



IECEx TEST REPORT COVER

ExTR Reference Number.....:	CN/CQM/ExTR12.0040/00		
ExTR Free Reference Number	CQM/PCEC/ExTR12.0014		
Compiled by + signature (ExTL).....:	An Penghui	<i>An Penghui</i>	
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Approved by + signature (ExCB).....:	Zhang Wei		
Date of issue	2012-07-25		
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)	China Quality Mark Certification Group		
Address	No.33 Zengguang Road, Haidian District, Beijing 100048		
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; IEC60079-1:2007; IEC60079-31:2008		
Clauses considered.....:	All clauses considered		
Test procedure	IECEx System		
Test Report Form Number	ExTR Cover_4 (released 2010-12)		
Test item description	Explosion-proof Flood Light		
Model/type reference.....:	KArowana series		
Code (e.g. Ex __ II__ T__).....:	Ex d IIB T6 Gb/ Ex t IIIC T80°C Db IP66		
Rating	Rated voltage:100~240VAC; rated power: 30W		
All testing fully performed by ExTL staff at ExTL address above:	Yes.		

Instructions for Intended Use of 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: /

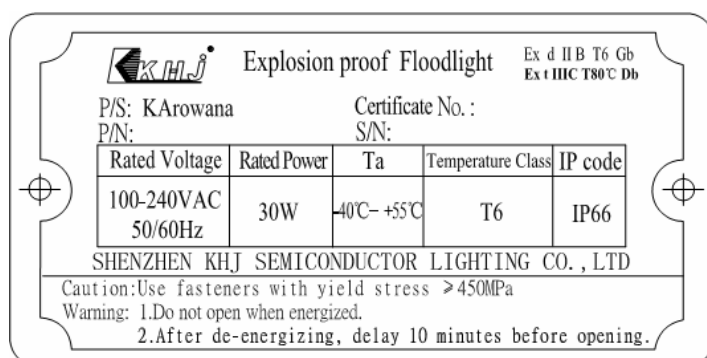
General remarks:

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.*

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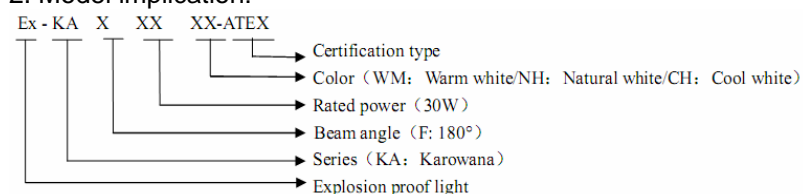
Copy of Marking Plate:



General product information:

1. The explosion-proof flood light is composed of a cover, a wiring cavity cover with light-transmitting part, a housing. The metallic part of the compartment is made of aluminium alloy. There are two flameproof compartments in the light. Two bushings are between the two compartments. The bushings are screwed into the threaded holes of the partition separating two compartments.

2. Model implication:



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 table 2 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.

Routine tests, if any:

Static pressure test is conducted according to Clause 16.1 of IEC 60079-1:2007.

Manufacturer's Documents			
Title:	Drawing No.:	Rev. Level:	Date:
Cover	110601-02	B	2011.11.10
Wiring cavity cover	110601-03	B	2011.11.10
Light-transmitting parts	110601-04	B	2011.11.10
Sealing ring for light cavity	110601-06	B	2011.11.10
Sealing ring for wiring cavity	110601-07	B	2011.11.10
Prevent the loss elastic element	110601-08	B	2011.11.10
Rubber pad	110601-13	A	2011.11.10
Cable tablet	110601-17	A	2011.11.10
Wiring base	110601-18	B	2011.11.10
Wiring base brass plate	110601-19	A	2011.11.10
Transparency platen	110601-23	B	2011.11.10
Inserts cover	110601-24	B	2011.11.10
Reflector	110601-25	B	2011.11.10
Insulation pad	110601-27	B	2011.11.10
Combination screw	110601-34	A	2011.11.10
Tabletting	110602-04	A	2011.11.10
Insert	110702-07	A	2011.11.10
Assembly drawing of explosion-proof flood light	111005-00-IECEx	A	2011.11.10
Housing	111005-01	A	2011.11.10
Reflector tablet	111005-02	A	2011.11.10
Reflector	111005-03	A	2011.11.10
Nameplate	111005-M03	A	2011.11.10
Explosion-proof sign nameplate	111005-M02	A	2011.11.10



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

ExTR Reference Number..... :
ExTR Free Reference Number : CQM/PCEC/ExTR12.0014
Complied by + signature (ExTL)..... : An Penghui
Reviewed by + signature (ExTL).... : Xu Jianwen
Date of issue : Jul. 3, 2012

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 T6; IIIC T80°C	N/A
4.2	Group II	IIB T6	Pass
4.3	Group III	IIIC 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		
5.1.1	Ambient temperatures	-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		
5.3.1	Determination of maximum surface temperature	The maximum surface temperature of the explosion-proof flood light locates on the light-transmitting part. Its maximum surface temperature is 74°C. Refer to clause 26.5.1.3 for details.	Pass
5.3.2	Limitation of maximum surface temperature		Pass
5.3.2.1	Group I electrical equipment		N/A
5.3.2.2	Group II electrical equipment	IIB T6	Pass
5.3.2.3	Group III electrical equipment		Pass
5.3.2.3.1	Maximum surface temperature determined without a dust layer	IIIC T80°C	Pass

IEC 60079-0			
Clause	Requirement – Test	Result – Remark	Verdict
5.3.2.3.2	Maximum surface temperature with respect to dust layers		N/A
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	KArowana explosion-proof flood light complies with the relevant requirements of IEC 60079-0, IEC 60079-1 and IEC 60079-31.	Pass

6.2	Mechanical strength of equipment	See clause 26.4.	Pass
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6.3	Opening times	After 10 minutes the temperature of the heat sink reduced to below 80°C. An opening delay marking is marked on the cover. See IEC 60079-0 clause 29.11.	Pass
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6.4	Circulating currents	No circulating currents.	N/A
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6.5	Gasket retention	The sealing rings are cemented by double component silicone.	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		N/A
6.6.2	Lasers or other continuous wave sources		N/A
6.6.3	Ultrasonic sources		N/A

7	NON-METALLIC ENCLOSURES AND NON-METALLIC PARTS OF ENCLOSURES		
7.1	General		Pass
7.1.1	Applicability	1. The sealing rings are made of silicon rubber. 2. The bushings are made of PA66	Pass
7.1.2	Specification of materials	See the relevant documents.	Pass
7.1.3	Plastic materials	The RTI of PA66 is 120°C.	Pass
7.1.4	Elastomeric materials	The COT of silicon rubber is -40°C~+180°C.	Pass

7.2	Thermal endurance		
7.2.1	Tests for thermal endurance	Relevant tests were carried out, see clause 26.8 and 26.9.	Pass

IEC 60079-0			
Clause	Requirement – Test	Result – Remark	Verdict
7.2.2	Material selection	The COT or TI (RTI) is at least 20K greater than the temperature of the hottest point of the sealing ring made of silicon rubber.	Pass
7.3	Resistance to light		N/A
7.4	Electrostatic charges on external non-metallic materials		
7.4.1	Applicability	No electrostatic charges on external non-metallic materials.	N/A
7.4.2	Avoidance of a build-up of electrostatic charge on Group I or Group II electrical equipment		N/A
7.4.3	Avoidance of a build-up of electrostatic charge on equipment for Group III		N/A
7.5	Threaded holes		N/A
8	METALLIC ENCLOSURES AND METALLIC PARTS OF ENCLOSURES		
8.1	Material Composition	ADC12 aluminum alloy is used, see the manufacturer's documents.	Pass
8.1.1	Group I		N/A
8.1.2	Group II	The content of Mg is 0.28%.The content of Ti is 0.04%.	Pass
8.1.3	Group III	The content of Mg is 0.28%.The content of Ti is 0.04%.	Pass
8.2	Threaded Holes	Threaded holes are provided on the cover, the wiring cavity cover and the housing. The thread form is compatible with the material of the cover and the enclosure.	Pass
9	FASTENERS		
9.1	General	M6 hexagon socket screws used for fastening the cover, the wiring cavity 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, the wiring cavity cover, and the housing. The tolerance fit of thread is 6g/6H.	Pass
9.3	Holes for special fasteners	Heading only	Pass
9.3.1	Thread engagement	The holes for special fasteners are through holes.	Pass

IEC 60079-0			
Clause	Requirement – Test	Result – Remark	Verdict
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	No hexagon socket set screw.	N/A
10	INTERLOCKING DEVICES	No interlocking devices.	N/A
11	BUSHINGS	The bushings are screwed into the threaded holes of the partition separating two compartments. Pin and bushing are injection and press together. See part IEC 60079-0 clause 26.6	Pass
12	MATERIALS USED FOR CEMENTING	Double component silicone is used to cement the light-transmitting part and the cover. Range of service temperature is -60°C~200°C.	Pass
13	EX COMPONENTS	No Ex component.	N/A
13.1	General		N/A
13.2	Mounting		N/A
13.3	Internal Mounting		N/A
13.4	External Mounting		N/A
14	CONNECTION FACILITIES AND TERMINAL COMPARTMENTS		
14.1	General	There are terminals inside the termination compartment.	Pass
14.2	Termination compartment	The opening size of the termination compartment is 59mm×118mm so that the conductors can be readily connected.	Pass
14.3	Type of protection	The terminal compartment is of type “d” and “t”.	Pass
14.4	Creepage and clearance		N/A
15	CONNECTION FACILITIES FOR EARTHING OR BONDING CONDUCTORS		
15.1	Equipment requiring earthing	This light has internal and external earthing screws.	Pass
15.1.1	Internal	A stainless steel screw M4×8 is used; the cross sectional area of internal earthing conductor is greater than 1.5mm ² ; the tightening torque is 2Nm.	Pass

IEC 60079-0			
Clause	Requirement – Test	Result – Remark	Verdict
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 2Nm.	Pass
15.2	Equipment not requiring earthing	No equipment not requiring earthing.	N/A
15.3	Size of conductor connection	See IEC 60079-0 clause 15.	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 spring washers to prevent loosening.	Pass
16	ENTRIES INTO ENCLOSURES		
16.1	General	The entries are two threaded holes located in the wall of the enclosure.	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	Reference only.	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		
17.3	Construction and mounting of the ventilation systems		N/A
17.4	Clearances for the ventilating systems		N/A

IEC 60079-0			
Clause	Requirement – Test	Result – Remark	Verdict
17.5	Materials for external fans and fan hoods		N/A
17.6	Equipotential bonding conductors		N/A
18	SUPPLEMENTARY REQUIREMENTS FOR SWITCHGEAR		N/A
18.1	Flammable dielectric	No switchgear.	
18.2	Disconnectors		N/A
18.3	Group I – Provisions for locking		
18.4	Doors and covers		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		N/A
20.1.2	Explosive dust atmospheres		N/A
20.2	Energized plugs		N/A
21	SUPPLEMENTARY REQUIREMENTS FOR LUMINAIRES		
21.1	General		N/A
21.2	Covers for luminaires of EPL Gb or EPL Db	1. Having warning text "WARNING-DO NOT OPEN WHEN ENERGIZED", which is printed on the nameplate. 2. Having warning text "WARNING – AFTER DE-ENERGIZING, DELAY 10 MINUTES BEFORE OPENING", which is printed on the nameplate.	Pass
21.3	Covers for luminaires of EPL Gc or EPL Dc	Gb Db	N/A
21.4	Special lamps	No special lamps.	N/A

IEC 60079-0			
Clause	Requirement – Test	Result – Remark	Verdict
22	SUPPLEMENTARY REQUIREMENTS FOR CAPLIGHTS AND HANDLIGHTS		
22.1	Group I caplights	No caplights and handlights.	N/A
22.2	Group II and Group II caplights and handlights		N/A
23	APPARATUS INCORPORATING CELLS AND BATTERIES		
23.1	General	No cells and batteries.	N/A
23.2	Batteries		N/A
23.3	Cell types		N/A
23.4	Cells in a battery		N/A
23.5	Ratings of batteries		N/A
23.6	Interchangeability		N/A
23.7	Charging of primary batteries		N/A
23.8	Leakage		N/A
23.9	Connections		N/A
23.10	Orientation		N/A
23.11	Replacement of cells or batteries		N/A
23.12	Replaceable battery pack		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		Pass

IEC 60079-0			
Clause	Requirement – Test	Result – Remark	Verdict
26.2	Test configuration	The KArowana explosion-proof flood light was used in the temperature measurement. And the most unfavorable condition was considered.	Pass

26.3	Tests in explosive test mixtures	See the tests in relevant standards.	Pass
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26.4	Tests of enclosures		
26.4.1	Order of tests		
26.4.1.1	Metallic enclosures, metallic parts of enclosures and glass of parts of enclosures	The enclosure of KArowana explosion-proof flood light is comprised of a cover, a wiring cavity cover, a housing, and a light-transmitting part. For test order refers to clause 26.4.1.2.2.	Pass
26.4.1.2	Non-metallic enclosures or non-metallic parts of enclosures	The KArowana explosion-proof flood light has two flame-proof compartments. Two bushings made of PA66 are used for blanking the part between these two compartments. The sealing rings are considered as the non-metallic parts.	Pass
26.4.1.2.1	Group I electrical equipment		N/A
26.4.1.2.2	Group II and Group III electrical equipment	Tests were carried out on two samples. Tests were performed in the following order: 1. thermal resistance to heat; 2. thermal resistance to cold; 3. pressure test 4. test for resistance to impact; 5. test for degrees of protection; 6. test of ability of the enclosure to withstand pressure; 7. test of erosion by flame 8. test for non-transmission of an internal ignition.	Pass
26.4.2	Resistance to impact	Tests were carried out on two samples. The impact test was carried out on the wiring cavity cover, housing of each sample, impact energy 7J at room temperature of 15°C. The impact test to light-transmitting part was carried out on three samples, impact energy: 4J at room temperature of 15°C.	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		
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		
26.5.1	Temperature measurement		

IEC 60079-0																																	
Clause	Requirement – Test	Result – Remark	Verdict																														
26.5.1.1	General		Pass																														
26.5.1.2	Service temperature	Using maximum surface temperature instead of maximum service temperature is approved by the manufacturer.	Pass																														
26.5.1.3	Maximum surface temperature	<div>Test voltage is 1.1 times of rated voltage, i.e. AC264V; Tests were carried out on two directions: vertically downward and direction which forms 60° angle with horizon.</div> <table><tr><th>Part</th><th>vertically downward (°C)</th><th>direction which forms 60° angle with horizon (°C)</th></tr><tr><td>Housing</td><td>69</td><td>69</td></tr><tr><td>Sealing ring of wiring cavity</td><td>65</td><td>65</td></tr><tr><td>Sealing ring of light source cavity</td><td>70</td><td>74</td></tr><tr><td>Light-transmitting part</td><td>72</td><td>71</td></tr><tr><td>Light-transmitting part</td><td>72</td><td>72</td></tr><tr><td>Cementing material</td><td>71</td><td>70</td></tr><tr><td>Entry</td><td>70</td><td>70</td></tr><tr><td>Heat sink</td><td>81</td><td>83</td></tr><tr><td>Ambient</td><td>55</td><td>55</td></tr></table> <div>The highest temperature measured on the enclosure was 74°C. Comply with T6. After 10 minutes the temperature of the heat sink reduced to below 80°C.</div>	Part	vertically downward (°C)	direction which forms 60° angle with horizon (°C)	Housing	69	69	Sealing ring of wiring cavity	65	65	Sealing ring of light source cavity	70	74	Light-transmitting part	72	71	Light-transmitting part	72	72	Cementing material	71	70	Entry	70	70	Heat sink	81	83	Ambient	55	55	Pass
Part	vertically downward (°C)	direction which forms 60° angle with horizon (°C)																															
Housing	69	69																															
Sealing ring of wiring cavity	65	65																															
Sealing ring of light source cavity	70	74																															
Light-transmitting part	72	71																															
Light-transmitting part	72	72																															
Cementing material	71	70																															
Entry	70	70																															
Heat sink	81	83																															
Ambient	55	55																															
26.5.2	Thermal shock test	The highest temperature part of light-transmitting part was sprayed by water of 12°C and 1mm diameter. The light-transmitting part was not broken.	Pass																														
26.5.3	Small component ignition test (Group I and Group II)																																
26.5.3.1	General	No small component.	N/A																														
26.5.3.2	Procedure		N/A																														
26.5.3.3	Acceptance criteria		N/A																														
26.6	Torque test for bushings																																
26.6.1	Test procedure	Two M12×1 bushings are used between the two compartments. A torque of 25Nm was applied to the stem of bushing.	Pass																														

IEC 60079-0			
Clause	Requirement – Test	Result – Remark	Verdict
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 25Nm.	Pass
26.7	Non-metallic enclosures or non-metallic parts of enclosures		
26.7.1	General		N/A
26.7.2	Test temperatures		N/A
26.8	Thermal endurance to heat	Keep in the condition of temperature 95°C, relative humidity 90% for 28 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 ring were not broken or damaged.	Pass
26.10	Resistance to light		N/A
26.10.1	Test procedure		
26.10.2	Acceptance criteria		N/A
26.11	Resistance to chemical agents for Group I electrical equipment		N/A
26.12	Earth continuity		N/A
26.13	Surface resistance test of parts of parts of enclosures of non-metallic materials		N/A
26.14	Charging tests		N/A
26.14.1	Introduction		N/A
26.14.2	Principle of the test		N/A
26.14.3	Samples and test apparatus		N/A
26.14.4	Ambient conditions		N/A
26.14.5	Conditioning		N/A
26.14.6	Determination of the most efficient charging method		
26.14.6.1	Method A: Rubbing with a pure polyamide cloth		N/A
26.14.6.2	Method B: Rubbing with a cotton cloth		N/A
26.14.6.3	Method C: Charging by influence with a d.c. high-voltage power supply		N/A
26.14.7	Assessment of discharge		N/A

IEC 60079-0			
Clause	Requirement – Test	Result – Remark	Verdict
26.15	Measurement of capacitance		N/A
26.15.1	Test procedure		N/A
26.15.2	Acceptance criteria		N/A
27	Routine tests	The product shall be submitted to static pressure test at 1.5 times the reference pressure for 1minute.	Pass
28	MANUFACTURER'S RESPONSIBILITY		
28.1	Conformity with the documentation	The manufacturer carried out the verification to ensure the explosion-proof light complied with the documentation.	Pass
28.2	Certificate	See documents provided by the manufacturer.	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 cover. The nameplate is made of stainless steel.	Pass
29.2	General	See test report cover.	Pass
29.3	Ex marking for explosive gas atmospheres	Ex d IIB T6 Gb.	Pass
29.4	Ex marking for explosive dust atmospheres	Ex t IIIC T80°C Db IP66	Pass
29.5	Combined types of protection	No combined types of protection.	N/A
29.6	Multiple types of protection	No multiple types of protection.	N/A
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

IEC 60079-0			
Clause	Requirement – Test	Result – Remark	Verdict
29.11	Warning markings	The warning texts “DO NOT OPEN WHEN ENERGIZED” and “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		N/A
29.12.2	Alternate marking of type of protection for explosive dust atmospheres		N/A
29.13	Cells and batteries	No cells and batteries.	N/A
30	INSTRUCTIONS		
30.1	General	The instruction manual includes summary, 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		
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
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

IEC 60079-0			
Clause	Requirement – Test	Result – Remark	Verdict
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	CQM/PCEC/ExTR12.0014
Complied by + signature (ExTL)	An Penghui <i>An Penghui</i>
Reviewed by + signature (ExTL) ...	Xu Jianwen <i>Xu Jianwen</i>
Date of issue	Jul. 3, 2012
Ex Testing Laboratory (ExTL)	Supervision & Test Center of Ex-products of China Petroleum & Chemical Industry
Address	No.85, No.3 Road, Dingzigu, 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 60079-1:2007, 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 T6 IIIC T80°C	Pass
5	FLAMEPROOF JOINTS		
5.1	General requirements	For the dimensions of flameproof joints see part IEC 60079-1 clauses 5.2 and 5.3	Pass
5.2	Non-threaded joints		
5.2.1	Width of joints (<i>L</i>)	The joint between cover and housing is a flange joint. Volume of the light source compartment: $\leq 0.88L$ $L=13.5\text{mm}$ $i=0.2\text{mm}$ Roughness: $3.2 \mu\text{m}$ The joint between wiring cavity cover and housing is a flange joint. Volume of the terminal compartment: $\leq 0.3L$ $L=13.5\text{mm}$ $i=0.2\text{mm}$ Roughness: $3.2 \mu\text{m}$	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 <i>L</i> is not interrupted by holes.	N/A
5.2.4.1	Flanged joints with holes outside the enclosure (see Figures 3 and 5)		N/A
5.2.4.2	Flanged joints with holes inside the enclosure (see Figure 4)		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)		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)		N/A

IEC 60079-1			
Clause	Requirement – Test	Result – Remark	Verdict
5.2.5	Conical joints	No conical joints.	N/A
5.2.6	Joints with partial cylindrical surfaces (not permitted for Group IIC)		N/A
5.2.7	Flanged joints for acetylene atmospheres		N/A
5.2.8	Serrated joints	No serrated joints.	N/A
5.3	Threaded joints	Bushing and housing: M12×1-6H/6g; the length of engagement is 11mm; the number of engaged threads is 11.	Pass
5.4	Gaskets (including O-rings)	One sealing ring is between cover and housing. The other sealing ring is between wiring cavity cover and housing. All sealing rings are stuck by double component silicone.	Pass
5.5	Equipment using capillaries	No equipment using capillaries.	N/A
6	CEMENTED JOINTS		
6.1	General	There is a cemented joint between light-transmitting part and housing. The light transmitting-part is cemented to the cover by double component silicone.	Pass
6.2	Mechanical strength	A pressing ring is 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		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		N/A

IEC 60079-1			
Clause	Requirement – Test	Result – Remark	Verdict
8.1.2	Labyrinth joints		N/A
8.1.3	Joints with floating glands		N/A
8.2	Bearings		
8.2.1	Sleeve Bearings		N/A
8.2.2	Rolling-element bearings		N/A
9	LIGHT-TRANSMITTING PARTS	The light transmitting-part is cemented to the cover by double component silicone. A pressing ring is used for ensuring the strength of cemented joint.	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		N/A
10.2	Composition limits		N/A
10.3	Dimensions		N/A
10.4	Elements with measurable paths		N/A
10.5	Elements with non-measurable paths		N/A
10.6	Removable devices		N/A
10.7	Mounting arrangements of the elements		N/A
10.8	Mechanical strength		N/A
10.9	Breathing devices and draining devices when used as Ex components		N/A
10.9.1	Mounting arrangements of the elements and components		N/A
10.9.2	Type tests for breathing and draining devices used as Ex components		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		N/A
10.9.2.1.2	Acceptance criteria		N/A
10.9.2.2	Thermal tests		N/A
10.9.2.2.1	Test procedure		N/A

IEC 60079-1			
Clause	Requirement – Test	Result – Remark	Verdict
10.9.2.2.2	Acceptance criteria		N/A
10.9.2.3	Test for non-transmission of an internal ignition		N/A
10.9.2.3.1	Test procedure		N/A
10.9.2.3.2	Acceptance criteria		N/A
10.9.3	Ex component certificate		N/A

11	FASTENERS, ASSOCIATED HOLES AND CLOSING DEVICES		
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11.1	Type of fastener	9 M6×25 screws are used for fastening the cover and the housing. 5 M6×25 screws are used for fastening the wiring cavity cover and the housing. All the screws are made of stainless steel. They can only be released or removed by tools.	Pass
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11.2	Plastic material or light alloys	No plastic material or light alloys.	Pass
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11.3	Yield stress	With a label as “USE FASTENERS WITH YIELD STRESS ≥ 450MPa” The property class of the M6 screw is A-70. The yield stress is 450MPa.	Pass
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11.4	Studs	No studs.	N/A
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11.5	Fasteners through walls	No fasteners through walls	N/A
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11.6	Blind holes	The remaining thickness of the wall of the flameproof enclosure around blinded holes is 4 mm.	Pass
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11.7	Screws into blind holes	When screws are fully tightened into blind holes in enclosure walls, with no washer fitted, at least one full thread shall remain free at the base of the hole.	Pass
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11.8	Closing of through holes	No through holes.	N/A
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11.9	Closure of apertures and compliance of blanking elements	No blanking elements.	N/A
11.9.1	Closing device removable from outside		N/A
11.9.2	Tool used to remove closing device		N/A
11.9.3	Special removal technique		N/A
11.9.4	Blanking element used with an adapter		N/A

11.10	Separate fastening arrangements for threaded doors/covers	No threaded doors/covers.	N/A
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IEC 60079-1			
Clause	Requirement – Test	Result – Remark	Verdict
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 of the explosion-proof flood light are separated by a partition and 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
13	ENTRIES FOR FLAMEPROOF ENCLOSURES		
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		N/A
13.2.2	Requirements for sealing device		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		N/A
13.3.3	Flameproof properties in the event of internal explosion		N/A
13.3.4	Exemption & warning label		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

IEC 60079-1			
Clause	Requirement – Test	Result – Remark	Verdict
15	TYPE TESTS	Carried out the determination of reference pressure, the test of static pressure and the test for non-transmission of an internal ignition in sequence.	Pass
15.1	Tests of ability of the enclosure to withstand pressure		
15.1.1	General	The explosion-proof flood light had no deformation that affects the type of protection. No permanent accretion of the clearance of any parts between joints	Pass
15.1.2	Determination of explosion pressure (reference pressure)	The net volume of light source compartment $\leq 880\text{cm}^3$. The ambient temperature for carrying out the tests was 15°C .	Pass
15.1.2.1	Test procedure	In atmospheric pressure, use air with ethylene ratio of 8% to do the test 3 times. The maximum reference pressure measured was 360kPa.	Pass
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		N/A
15.1.3	Overpressure test	The mechanical property of the enclosure will not be damaged in -40°C , therefore the tests were carried out in room temperature.	Pass
15.1.3.1	Overpressure test - First method (static)	Light source compartment: test pressure is 600kPa; duration of test is 10s. No damage and permanent deformation to the enclosure and no leakage. Terminal compartment: reference pressure determination is impracticable; the net volume of terminal compartment $\leq 300\text{cm}^3$; test pressure is 1500kPa; duration of test is 10s. No damage and permanent deformation to the enclosure and no leakage.	Pass
15.1.3.2	Overpressure test - second method (dynamic)		N/A
15.2	Test for non-transmission of an internal ignition	Remove the sealing rings before test of non-transmission of an internal ignition. For M thread, no reduction was made.	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 36.7%~37.2%.	Pass
15.2.1.2	Increasing of gaps for test		N/A

IEC 60079-1			
Clause	Requirement – Test	Result – Remark	Verdict
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	.	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		N/A
15.4.1.1	Replacement of breathing and draining devices		N/A
15.4.1.2	Over pressure test		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
16.1.1	Routine overpressure test – first method	The product shall be submitted to static pressure test at 1.5 times the reference pressure for 1minute.	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

IEC 60079-1			
Clause	Requirement – Test	Result – Remark	Verdict
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	No lampholders and lamp caps.	N/A
18.1	Device preventing lamps working loose		N/A
18.2	Holders and caps for lamps with cylindrical caps		
18.2.1	Holders and caps for tubular fluorescent lamps		N/A
18.2.2	Other holders		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	Bushing is made of PA66.	Pass
19.1	(Reserved for future use)		
19.2	Special constructional requirements		
19.2.1	Resistance to tracking and creepage distances on internal surfaces of the enclosure walls	CTI of PA66 is 200. The creepage distance is 8mm.	Pass
19.3	Supplementary requirements for type tests	Bushing is made of PA66.	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

IEC 60079-1			
Clause	Requirement – Test	Result – Remark	Verdict
19.3.1.3	Test of erosion by flame	The test was carried out in the enclosure giving the worst conditions. Test gas: ethane 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
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20.1	General	The marking complies with the test report IEC60079-0, see report IEC60079-0 clause 29.	Pass
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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 on the nameplate.	Pass
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20.3	Informative markings		N/A
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Annex A (Normative)	ADDITIONAL REQUIREMENTS FOR CRIMPED RIBBON ELEMENTS AND MULTIPLE SCREEN ELEMENTS OF BREATHING AND DRAINING DEVICES		
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A.1	Crimped ribbon and multiple screen elements	No breathing and draining devices.	N/A
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A.2	Path dimensions		N/A
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A.3	Annex B requirements		N/A
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A.4	Type tests		N/A
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Annex B (Normative)	ADDITIONAL REQUIREMENTS FOR ELEMENTS, WITH NON-MEASURABLE PATHS, OF BREATHING AND DRAINING DEVICES		
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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

IEC 60079-1			
Clause	Requirement – Test	Result – Remark	Verdict
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		N/A
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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
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 sample. The static pressure test was done according to clause 15.1.3.1. 600kPa is maintained for 10s. 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

IEC 60079-1			
Clause	Requirement – Test	Result – Remark	Verdict
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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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

IEC 60079-1			
Clause	Requirement – Test	Result – Remark	Verdict
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
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

IEC 60079-1			
Clause	Requirement – Test	Result – Remark	Verdict
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
Explosive atmospheres –
Part 31 : Equipment dust ignition protection by enclosure “t”

ExTR Reference Number			
ExTR Free Reference Number	CQM/PCEC/ExTR12.0014		
Complied by + signature (ExTL)	An Penghui		
Reviewed by + signature (ExTL)	Xu Jianwen		
Date of issue	Jul. 3, 2012		
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 60079-31:2008, 1 st edition		
Test procedure	IECEX System		
Test Report Form No	ExTR60079-31_1A		
TRF Originator			
Master TRF	dated 2009-10		
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 60079-31			
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		N / A
4.2.1.3	Temperature limitation		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	Gaskets and seals	One sealing ring is between cover and housing. The other sealing ring is between wiring cavity cover and housing. All sealing rings are cemented by double component silicone. All sealing rings are of one-piece continuous construction.	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 explosion-proof 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		

IEC 60079-31			
Clause	Requirement – Test	Result – Remark	Verdict
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
6.1.2	Thermal tests	Refer to test report IEC60079-0 cl. 26.5.	Pass
6.1.3	Pressure test	The explosion-proof flood light was 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	See this test report cover.	Pass
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Additional Narrative Remarks (as deemed applicable):