



LCIE

Laboratoire Central des Industries Electriques

Une société de Bureau Veritas

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EQUIPMENT FOR USE IN EXPLOSIVE ATMOSPHERES EVALUATION REPORT N° 118327-636261

☒ **ATEX**☒ **Equipment**☐ **Component**

- ☒ For EC type examination certificate application (Annex III)
- ☐ For supplementary EC type examination certificate application (Annex III)
- ☐ For unit verification conformity certificate application (Annex IX)
- ☐ For voluntary type examination certificate application
- ☐ For supplementary voluntary type examination certificate application

☐ **IECEx**☐ **Equipment**☐ **Component**

- ☐ For certificate of conformity application
- ☐ For supplementary certificate of conformity application

ExTR reference N°

Standard(s) EN (year)

EN 60079-0: 2009	EN 60079-31: 2009
EN 60079-1: 2007	
EN 60079-7: 2007	

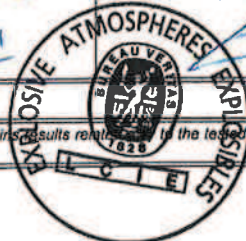
Standard(s) IEC (Edition)

	Certification Body (ExCB)	Testing Laboratory (ExTL)
Name	LCIE	LCIE
Address	33, Avenue du General Leclerc 92260 Fontenay-aux-Roses / FRANCE	33, Avenue du General Leclerc 92260 Fontenay-aux-Roses / FRANCE

	Applicant	Manufacturer
Name	BUREAU VERITAS CHINE	SHENZHEN KHJ SEMICONDUCTOR CO., LTD
Address	8/F Building N°8 Pudong Lujiazui Software Park, N°120, Lane 91, E. Shan Road 200127 SHANGAI P.R. CHINA	4-5 Floor, Building 7, HuangBeiJingXuan Industrial park, No.2 Dong Huan Rd, Yousong, LongHua town, Bao'an District, Shenzhen, China

	ExTL		ExCB
	Compiled by	Reviewed by	Approved by (Conformity Assessment officer)
Name	Jean-Yves JAMMES	Pablo SANTOS ALVAREZ	H. Equi
Date	2013/03/19	2013/03/20	2013/03/20
Signature			

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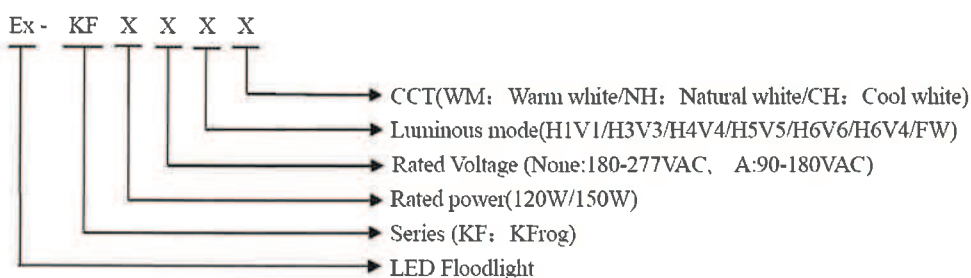




Report n° : 118327-636261

Applicant : BUREAU VERITAS CHINE
Product range : LED Floodlight
Type : Ex-KFXXXX*

General product information



1. * :
2. The LED floodlights are composed of a light source compartment, a power driving board compartment, a terminal compartment. The light source compartment and the power driving board compartment are protected by "d". The terminal compartment is protected by "e". Bushings are used between the light source part and the power pack part, and between the power pack part and the terminal part. A terminal is installed in the terminal part, a LED driving circuit board is installed in the power driving board compartment.
3. The LED floodlight whose rated power is 120W and 150W are chosen as represent samples. The rated voltage of LED floodlights is 277VAC.
4. Model implication refer to manual.
5. The main data list are as following :

Rated Voltage	Power Rated	Ta	Temperature Class		IP Code
			Gas	Dust	
90 - 180 VAC	120 W	-40°C ~ +55°C	T6	T80°C	IP 66
180 - 277 VAC	150 W	-40°C ~ +55°C	T5	T95°C	

No.	Parameters	Data	Unit	Remark
1	Rated voltage	90~277	VAC	
2	Frequency	50/60	Hz	
3	Power	120/150	W	
4	Illumination	>10	Lx	3M
5	Size	Φ410×168	mm	
6	Weight	15.5	Kg	



Report n° : 118327-636261

Applicant : BUREAU VERITAS CHINE
Product range : LED Floodlight
Type : Ex-KFXXXX*


Revision history

Initial issue : No history; initial issue based on PCEC ExTR n° PCEC/TR13002

Test item description : LED Floodlight
Trademark : KHJ SEMICONDUCTOR
Type : Ex-KFXXXX*

Tests not performed by the ExTL (sub-contracting and/or Test Results Acceptance)

PCEC performed all the tests of the ExTR.

Marking	ATEX	IECEx
	<p>SHENZHEN KHJ SEMICONDUCTOR LIGHTING CO., LTD Address : ... Type : Ex-KFXXXX* Serial number : ... Year of construction : ...</p> <p> II 2 GD Ex d e IIB T5 or T6 Gb Ex tb IIIC T95°C or T80°C Db IP66</p> <p>LCIE 13 ATEX 3xxx X WARNING – DO NOT OPEN WHEN ENERGIZED WARNING – AFTER DE-ENERGIZING, DELAY 10 MINUTES BEFORE OPENING</p>	
Rating(s)	<p>Rated voltage : 180- 277 (VAC) or 90-180 (VAC) Power : 120 (W) or 150 (W) Frequency : 50 (Hz) / 60 (Hz)</p>	

Classification of installation and use : Fixed
Ingress protection : IP66
Rated ambient temperature range (°C) : -40°C ≤ Tamb ≤ +55°C

Manufacturer's documents

Title	Reference	Revision	Date
TECHNICAL FILE	TF-KFrog-ATEX	00	2012.11.20

	Report n° : 118327-636261	
	Applicant	BUREAU VERITAS CHINE
	Product range	LED Floodlight
	Type	Ex-KFXXXX*

Assessment

The following ExTR issued by the PCEC have been submitted to LCIE:

PCEC/TR 13002 – IECEx Test report cover – 4 pages
PCEC/TR 13002 – IECEx Test report according to IEC 60079-0 – 16 pages
PCEC/TR 13002 – IECEx Test report according to IEC 60079-1 – 14 pages
PCEC/TR 13002 – IECEx Test report according to IEC 60079-7 – 14 pages
PCEC/TR 13002 – IECEx Test report according to IEC 60079-31 – 3 pages

These reports have been reviewed and have led to several remarks and modification demands.

Some precisions are added below:

Threaded joints :

Joint between the bushing (see drawing 110702-07) and the Housing (see drawing 110702-01)
Size = M12x1

Reference pressure :

The reference pressure of the light source compartment has been measured at 422 kPa
The reference pressure of the power driving board has been measured at 586 kPa
Moreover the overpressure test has been realized at a value lower than 4 times the reference pressure of each compartment.
Routine tests are needed.

Further to the modification brought by the PCEC on the reports, the LCIE accepts the ExTR and test results of the PCEC.

Conclusions :

The results show that the Ex-KFXXXX LED Floodlights comply with the requirements of standards :
EN 60079-0:2009,
EN 60079-1:2007.
EN 60079-7: 2007
EN 60079-31: 2009

The complete IECEx test report N°PCEC/TR13002 is available in annex A.

	Report n° : 118327-636261	
	Applicant	BUREAU VERITAS CHINE
	Product range	LED Floodlight
	Type	Ex-KFXXXX*

Annex A

IECE_x TEST REPORT PCEC/TR13002



IECEX TEST REPORT COVER

ExTR Reference Number..... :	
ExTR Free Reference Number :	PCEC/TR13002
Compiled by + signature (ExTL).... :	An Penghui <i>An Penghui</i>
Reviewed by + signature (ExTL)... :	Xu Jianwen <i>Xu Jianwen</i>
Approved by + signature (ExCB)... :	
Date of issue :	
Ex Testing Laboratory (ExTL) :	Supervision & Test Center of Ex-products of China Petroleum & Chemical Industry
Address..... :	No 85, No. 3 Rd, Dingzigu, Hongqiao District, Tianjin, 300131, P.R.China
Ex Certification Body (ExCB) :	
Address..... :	
Applicant's name :	SHENZHEN KHJ SEMICONDUCTOR LIGHTING CO., LTD
Address..... :	4-5 Floor, Building 7, HuangBeiLingJingXuan Industrial park, No.2 Dong Huan Rd, Yousong, LongHua town, Bao'an District, Shenzhen, China.
Standards associated with this ExTR package :	IEC 60079-0:2007; IEC 60079-1:2007; IEC 60079-7:2006; IEC 60079-31:2008
Clauses considered :	All clauses considered
Test procedure :	IECEX System
Test Report Form Number :	ExTR Cover_4 (released 2010-12)
Test item description..... :	LED Floodlight
Model/type reference :	Ex-KFrog series
Code (e.g. Ex _ II _ T _)..... :	Ex d e IIB T5 or T6 Gb; Ex tb IIIC T95°C or T80°C Db IP66
Rating..... :	Rated voltage: 180~277VAC, 90~180VAC; Light source and rated power: LED120W, LED150W.
All testing fully performed by ExTL Yes. staff at ExTL address above:	
Instructions for Intended Use of ExTR Cover: An ExTR Cover is the sole top-level document to associate together all other parts of an IECEx Test Report (ExTR) package. An ExTR package is comprised of an ExTR Cover and one or more associated ExTR documents (which may include Ex Test Reports, ExTR Addendums and ExTR of National Differences). All ExTR package documents are compiled and reviewed by the ExTL. The Issuing ExCB indicates final approval of the overall ExTR package on this ExTR Cover.	
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Manufacturer's name.....: SHENZHEN KHJ SEMICONDUCTOR LIGHTING CO., LTD
 Address.....: 4-5 Floor, Building 7, HuangBeiLingJingXuan Industrial park, No.2
 Dong Huan Rd, Yousong, LongHua town, Bao'an
 District, Shenzhen, China.

Trademark.....:

Particulars: Test item vs. Test requirements

Classification of installation and use.....: stationary
 Ingress protection: IP66
 Rated ambient temperature range (°C): -40°C~+55°C
 Rated service temperature range (°C) for Ex Components.....: /

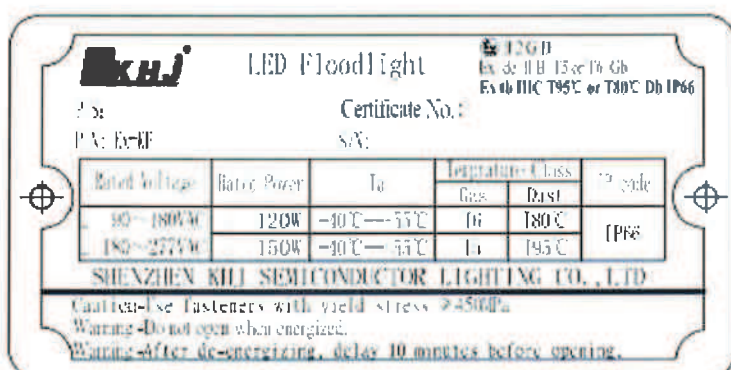
General remarks:

The test results presented in this ExTR package relate only to the item or product tested.

- "(see Attachment #)" refers to additional information appended to the ExTR package.
- "(see appended table)" refers to a table appended to the ExTR package.
- Throughout this ExTR package, a point is used as the decimal separator.
- *Where the term "N/A" appears in any part of an ExTR package, it indicates that the associated issue was considered "Not applicable" to the involved evaluation.*
- *In accordance with IECEx 02, a Receiving ExCB may request a sample of the Ex equipment and copies of the documentation referred to in an ExTR Cover.*

The technical content of this ExTR package shall not be reproduced except in full without the written approval of the Issuing ExCB and ExTL.

Copy of Marking Plate:



Nameplate



Sample

General product information:

1. The LED floodlights are composed of a light source compartment, a power driving board compartment, a terminal compartment. The light source compartment and the power driving board compartment are protected by "d". The terminal compartment is protected by "e". Bushings are used between the light source part and the power pack part, and between the power pack part and the terminal part. A terminal is installed in the terminal part, a LED driving circuit board is installed in the power driving board compartment.
2. The LED floodlight whose rated power is 120W and 150W are chosen as represent samples. The rated voltage of LED floodlights is 277VAC.
3. Model implication refer to manual.
4. The main data list are as following:

Rated Voltage	Rated Power	Ta	Temperature Class		IP code
			Gas	Dust	
<input type="checkbox"/> 90~180VAC	<input type="checkbox"/> 120W	-40℃ ~+55℃	T6	T80℃	IP66
<input type="checkbox"/> 180~277VAC	<input type="checkbox"/> 150W	-40℃ ~+55℃	T5	T95℃	

In accordance with OD 024, testing not fully performed by ExTL staff at the above ExTL address:
N/A

National differences considered as part of this evaluation, if any:
N/A

"Conditions of Use" for Ex Equipment or "Schedule of Limitations" for Ex Components, if any:

1. Repair of the flameproof joints must be made in compliance with the structural specifications provided by the manufacturer. Repairs must not be made on the basis of values specified in tables 1 and tables 3 of IEC 60079-1.
2. The assembly should be equipped with suitably certified cable glands with a compatible mode of protection for the intended use. The unused holes should be closed by suitably certified plugs.
3. The LED floodlights shall be mounted only in accordance with manufacture's instruction.
4. Warning: Do not open when energized.
5. Warning: After de-energizing, delay 10 minutes before opening.

Routine tests, if any:

1. Static pressure test is conducted according to Clause 16.1 of IEC 60079-1:2007;
2. Power-frequency withstand voltage test is conducted according to Clause 7.1 of IEC 60079-7:2006.

Manufacturer's Documents			
Title:	Drawing No.:	Rev. Level:	Date:
Assembly drawing of Ex – KFrog series LED floodlight	110702-00-ATEX	A	2012.9.20
Nameplate	110702-M06	A	2012.9.16
Explosion-proof sign nameplate	110702-M07	A	2012.9.16
Warning signs nameplate	111003-M03	A	2012.9.16
Housing	110702-01	A	2011.12.7
Cover	110702-02	A	2011.12.7
Light-transmitting parts	110702-03	A	2011.12.7
Cover sealing ring	110702-04	A	2012.2.16
Side cover sealing ring	110702-05	A	2012.2.16
Ring plug	110702-06	A	2012.2.16
Inserts	110702-07	A	2011.11.10
Driver frame	110702-08	A	2011.12.07
Reflector washer	110702-09	A	2011.12.7
Rubber pad	110601-13	A	2011.11.10
Cable tablet	110601-17	A	2011.11.10
Terminal	110601-18	B	2011.11.10
Brass gasket of terminal	110601-19	A	2011.11.10
Inserts cover	110601-24	B	2011.11.10
Combination screw	110601-34	A	2011.11.10
Side cover	110602-03	C	2012.2.16
Clamping washer	110602-04	A	2011.11.10
H5V5 reflector	111003-04	A	2011.11.02



IECEx TEST REPORT
IEC 60079
Electrical equipment for explosive gas atmospheres
Part 0: General requirements

ExTR Reference Number..... :

ExTR Free Reference Number : PCEC/TR13002

Complied by + signature (ExTL).... : An Penghui

An Penghui

Reviewed by + signature (ExTL) ... : Xu Jianwen

Xu Jianwen

Date of issue : Jan. 8, 2013

Ex Testing Laboratory (ExTL) : Supervision & Test Center of Ex-products of China Petroleum & Chemical Industry

Address : No 85, No. 3 Rd, Dingzigu, Hongqiao District, Tianjin, 300131, P.R. China

Applicant's name : SHENZHEN KHJ SEMICONDUCTOR LIGHTING CO., LTD

Address : 4-5 Floor, Building 7, HuangBeiLingJingXuan Industrial park, No.2 Dong Huan Rd, Yousong, LongHua town, Bao'an District, Shenzhen, China.

Standard : IEC 60079-0:2007, Fifth edition

Test procedure : IECEx Scheme

Test Report Form No. : ExTR60079-0_5A

TRF Originator..... : Underwriters Laboratories

Master TRF : dated 2007-11

Instructions for Intended Use of Ex Test Report:

This ExTR blank document is to be compiled and reviewed by the ExTL. The ExTR package in which this ExTR is incorporated (comprised of a single ExTR document or multiple ExTR documents) is to be accompanied by a single ExTR Cover Sheet, which is to be approved by the ExCB. ExTR Addendum(s) and/or ExTR Report of National Differences may also supplement this ExTR.

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Possible test case verdicts:

- test case does not apply to the test object : N / A

- test object does meet the requirement : Pass

General remarks:

The tests results presented in this report relate only to the object tested.

This report shall not be reproduced except in full without the written approval of the testing laboratory.

"(see Attachment #)" refers to additional information appended to the report.

"(see appended table)" refers to a table appended to the report.

Throughout this report a point is used as the decimal separator.

IEC 60079-0																	
Clause	Requirement – Test	Result – Remark	Verdict														
1	SCOPE																
2	NORMATIVE REFERENCES																
3	TERMS AND DEFINITIONS																
4	APPARATUS GROUPING AND TEMPERATURE CLASSIFICATION																
4.1	Group I	IIB T5 or T6; IIIC T95°C or T80°C	N/A														
4.2	Group II	IIB T5 or T6	Pass														
4.3	Group III	IIIC T95°C or T80°C	Pass														
4.4	Equipment for a particular explosive atmosphere	Not equipment for a particular explosive atmosphere	N/A														
5	TEMPERATURES																
5.1	Environmental influences		Pass														
5.1.1	Ambient temperatures	The ambient temperature is -40°C~+55°C.	Pass														
5.1.2	External source of heating or cooling	No external heating and cooling sources	N/A														
5.2	Service temperature	Using maximum surface temperature instead of maximum service temperature is approved by the manufacturer. See clause 26.5.1.3.	Pass														
5.3	Maximum surface temperature		Pass														
5.3.1	Determination of maximum surface temperature	Refer to Cl. 26.5.1 in test report IEC60079-0 for determination of maximum surface temperature.	Pass														
5.3.2	Limitation of maximum surface temperature	<table border="1"> <thead> <tr> <th rowspan="2">Rated Voltage</th><th rowspan="2">Rated Power</th><th colspan="2">Temperature Class</th></tr> <tr> <th>Gas</th><th>Dust</th></tr> </thead> <tbody> <tr> <td><input type="checkbox"/> 90~180VAC</td><td><input type="checkbox"/> 120W</td><td>T6</td><td>T80°C</td></tr> <tr> <td><input type="checkbox"/> 180~277VAC</td><td><input type="checkbox"/> 150W</td><td>T5</td><td>T95°C</td></tr> </tbody> </table>	Rated Voltage	Rated Power	Temperature Class		Gas	Dust	<input type="checkbox"/> 90~180VAC	<input type="checkbox"/> 120W	T6	T80°C	<input type="checkbox"/> 180~277VAC	<input type="checkbox"/> 150W	T5	T95°C	Pass
Rated Voltage	Rated Power	Temperature Class															
		Gas	Dust														
<input type="checkbox"/> 90~180VAC	<input type="checkbox"/> 120W	T6	T80°C														
<input type="checkbox"/> 180~277VAC	<input type="checkbox"/> 150W	T5	T95°C														
5.3.2.1	Group I electrical equipment	This product does not belong to group I.	N/A														
5.3.2.2	Group II electrical equipment	Refer to Cl. 26.5.1 in test report IEC60079-0. T5 or T6	Pass														
5.3.2.3	Group III electrical equipment		Pass														
5.3.2.3.1	Maximum surface temperature determined without a dust layer	Refer to Cl. 26.5.1 in test report IEC60079-0. T95°C or T80°C	Pass														
5.3.2.3.2	Maximum surface temperature with respect to dust layers	Refer to Cl.5.3.2.3.1 of IEC60079-0	N/A														

IEC 60079-0			
Clause	Requirement – Test	Result – Remark	Verdict
5.3.3	Small component temperature for Group I or Group II electrical equipment	No small component.	N/A

6	REQUIREMENTS FOR ALL ELECTRICAL EQUIPMENT		
6.1	General	Ex-KFrog LED floodlight complies with the relevant requirements of IEC 60079-0, IEC 60079-1, IEC 60079-7 and IEC 60079-31.	Pass

6.2	Mechanical strength of equipment	Ex-KFrog LED floodlight was submitted to the tests in Cl.26.4.	Pass
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6.3	Opening times	After 10 minutes the temperature of the hot components is decreased to below the temperature class. An opening delay marking is printed in the nameplate. See IEC 60079-0 clause 29.11.	Pass
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6.4	Circulating currents	The Ex-KFrog LED floodlight can not generate circulating currents.	N/A
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6.5	Gasket retention	1 cover sealing ring, 2 the side cover sealings rings and 1 rubber o-ring are installed in grooves of cover, side cover, and rings plug.	Pass
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6.6	Electromagnetic and ultrasonic energy radiating equipment	No electromagnetic and ultrasonic energy radiating equipment.	N/A
6.6.1	Radio frequency sources	No electromagnetic and ultrasonic energy radiating equipment.	N/A
6.6.2	Lasers or other continuous wave sources	No electromagnetic and ultrasonic energy radiating equipment.	N/A
6.6.3	Ultrasonic sources	No electromagnetic and ultrasonic energy radiating equipment.	N/A

7	NON-METALLIC ENCLOSURES AND NON-METALLIC PARTS OF ENCLOSURES		Pass
7.1	General		Pass
7.1.1	Applicability	The sealing rings used complies with the requirements of this clause. 1. The sealing rings and rubber o-ring are made of flame retardant silicon rubber(TY2961). 2. The insulation material of bushings are made of PA66+30%GF 3.The insulation material of terminal are made of PBT1500.	Pass

IEC 60079-0			
Clause	Requirement – Test	Result – Remark	Verdict
7.1.2	Specification of materials	The material of the sealing rings and the rubber o-ring is flame retardant silicon rubber (TY2961). Refer to the documents provided by the manufacturer for relevant documents and manufacturing process.	Pass
7.1.3	Plastic materials	1.The RTI of PA66+30%GF is 120°C. 2. The RTI of PBT1500 is 120°C.	Pass
7.1.4	Elastomeric materials	The sealing rings and rubber o-ring. It is manufactured by Guangdong Qingyuan Xin'an TianYu Silicon Co.,Ltd. When the maximum ambient temperature is 55°C, the maximum temperature of the sealing rings is 76°C.The COT of flame retardant silicon rubber(TY2961) is -40°C~+180°C.	Pass

7.2	Thermal endurance		Pass
7.2.1	Tests for thermal endurance	Relevant tests were carried out, see clause 26.8 and 26.9.	Pass
7.2.2	Material selection	The COT is at least 20K greater than the temperature of the hottest point of the sealing rings made of flame retardant silicon rubber(TY2961) . The maximum temperature of the sealing rings is 76°C. Refer to Cl. 26.5.1 in this test report. The COT of it is -40°C~+180°C. The TI(RTI) is at least 20K greater than the temperature of the hottest point of the bushings and terminal made of PA66. The maximum temperature of the bushing is 77°C. The maximum temperature of the terminal is 68°C. Refer to Cl. 26.5.1 in this test report. The RTI of it is -60°C~120°C.	Pass

7.3	Resistance to light	No non-metallic materials expose to the light.	N/A
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7.4	Electrostatic charges on external non-metallic materials		Pass
7.4.1	Applicability	The enclosure is made of metal. The spraying layer is covered the enclosure.	Pass
7.4.2	Avoidance of a build-up of electrostatic charge on Group I or Group II electrical equipment	The enclosure is made by metallic material. The thickness of spraying layer for metallic enclosure surface is less than 2mm.	Pass
7.4.3	Avoidance of a build-up of electrostatic charge on equipment for Group III	No conductive material covered with plastic.	N/A

7.5	Threaded holes	No threaded holes on the non-metallic materials.	N/A
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IEC 60079-0			
Clause	Requirement – Test	Result – Remark	Verdict
8	METALLIC ENCLOSURES AND METALLIC PARTS OF ENCLOSURES		Pass
8.1	Material Composition	ADC12 aluminum alloy is used, see the manufacturer's documents.	Pass
8.1.1	Group I	Group II and Group III.	N/A
8.1.2	Group II	The content of Mg is 0.25%. The content of Ti is 0.04%.	Pass
8.1.3	Group III	The content of Mg is 0.25%. The content of Ti is 0.04%.	Pass
8.2	Threaded Holes	No Threaded holes is provided. This product use hexagon head nuts to fasten hexagon socket head cap screws.	N/A
9	FASTENERS		Pass
9.1	General	M6 hexagon socket screws used for fastening the cover and the housing, the side cover and the housing are made of stainless steel. It can only be released or removed by tools.	Pass
9.2	Special fasteners	M6 hexagon socket screws are used for fastening the cover and the housing, the side cover and the housing. The tolerance fit of thread is 6g/6H. The hexagon socket screws comply with the ISO4762.	Pass
9.3	Holes for special fasteners	Heading only.	Pass
9.3.1	Thread engagement	The holes for special fasteners are through holes.	Pass
9.3.2	Tolerance and clearance	The holes under the head of the M6 special fasteners have a tolerance of H13.	Pass
9.3.3	Hexagon socket set screw	All fasteners are hexagon socket set screw. They are fastened by hexagon head nuts. No thread hole is used to fasten the hexagon socket set screw.	Pass
10	INTERLOCKING DEVICES	No interlocking devices.	N/A

IEC 60079-0			
Clause	Requirement – Test	Result – Remark	Verdict
11	BUSHINGS	<p>The bushings are screwed into the threaded holes of the partition separating the light source compartment and the power driving board compartment.</p> <p>The bushings are screwed into the threaded holes of the partition separating the terminal compartment and the power driving board compartments.</p> <p>The electric conduction pole and bushing are injection and press together.</p> <p>For the bushings, refer to drawing 110702-07, which is named insert by the manufacturer. The material of conductor is brass, the insulating material is PA66+GF30%, which is the sheath of insert.</p> <p>See part IEC 60079-0 clause 26.6.</p>	Pass
12	MATERIALS USED FOR CEMENTING	<p>Double component silicone is used to cement the light-transmitting part and the cover. The COT of double component silicone is</p> <p>-60°C~200°C. The highest service temperature of cemented part is 68°C.</p>	Pass
13	EX COMPONENTS	No Ex component.	N/A
13.1	General	No Ex component.	N/A
13.2	Mounting	No Ex component.	N/A
13.3	Internal Mounting	No Ex component.	N/A
13.4	External Mounting	No Ex component.	N/A
14	CONNECTION FACILITIES AND TERMINAL COMPARTMENTS		Pass
14.1	General	There are terminals inside the terminal compartment.	Pass
14.2	Termination compartment	The opening size of the termination compartment is less than 300cm ³ so that the conductors can be readily connected.	Pass
14.3	Type of protection	The terminal compartment is of type "e" and "t".	Pass
14.4	Creepage and clearance	Refer to IEC60079-7	Pass
15	CONNECTION FACILITIES FOR EARTHING OR BONDING CONDUCTORS		Pass
15.1	Equipment requiring earthing	This light has internal and external earthing screws.	Pass

IEC 60079-0			
Clause	Requirement – Test	Result – Remark	Verdict
15.1.1	Internal	A stainless steel screw M4×8 is used; the cross sectional area of internal earthing conductor is 1.5mm ² ; the tightening torque is 2N.m.	Pass
15.1.2	External	A stainless steel screw M4×8 is used; the cross sectional area of external earthing conductor is greater than 4mm ² ; the tightening torque is 2N.m.	Pass
15.2	Equipment not requiring earthing	No equipment not requiring earthing.	N/A
15.3	Size of conductor connection	See Cl.15 of IEC 60079-0.	Pass
15.4	Protection against corrosion	The material of screws and washer for the earthing facilities is stainless steel.	Pass
15.5	Secureness of electrical connections	All the connecting facilities have pressuring wire pad to prevent loosening.	Pass
16	ENTRIES INTO ENCLOSURES		Pass
16.1	General	The entries are three threaded holes located in the wall of the enclosure "e".	Pass
16.2	Identification of entries	The dimension of entry and the type of thread is specified in the instruction and drawings.	Pass
16.3	Cable glands	No cable glands.	N/A
16.4	Blanking elements	No blanking elements	N/A
16.5	Temperature at branching point and entry point	See IEC 60079-0 clause 26.5.1.3.	Pass
16.6	Electrostatic charges of cable sheaths	Cable sheaths are not considered non-metallic enclosures.	N/A
17	SUPPLEMENTARY REQUIREMENTS FOR ROTATING ELECTRICAL MACHINES		N/A
17.1	Fans and fan hoods	No rotating electrical machines.	N/A
17.2	Ventilation openings for external fans	No rotating electrical machines.	N/A
17.3	Construction and mounting of the ventilation systems	No rotating electrical machines.	N/A

IEC 60079-0			
Clause	Requirement – Test	Result – Remark	Verdict
17.4	Clearances for the ventilating systems	No rotating electrical machines.	N/A
17.5	Materials for external fans and fan hoods	No rotating electrical machines.	N/A
17.6	Equipotential bonding conductors	No rotating electrical machines.	N/A
18	SUPPLEMENTARY REQUIREMENTS FOR SWITCHGEAR		N/A
18.1	Flammable dielectric	No switchgear.	N/A
18.2	Disconnectors	No switchgear.	N/A
18.3	Group I – Provisions for locking	No switchgear.	N/A
18.4	Doors and covers	No switchgear.	N/A
19	SUPPLEMENTARY REQUIREMENTS FOR FUSES	No fuses.	N/A
20	SUPPLEMENTARY REQUIREMENTS FOR PLUGS, SOCKETS OUTLETS AND CONNECTORS		N/A
20.1	Interlocking	No plugs, sockets outlets and connectors.	N/A
20.1.1	Explosive gas atmospheres	No plugs, sockets outlets and connectors.	N/A
20.1.2	Explosive dust atmospheres	No plugs, sockets outlets and connectors.	N/A
20.2	Energized plugs	No plugs, sockets outlets and connectors.	N/A
21	SUPPLEMENTARY REQUIREMENTS FOR LUMINAIRES		Pass
21.1	General	Ceiling installation use the lifting bolt first and lifting plug lock, use at the same time set screw locking, and then lifting plug and light body assembly lock. Refer to drawing No.110702-00-ATEX.	Pass
21.2	Covers for luminaires of EPL Gb or EPL Db	Having warning marking "WARNING-DO NOT OPEN WHEN ENERGIZED", which is cast on the cover.	Pass
21.3	Covers for luminaires of EPL Gc or EPL Dc	Gb,Db.	N/A
21.4	Special lamps	The type of light source is LED.	Pass

IEC 60079-0			
Clause	Requirement – Test	Result – Remark	Verdict
22	SUPPLEMENTARY REQUIREMENTS FOR CAPLIGHTS AND HANDLIGHTS		N/A
22.1	Group I caplights	No caplights and handlights.	N/A
22.2	Group II and Group II caplights and handlights	No caplights and handlights.	N/A
23	APPARATUS INCORPORATING CELLS AND BATTERIES		N/A
23.1	General	No cells and batteries.	N/A
23.2	Batteries	No cells and batteries.	N/A
23.3	Cell types	No cells and batteries.	N/A
23.4	Cells in a battery	No cells and batteries.	N/A
23.5	Ratings of batteries	No cells and batteries.	N/A
23.6	Interchangeability	No cells and batteries.	N/A
23.7	Charging of primary batteries	No cells and batteries.	N/A
23.8	Leakage	No cells and batteries.	N/A
23.9	Connections	No cells and batteries.	N/A
23.10	Orientation	No cells and batteries.	N/A
23.11	Replacement of cells or batteries	No cells and batteries.	N/A
23.12	Replaceable battery pack	No cells and batteries.	N/A
24	DOCUMENTATION	The relevant documents provided by the manufacturer had been evaluated.	Pass
25	COMPLIANCE OF PROTOTYPE OR SAMPLE WITH DOCUMENTS		Pass
26	TYPE TESTS		
26.1	General	Tests are carried out according to IEC60079-0:2007, IEC60079-1:2007, IEC60079-7:2006, IEC60079-31:2008.	Pass

IEC 60079-0			
Clause	Requirement – Test	Result – Remark	Verdict
26.2	Test configuration	Tests were carried out under the most unfavorable conditions.	Pass

26.3	Tests in explosive test mixtures	Explosive test mixtures used in tests comply with the requirements of standard.	Pass
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26.4	Tests of enclosures		Pass
26.4.1	Order of tests		Pass
26.4.1.1	Metallic enclosures, metallic parts of enclosures and glass of parts of enclosures	The enclosure of Ex-KFrog floodlights is comprised of a cover, a side cover, a housing, and a light-transmitting part which are made of ADC12 and tempered glass.	Pass
26.4.1.2	Non-metallic enclosures or non-metallic parts of enclosures	Two bushings and terminal are made of PA66. The sealing rings and the rubber o-ring are made of flame retardant silicon rubber.	Pass
26.4.1.2.1	Group I electrical equipment	Group II and Group III.	N/A
26.4.1.2.2	Group II and Group III electrical equipment	Tests were performed in the following order: 1. Temperature measured 2. The tests of thermal endurance to heat and cool, 3. tests for resistance to impact, 4. IP test, 5. And other tests required by the standards.	Pass
26.4.2	Resistance to impact	Under the environment condition at 20°C, carry out test on two sample enclosures. Each sample was tested once at the Shell body and ballast shell body with impact energy 7J each time. Under the environment condition at 20°C, impact test on the glass cover was carried out on three samples. Each sample was impacted for once with impact energy 4J.	Pass
26.4.3	Drop test	Not a portable device.	N/A
26.4.4	Acceptance criteria	No damage affecting the explosion-proof performance has been found.	Pass
26.4.5	Degree of protection (IP) by enclosures		Pass
26.4.5.1	Test procedure	The test procedure is according to IEC60529. The protection degree is IP66.	Pass
26.4.5.2	Acceptance criteria	No ingress of dust or water.	Pass

26.5	Thermal tests		Pass
26.5.1	Temperature measurement		Pass
26.5.1.1	General		Pass
26.5.1.2	Service temperature	Using maximum temperature of non-metallic part instead of maximum service temperature.	Pass

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Clause	Requirement – Test	Result – Remark	Verdict																																								
26.5.1.3	Maximum surface temperature	<p>Test voltage is 1.1 times of rated voltage, i.e. AC 305V; Tests were carried out on three directions: vertically downward, Downward 45° and horizontal.</p> <p>Power:150W</p> <table border="1"> <thead> <tr> <th>Part</th><th>vertically downward K</th><th>Downward 45° K</th><th>horizontal K</th></tr> </thead> <tbody> <tr> <td>Housing</td><td>36</td><td>33</td><td>39</td></tr> <tr> <td>Sealing ring of entry point</td><td>10</td><td>8</td><td>15</td></tr> <tr> <td>Sealing ring of the light-transmitting part</td><td>18</td><td>19</td><td>21</td></tr> <tr> <td>Sealing ring of increased safety cavity</td><td>7</td><td>5</td><td>14</td></tr> <tr> <td>Light cavity base plate</td><td>42</td><td>35</td><td>44</td></tr> <tr> <td>Terminal</td><td>8</td><td>3</td><td>13</td></tr> <tr> <td>Light-transmitting part</td><td>22</td><td>22</td><td>26</td></tr> <tr> <td>Bushing between light source compartment and the power driving board compartment.</td><td>21</td><td>19</td><td>21</td></tr> <tr> <td>Cementing material of the light-transmitting part</td><td>9</td><td>9</td><td>13</td></tr> </tbody> </table> <p>When the ambient temperature is 55℃,the maximum surface temperature was 94℃,comply with class T5.</p> <p>When the ambient temperature is 55℃,the maximum surface temperature of sealing ring was 76℃.</p> <p>After 10 minutes the temperature of the internal hot component reduced to below 95℃.</p>	Part	vertically downward K	Downward 45° K	horizontal K	Housing	36	33	39	Sealing ring of entry point	10	8	15	Sealing ring of the light-transmitting part	18	19	21	Sealing ring of increased safety cavity	7	5	14	Light cavity base plate	42	35	44	Terminal	8	3	13	Light-transmitting part	22	22	26	Bushing between light source compartment and the power driving board compartment.	21	19	21	Cementing material of the light-transmitting part	9	9	13	Pass
Part	vertically downward K	Downward 45° K	horizontal K																																								
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IEC 60079-0																																											
Clause	Requirement – Test	Result – Remark	Verdict																																								
26.5.1.3	Maximum surface temperature	<p>Test voltage is 1.1 times of rated voltage, i.e. AC 305V; Tests were carried out on three directions: vertically downward, Downward 45° and horizontal.</p> <p>Power: 120W</p> <table border="1"> <thead> <tr> <th>Part</th><th>vertically downward K</th><th>Downward 45° K</th><th>Horizontal K</th></tr> </thead> <tbody> <tr> <td>Housing</td><td>20</td><td>20</td><td>22</td></tr> <tr> <td>Sealing ring of entry point</td><td>2</td><td>1</td><td>1</td></tr> <tr> <td>Sealing ring of the light-transmitting part</td><td>11</td><td>10</td><td>13</td></tr> <tr> <td>Sealing ring of increased safety cavity</td><td>14</td><td>14</td><td>18</td></tr> <tr> <td>Light cavity base plate</td><td>28</td><td>26</td><td>27</td></tr> <tr> <td>Terminal</td><td>3</td><td>2</td><td>5</td></tr> <tr> <td>Light-transmitting part</td><td>14</td><td>12</td><td>13</td></tr> <tr> <td>Bushing between light source compartment and the power driving board compartment.</td><td>8</td><td>10</td><td>10</td></tr> <tr> <td>Cementing material of the light-transmitting part</td><td>3</td><td>2</td><td>5</td></tr> </tbody> </table> <p>When the ambient temperature is 55°C, the maximum surface temperature was 77°C, comply with class T6.</p> <p>After 10 minutes the temperature of the internal hot component reduced to below 80°C.</p>	Part	vertically downward K	Downward 45° K	Horizontal K	Housing	20	20	22	Sealing ring of entry point	2	1	1	Sealing ring of the light-transmitting part	11	10	13	Sealing ring of increased safety cavity	14	14	18	Light cavity base plate	28	26	27	Terminal	3	2	5	Light-transmitting part	14	12	13	Bushing between light source compartment and the power driving board compartment.	8	10	10	Cementing material of the light-transmitting part	3	2	5	Pass
Part	vertically downward K	Downward 45° K	Horizontal K																																								
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Bushing between light source compartment and the power driving board compartment.	8	10	10																																								
Cementing material of the light-transmitting part	3	2	5																																								
26.5.2	Thermal shock test	The highest temperature part of light-transmitting part was sprayed by water of 8.7°C and 1mm diameter. The light-transmitting part was not broken.	Pass																																								
26.5.3	Small component ignition test (Group I and Group II)																																										

IEC 60079-0			
Clause	Requirement – Test	Result – Remark	Verdict
26.5.3.1	General	No small component.	N/A
26.5.3.2	Procedure	No small component.	N/A
26.5.3.3	Acceptance criteria	No small component.	N/A
26.6	Torque test for bushings		Pass
26.6.1	Test procedure	Two M12×1 bushings are used between the two compartments. A torque of 25N.m was applied to the stem of bushing.	Pass
26.6.2	Acceptance criteria	Neither the stem in the bushing, nor the bushing itself turned when the stem is subjected to a torque of 25N.m.	Pass
26.7	Non-metallic enclosures or non-metallic parts of enclosures		N/A
26.7.1	General	The enclosures are made of ADC12 aluminum alloy, see the manufacturer's documents.	N/A
26.7.2	Test temperatures	The enclosures are made of ADC12 aluminum alloy, see the manufacturer's documents.	N/A
26.8	Thermal endurance to heat	Keep in the condition of temperature 95°C, relative humidity 90% for 14 days; stored in the condition of temperature 96°C for 14 days.	Pass
26.9	Thermal endurance to cold	Continuously stored in the condition of temperature -45°C for 24h; all cemented joints, the bushing between the two flame-proof compartments and sealing rings were not broken or damaged.	Pass
26.10	Resistance to light	Heading only.	N/A
26.10.1	Test procedure	No non-metallic materials expose to the light.	N/A
26.10.2	Acceptance criteria	No non-metallic materials expose to the light.	N/A
26.11	Resistance to chemical agents for Group I electrical equipment	Group II and Group III.	N/A
26.12	Earth continuity	Metallic enclosure.	N/A
26.13	Surface resistance test of parts of parts of enclosures of non-metallic materials	Metallic enclosure.	N/A
26.14	Charging tests	Heading only.	N/A
26.14.1	Introduction	Metallic enclosure.	N/A
26.14.2	Principle of the test	Metallic enclosure.	N/A
26.14.3	Samples and test apparatus	Metallic enclosure.	N/A
26.14.4	Ambient conditions	Metallic enclosure.	N/A

IEC 60079-0			
Clause	Requirement – Test	Result – Remark	Verdict
26.14.5	Conditioning	Metallic enclosure.	N/A
26.14.6	Determination of the most efficient charging method		
26.14.6.1	Method A: Rubbing with a pure polyamide cloth	Metallic enclosure.	N/A
26.14.6.2	Method B: Rubbing with a cotton cloth	Metallic enclosure.	N/A
26.14.6.3	Method C: Charging by influence with a d.c. high-voltage power supply	Metallic enclosure.	N/A
26.14.7	Assessment of discharge	Metallic enclosure.	N/A
26.15	Measurement of capacitance	Heading only	N/A
26.15.1	Test procedure	Metallic enclosure.	N/A
26.15.2	Acceptance criteria	Metallic enclosure.	N/A
27	Routine tests	See this test report cover.	Pass
28	MANUFACTURER'S RESPONSIBILITY		
28.1	Conformity with the documentation	The manufacturer carries out the verifications or tests. The sample conforms to the documentation.	Pass
28.2	Certificate	The explosion-proof flood light comply with the requirements of IEC60079-0:2007, IEC60079-1:2007, IEC60079-7:2006 and IEC60079-31:2008	Pass
28.3	Responsibility for marking	See documents provided by the manufacturer.	Pass
29	MARKING	Reference only.	Pass
29.1	Location	The nameplate of the explosion-proof flood light is riveted on the front cover and side cover. The nameplate is made of stainless steel.	Pass
29.2	General	See this test report cover.	Pass
29.3	Ex marking for explosive gas atmospheres	Ex d e IIB T5 or T6 Gb.	Pass
29.4	Ex marking for explosive dust atmospheres	Ex tb IIIC T95°C or T80°C Db IP66	Pass
29.5	Combined types of protection	type "d" and "e"	Pass
29.6	Multiple types of protection	type "d e" and "tb"	Pass

IEC 60079-0			
Clause	Requirement – Test	Result – Remark	Verdict
29.7	Ga using two independent Gb types of protection	Not Ga using two independent Gb types of protection	N/A
29.8	Ex components	No Ex components	N/A
29.9	Small equipment and small Ex components	No small equipment and small Ex components.	N/A
29.10	Extremely small equipment and extremely small Ex components	No extremely small equipment and extremely small Ex components.	N/A
29.11	Warning markings	The warning words "Warning-DO NOT OPEN WHEN ENERGIZED" and "Warning-AFTER DE-ENERGIZING, DELAY 10 MINUTES BEFORE OPENING" are printed on the nameplate.	Pass
29.12	Alternate marking of equipment protection levels (EPLs)	No alternate marking of equipment protection levels (EPLs).	N/A
29.12.1	Alternate marking of type of protection for explosive gas atmospheres	No alternate marking of equipment protection levels (EPLs).	N/A
29.12.2	Alternate marking of type of protection for explosive dust atmospheres	No alternate marking of equipment protection levels (EPLs).	N/A
29.13	Cells and batteries	No cells and batteries.	N/A
30	INSTRUCTIONS		
30.1	General	The instruction manual includes structure, parameters, installation instruction, notes, caution, analysis and solution, transportation and storage, after-sales service and contact.	Pass
30.2	Cells and batteries	No cells and batteries.	N/A
Annex A (Normative)	SUPPLEMENTARY REQUIREMENTS FOR CABLE GLANDS		N/A
A.1	General	No cable glands.	N/A
A.2	Constructional requirements		
A.2.1	Cable sealing		N/A
A.2.2	Filling compounds		N/A
A.2.3	Clamping		
A.2.3.1	General		N/A
A.2.3.2	Group II or Group III cable glands		N/A
A.2.4	Lead-in of cable		
A.2.4.1	Sharp edges		N/A

IEC 60079-0			
Clause	Requirement – Test	Result – Remark	Verdict
A.2.4.2	Point of entry		N/A
A.2.5	Released by a tool		N/A
A.2.6	Fixing		N/A
A.2.7	Degree of protection		N/A
A.3	Type tests		
A.3.1	Tests of clamping of non-armoured and braided cables		N/A
A.3.1.1	Cable glands with clamping by the sealing ring		N/A
A.3.1.2	Cable glands with clamping by the filling compound		N/A
A.3.1.3	Cable glands with clamping by means of a clamping device		N/A
A.3.1.4	Tensile test		N/A
A.3.1.5	Mechanical strength		N/A
A.3.2	Tests of clamping of armoured cables		N/A
A.3.2.1	Tests of clamping where the armourings are clamped by a device within the gland		N/A
A.3.2.1.1	Tensile test		N/A
A.3.2.1.2	Mechanical strength		N/A
A.3.2.2	Tests of clamping where the armourings are not clamped by a device within the gland		N/A
A.3.3	Type test for resistance to impact		N/A
A.3.4	Test for degree of protection (IP) of cable glands		N/A
A.4	Marking		
A.4.1	Marking of cable glands		N/A
A.4.2	Marking of cable sealing rings		N/A
Annex B (Normative)	Table B.1 – Clauses with which Ex components shall comply		N/A



IECEX TEST REPORT
IEC 60079-1
Explosive atmospheres - Part 1:
Equipment protection by flameproof enclosures "d"

ExTR Reference Number.....:

ExTR Free Reference Number.....: PCEC/TR13002

Complied by + signature (ExTL).....: An Penghui

An Penghui

Reviewed by + signature (ExTL) ...: Xu Jianwen

Xu Jianwen

Date of issue.....: Jan. 8, 2013

Ex Testing Laboratory (ExTL).....: Supervision & Test Center of Ex-products of China Petroleum & Chemical Industry

Address.....: No.85,No.3 Road, Dingzigu,Tianjin, P.R. China

Applicant's name.....: SHENZHEN KHJ SEMICONDUCTOR LIGHTING CO., LTD

Address.....: 4-5 Floor, Building 7, HuangBeiLingJingXuan Industrial park, No.2 Dong Huan Rd, Yousong, LongHua town, Bao'an District, Shenzhen, China.

Standard.....: IEC 60079-1:2007, Sixth edition

Test procedure.....: IECEX Scheme

Test Report Form No.: ExTR60079-1_6A

TRF Originator.....: Underwriters Laboratories Inc.

Master TRF.....: dated 2007-05

Instructions for Intended Use of Ex Test Report:

This ExTR blank document is to be compiled and reviewed by the ExTL. The ExTR package in which this ExTR is incorporated (comprised of a single ExTR document or multiple ExTR documents) is to be accompanied by a single ExTR Cover Sheet, which is to be approved by the ExCB. IECEX Test Report Addendum(s) and/or IECEX Test Report of National Differences may also supplement this ExTR.

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Possible test case verdicts:

- test case does not apply to the test object:N / A

- test object does meet the requirement.....:Pass

General remarks:

The tests results presented in this report relate only to the object tested.

This report shall not be reproduced except in full without the written approval of the testing laboratory.

"(see Attachment #)" refers to additional information appended to the report.

"(see Appended table)" refers to a table appended to the report.

Throughout this report, a point is used as the decimal separator.

IEC 60079-1			
Clause	Requirement – Test	Result – Remark	Verdict
1	SCOPE		
2	NORMATIVE REFERENCES		
3	TERMS AND DEFINITIONS		
4	EQUIPMENT GROUPING AND TEMPERATURE CLASSIFICATION	IIB T5 or T6 IIIC T95°C or T80°C	Pass
5	FLAMEPROOF JOINTS		
5.1	General requirements	The joints of the Ex-KF Floodlight comply with requirements of Clause 5 and are smeared with WD—40. Refer to technical document provided by the manufacturer.	Pass
5.2	Non-threaded joints		
5.2.1	Width of joints (<i>L</i>)	<p>1. Position: between cover and housing material: ADC12/ ADC12 flange joint Volume of the light source compartment:0.7L L(M)=13.3mm, L(R)=12.5mm. i(M)=0.18mm, i(R)=0.20mm. Ra3.2/3.2(M), Ra6.3/6.3(R)</p> <p>2. Position: between the side cover and housing material: ADC12/ ADC12 flange joint Volume of the light source compartment:0.224L L(M)=13.4mm, L(R)=12.5mm. i(M)=0.18mm, i(R)=0.20mm. Ra3.2/3.2(M), Ra6.3/6.3(R)</p>	Pass
5.2.2	Gap (<i>i</i>)	See part IEC 60079-0 clause 5.2.1.	Pass
5.2.3	Spigot joints	No spigot joints	N/A
5.2.4	Holes in joint surfaces	The flameproof joint L is not interrupted by holes.	N/A

IEC 60079-1			
Clause	Requirement – Test	Result – Remark	Verdict
5.2.4.1	Flanged joints with holes outside the enclosure (see Figures 3 and 5)	The flameproof joint L is not interrupted by holes.	N/A
5.2.4.2	Flanged joints with holes inside the enclosure (see Figure 4)	The flameproof joint L is not interrupted by holes.	N/A
5.2.4.3	Spigot joints where, to the edges of the holes, the joint consists of a cylindrical part and a plane part (see Figure 6)	The flameproof joint L is not interrupted by holes.	N/A
5.2.4.4	Spigot joints where, to the edges of the holes, the joint consists only of the plane part (see Figures 7 and 8), in so far as plane joints are permitted (see 5.2.7)	The flameproof joint L is not interrupted by holes.	N/A
5.2.5	Conical joints	No conical joints.	N/A
5.2.6	Joints with partial cylindrical surfaces (not permitted for Group IIC)	No partial cylindrical joints.	N/A
5.2.7	Flanged joints for acetylene atmospheres	II B.	N/A
5.2.8	Serrated joints	No serrated joints.	N/A
5.3	Threaded joints	<p>1. Between bushing and Housing: material: PA66+GF30%/cast aluminium, Thread specification: M12×1 thread pitch: 1mm length of thread: 11mm number of full thread engagement: 11</p> <p>Metric thread complies with the requirements of 6g/6H fit tolerance. Metric thread can fulfill the requirements of medium tolerance in ISO965-1 and ISO965-3.</p>	Pass
5.4	Gaskets (including O-rings)	The flameproof joint L is not interrupted by gasket.	Pass
5.5	Equipment using capillaries	No equipment using capillaries.	N/A
6	CEMENTED JOINTS		
6.1	General	<p>There is a cemented joint between light-transmitting part and housing.</p> <p>The light transmitting-part is cemented to the cover by double component silicone.</p>	Pass

IEC 60079-1			
Clause	Requirement – Test	Result – Remark	Verdict
6.2	Mechanical strength	8 clamping washer with M4 screws are used for ensuring the strength of cemented joint. The sample was submitted to static pressure test. For pressure test, see part IEC 60079-1 clause 15.1.3.	Pass
6.3	Width of cemented joints	The width of cemented joint is greater than 10mm.	Pass
7	OPERATING RODS		
7.1	Diameter of operating rod	No operating rods.	N/A
7.2	Diametrical clearance	No operating rods.	N/A
8	SUPPLEMENTARY REQUIREMENTS FOR SHAFTS AND BEARINGS		
8.1	Joints of shafts	No shafts and bearings.	N/A
8.1.1	Cylindrical joints	No shafts and bearings.	N/A
8.1.2	Labyrinth joints	No shafts and bearings.	N/A
8.1.3	Joints with floating glands	No shafts and bearings.	N/A
8.2	Bearings		
8.2.1	Sleeve Bearings	No shafts and bearings.	N/A
8.2.2	Rolling-element bearings	No shafts and bearings.	N/A
9	LIGHT-TRANSMITTING PARTS	The light transmitting-part is cemented to the cover by double component silicone. A clamping washer is used for ensuring the strength of cemented joint. The light-transmitting part is made of toughened glass and is not submitted to the tests in Clause 19.	Pass
10	BREATHING AND DRAINING DEVICES WHICH FORM PART OF A FLAMEPROOF ENCLOSURE	No breathing and draining devices.	N/A
10.1	Openings for breathing or draining	No breathing and draining devices.	N/A
10.2	Composition limits	No breathing and draining devices.	N/A
10.3	Dimensions	No breathing and draining devices.	N/A

IEC 60079-1			
Clause	Requirement – Test	Result – Remark	Verdict
10.4	Elements with measurable paths	No breathing and draining devices.	N/A
10.5	Elements with non-measurable paths	No breathing and draining devices.	N/A
10.6	Removable devices	No breathing and draining devices.	N/A
10.7	Mounting arrangements of the elements	No breathing and draining devices.	N/A
10.8	Mechanical strength	No breathing and draining devices.	N/A
10.9	Breathing devices and draining devices when used as Ex components	No breathing and draining devices.	N/A
10.9.1	Mounting arrangements of the elements and components	No breathing and draining devices.	N/A
10.9.2	Type tests for breathing and draining devices used as Ex components	No breathing and draining devices.	N/A
10.9.2.1	Test of the ability of the breathing and draining device to withstand pressure		
10.9.2.1.1	Test procedure	No breathing and draining devices.	N/A
10.9.2.1.2	Acceptance criteria	No breathing and draining devices.	N/A
10.9.2.2	Thermal tests	No breathing and draining devices.	N/A
10.9.2.2.1	Test procedure	No breathing and draining devices.	N/A
10.9.2.2.2	Acceptance criteria	No breathing and draining devices.	N/A
10.9.2.3	Test for non-transmission of an internal ignition	No breathing and draining devices.	N/A
10.9.2.3.1	Test procedure	No breathing and draining devices.	N/A
10.9.2.3.2	Acceptance criteria	No breathing and draining devices.	N/A
10.9.3	Ex component certificate	No breathing and draining devices.	N/A
11	FASTENERS, ASSOCIATED HOLES AND CLOSING DEVICES		
11.1	Type of fastener	See clause 9.2 of IEC 60079-0.	Pass
11.2	Plastic material or light alloys	See clause 9.2 in report of IEC 60079-0.	Pass
11.3	Yield stress	With a label as "CAUTION - USE FASTENERS WITH YIELD STRESS \geq 450MPa" The property class of the M6/M8 screw and M6/M8 nut is A-70. The yield stress of them is greater than 450MPa.	Pass
11.4	Studs	Studs are not included.	N / A

IEC 60079-1			
Clause	Requirement – Test	Result – Remark	Verdict
11.5	Fasteners through walls	No fasteners through walls	N/A
11.6	Blind holes	The remaining thickness of the wall of the enclosure is more than 3mm.	Pass
11.7	Screws into blind holes	No screw into blind holes.	N/A
11.8	Closing of through holes	No through holes.	N/A
11.9	Closure of apertures and compliance of blanking elements	No blanking elements.	N/A
11.9.1	Closing device removable from outside	No blanking elements.	N/A
11.9.2	Tool used to remove closing device	No blanking elements.	N/A
11.9.3	Special removal technique	No blanking elements.	N/A
11.9.4	Blanking element used with an adapter	No blanking elements.	N/A
11.10	Separate fastening arrangements for threaded doors/covers	No threaded doors/covers.	N/A
12	MATERIALS AND MECHANICAL STRENGTH OF ENCLOSURES – MATERIALS INSIDE THE ENCLOSURES		
12.1	Tests prescribed by Clauses 14 to 16	See relevant reports.	Pass
12.2	Assembly of multiple flameproof enclosures	The two explosion-proof compartments (light source compartment and power driving board compartment) of the explosion-proof flood light are separated by two bushings pass through the partition.	Pass
12.3	Intercommunicating enclosure compartments	No intercommunicating enclosure compartments.	N/A
12.4	Use of cast iron	No use of cast iron.	N/A
12.5	Use of liquids	No use of liquids.	N/A
12.6	Insulating materials for Group I apparatus	No insulating materials for Group I apparatus.	N/A
12.7	Zinc content	The zinc content of enclosure is 0.93%; see manufacturer's documents.	Pass

IEC 60079-1			
Clause	Requirement – Test	Result – Remark	Verdict
13	ENTRIES FOR FLAMEPROOF ENCLOSURES	The specific thread type and size of the entries are specified in the instruction.	Pass
13.1	Cable glands	No cable glands.	N/A
13.2	Conduit sealing devices	No conduit sealing devices.	N/A
13.2.1	Permitted for Group II only	No conduit sealing devices.	N/A
13.2.2	Requirements for sealing device	No conduit sealing devices.	N/A
13.3	Plugs and sockets and cable couplers		
13.3.1	Construction & mounting	No plugs and sockets and cable couplers.	N/A
13.3.2	Flameproof joints of contact parts	No plugs and sockets and cable couplers.	N/A
13.3.3	Flameproof properties in the event of internal explosion	No plugs and sockets and cable couplers.	N/A
13.3.4	Exemption & warning label	No plugs and sockets and cable couplers.	N/A
13.4	Bushings	See part IEC 60079-1 C.2.1.4.	Pass
14	VERIFICATION AND TESTS	The maximum surface temperature was measured under the condition of 110% rated voltage.	Pass
15	TYPE TESTS	Carry out test on sample which has been tested for mechanical performance according to Cl.15. Samples were tested according to the following sequence: 1. Overpressure test. 2. Test of erosion by flame. 3. Test for non-transmission of an internal ignition. 4. Flammability test.	Pass
15.1	Tests of ability of the enclosure to withstand pressure		
15.1.1	General	Tests of ability of the enclosure to withstand pressure are carried out according to Cl.15.1.2 and Cl.15.1.3. After the tests, no permanent damage or deformation has been found.	Pass
15.1.2	Determination of explosion pressure (reference pressure)	The reference pressure is measured under the condition of 14°C. The test factor is considered during the test.	Pass

IEC 60079-1																			
Clause	Requirement – Test	Result – Remark	Verdict																
15.1.2.1	Test procedure	<p>Test three times in the gas mixture. The explosion pressure of the light source compartment are as follow:</p> <table><tr><td>gas radio of ethylene</td><td>pressure</td></tr><tr><td>8.3%</td><td>291 kPa</td></tr><tr><td>8.1%</td><td>272 kPa</td></tr><tr><td>8.1%</td><td>274 kPa</td></tr></table> <p>According to sheet Cl.15.1.2 of IEC60079-1, the reference pressure should multiply 1.45 when the minimum ambient temperature is -40°C.</p> <p>So the maximum reference pressure of the light source compartment is 422kPa.</p> <p>Test three times in the gas mixture. The explosion pressure of the power driving board compartment are as follow:</p> <table><tr><td>gas radio of ethylene</td><td>pressure</td></tr><tr><td>8.3%</td><td>380 kPa</td></tr><tr><td>8.2%</td><td>391 kPa</td></tr><tr><td>8.3%</td><td>404 kPa</td></tr></table> <p>According to sheet Cl.15.1.2 of IEC60079-1, the reference pressure should multiply 1.45 when the minimum ambient temperature is -40°C.</p> <p>So the maximum reference pressure of the power driving board compartment is 586kPa.</p>	gas radio of ethylene	pressure	8.3%	291 kPa	8.1%	272 kPa	8.1%	274 kPa	gas radio of ethylene	pressure	8.3%	380 kPa	8.2%	391 kPa	8.3%	404 kPa	Pass
gas radio of ethylene	pressure																		
8.3%	291 kPa																		
8.1%	272 kPa																		
8.1%	274 kPa																		
gas radio of ethylene	pressure																		
8.3%	380 kPa																		
8.2%	391 kPa																		
8.3%	404 kPa																		
15.1.2.2	Rotating electrical machines	No rotating electrical machines.	N/A																
15.1.2.3	Pressure-piling	No pressure-piling.	N/A																
15.1.2.4	Apparatus intended for use in a single gas	The apparatus is not intended for use in a single gas	N/A																
15.1.3	Overpressure test	The first method was used.	Pass																
15.1.3.1	Overpressure test - First method (static)	<p>Light source compartment: test pressure is 1500kPa; duration of test is 12s. No damage and permanent deformation to the enclosure and no leakage.</p> <p>power driving board compartment: test pressure is 1500kPa; duration of test is 12s. No damage and permanent deformation to the enclosure . The joints were not permanently enlarged in any place.</p>	Pass																
15.1.3.2	Overpressure test - second method (dynamic)	Test was carried out according to the first method.	N/A																

IEC 60079-1			
Clause	Requirement – Test	Result – Remark	Verdict
15.2	Test for non-transmission of an internal ignition	Remove the sealing rings before test of non-transmission of an internal ignition. No reduction to threads.	Pass
15.2.1	Electrical equipment of groups I, IIA and IIB		
15.2.1.1	Test gap and test gas	The test gap of the sample is the same as the maximum structure gap specified by the manufacturer drawing. The test gas is hydrogen 36.8%~37% of terminal compartment and hydrogen 36.9%~37% of light source compartment.	Pass
15.2.1.2	Increasing of gaps for test		N/A
15.2.1.3	Number of tests and acceptance criterion	Five tests have been carried out to the light source compartment and terminal compartment. The explosion is not transmitted.	Pass
15.2.2	Electrical apparatus of group IIC	II B.	N/A
15.2.2.1	First method		N/A
15.2.2.2	Second method		N/A
15.2.2.3	Single constructions		N/A

15.3	(Reserved for future use)
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15.4	Tests of flameproof enclosures with breathing and draining devices	No breathing and draining devices.	N/A
15.4.1	Tests of ability of the enclosure to withstand pressure	No breathing and draining devices.	N/A
15.4.1.1	Replacement of breathing and draining devices	No breathing and draining devices.	N/A
15.4.1.2	Over pressure test	No breathing and draining devices.	N/A
15.4.2	Thermal tests		
15.4.2.1	Test procedure		N/A
15.4.2.2	Acceptance criterion		N/A
15.4.3	Tests for non-transmission of an internal ignition		N/A
15.4.3.1	Test procedure		N/A
15.4.3.2	Non-transmission test for breathing and draining devices		N/A
15.4.3.2.1	Method A		N/A
15.4.3.2.2	Method B		N/A
15.4.3.3	Acceptance criterion		N/A

16	ROUTINE TESTS
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16.1	General	Apply static pressure test.	Pass
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IEC 60079-1			
Clause	Requirement – Test	Result – Remark	Verdict
16.1.1	Routine overpressure test – first method	The product shall be submitted to static pressure test at 1.5MPa.	Pass
16.1.2	Routine test – second method		N/A
16.1.3	Routine test – empty enclosure & parts of enclosure		N/A
16.2	Routine tests – where not required		N/A
16.3	Routine tests – acceptance criterion		N/A
17	SWITCHGEAR FOR GROUP I	No switchgear for group I.	N/A
17.1	Means of isolation		N/A
17.1.1	Fitted inside Ex d enclosure		N/A
17.1.2	Fitted inside another enclosure		N/A
17.1.3	Plug and socket or a cable coupler – Compliance with 13.3		N/A
17.2	Doors or covers		
17.2.1	Quick-acting doors or covers		N/A
17.2.1.1	Retention of properties		N/A
17.2.1.2	Closure of isolator		N/A
17.2.2	Doors or covers fixed by screws		N/A
17.2.3	Threaded doors or covers		N/A
18	LAMPHOLDERS AND LAMP CAPS	Heading only.	N/A
18.1	Device preventing lamps working loose	No lampholders and lamp caps.	N/A
18.2	Holders and caps for lamps with cylindrical caps		
18.2.1	Holders and caps for tubular fluorescent lamps	No lampholders and lamp caps.	N/A
18.2.2	Other holders	No lampholders and lamp caps.	N/A
18.3	Holders for lamps with threaded caps		
18.3.1	Resistant to corrosion		N/A
18.3.2	Contact separation		N/A
18.3.3	E26/E27 and E39/E40 threaded lampholders		N/A
19	NON-METALLIC ENCLOSURES AND NON-METALLIC PARTS OF ENCLOSURES	The bushings are made of PA66+GF30%.	Pass
19.1	(Reserved for future use)		

IEC 60079-1			
Clause	Requirement – Test	Result – Remark	Verdict
19.2	Special constructional requirements		
19.2.1	Resistance to tracking and creepage distances on internal surfaces of the enclosure walls	CTI of PA66+GF30% is 200. The creepage distance is 15.7mm.	Pass
19.3	Supplementary requirements for type tests	The bushings are made of PA66+GF30%.	Pass
19.3.1	Tests for flameproofness		
19.3.1.1	Test procedure	Follow the order as detailed in 19.3.1.2 through 19.3.1.4.	Pass
19.3.1.2	Tests of ability of the enclosure to withstand pressure	See part IEC 60079-1 clause 15.1.	Pass
19.3.1.3	Test of erosion by flame	The test was carried out in the enclosure giving the worst conditions. Test gas: ethylene Times of ignition: 50	Pass
19.3.1.4	Test for non-transmission of an internal ignition	See part IEC 60079-1 clause 15.2.	Pass
19.3.2	Flammability	The class of PA66 is V-2.	Pass
20	MARKING		
20.1	General	The marking complies with the test report IEC60079-0, see report IEC60079-0 clause 29.	Pass
20.2	Caution and warning markings	The warning texts "DO NOT OPEN WHEN ENERGIZED" and "AFTER DE-ENERGIZING, DELAY 10 MINUTES BEFORE OPENING" are printed in the nameplate.	Pass
20.3	Informative markings		N/A
Annex A (Normative)	ADDITIONAL REQUIREMENTS FOR CRIMPED RIBBON ELEMENTS AND MULTIPLE SCREEN ELEMENTS OF BREATHING AND DRAINING DEVICES		
A.1	Crimped ribbon and multiple screen elements	No breathing and draining devices.	N/A
A.2	Path dimensions		N/A
A.3	Annex B requirements		N/A
A.4	Type tests		N/A

IEC 60079-1			
Clause	Requirement – Test	Result – Remark	Verdict
Annex B (Normative)	ADDITIONAL REQUIREMENTS FOR ELEMENTS, WITH NON-MEASURABLE PATHS, OF BREATHING AND DRAINING DEVICES		

B.1	Sintered metal elements		
B.1.1	Construction	No breathing and draining devices.	N/A
B.1.2	Bubble test pore size		N/A
B.1.3	Density		N/A
B.1.4	Open porosity and/or fluid permeability		N/A
B.1.5	Identification		N/A

B.2	Pressed metal wire elements		
B.2.1	Construction		N/A
B.2.2	Specifications		N/A
B.2.3	Bubble test pore size		N/A
B.2.4	Density		N/A
B.2.5	Open porosity and or fluid permeability		N/A
B.2.6	Identification		N/A

B.3	Metal foam elements		
B.3.1	Construction		N/A
B.3.2	Chromium content		N/A
B.3.3	Bubble test pore size		N/A
B.3.4	Density		N/A
B.3.5	Open porosity and/or fluid permeability		N/A
B.3.6	Identification		N/A

Annex C (Normative)	ADDITIONAL REQUIREMENTS FOR FLAMEPROOF ENTRY DEVICES		
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C.1	General	Bushing.	Pass
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C.2	Constructional requirements		
C.2.1	Sealing methods		
C.2.1.1	Cable glands with elastomeric sealing rings		
C.2.1.1.1	Minimum uncompressed axial height		N/A
C.2.1.1.2	Cable glands with only one specific elastomeric sealing ring	No cable glands with only one specific elastomeric sealing ring.	N/A
C.2.1.2	Cable glands sealed with setting compound	No cable glands sealed with setting compound.	N/A
C.2.1.3	Conduit sealing devices with setting compound	No conduit sealing devices with setting compound.	N/A

IEC 60079-1			
Clause	Requirement – Test	Result – Remark	Verdict
C.2.1.4	Bushings	Bushings are used between two flameproof compartments. For the length of engagement, refer to clause 5.3. Thermal endurance tests were carried out on the samples. The static pressure test was done according to clause 15.1.3.1. 1500kPa is maintained for 12s. No leakage was found.	Pass
C.2.2	Threads	The thread joints between bushing and housing comply with the requirements of 5.3.	Pass
C.2.3	Constructional requirements for Ex blanking elements		
C.2.3.1	Design requirements	No Ex blanking elements.	N/A
C.2.3.2	Parallel threads		N/A
C.2.4	Constructional requirements for Ex thread adapters		
C.2.4.1	Compliance of threads	No Ex thread adapters.	N/A
C.2.4.2	Threads co-axial		N/A
C.2.4.3	Length and internal volume		N/A

C.3	Type tests		
C.3.1	Sealing test		N/A
C.3.1.1	Cable glands and conduit sealing devices with sealing ring		N/A
C.3.1.2	Cable glands sealed with setting compound		N/A
C.3.1.3	Conduit sealing devices sealed with setting compound		N/A
C.3.2	Test of mechanical strength		
C.3.2.1	Cable glands with a threaded compression element		N/A
C.3.2.2	Cable glands with a compression element fixed by screws		N/A
C.3.2.3	Cable glands sealed with setting compound		N/A
C.3.2.4	Acceptance criteria		N/A
C.3.3	Type tests for Ex blanking elements		
C.3.3.1	Torque test	No Ex blanking elements	N/A
C.3.3.2	Over-pressure test		N/A
C.3.4	Type tests for Ex thread adapters		
C.3.4.1	Torque test	No Ex thread adapters.	N/A
C.3.4.2	Impact test		N/A
C.3.4.3	Over-pressure test		N/A

Annex D (Normative)	EMPTY FLAMEPROOF ENCLOSURES AS EX COMPONENTS
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D.1	General
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IEC 60079-1			
Clause	Requirement – Test	Result – Remark	Verdict

D.2	Introductory remarks		
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D.3	Ex component enclosure requirements		
D.3.1	Compliance with IEC 60079-0 & 60079-1	No Ex component enclosure.	N/A
D.3.2	Geometry of enclosure		N/A
D.3.3	Rotating machines		N/A
D.3.4	Means of mounting		N/A
D.3.5	Drilled holes		N/A
D.3.6	Reference pressure		N/A
D.3.7	Over-pressure		N/A
D.3.8	Marking internally		N/A
D.3.9	External marking provision		N/A
D.3.10	Information in certificate		N/A

D.4	Utilization of an Ex component enclosure certificate to prepare an equipment certificate		
D.4.1	Procedure		N/A
D.4.2	Application of the schedule of limitations		N/A

Annex E (Normative)	CELLS AND BATTERIES USED IN FLAMEPROOF "D" ENCLOSURES		
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E.1	Introductory remarks		
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E.2	Acceptable electrochemical systems	No cells and batteries.	N/A
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E.3	General requirements for cells (or batteries) inside flameproof enclosures		
E.3.1	Restrictions		N/A
E.3.2	Warning label		N/A
E.3.3	Mounting		N/A
E.3.4	Relative movement		N/A

E.4	Arrangement of safety devices		
E.4.1	Prevention of excessive temperature and cell damage		
E.4.1.1	Short circuit condition		N/A
E.4.1.2	Infallible components		N/A
E.4.2	Prevention of cell polarity reversal or reverse charging by another cell in the same battery		
E.4.2.1	Additional protection		N/A
E.4.2.2	Protection against polarity reversal or reverse charging		N/A

IEC 60079-1			
Clause	Requirement – Test	Result – Remark	Verdict
E.4.3	Prevention of inadvertent charging of a battery by other voltage sources in the enclosure		N/A
E.5	Recharging of secondary cells inside flameproof enclosures		
E.5.1	Allowable cell type		N/A
E.5.2	Charging condition and safety devices		N/A
E.5.3	Reverse charging		N/A
E.5.4	Additional safety device(s)		N/A
E.5.5	Recharging within enclosure		N/A
E.6	Rating of protection diodes and reliability of protection devices		N/A
E.6.1	Voltage rating & compliance with E.4.2		N/A
E.6.2	Voltage rating & compliance with E.4.3		N/A
E.6.3	Current rating		N/A
E.6.4	Safety integrity		N/A
Annex F (Informative)	MECHANICAL PROPERTIES FOR SCREWS AND NUTS		
Annex G (Informative)	INTRODUCTION OF AN ALTERNATIVE RISK ASSESMENT METHOD ENCOMPASSING "EQUIPMENT PROTECTION LEVELS" FOR EX EQUIPMENT		



IECEx TEST REPORT
IEC 60079
Electrical equipment for explosive gas atmospheres
Part 7: Increased safety "e"

ExTR Reference Number..... :			
ExTR Free Reference Number	PCEC/TR13002		
Complied by + signature (ExTL).... :	An Penghui	<i>An Penghui</i>	
Reviewed by + signature (ExTL).... :	Xu Jianwen	<i>Xu Jianwen</i>	
Date of issue	Jan. 8, 2013		
Ex Testing Laboratory (ExTL)	Supervision & Test Center of Ex-products of China Petroleum & Chemical Industry		
Address.....	No 85, No. 3 Rd, Dingzigu, Hongqiao District, Tianjin, 300131, P.R. China		
Applicant's name	SHENZHEN KHJ SEMICONDUCTOR LIGHTING CO., LTD		
Address.....	4-5 Floor, Building 7, HuangBeiLingJingXuan Industrial park, No.2 Dong Huan Rd, Yousong, LongHua town, Bao'an District, Shenzhen, China.		
Standard	IEC 60079-7:2006, Fourth edition		
Test procedure	IECEx Scheme		
Test Report Form No.	ExTR60079-7_4A		
TRF Originator.....	Underwriters Laboratories Inc. (UL)		
Master TRF			
Instructions for Intended Use of Ex Test Report: This ExTR blank document is to be compiled and reviewed by the ExTL. The ExTR package in which this ExTR is incorporated (comprised of a single ExTR document or multiple ExTR documents) is to be accompanied by a single ExTR Cover Sheet, which is to be approved by the ExCB. ExTR Addendum(s) and/or ExTR Report of National Differences may also supplement this ExTR.			
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Possible test case verdicts: - test case does not apply to the test object:N / A - test object does meet the requirement:Pass			
General remarks: The tests results presented in this report relate only to the object tested. This report shall not be reproduced except in full without the written approval of the testing laboratory. "(see Attachment #)" refers to additional information appended to the report. "(see appended table)" refers to a table appended to the report. Throughout this report a point is used as the decimal separator.			

IEC 60079-7			
Clause	Requirement – Test	Result – Remark	Verdict
1	SCOPE	180~277VAC, 90~180VAC	
2	NORMATIVE REFERENCES		
3	TERMS AND DEFINITIONS		
4	CONSTRUCTIONAL REQUIREMENTS FOR ALL ELECTRICAL APPARATUS		Pass
4.1	General	<p>The terminal compartment complies with the requirements of this part.</p> <p>The insulation material of bushings inside the terminal compartment are made of PA66+30%GF.</p> <p>The insulation material of terminal inside the terminal compartment are made of PBT1500.</p>	Pass
4.2	Electrical connections		
4.2.1	General	<p>Electrical connections are M4 screws made of SUS304.</p> <p>A pressuring wire pad and spring washer (specification: $\Phi 4$) are used for each electrical connection facility to avoid conductors slipping out and loosening of the connection.</p> <p>The tightening torque for screws is 3.2Nm.</p>	Pass
4.2.2	Field wiring connections		
4.2.2.1	General	<p>1 terminal only connects to 1 wire.</p> <p>Cross sectional area of conductor for terminal is 2.5mm^2.</p>	Pass
4.2.2.2	Connections made using terminals complying with IEC 60947-7-1, IEC 60947-7-2, IEC 60999-1, or IEC 60999-2	The explosion-proof floodlighting does not contain connections made using terminals complying with IEC 60947-7-1, IEC 60947-7-2, IEC 60999-1, or IEC 60999-2.	N / A
4.2.2.3	Field wiring connection facilities integral to "e" apparatus or components	See IEC 60079-0 clause 26.5.1.3.	N / A
4.2.2.4	Connections designed to be used with cable lugs and similar devices	Wiring connections are designed to be used with cable tablet. Terminal base assembly are used to avoid rotation or movement.	Pass
4.2.2.5	Connections using permanent arrangements	Not using permanent arrangement.	N / A
4.2.3	Factory connections		

IEC 60079-7			
Clause	Requirement – Test	Result – Remark	Verdict
4.2.3.1	General	The two bushings are installed between the terminal cavity which is of "e" and driver power cavity which is of "d". And another two bushings is installed between the light source cavity which is of "d" and driver power cavity which is of "d". Creepage and clearance meet requirements of IEC 60079-7. The insulation material of terminal inside the terminal compartment are made of PBT1500. Creepage and clearance meet requirements of IEC 60079-7.	Pass
4.2.3.2	Field wiring connection methods used for factory connections	See part IEC 60079-7 clause 4.2.2.4.	Pass
4.2.3.3	Permanent connections	No permanent connections.	N / A
4.2.3.4	Pluggable connections	No pluggable connections.	N / A
4.2.3.5	Terminal bridging connections	No terminal bridging connections.	N / A

4.3	Clearances	(see appended table 4.3)	Pass
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4.4	Creepage distances		
4.4.1	Required values of creepage distance	(see appended table 4.4) The CTI of PA66+GF30% is 200, comply with class III a The CTI of PBT1500 is 400, comply with class II.	Pass
4.4.2	Creepage distances between bare conductive parts at different potentials	(see appended table 4.4)	Pass
4.4.3	Effects of ribs and grooves	(see appended table 4.4)	Pass

4.5	Solid electrical insulating materials		
4.5.1	Clarification of the term solid electrical insulating materials	The terminal : PBT1500 The bushings: PA66+GF30%;	Pass
4.5.2	Mechanical characteristics	RTI of PA66+GF30% is 120°C. RTI of PBT1500 is 120°C.	Pass
4.5.3	Insulating parts made of plastics or laminates	No using insulating varnish.	N / A

4.6	Windings		N / A
4.6.1	Insulated conductors to comply with either 4.6.1.1 or 4.6.1.2	No windings	N / A
4.6.1.1	Two layers of insulation	No windings	N / A
4.6.1.2	Enamelled round winding wires	No windings	N / A
4.6.2	Windings following fastening and wrapping	No windings	N / A

IEC 60079-7			
Clause	Requirement – Test	Result – Remark	Verdict
4.6.3	Minimum nominal conductor dimension	No windings	N / A
4.6.4	Sensing elements of RTDs	No windings	N / A
4.7	Temperature limitations		Pass
4.7.1	General	See part IEC 60079-0 clause 26.5.1.	Pass
4.7.2	Conductors	See part IEC 60079-0 clause 26.5.1.	Pass
4.7.3	Insulated windings	No insulated windings	N / A
4.7.4	Winding Protection	No insulated windings	N / A
4.8	Wiring internal to apparatus	The conductors are packed up with a bushing and bound with a cable tablet.	Pass
4.9	Degrees of protection provided by enclosures		
4.9.1	Minimum degree of protection	IP66, see part IEC 60079-0 clause 26.4.5	Pass
4.9.2	Accumulation of condensation within enclosure	No accumulation of condensation within enclosure.	N / A
4.9.3	Covers of enclosures containing non-intrinsically-safe items shall be adequately labelled	No circuits or systems with type of protection "i" within the enclosure.	N / A
4.10	Fasteners	Group II and group III	N / A
5	SUPPLEMENTARY REQUIREMENTS FOR SPECIFIC ELECTRICAL APPARATUS		
5.1	General	luminaires	Pass
5.2	Rotating electrical machines		
5.2.1	Degrees of protection provided by machine enclosures	No rotating electrical machines	N / A
5.2.2	Internal fans	No rotating electrical machines	N / A
5.2.3	Minimum radial air gap	No rotating electrical machines	N / A
5.2.4	Machines with cage rotors		N / A
5.2.4.1	Requirements for machines with caged rotors	No rotating electrical machines	N / A
5.2.4.2	Requirements for the bars of caged rotors	No rotating electrical machines	N / A
5.2.4.3	Rotor construction and air gap sparking	No rotating electrical machines	N / A
5.2.4.4	Limiting temperature of the rotor	No rotating electrical machines	N / A
5.2.4.4.1	Starting current ratio I_A/I_N shall be determined and marked	No rotating electrical machines	N / A

IEC 60079-7			
Clause	Requirement – Test	Result – Remark	Verdict
5.2.4.4.2	Winding temperature sensors associated with protective devices	No rotating electrical machines	N / A
5.2.4.5	Converter-fed motors	No rotating electrical machines	N / A
5.2.4.6	Information on thermal protection	No rotating electrical machines	N / A
5.2.5	Winding requirements	No rotating electrical machines	N / A
5.2.6	Stator winding terminals	No rotating electrical machines	N / A
5.2.7	Stator winding insulation system	No rotating electrical machines	N / A
5.2.8	Bearing seals and shaft seals		N / A
5.2.8.1	Non-rubbing seals and labyrinths	No rotating electrical machines	N / A
5.2.8.2	Rubbing seals	No rotating electrical machines	N / A

5.3	Luminaires	Luminaires are type of "d"	N / A
5.3.1	Light source		N / A
5.3.2	Minimum distance between lamp and protective cover		N / A
5.3.3	Lampholders and lamp caps		N / A
5.3.3.1	Screw lampholders and lamp caps		N / A
5.3.3.2	Other lampholders and lamp caps		N / A
5.3.3.3	Requirements for electrical contact between the lampholder and lamp cap		N / A
5.3.4	Surface temperature of lamps		N / A
5.3.5	Temperature of lamp caps		N / A
5.3.6	Limiting temperatures		N / A
5.3.7	Luminaires for tubular fluorescent bi-pin lamps		N / A
5.3.7.1	General		N / A
5.3.7.2	Maximum ambient temperature		N / A
5.3.7.3	Temperature class		N / A
5.3.7.4	Lampholders for bi-pin lamps		N / A
5.3.7.5	Enhanced voltage used to initiate discharge within the lamp		N / A
5.3.7.6	Maximum values for torque and /or force at each end of the lamp		N / A
5.3.7.7	Reliability under corrosion and vibration conditions		N / A
5.3.7.8	Where provided, isolation switch shall de-energize each lampholder when the protective cover is removed		N / A

5.4	Caplights and handlights	No caplights and handlights	N / A
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IEC 60079-7			
Clause	Requirement – Test	Result – Remark	Verdict
5.5			
5.5.1	Measuring instruments and instrument transformers and limiting temperatures according to Clause 4.7	No measuring instruments and instrument transformers	N / A
5.5.2	Current transformers and current carrying parts of measuring instruments shall be able to withstand thermal and dynamic stresses	No measuring instruments and instrument transformers	N / A
5.5.3	Temperature attained during the passage of a current	No measuring instruments and instrument transformers	N / A
5.5.4	Measuring instruments supplied by current transformers	No measuring instruments and instrument transformers	N / A
5.5.5	Measuring instruments with moving coils not permitted	No measuring instruments and instrument transformers	N / A
5.5.6	Guarding against secondary circuit becoming open circuited in service and marking with an "X"	No measuring instruments and instrument transformers	N / A
5.6	Transformers other than instrument transformers	No transformers	N / A
5.7	Batteries		
5.7.1	Secondary batteries with capacity greater than 25 Ah		N / A
5.7.1.1	General	No batteries	N / A
5.7.1.2	Battery containers	No batteries	N / A
5.7.1.3	Cells	No batteries	N / A
5.7.1.4	Connections	No batteries	N / A
5.7.2	Primary and secondary batteries with capacity up to 25 Ah	No batteries	N / A
5.7.3	Release of flammable gas	No batteries	N / A
5.7.4	Charging of cells	No batteries	N / A
5.7.5	Discharge of cells	No batteries	N / A
5.7.6	Incorporation of other types of protection	No batteries	N / A
5.7.7	Disconnection and transportation	No batteries	N / A
5.8	General purpose connection and junction boxes	No general purpose connection and junction boxes	N/A
5.9	Resistance heaters (other than trace heaters)		

IEC 60079-7			
Clause	Requirement – Test	Result – Remark	Verdict
5.9.1	Supplementary requirements for the resistance heating devices and resistance heating units	No resistance heaters	N / A
5.9.2	Application of 4.6 and Clause 7 of IEC 60079-0	No resistance heaters	N / A
5.9.3	Temperature coefficient of heating resistors	No resistance heaters	N / A
5.9.4	Testing of insulating materials used in a resistance heating device	No resistance heaters	N / A
5.9.5	Cold start current of the resistance heating device	No resistance heaters	N / A
5.9.6	The manufacturer shall specify an electrical protective device for use with each resistance heating device or unit.	No resistance heaters	N / A
5.9.7	Requirements for electrically conductive covering	No resistance heaters	N / A
5.9.8	Electrical insulation of the heating resistors	No resistance heaters	N / A
5.9.9	Cross-section of the conductors for connections to the resistance heating device	No resistance heaters	N / A
5.9.10	Determination of the temperature class of a resistance heating device	No resistance heaters	N / A
5.9.11	Prevention from exceeding the limiting temperature of resistance heating device or unit	No resistance heaters	N / A
5.9.12	Protection offered by a safety device	No resistance heaters	N / A
5.9.13	Requirements for resistance heating devices and units	No resistance heaters	N / A

5.10	Other electrical apparatus	No other electrical apparatus.	N / A
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6	TYPE VERIFICATIONS AND TYPE TESTS		Pass
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6.1	Dielectric strength	(see appended table 6.1)	Pass
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6.2	Rotating electrical machines		
6.2.1	Machines with cage rotors	No rotating electrical machines	N / A
6.2.2	Test conditions required for rotating electrical machines	No rotating electrical machines	N / A
6.2.3	Additional tests for machines		
6.2.3.1	Stator winding insulation system		

IEC 60079-7			
Clause	Requirement – Test	Result – Remark	Verdict
6.2.3.1.1	Test required for motor components	No rotating electrical machines	N / A
6.2.3.1.2	Arrangements for stator connection cables	No rotating electrical machines	N / A
6.2.3.1.3	Insulation systems and connection cables	No rotating electrical machines	N / A
6.2.3.1.4	Insulation systems and connecting cables - Impulse test	No rotating electrical machines	N / A
6.2.3.2	Cage rotor construction		
6.2.3.2.1	Tests to be carried out using a machine representative of a finished machine	No rotating electrical machines	N / A
6.2.3.2.2	Ageing process of rotor cage	No rotating electrical machines	N / A
6.2.3.2.3	Motors to be subjected to 10 direct-on-line uncoupled starts or 10 locked rotor tests	No rotating electrical machines	N / A
6.2.3.2.4	Maintenance of terminal voltage and hydrogen concentration	No rotating electrical machines	N / A

6.3	Luminaires		
6.3.1	Mechanical tests for screw lampholders other than E10	No luminaires designed for mains supply	N / A
6.3.2	Abnormal operation of luminaires with tubular fluorescent lamps		
6.3.2.1	Rectification test		N / A
6.3.2.2	Inoperative lamp test		N / A
6.3.2.3	Power dissipation of cathodes of lamps supplied by electronic ballasts		N / A
6.3.3	Sulphur dioxide test for the connection of bi-pin lamp caps to lampholders		N / A
6.3.4	Vibration test for luminaires with bi-pin lamps		N / A

6.4	Measuring instruments and instrument transformers	No measuring instruments and instrument transformers	N / A
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6.5	Transformers other than instrument transformers	No transformers other than instrument transformers	N / A
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6.6	Secondary batteries		
6.6.1	Application of tests	No secondary batteries	N / A
6.6.2	Insulation resistance		
6.6.2.1	Test conditions	No secondary batteries	N / A
6.6.2.2	Insulation resistance	No secondary batteries	N / A
6.6.3	Shock test		

IEC 60079-7			
Clause	Requirement – Test	Result – Remark	Verdict
6.6.3.1	General	No secondary batteries	N / A
6.6.3.2	Test conditions	No secondary batteries	N / A
6.6.3.3	Test procedure	No secondary batteries	N / A
6.6.3.4	Acceptance criteria	No secondary batteries	N / A
6.6.4	Test for ventilation of battery container		
6.6.4.1	Determination of the maximum hydrogen concentration within the battery container		N / A
6.6.4.2	Determination of hydrogen flow rate	No secondary batteries	N / A
6.6.4.3	Test Method	No secondary batteries	N / A
6.6.4.4	Test Procedure	No secondary batteries	N / A
6.6.4.5	The test to be carried out at least twice	No secondary batteries	N / A
6.6.4.6	Hydrogen concentration not to exceed 2 %	No secondary batteries	N / A

6.7	General purpose connection and junction boxes	No general purpose connection and junction boxes	N/A
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6.8	Resistance heating devices and resistance heating units		N / A
6.8.1	Type tests and additional requirements of 5.9	No resistance heating devices and resistance heating units	N / A
6.8.2	The tests carried out on a sample or prototype	No resistance heating devices and resistance heating units	N / A
6.8.3	Verification of the electrical insulation of the sample or prototype	No resistance heating devices and resistance heating units	N / A
6.8.4	Thermal stability of the insulating materials of the resistance heating device	No resistance heating devices and resistance heating units	N / A
6.8.5	The test for resistance to impact shall be carried out on two new samples or prototypes with an apparatus similar to that shown in IEC 60079-0.	No resistance heating devices and resistance heating units	N / A
6.8.6	Test for cold start current	No resistance heating devices and resistance heating units	N / A
6.8.7	Tests for specific forms of resistance heating devices or units	No resistance heating devices and resistance heating units	N / A

6.9	Terminal insulating material tests	4mm ² conductors were installed on the terminal. Then 60N pulling forces were applied to each of them respectively for 1 min. The conductors did not dislodge from the clamping unit; the terminal assembly did not separate from the terminal insulator.	Pass
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IEC 60079-7			
Clause	Requirement – Test	Result – Remark	Verdict

7	ROUTINE VERIFICATIONS AND ROUTINE TESTS		
7.1	Dielectric tests	1554V is applied between the terminal and the enclosure and between the terminal and the terminal for 1min.	Pass
7.2	Dielectric tests for batteries	No batteries	N / A
7.3	Inter-turn overvoltage test	No current transformers	N / A

8	EX COMPONENT CERTIFICATES		Pass
8.1	General	The relevant document is already provided by the manufacturers.	Pass
8.2	Terminals	No terminals	N / A

9	MARKING AND INSTRUCTIONS		
9.1	General Marking	See test report cover.	Pass
	Rated voltage(s) or voltage range(s) (V)	See test report cover.	Pass
	Rated current (mA or A)		N / A
	Rated power	See test report cover.	Pass
	Starting current ratio I_A/I_N		N / A
	Time t_E		N / A
	Short circuit current I_{SC}		N / A
	Electrical rating, lamp	See test report cover.	Pass
	Lamp dimensions		N / A
	Rated maximum dissipated power		N / A
	Permissible number of conductors		N / A
	Size of conductors		N / A
	Maximum current		N / A
	Restrictions in use		N / A
	Characteristics of special protective devices		N / A
	Type of construction of cells		N / A
	Number of cells		N / A
	Nominal voltage of cells		N / A
	Rated capacity of cells		N / A
	Duration of cell discharge		N / A
	WARNING - DO NOT CHARGE IN HAZARDOUS AREA		N / A
	Conductor range		N / A
	Rated voltage		N / A
	Operating temperature		N / A

IEC 60079-7			
Clause	Requirement – Test	Result – Remark	Verdict
9.2	Instructions for use		Pass
9.2.1	Battery operated apparatus	No battery	N / A
	Name of manufacturer or supplier or registered trademark	No battery	N / A
	Manufacturer's type identification	No battery	N / A
	Number of cells	No battery	N / A
	Nominal voltage of the battery	No battery	N / A
	Rated capacity	No battery	N / A
	Charging instructions	No battery	N / A
	Safe operating conditions	No battery	N / A
	WARNING - REFER TO THE INSTRUCTION MANUAL FOR BATTERY CHARGING	No battery	N / A
9.2.2	Terminals		Pass
	Assigned torque value(s)	See manual.	Pass
	Indication of rearrangement or adjustment to adapt to various sizes of conductors	See manual.	Pass
	Instructions for proper conductor installation	See manual.	Pass
	Conductor insulation stripping requirements	See manual.	Pass
9.2.3	Luminaires		Pass
	Bi-pin luminaires	See manual.	Pass
	Screw-cap lamps		N / A
9.2.4	Motors	No motors	N / A
	Routine maintenance and lubrication of bearings		N / A
	Routine testing of insulated rotor bar insulation		N / A
9.3	Warning markings		N / A

ANNEX A	CAGE MOTORS- METHODS OF TEST AND OF CALCULATION		
A.1	Temperature rise of the stator	No cage motors	N / A
A.2	Temperature rise of the stator and rotor windings at rated service		N / A
A.3	Determination of temperature rise in stalled motors		N / A
A.3.1	Ambient temperature and application of rated voltage and rated frequency		N / A
A.3.2	Measurement of stator current		N / A
A.3.3	Temperature rises in the rotor cage		N / A

IEC 60079-7			
Clause	Requirement – Test	Result – Remark	Verdict
A.3.4	Average temperature rise in the stator		N / A
A.3.5	Stalled motor test		N / A
A.4	Calculation of temperature rise in stalled motors		N / A
A.4.1	Calculating the temperature of the short-circuited rotor		N / A
A.4.2	The rate of temperature rise		N / A
A.5	Determination of time t_E		N / A
A.6	Motors designed for arduous starting conditions		N / A
A.7	Motors forming units with converters and the associated protective devices		N / A

ANNEX B	TYPE TESTS FOR SPECIFIC FORMS OF RESISTANCE HEATING DEVICES OR RESISTANCE HEATING UNITS		
B.1	Resistance heating devices subjected to mechanical stresses	No resistance heating devices and resistance heating units.	N / A
B.2	Resistance heating devices or units intended for immersion		N / A
B.3	Resistance heating devices or units having hygroscopic insulating material		N / A
B.4	Verification of limiting temperature of resistance heating devices (other than trace heaters)		N / A
B.4.1	Test procedure		N / A
B.4.2	Resistance heating unit protected by a safety device in accordance to 5.9.12		N / A
B.4.2.1	Safety device sensing the temperature		N / A
B.4.2.2	Safety device sensing the temperature and at least one other protective parameter		N / A
B.4.2.3	Safety device sensing a parameter other than the temperature		N / A
B.4.3	Resistance heating unit of stabilized design		N / A
B.4.4	Heating device with temperature self-limiting characteristic		N / A
ANNEX H	TEST PROCEDURE FOR T8, T10 AND T12 LAMPS		
H.1	Asymmetric pulse test		

IEC 60079-7			
Clause	Requirement – Test	Result – Remark	Verdict
H.1.1	General	No tubular fluorescent lamps	N / A
H.1.2	Test procedure		N / A
H.2	Asymmetric power test		
H.2.1	General		N / A
H.2.2	Test procedure		N / A

APPENDIX A: Additional construction remarks

4.3	TABLE: clearance distance measurements			Pass
Clearance (cl) between circuit parts:	U _{r.m.s.} a.c. or d.c. (V)	Required cl (mm)	Measured cl (mm)	
between different live parts (Terminal:PBT1500)	277V AC	6.0	15.2	
between different live parts (Bushing: PA66+GF30%)	277V AC	6.0	15.7	

4.4	TABLE: creepage distance measurements			Pass
Creepage (dcr) distance between circuit parts:	U _{r.m.s.} a.c. or d.c. (V)	Required dcr (mm)	Measured dcr (mm)	
between different live parts (Terminal:PBT1500)	277V AC	8.0	15.7	
between different live parts (Bushing: PA66+GF30%)	277V AC	10.0	15.7	

APPENDIX B: Additional test remarks

6.1	TABLE: dielectric strength tests	
test voltage applied between:	test voltage (V) a.c. / d.c.	breakdown Yes / No
Between terminal and enclosure	1554V AC	No
Between terminal and terminal	1554V AC	No
Between bushing and enclosure	1554V AC	No
Between bushing and bushing	1554V AC	No
supplementary information		



IECEx TEST REPORT
IEC 60079
Explosive atmospheres –
Part 31 : Equipment dust ignition protection by enclosure “t”

ExTR Reference Number	
ExTR Free Reference Number	PCEC/TR13002
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Reviewed by + signature (ExTL)	Xu Jianwen <i>Xu Jianwen</i>
Date of issue	Jan. 8, 2013
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Address	4-5 Floor, Building 7, HuangBeiLingJingXuan Industrial park, No.2 Dong Huan Rd, Yousong, LongHua town, Bao'an District, Shenzhen, China.
Standard	IEC 60079-31:2008, 1 st edition
Test procedure	IECEx System
Test Report Form No.	ExTR60079-31_1A
TRF Originator	
Master TRF	dated 2009-10

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Possible test case verdicts:

- test case does not apply to the test object :N / A
- test object does meet the requirement..... :Pass

General remarks:

The tests results presented in this report relate only to the object tested.

This report shall not be reproduced except in full without the written approval of the testing laboratory.

"(see Attachment #)" refers to additional information appended to the report.

"(see appended table)" refers to a table appended to the report.

Throughout this report a point is used as the decimal separator.

IEC 60079-31			
Clause	Requirement – Test	Result – Remark	Verdict
1	SCOPE		
2	NORMATIVE REFERENCES		
3	TERMS AND DEFINITIONS		
4	LEVEL OF PROTECTION	Refer to test report IEC60079-0	Pass
4.1	General	Refer to test report IEC60079-0	Pass
4.2	Additional requirements for level of protection "ta"	The protection lever is "tb".	N / A
4.2.1	Thermal protection		
4.2.1.1	General	The product is of protection "tb"	N / A
4.2.1.2	Protective devices	The product is of protection "tb"	N / A
4.2.1.3	Temperature limitation	The product is of protection "tb"	N / A
5	CONSTRUCTION	Refer to test report IEC60079-1 clause 5.3.	Pass
5.1	Joints		
5.1.1	General	Refer to test report IEC60079-1 clause 5.3.	Pass
5.1.2	<i>Gaskets and seals</i>	One sealing ring is between cover and housing. Two sealing rings are between side cover and housing. One rubber o-ring is between rings plug and housing.	Pass
5.1.3	Cemented joints	Cemented joint is used between light-transmitting part and cover. A pressing ring is used for ensuring the strength of cement joints.	Pass
5.1.4	Operating rods, spindles and shafts	No operating rods.	N / A
5.1.5	Windows		
5.1.5.1	Windows employing a cemented joint	Refer to test report IEC60079-1 clause 6.	Pass
5.1.5.2	Windows employing a gasket joint	No windows employing a gasket joint.	N / A
5.2	Cable glands and threaded entries		
5.2.1	Cable glands	The enclosure does not contain cable glands.	N / A
5.2.2	Threaded entries	See clause 5.3 in IEC 60079-1	Pass
6	VERIFICATION AND TESTS		
6.1	Type tests		
6.1.1	Type tests for dust exclusion by enclosures	Refer to Cl.26.4.2, Cl.26.4.5 in test report IEC60079-0.	Pass

IEC 60079-31			
Clause	Requirement – Test	Result – Remark	Verdict
6.1.2	Thermal tests	Refer to test report IEC60079-0 cl. 26.5.	Pass
6.1.3	Pressure test	The KFrog series lamp were submitted to gas pressure test. Test pressure: 2KPa. Duration: 61s, No damage to enclosure or permanent deformation affecting the explosion-proof performance has been found.	Pass
6.2	Routine tests	No additional routine tests.	Pass

7	MARKING	The marking for equipment dust ignition protection is Ex tb IIIC T80℃ or T 95℃ Db IP66.	Pass
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Additional Narrative Remarks (as deemed applicable):