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EN 1154:1997 / A1:2002



ASSESSMENT OF :

ARCTEK R500 FIXED STRENGTH CONCEALED DOUBLE ACTION CONTROLLED DOOR CLOSING DEVICES.

A Report To: ARCTEK (Shanghai) International Co.,Ltd Room 105, No. 7 Lane 98 Danba Road Putuo District Shanghai China 200062 PC

Document Reference: WIL 320907





Registered Office: Exova (UK) Ltd, Lochend Industrial Estate, Newbridge, Midlothian EH28 8PL United Kingdom. Reg No.SC 70429 This report in issued in accordance with our terms and conditions, a copy of which is available on request. Date: 17 August 2012

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TEST CONCLUSIONS

Samples of:

Supplied by : ARCTEK (Shanghai) International Co.,Ltd.

Product : Transom mounted concealed door closer.

Model : ARCTEK R500

have been tested in accordance with:

BSEN 1154: 1997./ A1:2002 (Building hardware - Controlled door closing devices.)

By Exova Warringtonfire [A UKAS accredited Testing Laboratory (No. 0621) and EC Notified Body number 1104]

At Key Industrial Park, Fernside Rd., Willenhall. West Midlands. WV13 3YA.

Results and comments as detailed below:

Results as detaile	d below:	
Clause No.	Description	Complience
5.1	Product information instructions shall contain	Yes
5.1.1	Instructions for installation, regulation and maintenance	Yes
5.1.1	details of Limitation of opening angle	Yes
5.1.2	Power sizes for non-standard applications	Yes
5.2	Performance requirements	Yes
5.2.2	Durability	Yes
5.2.3	Closing moment after 5000 cycles and 500 000 cycles	Yes
5.2.4	Opening moment after 5000 cycles	Yes
5.2.5	Efficiency after 5000 cycles and 500 000 cycles	Yes
5.2.6	Max & min closing time after 5000 & 500 000 cycles	Yes
5.2.6	Change of closing time 5000 cycles to 500 000 cycles	Yes
5.2.7	Angles of operation	Yes
5.2.8	Overload performance at 5000 cycles & 500 000 cycles	Yes
5.2.8	Overload performance for delayed action closers	N/a
5.2.9	Temperature dependence	Yes
5.2.10	Fluid leakage	Yes
5.2.11	Damage	Yes
5.2.12	Latch control (optional)	Yes
5.2.13	Backcheck (optional)	N/a
5.2.14	Delayed closing (optional)	N/a
5.2.15	Adjustable closing force (optional)	N/a
5.2.16	Zero position (double action closers only)	Yes
5.2.17	Corrosion resistance	Yes
5.2.18	Additional requirements for fire door closers	NO
8	Marking.	Yes

#: Needs amending.

No inferences can be made regarding performance against other requirements of this standard

Tests marked "NA" are not applicable to the type of device under test. Tests marked "NT" cannot be applied to the type of device under test

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ARCTEK (Shanghai)

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AUTHORISATION

Tests performed by	: Steve Wilkes, Deputy Operations Manager
Report issued by: S Signed : Source Date : 17 August 20 For and on behalf o	Steve Wilkes, Deputy Operations Manager
Report authorised b Signed : Date : 17 August 20 For and on behalf o Report issued: 17 /	by: Ian Keeling, Business Unit Manager 012 f Exova Warringtonfire August 2012
U KAS U KAS TESTING 0621	NOTE. Tests marked "Not UKAS Accredited" are not covered by the Laboratory UKAS accreditation schedule. Tests marked NT were not tested Tests marked NA are not applicable to the product on test. The laboratory has tested the products supplied by the client as sampled in accordance with their own requirements
Exova Warringtonf	ire is an EC Notified Body Number 1104

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EXOVA Warringtonfire

TEST DETAILS

CLIENT DETAILS Company name Address	ARCTEK (Shanghai) International Co.,Ltd Room 105, No.7 Lane 98 Danba Road Putuo District Shanghai China 200062 PC	
Contact	Ken Hsu	
ORDER DETAILS Order number Dated	Supplied by WCL 30/07/12	
SAMPLE DETAILS Product Models Markings Supplied by Date of Manufacture Other information	Transom mounted concealed double action door closer. ARCTEK R500 Written confirmation received ARCTEK (Shanghai) International Co.,Ltd Written confirmation received None	
<u>TEST DETAILS</u> Test specification Full test Test to clauses Corrosion resistance	BSEN 1154: 1997 – controlled door closing devices Based on a full test Assessment based on a full test Grade 3 (96hrs)	
Date sample received Date test started Date test completed	03/09/09 04/09/09 12 January 2010	
Special Test requirements Other reports to be used in conjunction with this report Closer type:	EN 1154 Assessment 186746	
backcheck Delay	Back check Not possible Delayed action Not possible	
Arm configuration: Mounting:	Straps Concealed in transom	
STANDARD REQUIREMENTS Test door mass: No of cycles: Closing torque 0 - 4°: 88 - 92°: any angle: Opening torque 0 - 60°: Efficiency 0 - 4°:	40Kg 500,000 cycles 13-18Nm 4Nm 3Nm 36Nm 50%	

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INITIAL OBSERVATIONS

Definitions, Clause 3.1, controlled door closing device must contain all parts necessary for installation and operation.

This sample of door closing device contained:-

· · · · · · · · · · · · · · · · · · ·	Supplied	Details
Body	YES	R500 body supplied
Arms	NO	N/a
Fixing brackets	YES	Closer bracket supplied
Shoes or straps	YES	Straps supplied
Top centres	NO	N/a
Floor pivots	YES	Bottom pivot supplied
Fixing screws	YES	Wood & machine screws supplied
Covers	YES	Cover plate
Special tools	NO	Not supplied

Clause 5.1: Requirements with regard to product information

Device must be supplied with instructions which must contain the following:-

	Supplied	Details
Clear fixing instructions.	YES	Clear fixing instructions supplied
Instructions for regulation.	YES	Regulation instructions shown
Instructions for maintenance.	YES	Written confirmation received
Limitations of opening angle.	YES	Written confirmation received
Details of closer power for each	YES	Written confirmation received
application and fixing position.		

Clause 8 Requirements for marking of closing devices and accessories.

Every closer and accessory must be marked with:-

	Marked	Details
Manufacturers name or trademark or	YES	Written confirmation received
other means of identification.		
Product model identification.	YES	Written confirmation received
Standard number	YES	Written confirmation received
Week and year of manufacture.	YES	Written confirmation received

Every closer must be marked with Classification according to clause 4:-

Category	Number of test	Test door mass	Fire	Safety	Corrosion
	cycles		resistance		resistance
3	8	2	0	1	3
	Written	Confirmation	Received		

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TEST RESULTS

SAMPLE A

Clause 7.2 General Requirements and operation at extremes of temperature

Clause 5.1 - Product information - see Page 6

Clause 8 - Marking - see Page 6

Clause 5.2.12 –Latch angle (optional). If incorporated must be effective over a maximum range of 15° and shall be adjustable.

	Double action	Double action	P = Pass
	clockwise closing	anticlockwise closing	F = Fail
Sample "A"	10°	11°	Р

CLAUSE 5.2.18. Additional requirements for closers intended for fire or smoke doors.

Requirement	Test information	P = Pass
		F = Fail
Capable of closing door from any angle to which it may open	120°	Р
Size 1 and 2 closers not permitted	Size 2	Р
Adjustable closers must be adjustable up to size 3		
No hold open unless electrically powered.	No hold open	Р
Regulators must be either concealed or operated by a tool	Tool operable	Р
It must not be possible to inhibit closing action without use if a	Not possible	Р
tool.		
Delayed action closers must be capable of adjustment to	N/a	N/a
<120 secs from 120°		
Must have been subjected to a fire / smoke test	Size 2	N/a

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Closer	Conditioning	Test	Measured cl	osing time -	seconds		P = Pass
temperature	time (8 hours)	requirement		0			F = Fail
minimum 1 2		2	3	average			
Sample "A." closer - Size 2 Test door mas			s 40 Kg				
+20°C	8hrs	set to 5 secs	4.97	4.97	4.99	4.98	Р
-15°C	16hrs	3 secs min	18.50	17.93	18.00	18.14	Р
+40°C	8hrs	25 secs max	2.93	3.02	3.07	3.01	Р

CLAUSE 7.2.2 Operation at extremes of temperature.

Closer condition after thermal compensation test: : Satisfactory.

CLAUSE 7.2.3 Initial Zero position performance

	pointer position with	pointer position with	Difference in positions	P = Pass
	clockwise torque of	anticlockwise torque	= Free play	F = Fail
	5 Nm	of 5 Nm	(3 mm maximum)	
Sample "A."	1.24mm	0.94mm	0.30mm	Р

Closer condition after Zero position test: Satisfactory.

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SAMPLE B

Clause 7.3 Mechanical performance and durability

Operating angle and test settings.

	Test requirement	Test result	P = Pass F =Fail
Closer strength - size 2	Test door mass 40 Kg.	40Kg	Р
Maximum opening angle	105° grade 3, 180° grade 4	120°	Р
Door closes from	105° grade 3, 180° grade 4	120°	Р
Door under control from	70° minimum	109°	Р
Set closing time 90° to 0° clockwise closing	3 - 7 secs	5.01 secs	Р
Set closing time 90° to 0° anticlockwise closing	3 - 7 secs	5.01 secs	Р
Set opening time 0 - 90° clockwise opening.	2 - 3 secs	2.61secs.	Р
Set opening time 0 - 90° anticlockwise opening	2 - 3secs	2.61secs.	Р

Closer cycled for 5000 cycles

Observations on initial cycling of closer up to 5000 cycles:- Satisfactory.

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Specification	Requirement	Test result	Test result	P = Pass
				F =Fail
		Clockwise	Anticlockwise	
		closing	closing	
Cycles completed	5,000	2,500	2,500	Р
Ambient temp.	15 - 30° C	23.1°C	22.4°C	Р
Closer temp	Within 2° of ambient	22.9°C	22.1°C	Р
Opening moment.	Max opening torque	22.52Nm	22.11Nm	N/a
(ave of 3 tests)	0 - 4°			
Closer size 2	Max opening torque	24.72Nm	24.39Nm	Р
	0 - 60° < 36Nm			
	Max opening torque	24.49Nm	24.01Nm	N/a
Closing moment.	88 - 92°			
(ave of 3 tests)	Max closing moment 0 - 4°	14.44Nm	17.26Nm	Р
Closer size 2	> = 13 < 18Nm			
	Max closing torque 88 - 92°	13.63Nm	14.12Nm	Р
	> = 4Nm			
	Minimum closing torque at any angle	4.21Nm	6.29Nm	Р
	> 3Nm			
Efficiency	Size 2 closer min value 50%	64%	78%	Р
Closing time	Min < = 3 secs.	2.54secs	2.51secs	Р
	Max > = 20 secs.	2mins to 23	2mins to 21	
Closing overload	Abuse weight	18kg	18kg	
test	Closing time 90° - 0° set to 10 secs.	10.02secs.	10.02secs.	Р
	Overload abuse weight arrest at 15°	15°	15°	
	10 abuse tests performed	10 Performed	10 Performed	

Clause 7.3.4 Tests after 5000 cycles

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Specification	Requirement	Test result	P = Pass
			F = Fail
Delayed action	Delay time set to 20 secs,		
closers only	Dwell time set to 270 secs		N/a
-	Perform 500 cycles		
	Delay time for last 5 cycles 10s – 30 s		
Closing time (CC)	Closing time 90° - 0° set to 3 -7 secs	3.97 secs	Р
Closing time (ACC)	Closing time 90° - 0° set to 3 -7 secs	4.07 secs	Р
Backcheck	Open to 110°		N/a
	Arrest angle < 80°		
Backcheck closers cycle up to 100,000 cycles with backcheck			N/a
as set.			
Backcheck	Arrest angle < 90°		N/a
Backcheck closers cycle from 100,000 cycles to 500,000			N/a
without backcheck			
Nonbackcheck closers cycle from 5000 cycles to 500,000		500,000 cycles	P
cycles			

Continued cycling 5000 cycles to 500,000 cycles

Observations on cycling of closer from 5000 cycles to 500,000 cycles:- Satisfactory.

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Specification	Requirement	Test result	Test result	P = Pass
				F =Fail
		Clockwise	Anticlockwise	
		closing	closing	
Cycles completed	500,000	250,000	250,000	Р
Ambient temp.	15 - 30° C	22.7°C	22.6°C	Р
Closer temp	Within 2° of original ambient.	22.4°C	22.5°C	Р
Closing time	< 2* original > 0.7* original	3.97secs.	4.07secs.	Р
Closer temp	Max opening torque	21.83Nm	23.30Nm	N/a
Opening moment.	0 - 4°			
(ave of 3 tests)	Max opening torque	23.42Nm	24.16Nm	Р
Closer size 2	0 - 60° < 36Nm			
	Max opening torque	24.11Nm	23.78Nm	N/a
	88 - 92°			
	Max closing moment 0 - 4°	15.71Nm	16.57Nm	Р
Closing moment.	> = 13 < 18Nm			
(ave of 3 tests)	Max closing torque 88 - 92°	14.37Nm	13.88Nm	Р
Closer size 2	> = 4Nm			
	Minimum closing torque at any angle	5.56Nm	5.68Nm	Р
	> 3Nm			
Efficiency	Size 2 closer min value 50%	72%	71%	Р
Closing time	Min < = 3 secs.	2 mins to 17.	2 mins to 23.	Р
-	Max > = 20 secs.	2.69secs.	2.59secs.	
Closing overload	Abuse weight	18kg	18kg	
test	Closing time 90° - 0° set to 10 secs.	10.09secs.	10.09secs.	Р
	Overload abuse weight arrest at 15°	15°	15°	
	10 abuse tests performed	10 Performed	10 Performed	

Clause 7.3.4 tests after 500,000 cycles

Zero position performance

Pointer position with clockwise torque of 5Nm	Pointer position with anticlockwise torque of 5Nm	Difference in positions = Free play maximum 6 mm	P = Pass F = Fail
1.86mm	0.47mm	1.39mm	Р

Observations on cycling of closer from 5000 cycles to 500,000 cycles:- Satisfactory.

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Specification	Requirement	Test result	Test result	P = Pass
				F =Fail
		Clockwise	Anticlockwise	
		closing	closing	
Sample "C"	Size 2			
Ambient temp.	15 - 30° C	20.4°C	21.3°C	Р
Closer temp	Within 2° of original ambient.	20.1°C	21.4°C	Р
Closer temp	Max closing moment 0 - 4°	15.49Nm	15.25Nm	N/a
Closing moment.	> = 13 < 18Nm			
(ave of 3 tests)	Max closing torque 88 - 92°	14.38Nm	13.36Nm	N/a
Closer size 2	> = 4Nm			
	Minimum closing torque at any angle	5.34Nm	4.22Nm	N/a
	> 3Nm			
Grade of corrosion resistance	Exposure time	96hrs	(Grade 3)	Р
Ambient temp.	15 - 30° C	21.4°C	21.3°C	Р
Closer temp	Within 2° of original ambient.	21.0°C	21.3°C	Р
Closer temp	Max closing moment 0 - 4° > 80% of	16.05Nm	15.95Nm	Р
Closing moment.	above	(104%)	(105%)	
(ave of 3 tests)	Max closing torque 88 - 92°> 80%	14.03Nm	14.14Nm	Р
Closer size 2	of above	(98%)	(106%)	
	Minimum closing torque at any	5.02Nm	4.28Nm	Р
	angle> 80% of above	(94%)	(101%)	

Clause 7.4 Sample "C" Corrosion resistance tests

Details of any Visual corrosion or damage during test : Satisfactory.

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OBSERVATIONS AND COMMENTS

All of the test evidence contained in this report has been assessed from a previously tested identical transom mount concealed door closer under test ref 186746, it is therefore our opinion that the ARCTEK R500 Transom mounted concealed double action door closer also complies with the requirements of BS EN 1154.

NOTE : As the door closer is power size 2 and there is no fire test evidence, this door closer is not suitable for use on fire doors.

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REVISION HISTORY

Issue No : 2	Re - Issue Date : 16 August 2012	
Revised By: S Wilkes	Approved By: I Keeling	
Reason for Revision: Amendments required by client.		

Issue No :	Re - Issue Date :
Revised By:	Approved By:
Reason for Revision:	

----- END OF REPORT -----

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