# TEST REPORT

| | |
|---|---|
| **Kunde:** *Client:* | AOK INDUSTRIAL COMPANY LIMITED |
| **Adresse:** *Address:* | 1# Building, Sans Souci Technology Industrial Park, Shajin street, Shenzhen city, Guangdong Provice, China |
| **Hersteller:** *Manufacturer:* | AOK INDUSTRIAL COMPANY LIMITED |
| **Adresse:** *Address:* | 1# Building, Sans Souci Technology Industrial Park, Shajin street, Shenzhen city, Guangdong Provice, China |
| **Name der Marke:** *Brand Name:* | AOK |
| **Beschreibungdes Produkts:** *Product Description:* | LED Flood Light (Sport Light) |
| **Modelle:** *Models:* | AOK-720WiNS-NV-L5-00-4080-30-B |
| **Bewertung:** *Rating:* | 100-277V~, 50/60Hz, 720W, IP66, ta:50°C, CCT: 4000K |
| **Verfahren:** *Method:* | According to requirement clause 12.4.1 of AS/NZS 60598.1: 2017+A1:2017; AS/NZS 60598.2.5:2018;(also reference IEC 60598-1) |
| **Prüfergebnis*:** *Test result*:* | Pass |

| **Datum der Prüfung:** *Date of Test:* | **Datum der Emission:** *Date of Issue:* | **Klassifizierung:** *Classification:* | **Gegenstand der Prüfung:** *Test item:* |
|---|---|---|---|
| 2021-01-05~2021-01-06 | 2021-01-27 | Commission Test | ISTMT+TM21 Test |

**Prüflabor (Testlabor) /** Testing Laboratory:
Shenzhen Southern LCS Compliance Testing Laboratory Ltd.

| **Test von/**Test by: | **Check von/**Check by: | **Genehmigt von/**Approved by: |
|---|---|---|
| Bill Bai | Torres He | Jesse Liu |
| Bill Bai/ Project Engineer | Torres He/ Director | Jesse Liu/ Manager |

LCS TESTING LABORATORY APPROVED

**Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens.**

*Remark: The duplication of this report or parts of it and its use for advertising purposes is only allowed with permission of the testing laboratory.This report contains the result of examination of the product sample submitted by the appliance. A general statement concerning the quality of the products from the series manufacturer cannot be derived therefore.*

# 1. GENERAL INFORMATION

## 1.1 Product Information

| | |
|---|---|
| **Information of product:** | |
| Product description | LED Flood Light (Sport Light) |
| Model Number | AOK-720WiNS-NV-L5-00-4080-30-B |
| Rated Inputs | 100-277V~, 50/60Hz |
| Rated Power | 720W |
| Declared CCT. | 4000K |
| LED Package, Array or Module | EUD-600S560DV (6S59P), 354 pcs LED chips(S)<br>EUK-200S560DV (2S59P), 118 pcs LED chips(S) |
| Date of Receipt Samples | 2021-01-05 |
| Quantity of Receipt Samples | 1 unit |
| **Information of LED chip:** | |
| LED Chip Manufacturer | Lumileds |
| LED type | LED Package |
| Model of the LED chip(s) | L150-4080502400000 |
| Forward voltage of the LED chip | 23.5-26.5V |
| Forward current of the LED chip | 200mA |
| ISTMT temperature of the LED chip | 105°C |
| IES LM-80 Test Report | Report No.: S280e<br>Issue Date: 2019-12-20<br>Tested and Prepared by: LUMILEDS |

**General remarks:**

"(See attachment#)" refers to additional information appended to the report.

"(See remark#)" refers to a remark appended to the report.

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

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

Remark: Measurement was conducted at a stable ambient temperature 50°C±1°C.
ISTMT was test conducted on the product with the lowest CCT.4000K and the max. power 720W.
(The EUK-200S560DV driver power one LED module, The EUD-600S560DV driver powers three LED modules)
Detail information for models covered in this report as below.

**Model list:**

| **Model No.** | **Rating** | **CCT** |
|---|---|---|
| AOK-720WiNS-NV-L5-00-4080-30-B | 100-277V~, 50/60Hz, 720W, IP66, ta:50°C, | 4000K |

**LED specification:**

| **Model/Series** | **Manufacturer** | **$V_F$ (V)** | **$I_F$ (mA)** |
|---|---|---|---|
| L150-4080502400000 | Lumileds | 23.5-26.5V | 200mA |

## 1.2 Reference Standards or Methods

According to requirement clause 12.4.1 of AS/NZS 60598.1: 2017+A1:2017;
AS/NZS 60598.2.5:2018 (also reference IEC 60598-1)
IES LM-84-14: Measuring Luminous Flux and Color Maintenance of LED Lamps, Light Engines, and Luminaires---Annex A: measurement of in-situ conditions LED case temperature

## 1.3 Equipment list

| Item | Equipment No. | Equipment | Manufacturer/Type/Series No | Cal.Date | Due Date |
|---|---|---|---|---|---|
| 1 | SLCS-S-004 | Digital Power Meter | YOKOGAWA/ WT210 / 91L424211 | 2020.5.15 | 2021.5.14 |
| 2 | SLCS-S-011 | J Thermocouple | DE AO/J | 2020.5.15 | 2021.5.14 |
| 3 | SLCS-S-029 | Temperature recorder | AGILENT/ 34970A | 2020.5.15 | 2021.5.14 |

## 2. Test Result of ISTMT

## 2.1 Electrical data

| Criteria Item | Result |
|---|---|
| Input voltage | 230.0V |
| Input current | 3.09A |
| Total power | 706.8W |
| Power factor | 0.99 |
| Current on each LED module(For LED driver EUK-200S560DV) | 63mA |
| Current on each LED module(For LED driver EUD-600S560DV) | 63mA |
| Remark: There are 118 pcs LED chip(s) (2S59P) in models AOK-720WiNS-NV-L5-00-4080-30-B(For LED driver EUK-200S560DV),That we are measurement the total current of driver output was 3700mA, and current on each parallel was 63mA (3700mA/59=63mA), Because in each series that the forward current on each LED chip(s) was equivalent, so forward current on each LED chip(s) was 63mA.<br>There are 354 pcs LED chip(s) (6S59P) in models AOK-720WiNS-NV-L5-00-4080-30-B(For LED driver EUD-600S560DV),That we are measurement the total current of driver output was 3700mA, and current on each parallel was 63mA (3700mA/59=63mA), Because in each series that the forward current on each LED chip(s) was equivalent, so forward current on each LED chip(s) was 63mA. | |

## 2.2 Temperature data

| | | | |
|---|---|---|---|
| Ambient Temperature, °C : | 50±1°C | Relative Humidity, % : | 65% |
| Supply voltage: | 230 Vac / 50 Hz | Type of thermocouples: | J |
| Test Product Model | AOK-720WiNS-NV-L5-00-4080-30-B | | |
| Test LED Model | L150-4080502400000 | | |
| Test LED Driver Model | EUK-200S560DV+EUD-600S560DV | | |
| Number of Driver / Product | One Lamp with a power supply | | |
| Test Duration | ≥3.5Hours | | |

| Item | Parts | Test Result (℃) | Revise to ta. (℃) | Limit (℃) |
|---|---|---|---|---|
| 1 | Measured maximum Temperature @ TEMLED | 94.7 | 94.5 | 105 |
| 2 | tc of LED driver of EUK-200S560DV | 74.7 | 74.5 | 90 |
| 3 | tc of LED driver of EUD-600S560DV | 79.7 | 79.5 | 89 |
| 4 | Ambient | 50.2 | 50.0 | -- |

## 3. Lumen Maintenance Projection (IESNA TM-21-11 Method)

## 3.1 LM-80 report summary for LED chip(s)

| | | | |
|---|---|---|---|
| Manufactured by | Lumileds | | |
| LED Model | L150-4080502400000 | | |
| Number of LED light source tested | 30 units | | |
| Drive Current | 200mA | | |
| Case temperature | 85°C | 105°C | -- |
| 17000 hours lumen maintenance | 95.55% | 94.42% | -- |
| 17000 hours color maintenance (△u'v') | 0.0046 | 0.0048 | -- |

## 3.2 Lumen Maintenance Projection for luminaires

| Criteria Item | Result |
|---|---|
| 50000h at which to estimate lumen maintenance | 84.34% |
| Drive current on each LED light source | 63mA |
| Reported $L_{80}$ lumen maintenance life | 65000 |

# TM-21 Inputs

| Instructions |
|---|
| Yellow fields are completed by the user. Fields not used should be left blank. Cyan fields are calculated based on user entries.<br><br>First, enter a description of the LED light source tested. Then complete the fields labeled "LM-80 Testing Details". Test duration must be at least 6,000 hours. If only one case temperature data set is to be used (no interpolation), complete only "Tested case temperature 1". For only two case temperature data sets, complete 1 and 2.<br><br>Next, further to the right, in the corresponding box(es) for each tested case temperature, enter the test data along with the time (in hours) at which each measurement was taken. Data entered must be normalized then averaged measured data (per TM-21 sections 5.2.1 and 5.2.2). If case temperatures have different test durations, enter data up to the lowest of the test durations for all of the case temperatures.<br><br>Enter drive current, *in-situ* temperature data and the percentage of initial lumens to project to in the fields labeled "*In-Situ* Inputs".<br><br>Results can be tailored to estimate lumen maintenance at a specific time by entering a value (t) in the yellow field. A complete TM-21 report will appear on the next tab labeled "Report". |

| Description of LED Light Source Tested (manufacturer, model, catalog number) |
|---|
| Lumileds<br>L150-4080502400000 |

| LM-80 Testing Details | |
|---|---|
| Total number of units tested per case temperature: | 20 |
| Number of failures: | 0 |
| Number of units measured: | 20 |
| Test duration (hours): | 17000 |
| Tested drive current (mA): | 200 |
| Tested case temperature 1 ($T_c$, ° C): | 85 |
| Tested case temperature 2 ($T_c$, ° C): | 105 |
| Tested case temperature 3 ($T_c$, ° C): | |

## *In-Situ* Inputs

| | |
|---|---|
| Drive current for each LED package/array/module (mA): | 63 |
| *In-situ* case temperature ($T_c$, ° C): | 94.5 |
| Percentage of initial lumens to project to (e.g. for $L_{70}$, enter 70): | 80 |

## Results

| | |
|---|---|
| Time (t) at which to estimate lumen maintenance (hours): | 50,000 |
| Lumen maintenance at time (t) (%): | 84.34% |
| Reported L80 (hours): | 65,000 |

## LM-80 Test Inputs

| Test Data for 85° C Case Temperature | | Test Data for 105° C Case Temperature | | Tested Case Temperature 3 | |
|---|---|---|---|---|---|
| Time (hours) | Lumen Maintenance (%) | Time (hours) | Lumen Maintenance (%) | Time (hours) | Lumen Maintenance (%) |
| 1000 | 100.10% | 1000 | 99.91% | | |
| 2000 | 99.82% | 2000 | 99.60% | | |
| 3000 | 99.63% | 3000 | 99.31% | | |
| 4000 | 99.38% | 4000 | 99.00% | | |
| 5000 | 99.18% | 5000 | 98.72% | | |
| 6000 | 98.90% | 6000 | 98.42% | | |
| 7000 | 98.67% | 7000 | 98.14% | | |
| 8000 | 98.39% | 8000 | 97.82% | | |
| 9000 | 98.11% | 9000 | 97.47% | | |
| 10000 | 97.80% | 10000 | 97.11% | | |
| 11000 | 97.44% | 11000 | 96.75% | | |
| 12000 | 97.05% | 12000 | 96.32% | | |
| 13000 | 96.74% | 13000 | 95.90% | | |
| 14000 | 96.44% | 14000 | 95.51% | | |
| 15000 | 96.18% | 15000 | 95.18% | | |
| 16000 | 95.87% | 16000 | 94.80% | | |
| 17000 | 95.55% | 17000 | 94.42% | | |

# TM-21 Report

**Table 1: Report at each LM-80 Test Condition**

| Description of LED Light Source Tested (manufacturer, model, catalog number) | Lumileds L150-4080502400000 | | | | |
|---|---|---|---|---|---|
| **Test Condition 1 - 85° C Case Temp** | | **Test Condition 2 - 105° C Case Temp** | | | |
| Sample size | 20 | Sample size | 20 | Sample size | - |
| Number of failures | 0 | Number of failures | 0 | Number of failures | - |
| DUT drive current used in the test (mA) | 200 | DUT drive current used in the test (mA) | 200 | DUT drive current used in the test (mA) | - |
| Test duration (hours) | 17,000 | Test duration (hours) | 17,000 | Test duration (hours) | - |
| Test duration used for projection (hour to hour) | 8,000 - 17,000 | Test duration used for projection (hour to hour) | 8,000 - 17,000 | Test duration used for projection (hour to hour) | - |
| Tested case temperature (° C) | 85 | Tested case temperature (° C) | 105 | Tested case temperature (° C) | - |
| α | 3.291E-06 | α | 3.977E-06 | α | - |
| B | 1.010 | B | 1.010 | B | - |
| Reported L80(17k) (hours) | 71,000 | Reported L80(17k) (hours) | 59,000 | Reported L80(17k) (hours) | - |

**Table 2: Interpolation Report (projection based on *in-situ* temperature entered)**

| | |
|---|---|
| $T_{s,1}$ (° C) | 85.00 |
| $T_{s,1}$ (K) | 358.15 |
| $\alpha_1$ | 3.291E-06 |
| $B_1$ | 1.010 |
| $T_{s,2}$ (° C) | 105.00 |
| $T_{s,2}$ (K) | 378.15 |
| $\alpha_2$ | 3.977E-06 |
| $B_2$ | 1.010 |
| $E_a/k_b$ | 1.28E+03 |
| A | 1.185E-04 |
| $B_0$ | 1.010 |
| $T_{s,i}$ (° C) | 94.50 |
| $T_{s,i}$ (K) | 367.65 |
| $\alpha_i$ | 3.610E-06 |
| Reported L80(17k) at 94.5° C (hours) | 65,000 |

# 4. Photos

## 4.1 Thermocouple contact photo of @ $TEM_{LED}$

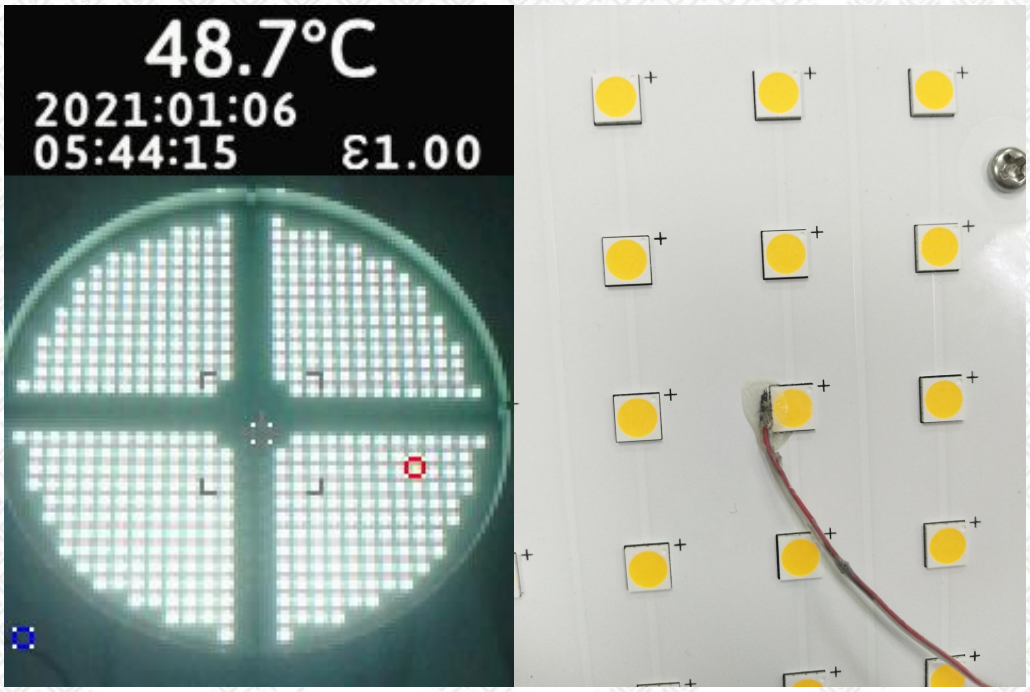


Photo 1

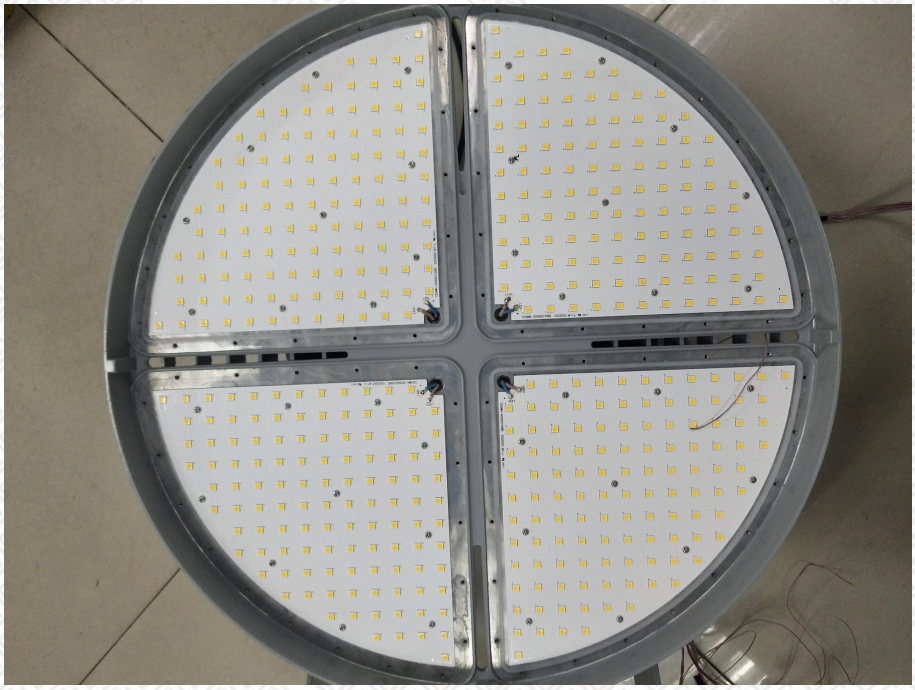

Photo 2

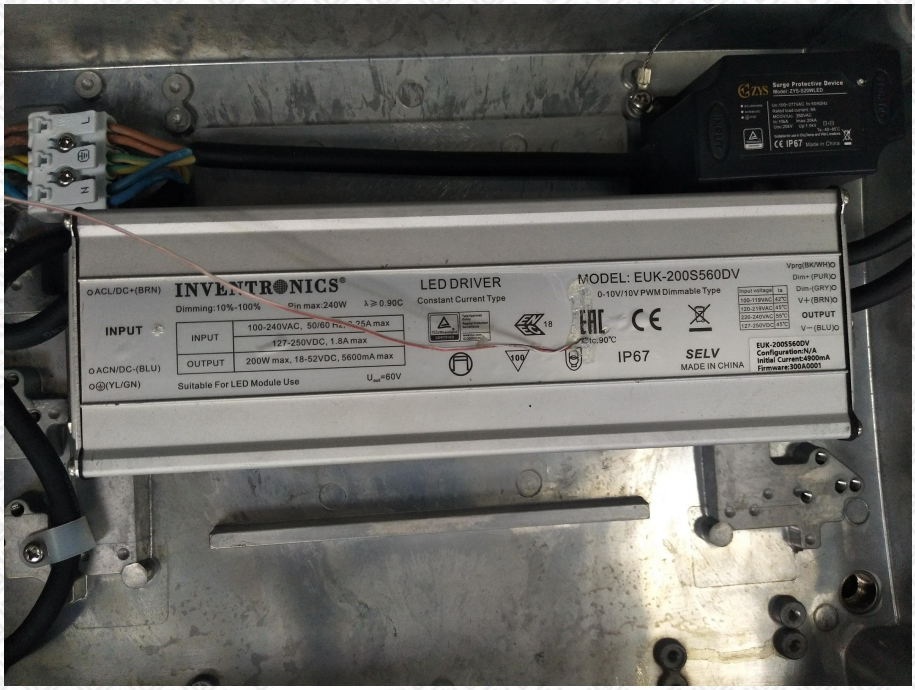


Photo 3


Photo 4

## 4.2 Product Photos

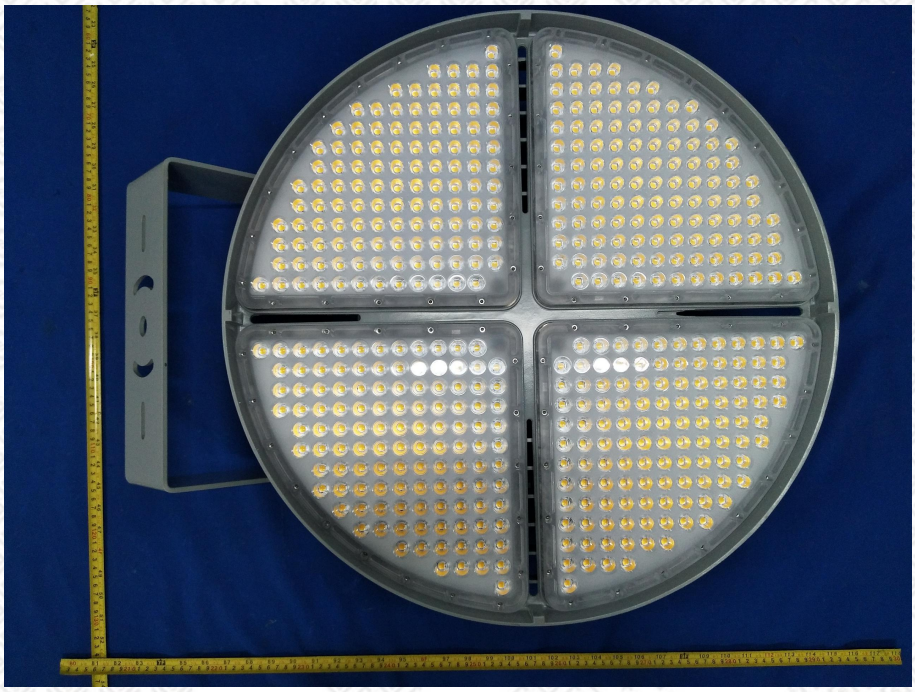

Photo 1

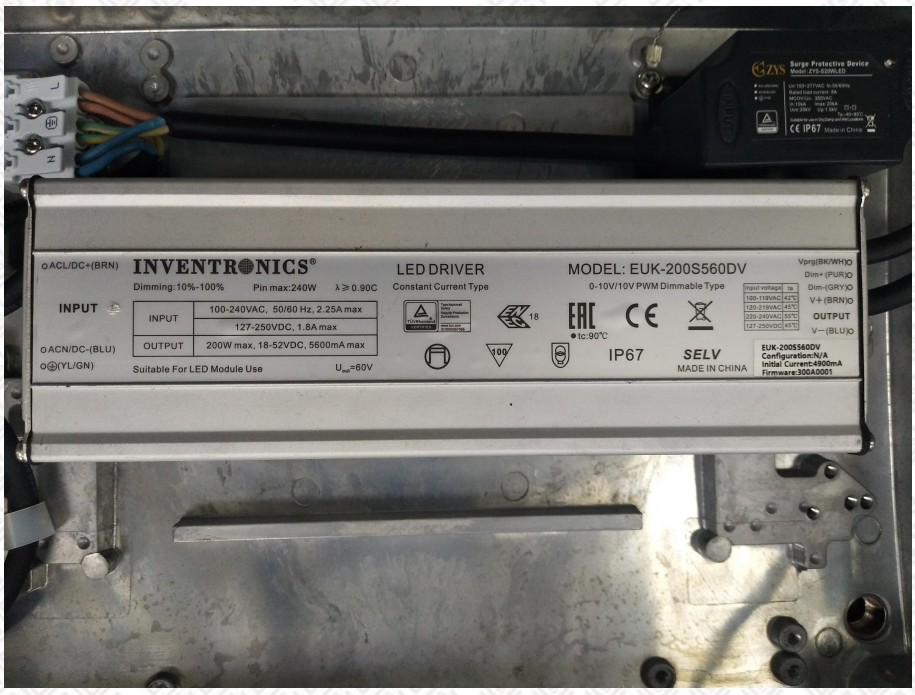


Photo 2


Photo 3

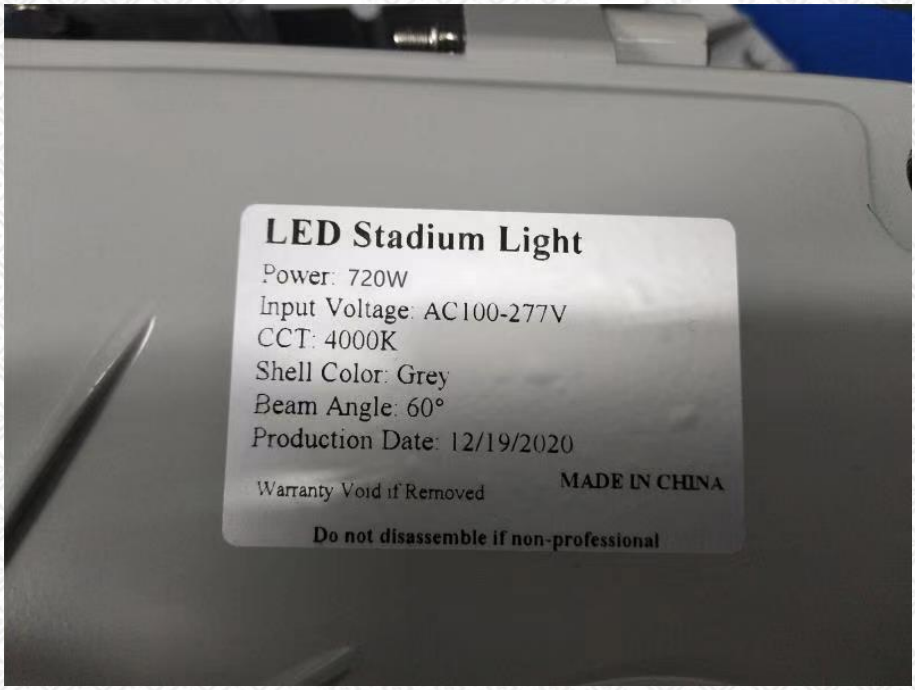


Photo 4 Label of the light

---------- **End of test report** ----------