

Test Report No.: 68.402.23.0448.01

Rev.: 02

Dated: 2023-11-17



Applicant: AOK Industrial Company Limited

Address: 1/F of 1#Building, East Block of 3/F of Building 1, And 2/F of Building 4, ST George's Science and Technology Industrial Park, Northside of Xinyu Road, Xiangshan Community, xinqiao Street Baoan District, 518000 Shenzhen, Guangdong, CHINA

Sample Description: LED STREET LIGHT

Tested Model No.: AOK-100WiLA-NV-L3-SN-3070-T2-P

Ref. Model No.: Refer to APPENDIX II

Brand Name:



Sample Received Date: 2023-06-25, 2023-11-06, Shenzhen

Test Period: From 2023-06-25 to 2023-11-15, Shenzhen

Purpose of examination: Verification of RoHS (Restriction of Hazardous Substances) directive 2011/65/EU and its amendment (EU) 2015/863 on submitted samples

Test Results: Refer to following page(s)

Remark: - The result relates only to the items tested.
- The reference model(s) was declared by client.

TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch
TÜV SÜD Group

Prepared by:

Reviewed by:

Elsa Deng
Project Handler



Scarlett Liang
Designated Reviewer

Any use for advertising purposes must be granted in writing. This test report may only be quoted in full. This report is the result of a single examination of the object in question and is not generally applicable evaluation of the quality of other products in regular production. For further details, please see testing and certification regulation, chapter A-3.4.

Disclaimer Measurement Uncertainty: Unless otherwise agreed upon, pass or fail verdicts are given based on the measured values without consideration of measurement uncertainties. Please note, every test method has a measurement uncertainty which has been evaluated by the laboratory according to ISO IEC 17025 requirements. By taking measurement uncertainties into account it might happen that measured values can neither be assessed as pass or fail.

TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch

Tel.: (86) 755 88286998

TÜV SÜD Group

Fax: (86) 755 88285299

Building 12 & 13, Zhiheng Wisdomland Business Park,
Guankou Erlu, Nantou, Nanshan District,
Shenzhen, Guangdong 518052 China

Test Report No.: 68.402.23.0448.01

Rev.: 02

Dated: 2023-11-17

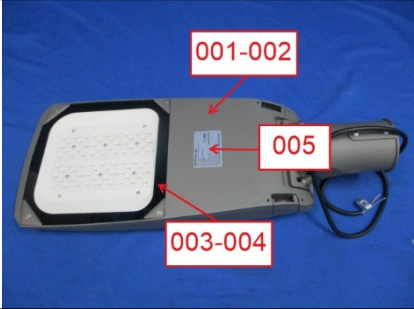
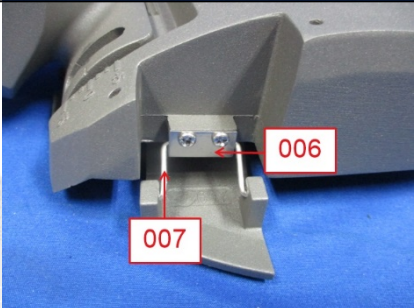
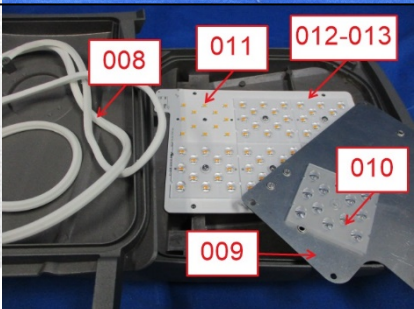
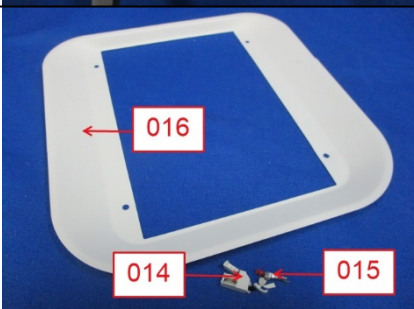
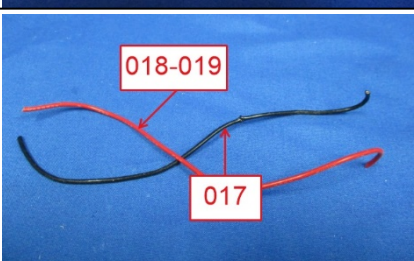


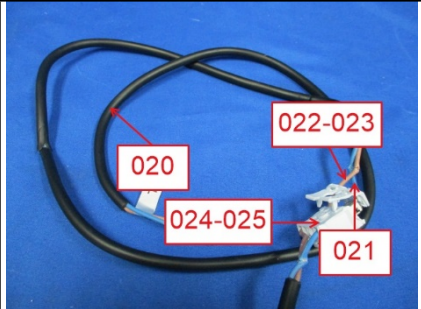
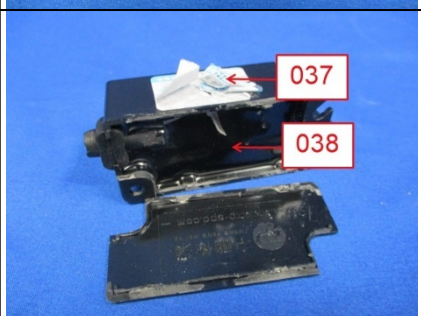
SUMMARY OF TEST RESULTS

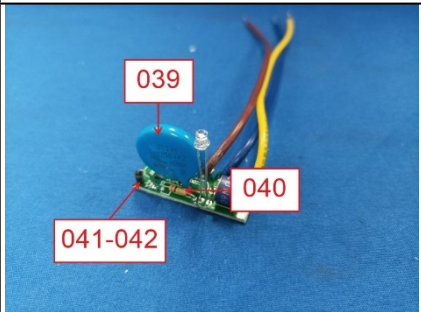
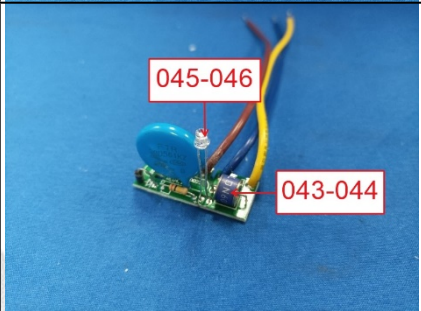
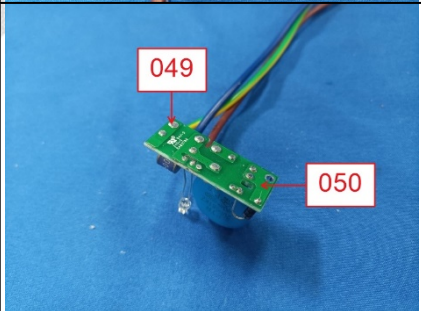
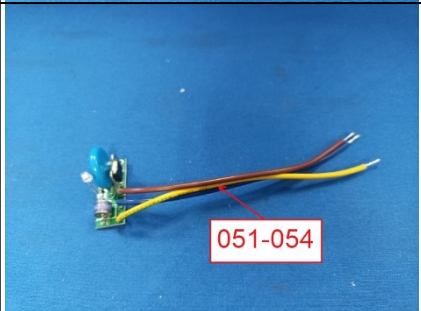
No.	Test Requested	Conclusion	Remarks
1.	Heavy Metal (Pb, Cd, Hg and Cr VI) Content	PASS	
2.	Polybrominated Biphenyls (PBBs) and Polybrominated Diphenyl Ethers (PBDEs) Content	PASS	
3.	Phthalates (DEHP, BBP, DBP and DIBP) Content	PASS	



1. TESTED SUBJECT DESCRIPTION

Test No.	Sample No.	Tested Material Description	Photo
T1	001	Grey coating	
T2	002	Silvery metal case	
T3	003	Transparent glass	
T4	004	Black coating	
T5	005	Black printed silvery soft plastic sticker	
T6	006	Silvery metal plate	
T7	007	Silvery metal hook	
T8	008	White soft plastic gasket	
T9	009	Silvery metal plate	
T10	010	Transparent plastic plate	
T11	011	White/orange LED body	
T12	012	White coating	
T13	013	Silvery metal plate	
T14	014	White plastic case	
T15	015	Silvery/coppery metal holder	
T16	016	White plastic plate	
T17	017	Black soft plastic wire jacket	
T18	018	Red soft plastic wire jacket	
T19	019	Silvery metal wire	

Test No.	Sample No.	Tested Material Description	Photo
T20	020	White printed black soft plastic cable jacket	
T21	021	Blue soft plastic wire jacket	
T22	022	Pink soft plastic wire jacket	
T23	023	Coppery metal wire	
T24	024	White plastic case (Connector)	
T25	025	Silvery metal holder (Connector)	
T26	026	Silvery metal screw	
T27	027	Silvery metal gasket	
T28	028	Silvery metal gasket	
T29	029	Black plastic cap	
T30	030	Black soft plastic gasket	
T31	031	Black plastic thread	
T32	032	Black soft plastic gasket	
T33	033	White printed black plastic case	
T34	034	Blue/black printed white soft plastic sticker	
T35	035	Black plastic case	
T36	036	Black soft plastic gasket	
T37	037	Blue/black/grey printed transparent white soft plastic sticker	
T38	038	Black/grey glue	

Test No.	Sample No.	Tested Material Description	Photo
T39	039	Blue body with pin (capacity)	
T40	040	Multicolor printed brown body with pin (resistor)	
T41	041	Grey printed black body (diode)	
T42	042	Silvery metal solder with pin (diode)	
T43	043	Blue/white ceramic case (EC)	
T44	044	Silvery metal case (EC)	
T45	045	Transparent plastic LED	
T46	046	Silvery metal pin	
T47	047	Black/white body (EC)	
T48	048	Silvery metal pin	
T49	049	Silvery metal solder	
T50	050	Green PCB	
T51	051	Blue soft plastic wire jacket	
T52	052	Brown soft plastic wire jacket	
T53	053	Yellow/green soft plastic wire jacket	
T54	054	Coppery metal wire	



2. TEST RESULT(S)

2.1 SCREENING TEST

Test method: With reference to EN 62321-1:2013, EN IEC 62321-2:2021, EN 62321-3-1:2014 and EN 62321-8:2017. For Heavy Metals and Flame Retardants, analyzed by Energy Dispersive X-ray Fluorescence Spectrometer (XRF); for phthalates, analyzed by Gas Chromatography and Mass Spectrometer (GC-MS).

Sample No.	Heavy Metals and Flame Retardants					Phthalates			
	Cd	Cr	Hg	Pb	Br	DEHP	BBP	DBP	DIBP
001	BL	BL	BL	BL	BL	BL	BL	BL	BL
002	BL	BL	BL	BL	NA	NA	NA	NA	NA
003	BL	BL	BL	BL	NA	NA	NA	NA	NA
004	BL	BL	BL	BL	BL	BL	BL	BL	BL
005	BL	BL	BL	BL	BL	BL	BL	BL	BL
006	BL	Inc. ^(a)	BL	BL	NA	NA	NA	NA	NA
007	BL	Inc. ^(a)	BL	BL	NA	NA	NA	NA	NA
008	BL	BL	BL	BL	BL	BL	BL	BL	BL
009	BL	Inc. ^(a)	BL	BL	NA	NA	NA	NA	NA
010	BL	BL	BL	BL	BL	BL	BL	BL	BL
011	BL	BL	BL	BL	BL	BL	BL	BL	BL
012	BL	BL	BL	BL	BL	BL	BL	BL	BL
013	BL	BL	BL	BL	NA	NA	NA	NA	NA
014	BL	BL	BL	BL	BL	BL	BL	BL	BL
015	BL	BL	BL	BL	NA	NA	NA	NA	NA
016	BL	BL	BL	BL	BL	BL	BL	BL	BL
017	BL	BL	BL	BL	BL	BL	BL	BL	BL
018	BL	BL	BL	BL	BL	BL	BL	BL	BL
019	BL	BL	BL	BL	NA	NA	NA	NA	NA
020	BL	BL	BL	BL	BL	BL	BL	BL	BL
021	BL	BL	BL	BL	BL	BL	BL	BL	BL
022	BL	BL	BL	BL	BL	BL	BL	BL	BL
023	BL	BL	BL	BL	NA	NA	NA	NA	NA
024	BL	BL	BL	BL	BL	BL	BL	BL	BL
025	BL	Inc. ^(a)	BL	BL	NA	NA	NA	NA	NA
026	BL	Inc. ^(a)	BL	BL	NA	NA	NA	NA	NA
027	BL	Inc. ^(a)	BL	BL	NA	NA	NA	NA	NA



Sample No.	Heavy Metals and Flame Retardants					Phthalates			
	Cd	Cr	Hg	Pb	Br	DEHP	BBP	DBP	DIBP
028	BL	Inc. ^(a)	BL	BL	NA	NA	NA	NA	NA
029	BL	BL	BL	BL	BL	BL	BL	BL	BL
030	BL	BL	BL	BL	BL	Inc. ^(a)	BL	BL	BL
031	BL	BL	BL	BL	BL	BL	BL	BL	BL
032	BL	BL	BL	BL	BL	BL	BL	BL	BL
033	BL	BL	BL	BL	BL	BL	BL	BL	BL
034	BL	BL	BL	BL	BL	BL	BL	BL	BL
035	BL	BL	BL	BL	Inc. ^(a)	BL	BL	BL	BL
036	BL	BL	BL	BL	BL	BL	BL	BL	BL
037	BL	BL	BL	BL	BL	BL	BL	BL	BL
038	BL	BL	BL	BL	BL	BL	BL	BL	BL
039	BL	BL	BL	BL	BL	BL	BL	BL	BL
040	BL	BL	BL	BL	BL	BL	BL	BL	BL
041	BL	BL	BL	BL	Inc. ^(a)	BL	BL	BL	BL
042	BL	BL	BL	OL*	NA	NA	NA	NA	NA
043	BL	BL	BL	BL	NA	NA	NA	NA	NA
044	BL	Inc. ^(a)	BL	BL	NA	NA	NA	NA	NA
045	BL	BL	BL	BL	BL	BL	BL	BL	BL
046	BL	BL	BL	BL	NA	NA	NA	NA	NA
047	Inc. ^(a)	BL	BL	BL	Inc. ^(a)	BL	BL	BL	BL
048	BL	BL	BL	BL	NA	NA	NA	NA	NA
049	BL	Inc. ^(a)	BL	BL	NA	NA	NA	NA	NA
050	BL	BL	BL	BL	Inc. ^(a)	BL	BL	BL	BL
051	BL	BL	BL	BL	BL	BL	BL	BL	BL
052	BL	BL	BL	BL	BL	BL	BL	BL	BL
053	BL	BL	BL	BL	BL	BL	BL	BL	BL
054	BL	BL	BL	BL	NA	NA	NA	NA	NA

Note:

- "BL" denotes below limit
- "OL" denotes over limit
- "Inc." denotes inconclusive
- "NA" denotes not applicable
- "(a)" denotes further confirmation test was conducted, results are listed in 2.2, 2.3 and 2.4.

TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch

Tel.: (86) 755 88286998

TÜV SÜD Group

Fax: (86) 755 88285299

Building 12 & 13, Zhiheng Wisdomland Business Park,

Guankou Erlu, Nantou, Nanshan District,

Shenzhen, Guangdong 518052 China

- "" denotes the exempt item according to DIRECTIVE 2011/65/EU Annex III item 7(a) "lead in high melting temperature type solder(i. e. lead-based alloy containing 85% by weight or more lead)".

-XRF screening limits in mg/kg for regulated elements in various matrices

ELEMENT	POLYMER		
	BL	INCONCLUSIVE	OL
Cd	$X \leq (70-3\sigma)$	$(70-3\sigma) < X < (130+3\sigma)$	$X \geq (130+3\sigma)$
Pb	$X \leq (700-3\sigma)$	$(700-3\sigma) < X < (1300+3\sigma)$	$X \geq (1300+3\sigma)$
Hg	$X \leq (700-3\sigma)$	$(700-3\sigma) < X < (1300+3\sigma)$	$X \geq (1300+3\sigma)$
Br	$X \leq (300-3\sigma)$	$X > (300-3\sigma)$	NA
Cr	$X \leq (700-3\sigma)$	$X > (700-3\sigma)$	NA

ELEMENT	METAL		
	BL	INCONCLUSIVE	OL
Cd	$X \leq (70-3\sigma)$	$(70-3\sigma) < X < (130+3\sigma)$	$X \geq (130+3\sigma)$
Pb	$X \leq (700-3\sigma)$	$(700-3\sigma) < X < (1300+3\sigma)$	$X \geq (1300+3\sigma)$
Hg	$X \leq (700-3\sigma)$	$(700-3\sigma) < X < (1300+3\sigma)$	$X \geq (1300+3\sigma)$
Cr	$X \leq (700-3\sigma)$	$X > (700-3\sigma)$	NA

ELEMENT	COMPLEX MATERIAL		
	BL	INCONCLUSIVE	OL
Cd	$X \leq (50-3\sigma)$	$(50-3\sigma) < X < (150+3\sigma)$	$X \geq (150+3\sigma)$
Pb	$X \leq (500-3\sigma)$	$(500-3\sigma) < X < (1500+3\sigma)$	$X \geq (1500+3\sigma)$
Hg	$X \leq (500-3\sigma)$	$(500-3\sigma) < X < (1500+3\sigma)$	$X \geq (1500+3\sigma)$
Br	$X \leq (250-3\sigma)$	$X > (250-3\sigma)$	NA
Cr	$X \leq (500-3\sigma)$	$X > (500-3\sigma)$	NA

-Screening limits in mg/kg for regulated phthalates in various matrices

PHthalATES	BL	INCONCLUSIVE
DEHP	$X < 600$	$X \geq 600$
BBP	$X < 600$	$X \geq 600$
DBP	$X < 600$	$X \geq 600$
DIBP	$X < 600$	$X \geq 600$

2.2 HEAVY METAL CONTENT

Test method: With reference to EN 62321-4:2014 /A1:2017, EN 62321-5:2014, EN 62321-7-1:2015 and EN 62321-7-2:2017, analyzed by Inductively Coupled Plasma Optical Emission Spectrometer (ICP-OES) and Ultraviolet-visible spectrophotometer (UV-Vis).

[Reporting Limit: 2.0 mg/kg for Cadmium; 10.0 mg/kg or 0.10 µg/cm² for Hexavalent Chromium, 10.0 mg/kg for Lead and Mercury.]

Sample No.	Result(s)				
	Total Cadmium	Hexavalent Chromium	Hexavalent Chromium	Total Mercury	Total Lead
006	--	/	Negative	--	--
007	--	/	Negative	--	--
009	--	/	Negative	--	--
025	--	/	Negative	--	--
026	--	/	Negative	--	--
027	--	/	Negative	--	--
028	--	/	Negative	--	--
044	--	/	Negative	--	--
047	<2.0	--	--	--	--
049	--	/	Negative	--	--
Unit	mg/kg	mg/kg	µg/cm²	mg/kg	mg/kg
RoHS Requirement	100	1000	Negative [#]	1000	1000

Note:

- "mg/kg" denotes milligram per kilogram
- "µg/cm²" denotes micrograms per square centimeter
- "<" denotes less than
- "Negative" denotes the absorbance value of sample is < 0.10 µg/cm², the sample is considered to be negative for Hexavalent Chromium.
- "[#]" According to DIRECTIVE 2011/65/EU Article 4(1) and Annex II. While, positive means the presence of CrVI on tested areas and the result(s) was (were) regarded as in conflict with European Parliament and Council Directive 2011/65/EU, Article 4(1) and Annex II.
- "--" denotes tested by XRF, result is listed in 2.1

2.3 POLYBROMINATED BIPHENYLS (PBBs) AND POLYBROMINATED DIPHENYL ETHERS (PBDEs) CONTENT

Test Method: With reference to EN 62321-6:2015, extracted by toluene and analyzed by Gas Chromatography and Mass Spectrometer (GC-MS). [Reporting Limit : 5 mg/kg]

Test Item		Result(s) [mg/kg]		RoHS Requirement [mg/kg]
		Sample 035	Sample 041+047	
PBBs	Monobromobiphenyl	<5	<5	Sum of PBBs 1000
	Dibromobiphenyl	<5	<5	
	Tribromobiphenyl	<5	<5	
	Tetrabromobiphenyl	<5	<5	
	Pentabromobiphenyl	<5	<5	
	Hexabromobiphenyl	<5	<5	
	Heptabromobiphenyl	<5	<5	
	Octabromobiphenyl	<5	<5	
	Nonabromobiphenyl	<5	<5	
	Decabromobiphenyl	<5	<5	
	Sum of detected PBBs	<50	<50	
PBDEs	Monobromodiphenyl ether	<5	<5	Sum of PBDEs 1000
	Dibromodiphenyl ether	<5	<5	
	Tribromodiphenyl ether	<5	<5	
	Tetrabromodiphenyl ether	<5	<5	
	Pentabromodiphenyl ether	<5	<5	
	Hexabromodiphenyl ether	<5	<5	
	Heptabromodiphenyl ether	<5	<5	
	Octabromodiphenyl ether	<5	<5	
	Nonabromodiphenyl ether	<5	<5	
	Decabromodiphenyl ether	<5	<5	
	Sum of detected PBDEs	<50	<50	

Note:

- "mg/kg" denotes milligram per kilogram
- "<" denotes less than

2.3 POLYBROMINATED BIPHENYLS (PBBs) AND POLYBROMINATED DIPHENYL ETHERS (PBDEs) CONTENT

Test Method: With reference to EN 62321-6:2015, extracted by toluene and analyzed by Gas Chromatography and Mass Spectrometer (GC-MS). [Reporting Limit : 5 mg/kg]

Test Item		Result(s) [mg/kg]	RoHS Requirement [mg/kg]
		Sample 050	
PBBs	Monobromobiphenyl	<5	Sum of PBBs 1000
	Dibromobiphenyl	<5	
	Tribromobiphenyl	<5	
	Tetrabromobiphenyl	<5	
	Pentabromobiphenyl	<5	
	Hexabromobiphenyl	<5	
	Heptabromobiphenyl	<5	
	Octabromobiphenyl	<5	
	Nonabromobiphenyl	<5	
	Decabromobiphenyl	<5	
	Sum of detected PBBs	<50	
PBDEs	Monobromodiphenyl ether	<5	Sum of PBDEs 1000
	Dibromodiphenyl ether	<5	
	Tribromodiphenyl ether	<5	
	Tetrabromodiphenyl ether	<5	
	Pentabromodiphenyl ether	<5	
	Hexabromodiphenyl ether	<5	
	Heptabromodiphenyl ether	<5	
	Octabromodiphenyl ether	<5	
	Nonabromodiphenyl ether	<5	
	Decabromodiphenyl ether	<5	
	Sum of detected PBDEs	<50	

Note:

- "mg/kg" denotes milligram per kilogram
- "<" denotes less than



2.4 PHTHALATES (DEHP, BBP, DBP and DIBP) CONTENT TEST

Test method: With reference to EN 62321-8:2017, extracted by organic solvent and analyzed by Gas Chromatography and Mass Spectrometer (GC-MS). [Reporting Limit : 100 mg/kg]

Test Item	Result(s) [mg/kg]	RoHS Requirement [mg/kg]
	Sample 030	
Di-(2-ethyl-hexyl) Phthalate (DEHP)	177	1000
Butyl-benzyl Phthalate (BBP)	<100	1000
Di-butyl Phthalate (DBP)	<100	1000
Di-iso-butyl Phthalate (DIBP)	<100	1000

Note:

- "mg/kg" denotes milligram per kilogram
- "<" denotes less than



Test Report No.: 68.402.23.0448.01

Rev.: 02

Dated: 2023-11-17



APPENDIX I:

Photos of submitted products



LED STREET LIGHT (AOK-100WILA-NV-L3-SN-3070-T2-P)





APPENDIX II:

According to client's declaration, tested material would be produced as relevant product(s):

Model list for luminaires:

Model No.	
AOK-20WiLA-NV-L3-ZZ-XXYY-BN-P	
AOK-30WiLA-NV-L3-ZZ-XXYY-BN-P	
AOK-40WiLA-NV-L3-ZZ-XXYY-BN-P	
AOK-50WiLA-NV-L3-ZZ-XXYY-BN-P	
AOK-60WiLA-NV-L3-ZZ-XXYY-BN-P	
AOK-70WiLA-NV-L3-ZZ-XXYY-BN-P	
AOK-80WiLA-NV-L3-ZZ-XXYY-BN-P	
AOK-90WiLA-NV-L3-ZZ-XXYY-BN-P	
AOK-100WiLA-NV-L3-ZZ-XXYY-BN-P	
AOK-110WiLA-NV-L3-ZZ-XXYY-BN-P	
AOK-120WiLA-NV-L3-ZZ-XXYY-BN-P	
AOK-130WiLA-NV-L3-ZZ-XXYY-BN-P	
AOK-140WiLA-NV-L3-ZZ-XXYY-BN-P	
AOK-150WiLA-NV-L3-ZZ-XXYY-BN-P	
AOK-160WiLA-NV-L3-ZZ-XXYY-BN-P	
AOK-170WiLA-NV-L3-ZZ-XXYY-BN-P	
AOK-180WiLA-NV-L3-ZZ-XXYY-BN-P	
'ZZ' stands for whether with NEMA receptacle and short circuit cap, can be 00 and SN, 00=without NEMA receptacle and short circuit cap, SN=with NEMA receptacle and short circuit cap;	
'XX' stands for CCT of LED, can be 27, 30, 40, 50, 57 and 65, 27=2700K, 30=3000K, 40=4000K, 50=5000K, 57=5700K, 65=6500K;	
'YY' stands for CRI(color rendering index), can be 70, 80 and 90, 70= Ra: 70, 80= Ra: 80, 90= Ra: 90;	
'BN' stands for beam angles Type, can be T2, T3 and T4, T2=Type II, T3=Type III, T4=Type IV	

-----End of Report-----