NVLAP Lab Code: 200952-0

**Verification Services**

Project No.:4787237129-1
Report No.:4787237129-1a
Report Issued Date: 2015-12-24

# Test Report

| **Customer Company & Address:** | | | |
|---|---|---|---|
| **Elec-Tech International Co., Ltd**<br>**ADD: 1 JINFENG RD TANGJIAWAN TOWN XIANGZHOU DISTRICT ZHUHAIGUANGDONG P.R. CHINA 519085** | | | |
| **Contact Person:** | Sean Luo | | |
| **Phone Number:** | 0756-3639678 | **Email Address:** | luolixue@electech.com.cn |

| | |
|---|---|
| **Relevant Standards:** | IES LM-79-2008 |
| **Product Description:** | Luminaire Description: Formed steel housing, white plastic enclosure<br>Amount of Light Source: 48 LEDs of 67-21S<br>Manufacturer Of Light Source: Everlight Electronics Co.,Ltd |
| **Brand Name:** | ETI & Commercial Electric |
| **Tested Model Number:** | 545681XX |
| **Product Family:** | N/A |
| **Allowable Variations:** | Where “XX” denotes color temperature, XX=41～50 identifies 4000K |
| **Electrical Specification:** | 120 V AC, 60 Hz, 18 W |

| **Test Laboratory & Address:** | | | |
|---|---|---|---|
| UL Verification Services (Guangzhou) Co., Ltd.<br>ADD: Building A1, 1F & 2F, Nansha Science and Technology Innovation Center, No. 25, South Huanshi Avenue , Nansha District, Guangzhou 511458, China | | | |
| **Telephone:** | +86 20 28667188 | **Fax:** | +86 20 83486605 |

| | | | |
|---|---|---|---|
| **Sample Reception Date:** | 2015-12-08 | **Test Date:** | 2015-12-16~2015-12-18 |

| **Tested By** | **Approved By** |
|---|---|
| Candy Zhang /Candy Zhang | Derek /Derek Zhang |
| **Signatory & Test Personnel Name** | **Signatory & Approval Name** |

# Test Report

## Statement of Results

| Test Flow | Test Item | Sample ID (Lab) | Pass/Fail/NA |
|---|---|---|---|
| 1 | Integrating Sphere Test | 2266553-S001 | Evaluate by customer |
| 2 | Goniophotometer Test | 2266553-S001 | Evaluate by customer |

## Deviation from Test Method (*if any*)

N/A

## Remark *(if any)*

This report shall not be used by the client to claim product endorsement by NVLAP, NIST or any agency of the US government.

# Test Report

## Test Flow 1: Integrating Sphere Test

### Environmental Conditions

| |
|---|
| **Temperature:** 25.1℃ |

### Test Equipment

| Equipment ID | Equipment Name | Last Calibration Date | Calibration Due Date |
|---|---|---|---|
| GVS-LE-PE001 | Integrating Sphere | Before Use | Before Use |
| GVS-LE-FS009 | Measurement Standard Lamp | 2015-08-22 | 2016-08-21 |

### Test Sample

| |
|---|
| 2266553-S001 |

### Test Method

The sample was tested according to the IES LM-79-2008.
Photometric paramters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at 25º C ± 1º C.
The sample measurements were made using a spectroradiometer connected by a fiber optic cable and detector through the detector port of the integrating sphere. The sample was operated at rated voltage and was stabilized before measurement. Chromaticity coordinates, correlated color temperature and color rendering index were calculated from the spectral radiant flux measurements taken at 1 nm intervals over the range of 380 to 780 nm.

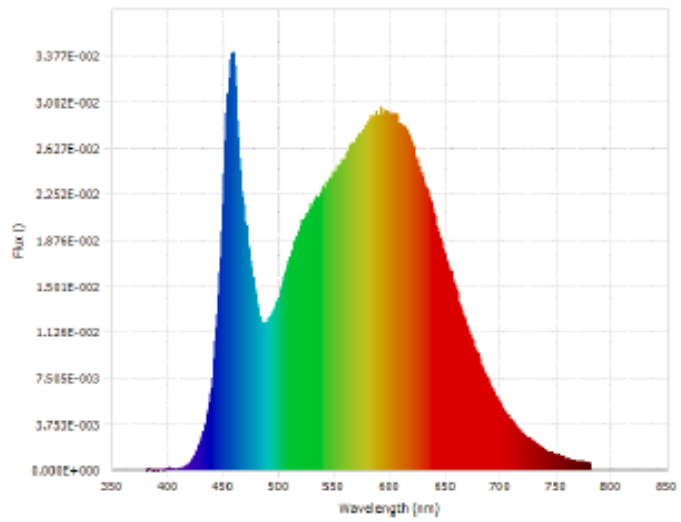
### Test Results

| Test Type | Voltage (V AC) | Frequency (Hz) | Current (A) | Power Factor | Power (W) |
|---|---|---|---|---|---|
| Input | 119.95 | 60 | 0.1567 | 0.956 | 18.0 |

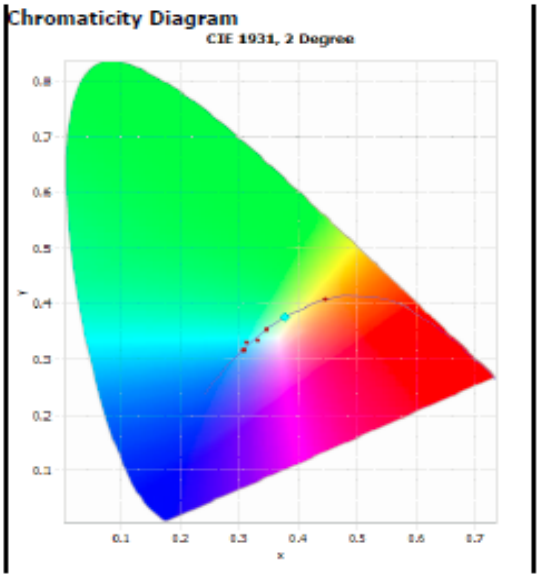
| Test Type | CCT (K) | CRI | Lumen Output (lm) | Luminous Efficacy (lm/W) |
|---|---|---|---|---|
| Output | 4081 | 86.4 | 1748 | 97.3 |

# Test Report

**Spectral Flux Graph**




**Chromaticity Diagram**




**Spectral Result**

| | | | |
|---|---|---|---|
| Radiant Flux Φ | 5.531 (W) | Luminous Flux Φ(v) | 1748.39 (lm) |
| Φ(v') | 3115.61 (lm') | Chrom x | 0.3774 |
| Chrom y | 0.3766 | Chrom u | 0.2232 |
| Chrom v | 0.3340 | Duv | 0.0008 |
| Chrom u' | 0.2232 | Chrom v' | 0.5011 |
| λ (peak) | 457.1 (nm) | λ (center) | 460.4 (nm) |
| λ (centroid) | 566.9 (nm) | λ (dom) | 578.3 (nm) |
| FWHM | 27.1 (nm) | Purity | 26.3 (%) |
| CCT | 4081.0 (K) | Luminous Efficacy η | 97.27 (lm/W) |
| SDCM | N/A | Ra | 86.35 |
| R1 | 85.8 | R2 | 94.0 |
| R3 | 96.4 | R4 | 82.3 |
| R5 | 84.6 | R6 | 90.0 |
| R7 | 87.0 | R8 | 70.6 |
| R9 | 28.4 | R10 | 84.1 |
| R11 | 81.2 | R12 | 63.1 |
| R13 | 88.4 | R14 | 98.7 |
| R15 | 80.9 | DUT Current | 0.1567 (A) |

# Test Report

## Test Flow 2: Goniophotometer Test

### Environmental Conditions

| |
|---|
| **Temperature:** 25.1℃ |

### Test Equipment

| Equipment ID | Equipment Name | Last Calibration Date | Calibration Due Date |
|---|---|---|---|
| GVS-LE-GS001 | Goniophotometer | Before Use | Before Use |
| GVS-LE-FS009 | Measurement Standard Lamp | 2015-08-22 | 2016-08-20 |

### Test Sample

| |
|---|
| 2266553-S001 |

### Test Method

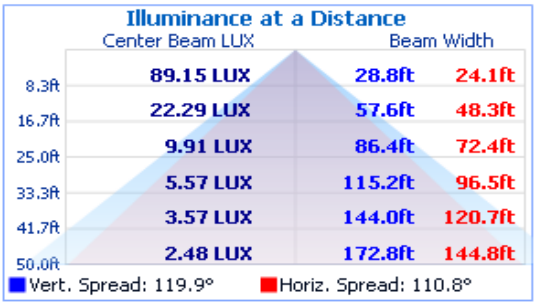
The sample was tested according to the IES LM-79-2008.
Photometric paramters were measured using a type C goniophotometer and software.
The ambient temperature shall be maintained at 25° C ± 1° C, measured at a point not more than 1 m from the sample and at the same height as the sample.
The samples were operated at rated voltage and was stabilized before measurement. Luminous flux, luminaire efficacy, zonal lumen were calculated from the software taken at $0.5^{o}$ vertical intervals and $22.5^{o}$ horizontal intervals.

### Test Results

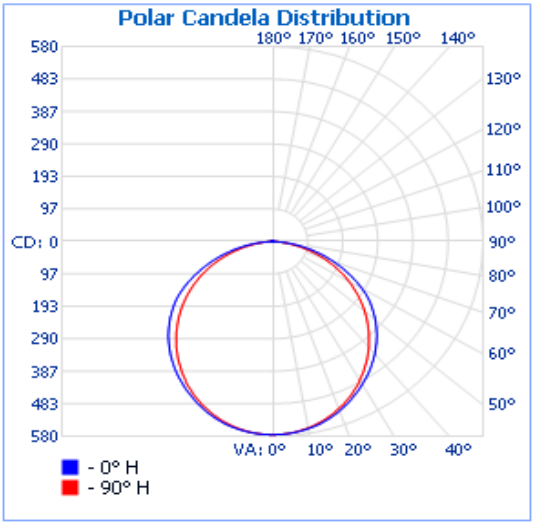
| Test Type | Voltage (V AC) | Frequency (Hz) | Current (A) | Power Factor | Power (W) |
|---|---|---|---|---|---|
| Input | 120.01 | 60 | 0.156 | 0.957 | 18.0 |

| Test Type | Lumen Output (lm) | Center Beam Candle Power (cd) | Field angle (10%) | | Beam angle (50%) | | Luminous Efficacy (lm/W) |
|---|---|---|---|---|---|---|---|
| | | | Horizontal Spread | Vertical Spread | Horizontal Spread | Vertical Spread | |
| Output | 1714 | 575 | 160.2 | 163.9 | 110.8 | 119.9 | 95.5 |

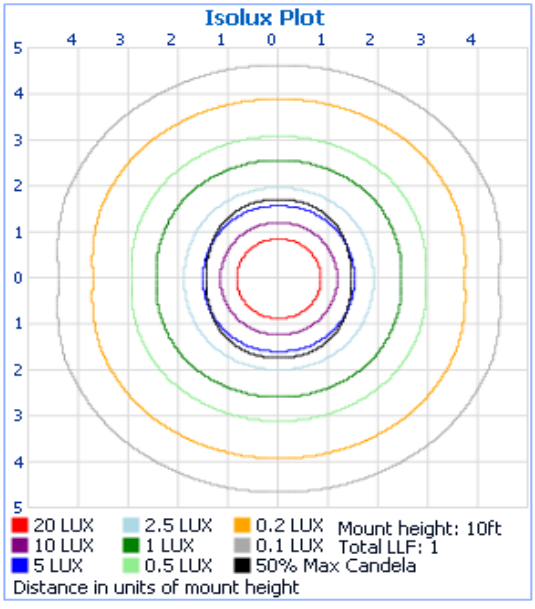
## Illuminance at a Distance




## Polar Candela Distribution




## Isolux Plot



## Zonal Lumen Tabulation

**Zonal Lumen Summary**

| Zone | Lumens | % Luminaire |
|---|---|---|
| 0-30 | 446.2 | 26% |
| 0-40 | 732.3 | 42.7% |
| 0-60 | 1,314.7 | 76.7% |
| 60-90 | 393.1 | 22.9% |
| 70-100 | 173.3 | 10.1% |
| 90-120 | 4.3 | 0.2% |
| 0-90 | 1,707.7 | 99.6% |
| 90-180 | 6.4 | 0.4% |
| 0-180 | 1,714.1 | 100% |

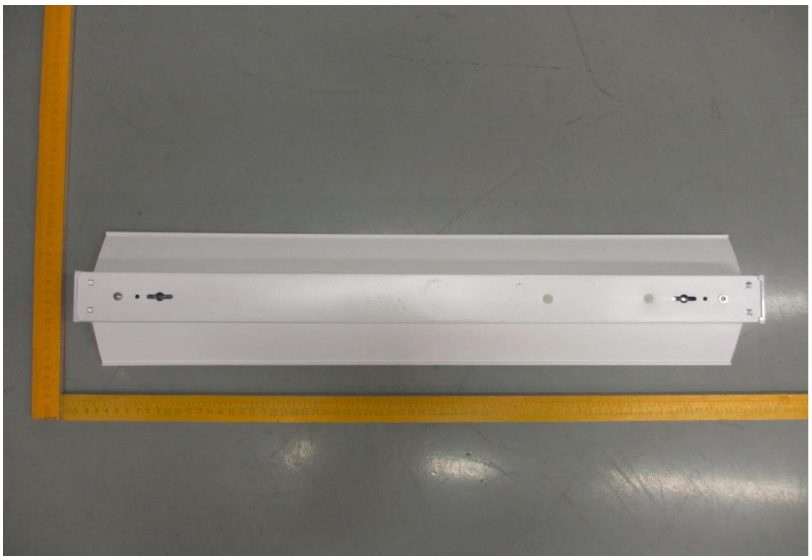
**Lumens Per Zone**

| Zone | Lumens | % Total | Zone | Lumens | % Total |
|---|---|---|---|---|---|
| 0-5 | 13.7 | 0.8% | 90-95 | 1.5 | 0.1% |
| 5-10 | 40.7 | 2.4% | 95-100 | 0.8 | 0% |
| 10-15 | 66.3 | 3.9% | 100-105 | 0.6 | 0% |
| 15-20 | 89.5 | 5.2% | 105-110 | 0.5 | 0% |
| 20-25 | 109.7 | 6.4% | 110-115 | 0.4 | 0% |
| 25-30 | 126.3 | 7.4% | 115-120 | 0.4 | 0% |
| 30-35 | 138.9 | 8.1% | 120-125 | 0.3 | 0% |
| 35-40 | 147.3 | 8.6% | 125-130 | 0.3 | 0% |
| 40-45 | 151.2 | 8.8% | 130-135 | 0.3 | 0% |
| 45-50 | 150.5 | 8.8% | 135-140 | 0.2 | 0% |
| 50-55 | 145.2 | 8.5% | 140-145 | 0.2 | 0% |
| 55-60 | 135.5 | 7.9% | 145-150 | 0.2 | 0% |
| 60-65 | 120.7 | 7.0% | 150-155 | 0.2 | 0% |
| 65-70 | 101.4 | 5.9% | 155-160 | 0.1 | 0% |
| 70-75 | 78.9 | 4.6% | 160-165 | 0.1 | 0% |
| 75-80 | 54.4 | 3.2% | 165-170 | 0.1 | 0% |
| 80-85 | 29.3 | 1.7% | 170-175 | 0.0 | 0% |
| 85-90 | 8.3 | 0.5% | 175-180 | 0.0 | 0% |

## Intensity Data(cd)

| | 0 | 22.5 | 45 | 67.5 | 90 | 112.5 | 135 | 157.5 | 180 | 202.5 | 225 | 247.5 | 270 | 292.5 | 315 | 337.5 | 360 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 575 | 575 | 575 | 575 | 575 | 575 | 575 | 575 | 575 | 575 | 575 | 575 | 575 | 575 | 575 | 575 | 575 |
| 0.5 | 575 | 575 | 575 | 575 | 575 | 575 | 575 | 575 | 575 | 575 | 575 | 575 | 575 | 575 | 575 | 575 | 575 |
| 1 | 575 | 575 | 575 | 575 | 575 | 575 | 575 | 575 | 575 | 575 | 575 | 575 | 575 | 575 | 575 | 575 | 575 |
| 2 | 575 | 575 | 575 | 575 | 575 | 575 | 575 | 575 | 575 | 575 | 575 | 575 | 575 | 575 | 575 | 575 | 575 |
| 3 | 574 | 574 | 574 | 574 | 574 | 574 | 574 | 574 | 574 | 574 | 574 | 574 | 574 | 574 | 574 | 574 | 574 |
| 4 | 574 | 574 | 573 | 573 | 573 | 573 | 573 | 574 | 574 | 574 | 573 | 573 | 573 | 573 | 573 | 574 | 574 |
| 5 | 573 | 573 | 573 | 572 | 572 | 572 | 573 | 573 | 573 | 573 | 573 | 572 | 572 | 572 | 573 | 573 | 573 |
| 6 | 572 | 572 | 572 | 571 | 571 | 571 | 572 | 572 | 572 | 572 | 572 | 571 | 571 | 571 | 572 | 572 | 572 |
| 7 | 571 | 571 | 570 | 570 | 570 | 570 | 570 | 571 | 571 | 571 | 570 | 570 | 570 | 570 | 570 | 571 | 571 |
| 8 | 569 | 569 | 569 | 568 | 568 | 568 | 569 | 569 | 569 | 569 | 569 | 568 | 568 | 568 | 569 | 569 | 569 |
| 9 | 568 | 571 | 568 | 566 | 566 | 566 | 567 | 568 | 568 | 564 | 566 | 566 | 566 | 566 | 567 | 568 | 568 |
| 10 | 566 | 566 | 565 | 564 | 564 | 564 | 565 | 566 | 566 | 566 | 565 | 564 | 564 | 564 | 565 | 566 | 566 |
| 11 | 564 | 564 | 563 | 562 | 561 | 562 | 563 | 564 | 564 | 564 | 563 | 562 | 561 | 562 | 563 | 564 | 564 |
| 12 | 562 | 562 | 560 | 559 | 558 | 559 | 560 | 562 | 562 | 562 | 560 | 559 | 558 | 559 | 560 | 562 | 562 |
| 13 | 560 | 559 | 557 | 556 | 556 | 556 | 557 | 559 | 560 | 559 | 557 | 556 | 556 | 556 | 557 | 559 | 560 |
| 14 | 557 | 557 | 555 | 554 | 553 | 554 | 555 | 557 | 557 | 557 | 555 | 554 | 553 | 554 | 555 | 557 | 557 |
| 15 | 554 | 554 | 552 | 550 | 549 | 550 | 552 | 554 | 554 | 554 | 552 | 550 | 549 | 550 | 552 | 554 | 554 |
| 16 | 551 | 551 | 549 | 547 | 546 | 547 | 549 | 551 | 551 | 551 | 549 | 547 | 546 | 547 | 549 | 551 | 551 |
| 17 | 548 | 548 | 545 | 543 | 542 | 543 | 545 | 548 | 548 | 548 | 545 | 543 | 542 | 543 | 545 | 548 | 548 |
| 18.5 | 543 | 543 | 540 | 538 | 537 | 538 | 540 | 543 | 543 | 543 | 540 | 538 | 537 | 538 | 540 | 543 | 543 |
| 19.5 | 539 | 539 | 536 | 534 | 532 | 534 | 536 | 539 | 539 | 539 | 536 | 534 | 532 | 534 | 536 | 539 | 539 |
| 24.5 | 519 | 518 | 514 | 512 | 510 | 512 | 514 | 518 | 519 | 518 | 514 | 512 | 510 | 512 | 514 | 518 | 519 |
| 29.5 | 495 | 494 | 488 | 485 | 483 | 485 | 488 | 494 | 495 | 494 | 488 | 485 | 483 | 485 | 488 | 494 | 495 |
| 34.5 | 470 | 468 | 459 | 454 | 450 | 454 | 459 | 468 | 470 | 468 | 459 | 454 | 450 | 454 | 459 | 468 | 470 |
| 39.5 | 441 | 438 | 428 | 420 | 416 | 420 | 428 | 438 | 441 | 438 | 428 | 420 | 416 | 420 | 428 | 438 | 441 |
| 49.5 | 374 | 371 | 358 | 345 | 337 | 345 | 358 | 371 | 374 | 371 | 358 | 345 | 337 | 345 | 358 | 371 | 374 |
| 54.5 | 336 | 333 | 320 | 305 | 295 | 305 | 320 | 333 | 336 | 333 | 320 | 305 | 295 | 305 | 320 | 333 | 336 |
| 59.5 | 292 | 291 | 280 | 262 | 251 | 262 | 280 | 291 | 292 | 291 | 280 | 262 | 251 | 262 | 280 | 291 | 292 |
| 64.5 | 241 | 242 | 237 | 218 | 204 | 218 | 237 | 242 | 241 | 242 | 237 | 218 | 204 | 218 | 237 | 242 | 241 |
| 69.5 | 188 | 190 | 189 | 173 | 157 | 173 | 189 | 190 | 188 | 190 | 189 | 173 | 157 | 173 | 189 | 190 | 188 |
| 74.5 | 134 | 137 | 139 | 129 | 110 | 129 | 139 | 137 | 134 | 137 | 139 | 129 | 110 | 129 | 139 | 137 | 134 |
| 79.5 | 82 | 85 | 87 | 83 | 63 | 83 | 87 | 85 | 82 | 85 | 87 | 83 | 63 | 83 | 87 | 85 | 82 |
| 84.5 | 34 | 36 | 40 | 39 | 25 | 39 | 40 | 36 | 34 | 36 | 40 | 39 | 25 | 39 | 40 | 36 | 34 |
| 89.5 | 3 | 4 | 7 | 8 | 5 | 8 | 7 | 4 | 3 | 4 | 7 | 8 | 5 | 8 | 7 | 4 | 3 |
| 94.5 | 1 | 2 | 3 | 3 | 1 | 3 | 3 | 2 | 1 | 2 | 3 | 3 | 1 | 3 | 3 | 2 | 1 |
| 99.5 | 1 | 1 | 2 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 2 | 1 | 1 |
| 104.5 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 109.5 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 114.5 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 119.5 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 124.5 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 129.5 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 134.5 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 139.5 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 144.5 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 149.5 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 154.5 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 159.5 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 164.5 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 169.5 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 174.5 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 179.5 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 180 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |

## Photos of sample



**End of Test Report**