure	1,4,7,10,11,12,13,14	1mm/2m	2011-12-12	2012-12-11
3	Stop Watch	2,5,8,10,11,12,13,14	0.01s/24h	2011-12-12	2012-12-11
4	Caliper	1,7,10,11,12,13,14	0.01mm/150mm	2011-12-12	2012-12-11
5	Push/Pull Gauge	1,6,7,8,11,12,13,14	1N/200N	2011-12-13	2012-12-12
6	Protractor	All Test	1/0-180degree	2011-12-6	2012-12-5

+ - If Test Number is used, the Test Number must be identified on the data sheet pages or on the Data Sheet Package cover page.

The following additional information is required when using client's or rented equipment, or when a UL ID Number for an instrument number is not used. The Inst. ID No. below corresponds to the Inst. ID No. above.

Inst. ID No.	Make/Model/Serial Number/Asset No.
1	YongKang Qianlong/TCS-100/11221/CGH11120002
2	Deli/8201/-/DHS-JC-001
3	ShangHai/JD-1A/-/CDH11120108
4	ChengLiang/150mm/-/DHS-F1-011
5	Sundoo/SN-200/2611085322/CCH11120035
6	Jiangxi/180°/-/DHS-G3-001

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[]UL test equipment information is recorded on Meter Use in UL's Laboratory Project Management (LPM) database.

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TEST SAMPLE IDENTIFICATION:

The table below is provided to provide correlation of sample numbers to specific product related information. Refer to this table when a test identifies a test sample by "Sample No." only.

Sample Card No.	Date Received	[] Test No.+	Sample No.	Manufacturer, Product Identification and Ratings
-	2012-4-24	1-14	1-3	ZHEJIANG DOORENHAUS HARDWARE INDUSTRY CO LTD,Commercial Testing, Door Closer, Regular Installation
				1) D4000 Size 1-6 with Backcheck 2) D8000 Size 1-6 with Backcheck 3) D9000 Size 1-6 with Backcheck

+ - If Test Number is used, the Test Number or Numbers the sample was used in must be identified on the data sheet pages or on the Data Sheet Package cover page.

[] Sampling Procedure -

PREPARATION FOR PERFORMANCE TEST(Models D4000, D8000, D9000) Section 3

Weight - The test door weight shall be as specified in Table 1 below. Center of gravity of the weighted door shall be 18 in (457 mm) from the pivot center of the door for size 2 or larger closers and 15 in. (381 mm) for size 1 closers. For light screen or combination storm door closers test door weight shall be 30 lbs (13.6 kg). Door weight is for test purposes only.

TABLE 1

Closer Size	Closing Force between the ½ in. (12.77 mm) and 3 in. (76 mm) mark (F1)		Test Door Weight
	lbf	N	
I	From 2 up to 3	From 9 up to 13	50 lbs/23 kg
II	From 3 up to 5	From 13 up to 22	80 lbs/36 kg
III	From 5 up to 8	From 22 up to 36	100 lbs/45 kg
IV	From 8 up to 11	From 36 up to 49	125 lbs/57 kg
V	From 11 up to 14	From 49 up to 62	155 lbs/70 kg
VI	14 and above	Above 62	180 LBS/82 KG

Mounting - Doors shall be hung on hinges, accurately aligned with vertical pins or on offset or center pivots, if required by the door closer. Force required to overcome friction or out of balance condition, shall be a 1/4 lbf. (1.1 N) or less, throughout the test measured perpendicular to the face of the door at a point 30 in (762 mm) from pivot center. Forces required to overcome friction or out of balance conditions are permitted to be greater than a 1/4 lbf. (1.1 N), if acceptable to closer manufacturer. Top jamb mounting shall be 2 in + 1/8 in (5l + 3 mm) reveal. Any force due to hinge friction shall not be used to adjust test data.

Actuating Means for mechanically opening the door to the 90 degree position (+ 5 degrees) and releasing shall be provided for the cycling test.

The Door Closer to be Tested - If door closer bodies of the same type are of substantially the same construction, the cycle test shall be required only for one arm application (i.e. regular arm, parallel arm, track arm, bracket mounting or top jamb mounting) under tests PT 1, PT 2, and PT 3. All other tests as applicable shall be required for all arm applications.

Door Opening Templates and Floor Marking - In preparation for the testing, attach a pointer to bottom the leading edge of door 30” from pivot center, and provide a template (Figure 4 of ANSI/BHMA A156.4) or floor markings along the swing of the pointer mounted on the test door at the following intervals: 135, 115, 90, 70, and 45 degrees. For the applicable tests, the door will be opened to the line being parallel to the leading edge of the door degree where the pointer intersects the required location. In addition, for tests which require an opening to a specified distance, mark lines (Figure 5 of ANSI/BHMA A156.4) at ½, 2, 3, 4 and 12 inches perpendicular to the door in the closed position, and 30 in. (762 mm) from the pivot center of the door.

PREPARATION FOR PERFORMANCE TEST: (CONT'D) Section 3

Installation - The door closer shall be installed in accordance with the manufacturer's written installation instructions.

Applied Forces and Force Readings All applied forces or force readings shall be made perpendicular to the face of the door at a point 30 in (762 mm) from the pivot center of the door. Force applications and readings shall be applied by a force gauge with a combined calibration and reading accuracy within 5%.

Overload Abuse Test Weights - In closers with adjustable spring power, set the closing force to the closest increment within the values specified for the closer size in Table 1.

TABLE 2

Door Closer Size	I	II	III	IV	V	VI
Overload Test Weight	35 lbs (16 kg)	40 lbs (18 kg)	45 lbs (21 kg)	55 lbs (25 kg)	60 lbs (27 kg)	65 lbs (30 kg)

BREAK-IN CYCLE TEST: (Models D4000, D8000, D9000) Section 4.1

METHOD

This test was conducted for Grades 1, 2, 3 (PT1, PT2, PT3, PT5, PT6, PT7, & Other PT Options closers).

The door closer was mounted on the test apparatus and the door closing time was regulated from 90 degrees to between 3 and 6 seconds. This time was maintained during the cycling by re-regulating if necessary. The backcheck valve was fully open, where applicable. The door closer was operated for 4,000 cycles. After the 4,000 cycles, the static tests were conducted.

RESULTS

Model D4000
The door closer **[**did**]** ~~**[did not]**~~ complete the 4,000 cycles.

Model D8000
The door closer **[**did**]** ~~**[did not]**~~ complete the 4,000 cycles.

Model D9000
The door closer **[**did**]** ~~**[did not]**~~ complete the 4,000 cycles.

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STATIC TEST 1: (Models D4000, D8000, D9000) Section 4.2

METHOD

[x] Surface or Concealed-in-Door Closers, (PT1, PT2, PT7) and Concealed-in-Floor or Overhead Concealed Closers, (PT3, PT5, PT 6)

After the 4,000 break in cycles were completed the general speed regulating valve on the closer was completely closed. The door was opened to 135° or the maximum designed opening if less than 135 degrees and release. The point at which the closing motion of the door essentially stopped (a slow creeping motion after deceleration shall be disregarded) was measured.

RESULTS

[x] Surface or Concealed-in-Door Closers, Grade 1 (PT1) and Concealed-in-Floor or Overhead Concealed Closers, Grade 1 (PT5)

Model D4000

The point at which the closing motion of the door essentially stopped ~~**[was]**~~ **[**was not**]** more than 20° from release point. (10°)

~~**[x]** Surface or Concealed-in-Door Closers, Grade 2 (PT2) and Concealed-in-Floor or Overhead Concealed Closers, Grade 2 (PT6)~~

Model D8000

The point at which the closing motion of the door essentially stopped ~~**[was]**~~ **[**was not**]** more than 20° from release point.(5°)

Model D9000

The point at which the closing motion of the door essentially stopped ~~**[was]**~~ **[**was not**]** more than 20° from release point.(15°)

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STATIC TEST 2 TWO SPEEDS OF CONTROL: Section 4.3
(Models D4000, D8000, D9000)

METHOD

Surface or Concealed-in-Door closers, Grades 1, 2, 3 (PT1, PT2, PT3) and Concealed-in-Floor or Overhead Concealed closers, Grades 1 (PT5)

[x] a) After the Static Test 1 the general speed regulating valve was adjusted for a normal closing motion and the latch speed regulating valve was fully opened. The door was opened to approximately 45 degrees and release. The point at which the door noticeably accelerates measured.

RESULTS

Surface or Concealed-in-Door closers, Grades 1, 2, 3 (PT1, PT2, PT3) and Concealed-in-Floor or Overhead Concealed closers, Grades 1 (PT5).

Model D4000

[x] a) The point at which the door noticeably accelerates **[**was**]** ~~**[**was not**]**~~ between the 12 in. (305 mm) and 2 in. (51 mm) marks.(10°)

Model D8000

[x] a) The point at which the door noticeably accelerates **[**was**]** ~~**[**was not**]**~~ between the 12 in. (305 mm) and 2 in. (51 mm) marks.(14°)

Model D9000

[x] a) The point at which the door noticeably accelerates **[**was**]** ~~**[**was not**]**~~ between the 12 in. (305 mm) and 2 in. (51 mm) marks.(12°)

STATIC TEST 3: (Models D4000, D8000, D9000) Section 4.4

METHOD

Surface or Concealed-in-Door closers, Grades 1, 2, 3 (PT1, PT2, PT3, PT5, PT6, PT7)

Test #1 With the general and latch speed regulating valve(s) fully closed the door was opened to 90 degrees and release.

Test #2 With the general and latch speed regulating valve(s) fully opened the door was opened to 90 degrees and release.

RESULTS

Model D4000

Results #1 The door **[**did**]** ~~**[**did not**]**~~ take 60 seconds or longer to fully close.(317s)

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Results #2 The door **[**did**]** ~~**[**did not**]**~~ fully close in 3 seconds or less.(1.31s)

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Model D8000

Results #1 The door [did] ~~[did not]~~ take 60 seconds or longer to fully close.(136s)

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Results #2 The door [did] ~~[did not]~~ fully close in 3 seconds or less.(1.66s)

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Model D9000

Results #1 The door [did] ~~[did not]~~ take 60 seconds or longer to fully close.(380s)

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Results #2 The door [did] ~~[did not]~~ fully close in 3 seconds or less.(1.27s)

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STATIC TEST 5 (CLOSING FORCE FOR CLOSERS WITH ADJUSTMENT THROUGH RANGE OF SIZES): (Models D4000, D8000, D9000) Section 4.6

METHOD

Surface or Concealed-in-Door closers, Optional (PT4H PT8M)

Test #1 The general and latch speed regulating valves were fully opened and then the closing force was adjusted to the minimum available for the closer being tested. The door was opened beyond the 3 in. (76 mm) line drawn on the floor. Holding the door open with a force meter, the door was allowed to close slowly under the power of the door closer. The greatest force exerted by the power of the door closer as the door travels between the 3 in. (76 mm) and
½ in. (12.7 mm) marks was read and recorded.

Test #2 The general and latch speed regulating valves were fully opened and then the closing force was adjusted to the maximum available for the closer being tested. The door was opened beyond the 3 in. (76 mm) line drawn on the floor. Holding the door open with a force meter, the door was allowed to close slowly under the power of the door closer. Read the greatest force exerted by the power of the door closer as the door travels between the 3 in. (76 mm) and ½ in. (12.7 mm) marks and record force.

RESULTS

Model D4000

Test #1 The recorded force **[**was**]** ~~**[was not]**~~ less than the maximum value specified in Table 1 for the minimum size closer specified by the manufacturer.(10N)

Test #2 The recorded force **[**was**]** ~~**[was not]**~~ equal to, or greater than the minimum value specified in Table 1 for the maximum size closer specified by the manufacturer.(67N)

Model D8000

Test #1 The recorded force [was] ~~[was not]~~ less than the maximum value specified in Table 1 for the minimum size closer specified by the manufacturer.(12N)

Test #2 The recorded force [was] ~~[was not]~~ equal to, or greater than the minimum value specified in Table 1 for the maximum size closer specified by the manufacturer.(70N)

Model D9000

Test #1 The recorded force [was] ~~[was not]~~ less than the maximum value specified in Table 1 for the minimum size closer specified by the manufacturer.(12N)

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Test #2 The recorded force [was] ~~[was not]~~ equal to, or greater than the minimum value specified in Table 1 for the maximum size closer specified by the manufacturer.(76N)

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STATIC TEST 6 (DOOR CLOSER EFFICIENCY): Section 4.7
(Models D4000, D8000, D9000)

METHOD

Surface or Concealed-in-Door closers, Grades 1, 2, 3 (PT1, PT2, PT3) and Grades 1, 2 (PT5, PT6)

The general and latch speed regulating valves were fully opened. Using a force meter, the door was opened slowly and uniformly. The opening forces F3, F4, and F5 as the door edge passes the 2 in. (51 mm), 3 in. (76 mm), and 4 in. (102 mm) mark respectively were recorded. Then starting beyond the 4 in. (102 mm) mark, the door closer was allowed to close the door in a slow and uniform manner resisted by the force meter. The force readings F6, F7, and F8 as the door edge passed the 4 in. (102 mm), 3 in. (76 mm), and 2 in. (51 mm) marks respectively were recorded. Calculate the door closer efficiency by the following formula:

Percent Efficiency = ((F6 + F7 + F8) / (F3 + F4 + F5)) x 100.

RESULTS

	F3	F4	F5	F6	F7	F8
Model D4000	100N	90N	85N	53N	61N	69N
Model D8000	83N	89N	83N	65N	20N	64N
Model D9000	95N	100N	92N	72N	77N	63N

Model D4000

The door closer efficiency [was] ~~[was not]~~ a minimum of 50% for sizes I and II and 60% for sizes III through VI.(66%)

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Model D8000

The door closer efficiency [was] ~~[was not]~~ a minimum of 50% for sizes I and II and 60% for sizes III through VI.(78%)

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Model D9000

The door closer efficiency [was] ~~[was not]~~ a minimum of 50% for sizes I and II and 60% for sizes III through VI.(73.8%)

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STATIC TEST 7 CHECKING CYLINDER TEST: Section 4.8

(Models D4000, D8000, D9000)

METHOD

Surface, Concealed-in-Door Closers, Concealed in floor, Overhead Concealed Grades 1,2 (PT1, PT2, PT5, PT6)

The general and latch speed regulating valves were opened and then the closing force was adjusted to the maximum in accordance with the manufacturer's instructions. The door was opened beyond the 3 in. (76 mm) line drawn on the floor. The door was held open with a force meter and then allowed to close slowly under the power of the door closer. The greatest force exerted by the power of the door closer was read as the door traveled between the 3 in.
(76 mm) and ½ in. (12.7 mm) marks, and recorded as force (F1).

The force equaled or exceeded the minimum values specified in the table below, so both the latch and speed regulating valves were fully close. The door was opened to 90 degrees, then release and the door was pushed closed with a 20 lbf (89 N) force applied 30 in (762 mm) from the pivot center.

TABLE 1

Closer Size	Closing Force between the ½ in. (12.77 mm) and 3 in. (76 mm) mark (F1)		Test Door Weight
	lbf	N	
I	From 2 up to 3	From 9 up to 13	50 lbs/23 kg
II	From 3 up to 5	From 13 up to 22	80 lbs/36 kg
III	From 5 up to 8	From 22 up to 36	100 lbs/45 kg
IV	From 8 up to 11	From 36 up to 49	125 lbs/57 kg
V	From 11 up to 14	From 49 up to 62	155 lbs/70 kg
VI	14 and above	Above 62	180 LBS/82 KG

RESULTS

Model D4000

The time required for the door to fully close ~~[was]~~ [was not] less than 8 seconds.(36s)

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Model D8000

The time required for the door to fully close ~~[was]~~ [was not] less than 8 seconds.(43s)

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Model D9000

The time required for the door to fully close ~~[was]~~ [was not] less than 8 seconds.(219s)

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STATIC TEST 8 BACKCHECK TESTS: (Models D4000, D8000, D9000) Section 4.9

METHOD

[x] Adjustable Backcheck for Surface or Concealed-in-Door closers, Grades 1 and 2 only (PT1 and PT2 only), Optional (PT4D) and Adjustable Backcheck for Concealed-in-Floor or Overhead Concealed closers, Grades 1 and 2 only (PT5 and PT6 only), Optional (PT8F).

The general and latch speed regulating valves were opened and the closing force was set. The backcheck valve was fully opened and tested by the actuating means of the test apparatus by pushing the door to 50 degrees maximum door opening. The actuating means pushed with a velocity sufficient to propel the door to a minimum opening angle of 110 degrees with the backcheck valve fully open.

The backcheck valve was then adjusted to provide an observable reduction in the door opening speed.

STATIC TEST 8 Backcheck Tests:(CONT'D) Section 4.9

RESULTS

[x] Adjustable Backcheck for Surface or Concealed-in-Door closers, Grades 1 and 2 only (PT1 and PT2 only), Optional (PT4D) and Adjustable Backcheck for Concealed-in-Floor or Overhead Concealed closers, Grades 1 and 2 only (PT5 and PT6 only), Optional (PT8F).

Model D4000

When the backcheck valve was then adjusted the closer **[**did**]** ~~**[did not]**~~ have an observable reduction in the door opening speed between 60 degrees and 85 degrees of door opening and the door did) ~~(did not)~~ completely stopped at a maximum of 90 degrees.(75°)

Model D8000

When the backcheck valve was then adjusted the closer **[**did**]** ~~**[did not]**~~ have an observable reduction in the door opening speed between 60 degrees and 85 degrees of door opening and the door did) ~~(did not)~~ completely stopped at a maximum of 90 degrees.(68°)

Model D9000

When the backcheck valve was then adjusted the closer **[**did**]** ~~**[did not]**~~ have an observable reduction in the door opening speed between 60 degrees and 85 degrees of door opening and the door did) ~~(did not)~~ completely stopped at a maximum of 90 degrees.(67°)

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STATIC TEST 11: (Models D4000, D8000, D9000) Section 4.12

METHOD

Overload Abuse Test for Surface or Concealed-in-Door closers, 1 and 2 only (PT1 and PT2 only)

The door closer was mounted on the test apparatus, as shown in Fig. 3 of ANSI/BHMA A156.4. The closing time was adjusted from 90 degrees to the closed position to 10 seconds. The test door weight shall be as described in Table 1 of ANSI/BHMA A156.4. The weights were attached to the cable in accordance with Table 2 ANSI/BHMA A156.4.

The door was opened and held to 90 degrees with the cable and weights attached. The door was then released allowing the weights to fall. The falling test weight was arrested when the door was 15 degrees from the closed position. The door was allowed to continue to close under its own momentum until it is arrested by the energy absorbing stop at 5 degrees or the door frame at 0 degrees, or in the case of double action closers, until it stops of its own accord. For Grade 1 (PT1) closers it was cycle 10 times and for Grade 2 (PT2) closers it was cycle 5 times.

RESULTS

Model D4000
The door closer **[**did**]** ~~**[did not]**~~ complete the cycles.

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Model D8000
The door closer **[**did**]** ~~**[did not]**~~ complete the cycles.

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Model D9000

The door closer **[**did**]** ~~**[did not]**~~ complete the cycles.

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INTERMEDIATE CYCLE TEST: (Models D4000, D8000, D9000) Section 5

METHOD

[x] For Surface or Concealed-in-Door Closers with Back check, Grades 1, 2, 3 (PT1, PT2, PT3) and Concealed-in-Floor or Overhead Concealed Closers with Back check, Grades 1, 2, 3 (PT5, PT6, PT7)

1) Both the general and latch speed regulating valves were opened and the closing force was set. The back check valve was opened and tested by the actuating means of the test apparatus pushing the door to the 50 degrees maximum door opening. The actuating means did push with a velocity sufficient to propel the door to a minimum opening angle of 110 degrees with the back check valve fully open.

The back check valve was adjusted to provide an observable reduction in the door opening speed between 60 degrees and 85 degrees of door opening and the door shall be completely stopped at a maximum of 90 degrees. The door closer was cycled as listed below:
[x] For Grade 1 (PT1, PT5), run 100,000 cycles with the back check control functional.

2) Both the general and latch speed regulating valves were opened, the back check control was turned off, and the spring force adjusted. The door was mechanically opened to 90 degrees and release allowing the door closer to close the door. One opening and closing constitutes one cycle. Cycle door with the door closer maintaining control over the door for:
[x] For Grade 1 (PT1, PT5), run 400,000 cycles with back check control disengaged for a total of 504,000 cycles.

INTERMEDIATE CYCLE TEST: (CONT'D) Section 5

RESULTS

Model D4000

The door closer **[**did**]** ~~**[did not]**~~ complete the cycles.

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Model D8000

The door closer **[**did**]** ~~**[did not]**~~ complete the cycles.

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Model D9000

The door closer **[**did**]** ~~**[did not]**~~ complete the cycles.

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Tested by:	David Huang		David Huang	Date	2012-4-24-7-31
	Printed Name		Signature		

Note on Spring Force Adjustment: Once spring force is set, adjust all speed regulating valves for a door closing time from a 90 degree opening to between 3 and 6 seconds. Maintain this time during the cycling by re-regulating if necessary.

INTERIM STATIC TEST: (Models D4000, D8000, D9000) Section 6

METHOD

The following tests were repeated, as applicable to the closer type:

[x] Range of Checking Control (4.2),
[x] Adjustment Through Range of Sizes (4.6),
[x] Door Closer Efficiency (4.7),
[x] Checking Cylinder Test (4.8),
[x] Backcheck Tests (4.9),

RESULTS

[x] Range of Checking Control (4.2):
[x] Surface or Concealed-in-Door Closers, Grade 1 (PT1) and Concealed-in-Floor or Overhead Concealed Closers, Grade 1 (PT5)

Models D4000

The point at which the closing motion of the door essentially stopped ~~[was]~~ **[**was not**]** more than 20° from release point.(10°)

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Models D8000

The point at which the closing motion of the door essentially stopped ~~[was]~~ **[**was not**]** more than 20° from release point.(5°)

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Models D9000

The point at which the closing motion of the door essentially stopped ~~[was]~~ **[**was not**]** more than 20° from release point.(15°)

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[x] Adjustment Through Range of Sizes (4.6)

Models D4000

Test #1 The recorded force **[**was**]** ~~[was not]~~ less than the maximum value specified in Table 1 for the minimum size closer specified by the manufacturer.(10N)

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Test #2 The recorded force **[**was**]** ~~[was not]~~ equal to, or greater than the minimum value specified in Table 1 for the maximum size closer specified by the manufacturer.(66N)

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Models D8000

Test #1 The recorded force [was] ~~[was not]~~ less than the maximum value specified in Table 1 for the minimum size closer specified by the manufacturer.(12N)

Test #2 The recorded force [was] ~~[was not]~~ equal to, or greater than the minimum value specified in Table 1 for the maximum size closer specified by the manufacturer.(69N)

Models D9000

Test #1 The recorded force [was] ~~[was not]~~ less than the maximum value specified in Table 1 for the minimum size closer specified by the manufacturer.(11N)

Test #2 The recorded force [was] ~~[was not]~~ equal to, or greater than the minimum value specified in Table 1 for the maximum size closer specified by the manufacturer.(74N)

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INTERIM STATIC TEST: (CONT'D) Section 6

[x] Door Closer Efficiency (4.7),

	F3	F4	F5	F6	F7	F8
Model D4000	99N	89N	85N	53N	61N	68N
Model D8000	83N	88N	83N	65N	69N	64N
Model D9000	95N	99N	92N	72N	76N	63N

Model D4000

The door closer efficiency **[**was**]** ~~**[**was not**]**~~ a minimum of 50% for sizes I and II and 60% for sizes III through VI.(67%)

Model D8000

The door closer efficiency **[**was**]** ~~**[**was not**]**~~ a minimum of 50% for sizes I and II and 60% for sizes III through VI.(78%)

Model D9000

The door closer efficiency **[**was**]** ~~**[**was not**]**~~ a minimum of 50% for sizes I and II and 60% for sizes III through VI.(74%)

[x] Checking Cylinder Test (4.8),

Model D4000

The time required for the door to fully close ~~**[**was**]**~~ **[**was not**]** less than 8 seconds.(34s)

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Model D8000

The time required for the door to fully close ~~**[**was**]**~~ **[**was not**]** less than 8 seconds.(40s)

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Model D9000

The time required for the door to fully close ~~**[**was**]**~~ **[**was not**]** less than 8 seconds.(212s)

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[x] Backcheck Tests (4.9),
[x] Adjustable Backcheck for Surface or Concealed-in-Door closers, Grades 1 and 2 only (PT1 and PT2 only), Optional (PT4D) and Adjustable Backcheck for Concealed-in-Floor or Overhead Concealed closers, Grades 1 and 2 only (PT5 and PT6 only), Optional (PT8F).

Model D4000

When the backcheck valve was then adjusted the closer **[**did**]** ~~**[did not]**~~ have an observable reduction in the door opening speed between 60 degrees and 85 degrees of door opening and the door did) ~~(did not)~~ completely stopped at a maximum of 90 degrees.(75°)

Model D8000

When the backcheck valve was then adjusted the closer **[**did**]** ~~**[did not]**~~ have an observable reduction in the door opening speed between 60 degrees and 85 degrees of door opening and the door did) ~~(did not)~~ completely stopped at a maximum of 90 degrees.(68°)

Model D9000

When the backcheck valve was then adjusted the closer **[**did**]** ~~**[did not]**~~ have an observable reduction in the door opening speed between 60 degrees and 85 degrees of door opening and the door did) ~~(did not)~~ completely stopped at a maximum of 90 degrees.(67°)

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Tested by: David Huang *David Huang* Date 2012-4-24-7-31

Printed Name Signature

FINAL CYCLE TEST: (Models D4000, D8000, D9000) Section 7

METHOD

[x] For Surface or Concealed-in-Door Closers with Back check, Grades 1, 2, 3 (PT1, PT2, PT3) and Concealed-in-Floor or Overhead Concealed Closers with Backcheck, Grades 1, 2, 3 (PT5, PT6, PT7)

The general and latch speed regulating valves were opened, the back check control was turned off and the spring force was adjusted. The door was mechanically opened to 90 degrees and released, which allowed the door closer to close the door. One opening and closing constitutes one cycle.

[x] For Grade 1 (PT1, PT5), run 996,000 cycles for a total of 1,500,000 cycles.

RESULTS

Models D4000

The door closer **[**did**]** ~~**[did not]**~~ complete the cycles.

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Model D8000

The door closer **[**did**]** ~~**[did not]**~~ complete the cycles.

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Model D9000

The door closer **[**did**]** ~~**[did not]**~~ complete the cycles.

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Tested by: David Huang *David Huang* Date 2012-4-24-7-31

Printed Name Signature

FINAL STATIC TEST: (Models D4000, D8000, D9000) Section 8

METHOD

[x] Range of Checking Control (4.2),
[x] Two speeds of closing control (4.3)
[x] Adjustable Closing Speed (4.4)
[x] Adjustment Through Range of Sizes (4.6),
[x] Door Closer Efficiency (4.7),
[x] Checking Cylinder Test (4.8),
[x] Backcheck Tests (4.9),
[x] Overload Abuse Test for Surface or Concealed-in-Door closers (4.12),

RESULTS

[x] Range of Checking Control (4.2):
[x] Surface or Concealed-in-Door Closers, Grade 1 (PT1) and Concealed-in-Floor or Overhead Concealed Closers, Grade 1 (PT5)

Models D4000

The point at which the closing motion of the door essentially stopped ~~[was]~~ **[**was not**]** more than 20° from release point.(3°)

Model D8000

The point at which the closing motion of the door essentially stopped ~~[was]~~ **[**was not**]** more than 20° from release point.(4°)

Model D9000

The point at which the closing motion of the door essentially stopped ~~[was]~~ **[**was not**]** more than 20° from release point.(15°)

[x] Two speeds of closing control (4.3)
Surface or Concealed-in-Door closers, Grades 1, 2, 3 (PT1, PT2, PT3) and Concealed-in-Floor or Overhead Concealed closers, Grades 1 (PT5).

FINAL STATIC TEST: (CONT'D) Section 8

Model D4000

[x] a) The point at which the door noticeably accelerates **[**was**]** ~~**[**was not**]**~~ between the 12 in. (305 mm) and 2 in. (51 mm) marks.(12°)

Model D8000

[x] a) The point at which the door noticeably accelerates **[**was**]** ~~**[**was not**]**~~ between the 12 in. (305 mm) and 2 in. (51 mm) marks.(15°)

Model D9000

[x] a) The point at which the door noticeably accelerates **[**was**]** ~~**[**was not**]**~~ between the 12 in. (305 mm) and 2 in. (51 mm) marks.(10°)

[x] Adjustable Closing Speed (4.4)

Model D4000

Results #1 The door **[**did**]** ~~**[**did not**]**~~ take 60 seconds or longer to fully close.(197s)

Results #2 The door **[**did**]** ~~**[**did not**]**~~ fully close in 3 seconds or less.(1.35s)

Model D8000

Results #1 The door **[**did**]** ~~**[**did not**]**~~ take 60 seconds or longer to fully close.(84s)

Results #2 The door **[**did**]** ~~**[**did not**]**~~ fully close in 3 seconds or less.(1.20s)

Model D9000

Results #1 The door **[**did**]** ~~**[**did not**]**~~ take 60 seconds or longer to fully close.(128s)

Results #2 The door **[**did**]** ~~**[**did not**]**~~ fully close in 3 seconds or less.(1.20s)

[x] Adjustment Through Range of Sizes (4.6)

Model D4000

Test #1 The recorded force **[**was**]** ~~**[**was not**]**~~ less than the maximum value specified in Table 1 for the minimum size closer specified by the manufacturer.(9N)

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Test #2 The recorded force **[**was**]** ~~**[**was not**]**~~ equal to, or greater than the minimum value specified in Table 1 for the maximum size closer specified by the manufacturer.(64N)

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Model D8000

Test #1 The recorded force [was] ~~[was not]~~ less than the maximum value specified in Table 1 for the minimum size closer specified by the manufacturer.(11N)

Test #2 The recorded force [was] ~~[was not]~~ equal to, or greater than the minimum value specified in Table 1 for the maximum size closer specified by the manufacturer.(68N)

Model D9000

Test #1 The recorded force [was] ~~[was not]~~ less than the maximum value specified in Table 1 for the minimum size closer specified by the manufacturer.(9N)

Test #2 The recorded force [was] ~~[was not]~~ equal to, or greater than the minimum value specified in Table 1 for the maximum size closer specified by the manufacturer.(72N)

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[x] Door Closer Efficiency (4.7),

	F3	F4	F5	F6	F7	F8
Model D4000	93N	85N	80N	56N	63N	65N
Model D8000	82N	85N	82N	65N	69N	67N
Model D9000	85N	92N	85N	68N	71N	62N

Model D4000

The door closer efficiency **[**was**]** ~~**[was not]**~~ a minimum of 50% for size I and II and 60% for sizes III through VI.(71.3%)

Model D8000

The door closer efficiency [was] ~~[was not]~~ a minimum of 50% for size I and II and 60% for sizes III through VI.(80.7%)

Model D9000

The door closer efficiency [was] ~~[was not]~~ a minimum of 50% for size I and II and 60% for sizes III through VI.(76.7%)

[x] Checking Cylinder Test (4.8),

Model D4000

The time required for the door to fully close ~~**[was]**~~ **[**was not**]** less than 8 seconds.(23s)

Model D8000

The time required for the door to fully close ~~**[was]**~~ **[**was not**]** less than 8 seconds.(24s)

Model D9000

The time required for the door to fully close ~~**[was]**~~ **[**was not**]** less than 8 seconds.(47s)

[x] Backcheck Tests (4.9),
[x] Adjustable Backcheck for Surface or Concealed-in-Door closers, Grades 1 and 2 only (PT1 and PT2 only), Optional (PT4D) and Adjustable Backcheck for Concealed-in-Floor or Overhead Concealed closers, Grades 1 and 2 only (PT5 and PT6 only), Optional (PT8F).

Model D4000

When the backcheck valve was then adjusted the closer **[**did**]** ~~**[did not]**~~ have an observable reduction in the door opening speed between 60 degrees and 85 degrees of door opening and the door did) ~~(did not)~~ completely stopped at a maximum of 90 degrees.(75°)

Model D8000

When the backcheck valve was then adjusted the closer **[**did**]** ~~**[did not]**~~ have an observable reduction in the door opening speed between 60 degrees and 85 degrees of door opening and the door did) ~~(did not)~~ completely stopped at a maximum of 90 degrees.(66°)

Model D9000

When the backcheck valve was then adjusted the closer **[**did**]** ~~**[did not]**~~ have an observable reduction in the door opening speed between 60 degrees and 85 degrees of door opening and the door did) ~~(did not)~~ completely stopped at a maximum of 90 degrees.(67°)

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FINAL STATIC TEST: (CONT'D) Section 8

[x] Overload Abuse Test for Surface or Concealed-in-Door closers (4.12)

Model D4000

The door closer **[**did**]** ~~**[did not]**~~ complete the cycles.

Model D8000

The door closer **[**did**]** ~~**[did not]**~~ complete the cycles.

Model D9000

The door closer **[**did**]** ~~**[did not]**~~ complete the cycles.

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