



Photometric Test Report

Relevant Standards

IES LM-79-2008

Prepared For

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Catalog Number

55270

Project Number

4787945842

Report Number

4787945842_8

Test Date

4/27/2017-4/28/2017

Issue Date

5/18/2017

Prepared By

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Approved By

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Duff Yang

The results contained in this report pertain only to the tested sample.

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1.0 Test List

| Test Item | Test | Test Date | Model Number | Tests Conducted By |
|-----------|---|-----------|--------------|--------------------|
| 1 | Integrating Sphere Test for the Lower CCT | 4/27/2017 | 55270 | Elvis Wu |
| 2 | Goniophotometer Test | 4/28/2017 | 55270 | Elvis Wu |

Remark (if any)

1. UL test equipment information is recorded on Meter Use in UL's Aurora database.



2.0 Production Description

Luminaire Description: 2x2 Luminaires for Ambient Lighting of Interior Commercial Spaces

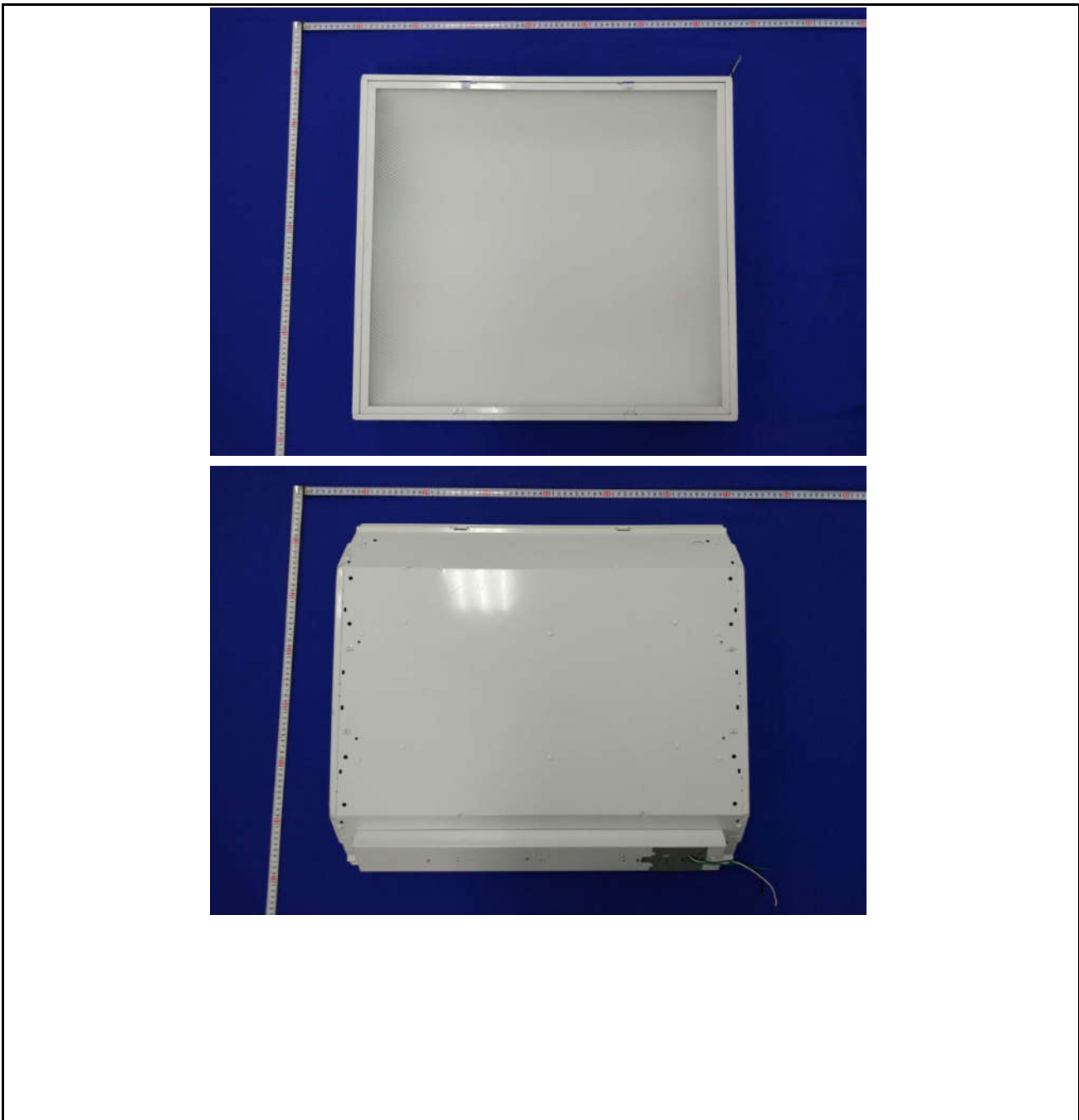
Model Number: 55270

Rated Voltage: 120-277V

Frequency: 50/60Hz

LED Package: 2835

Photos of Luminaire Characteristics





3.0 LM-79 Measurement and Test Results

3.1 Integrating Sphere Test for the lower CCT

| | | | | | |
|------------|-------|---------------------|------------|---------------------------|----|
| Model No. | 55270 | | Sample ID. | 916447-002 | |
| Driver No. | N/A | Operate time (Min.) | 80 | Stabilization time (Min.) | 70 |

Test Method

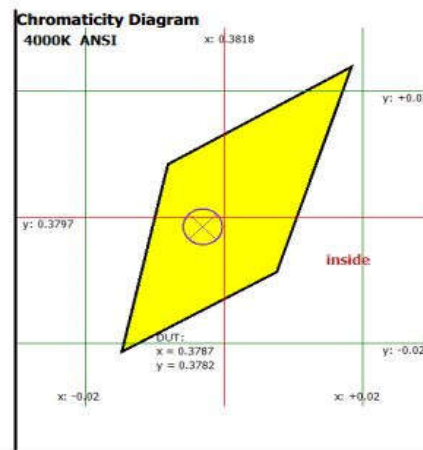
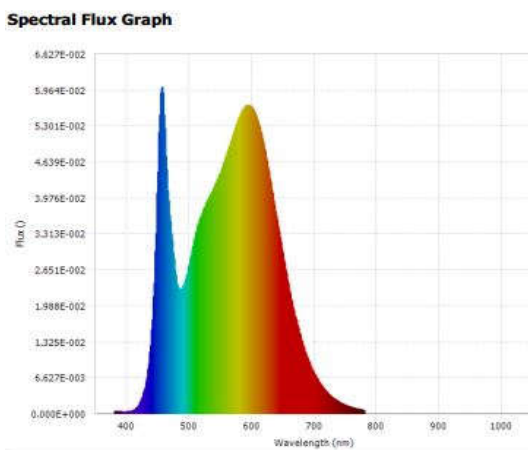
1.The sample was tested according to the IES LM-79-2008.
 2.Photometric paramters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at 25° C ± 1° C.The reference standard lamp is rated current 2.6A omni-directional Incandescent lamp and was calibrated by china seprei laboratory.
 3.The sample measurements were made using a spectroradiometer connected by a fiber optic cable and detector through the detector port of the integrating sphere. Coating reflectance of the integrating sphere was 90% to 98%.Photometric measurement conditions was using 4π geometry.The self-absorption factor is applied in the final test result.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.

Integrating Sphere Test Conditions

| Temperature (°C) | Voltage (Vac) | Frequency (Hz) | Current (A) | Power (W) | Power Factor | Current THD |
|------------------|---------------|----------------|-------------|-----------|--------------|-------------|
| 25.1 | 120.04 | 60 | 0.278 | 33.184 | 0.9944 | 7.70% |

Test Results

| Orientation | CCT (K) | CRI (Ra) | Duv | Luminous Flux (lm) | Luminous Efficacy (lm/W) | Luminous Efficacy (lm/ft) |
|-------------|---------|----------|--------|--------------------|--------------------------|---------------------------|
| Horizontal | 4057 | 84.0 | 0.0012 | 3279.9 | 98.84 | N/A |



Spectral Result

| | | | |
|--------------------|--------------|---------------------|--------------|
| Luminous Flux Φ(v) | 3279.94 (lm) | Chrom x | 0.3787 |
| Chrom y | 0.3782 | Chrom u | 0.2234 |
| Chrom v | 0.3346 | Duv | 0.0012 |
| Chrom u' | 0.2234 | Chrom v' | 0.5020 |
| CCT | 4057.0 (K) | Luminous Efficacy η | 98.84 (lm/W) |
| Ra | 84.04 | R1 | 82.9 |
| R2 | 92.8 | R3 | 95.6 |
| R4 | 80.3 | R5 | 82.6 |
| R6 | 89.2 | R7 | 84.7 |
| R8 | 64.3 | R9 | 11.9 |
| R10 | 82.2 | R11 | 79.3 |
| R12 | 63.8 | R13 | 85.9 |
| R14 | 98.2 | R15 | 76.5 |
| Rf | 82 | Rg | 92 |



3.0 LM-79 Measurement and Test Results

3.2 Goniophotometer Test

| | | | | | |
|-------------------|-------|----------------------------|-------------------|----------------------------------|----|
| Model No. | 55270 | | Sample ID. | 916447-002 | |
| Driver No. | N/A | Opreate time (Min.) | 80 | Stabilization time (Min.) | 70 |

Test Method

- 1.The sample was tested according to the IES LM-79-2008.
- 2.Photometric paramters were measured using a type C goniophotometer and software.
- 3.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 reference standard lamp is rated current 3.865A omni-directional Incandescent lamp and was calibrated by china seprei laboratory.
- 4.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° vertical intervals and 22.5° horizontal intervals..Photometric distance was more than five times of the largest dimension of the test SSL product.

Goniophotometer Test Conditions

| Temperature (°C) | Voltage (Vac) | Frequency (Hz) | Current (A) | Power (W) | Power Factor |
|------------------|---------------|----------------|-------------|-----------|--------------|
| 25.1 | 120.01 | 60 | 0.27844 | 33.19 | 0.9932 |

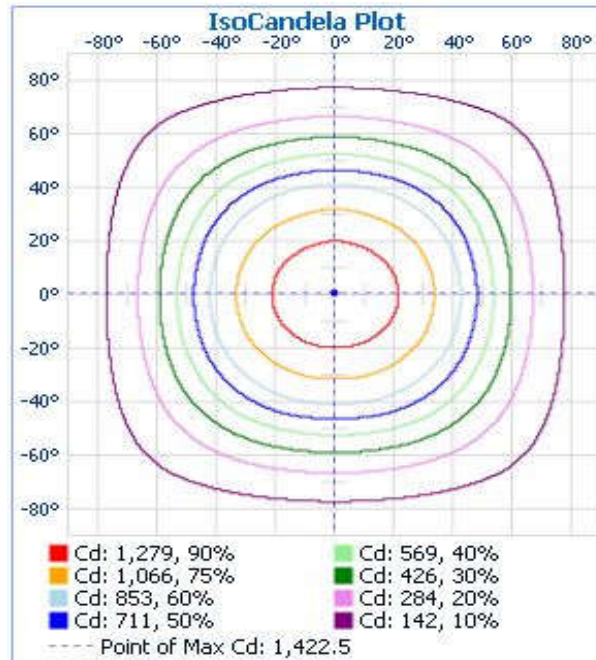
Test Result

| Orientation | Flux (lm) | Field Angle (10%) | | Beam Angle (50%) | | Luminous Efficacy (lm/W) |
|-------------|-----------|-------------------|-----------------|-------------------|-----------------|--------------------------|
| | | Horizontal Spread | Vertical Spread | Horizontal Spread | Vertical Spread | |
| Horizontal | 3301.80 | 154.8 | 154.8 | 95.9 | 93.1 | 99.5 |

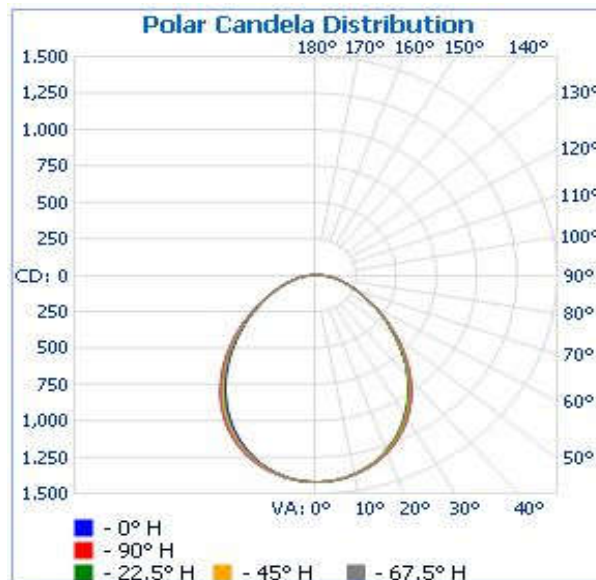


3.2 Goniophotometer Test (Cont'd)

IsoCandela Plot



Polar Candela Distribution





3.2 Goniophotometer Test (Cont'd)

Zonal Lumen Summary

| Zonal Lumen Summary | | |
|---------------------|---------|-------------|
| Zone | Lumens | % Luminaire |
| 0-30 | 1,068.7 | 32.4% |
| 0-40 | 1,698.9 | 51.5% |
| 0-60 | 2,754.4 | 83.4% |
| 60-90 | 547.0 | 16.6% |
| 70-100 | 237.8 | 7.2% |
| 90-120 | 0 | 0% |
| 0-90 | 3,301.4 | 100% |
| 90-180 | 0 | 0% |
| 0-180 | 3,301.4 | 100% |

Lumens Per Zone

| Lumens Per Zone | | | | | |
|-----------------|--------|---------|---------|--------|---------|
| Zone | Lumens | % Total | Zone | Lumens | % Total |
| 0-5 | 33.9 | 1.0% | 90-95 | 0 | 0% |
| 5-10 | 100.1 | 3.0% | 95-100 | 0 | 0% |
| 10-15 | 162.0 | 4.9% | 100-105 | 0 | 0% |
| 15-20 | 216.8 | 6.6% | 105-110 | 0 | 0% |
| 20-25 | 261.6 | 7.9% | 110-115 | 0 | 0% |
| 25-30 | 294.4 | 8.9% | 115-120 | 0 | 0% |
| 30-35 | 313.1 | 9.5% | 120-125 | 0 | 0% |
| 35-40 | 317.1 | 9.6% | 125-130 | 0 | 0% |
| 40-45 | 306.9 | 9.3% | 130-135 | 0 | 0% |
| 45-50 | 283.7 | 8.6% | 135-140 | 0 | 0% |
| 50-55 | 251.5 | 7.6% | 140-145 | 0 | 0% |
| 55-60 | 213.5 | 6.5% | 145-150 | 0 | 0% |
| 60-65 | 173.5 | 5.3% | 150-155 | 0 | 0% |
| 65-70 | 135.7 | 4.1% | 155-160 | 0 | 0% |
| 70-75 | 102.4 | 3.1% | 160-165 | 0 | 0% |
| 75-80 | 73.4 | 2.2% | 165-170 | 0 | 0% |
| 80-85 | 45.7 | 1.4% | 170-175 | 0 | 0% |
| 85-90 | 16.3 | 0.5% | 175-180 | 0 | 0% |



3.2 Goniophotometer Test (Cont'd)

Intensity Data(cd)

| | 0 | 22.5 | 45 | 67.5 | 90 | 113 | 135 | 158 | 180 | 203 | 225 | 247.5 | 270 | 293 | 315 | 337.5 | 360 |
|-----|------|------|------|------|------|------|------|------|------|------|------|-------|------|------|------|-------|------|
| 0 | 1421 | 1421 | 1421 | 1421 | 1421 | 1421 | 1421 | 1421 | 1421 | 1421 | 1421 | 1421 | 1421 | 1421 | 1421 | 1421 | 1421 |
| 1 | 1422 | 1422 | 1419 | 1420 | 1420 | 1419 | 1420 | 1422 | 1420 | 1422 | 1420 | 1419 | 1420 | 1420 | 1419 | 1422 | 1422 |
| 2 | 1419 | 1421 | 1418 | 1419 | 1419 | 1419 | 1418 | 1420 | 1420 | 1420 | 1418 | 1419 | 1419 | 1419 | 1418 | 1421 | 1419 |
| 3 | 1418 | 1420 | 1416 | 1418 | 1418 | 1417 | 1417 | 1419 | 1416 | 1419 | 1417 | 1417 | 1418 | 1418 | 1416 | 1420 | 1418 |
| 4 | 1415 | 1416 | 1414 | 1415 | 1416 | 1413 | 1413 | 1417 | 1413 | 1417 | 1413 | 1413 | 1416 | 1415 | 1414 | 1416 | 1415 |
| 5 | 1414 | 1412 | 1410 | 1413 | 1412 | 1413 | 1411 | 1412 | 1410 | 1412 | 1411 | 1413 | 1412 | 1413 | 1410 | 1412 | 1414 |
| 6 | 1409 | 1408 | 1408 | 1409 | 1410 | 1409 | 1406 | 1408 | 1406 | 1408 | 1406 | 1409 | 1410 | 1409 | 1408 | 1408 | 1409 |
| 7 | 1405 | 1404 | 1402 | 1406 | 1406 | 1406 | 1402 | 1403 | 1400 | 1403 | 1402 | 1406 | 1406 | 1406 | 1402 | 1404 | 1405 |
| 8 | 1400 | 1398 | 1399 | 1400 | 1402 | 1399 | 1397 | 1398 | 1394 | 1398 | 1397 | 1399 | 1402 | 1400 | 1399 | 1398 | 1400 |
| 9 | 1392 | 1391 | 1393 | 1395 | 1396 | 1395 | 1390 | 1391 | 1386 | 1391 | 1390 | 1395 | 1396 | 1395 | 1393 | 1391 | 1392 |
| 10 | 1385 | 1385 | 1384 | 1389 | 1390 | 1390 | 1384 | 1384 | 1381 | 1384 | 1384 | 1390 | 1390 | 1389 | 1384 | 1385 | 1385 |
| 11 | 1377 | 1378 | 1379 | 1383 | 1384 | 1382 | 1378 | 1377 | 1372 | 1377 | 1378 | 1382 | 1384 | 1383 | 1379 | 1378 | 1377 |
| 12 | 1372 | 1369 | 1371 | 1375 | 1378 | 1376 | 1369 | 1368 | 1364 | 1368 | 1369 | 1376 | 1378 | 1375 | 1371 | 1369 | 1372 |
| 13 | 1362 | 1360 | 1363 | 1368 | 1370 | 1366 | 1361 | 1360 | 1353 | 1360 | 1361 | 1366 | 1370 | 1368 | 1363 | 1360 | 1362 |
| 14 | 1352 | 1351 | 1354 | 1359 | 1362 | 1359 | 1352 | 1349 | 1344 | 1349 | 1352 | 1359 | 1362 | 1359 | 1354 | 1351 | 1352 |
| 15 | 1344 | 1341 | 1344 | 1350 | 1353 | 1350 | 1343 | 1338 | 1333 | 1338 | 1343 | 1350 | 1353 | 1350 | 1344 | 1341 | 1344 |
| 16 | 1332 | 1329 | 1334 | 1341 | 1345 | 1339 | 1331 | 1328 | 1320 | 1328 | 1331 | 1339 | 1345 | 1341 | 1334 | 1329 | 1332 |
| 17 | 1319 | 1319 | 1323 | 1330 | 1333 | 1330 | 1319 | 1316 | 1307 | 1316 | 1319 | 1330 | 1333 | 1330 | 1323 | 1319 | 1319 |
| 18 | 1308 | 1306 | 1311 | 1319 | 1323 | 1318 | 1307 | 1305 | 1293 | 1305 | 1307 | 1318 | 1323 | 1319 | 1311 | 1306 | 1308 |
| 19 | 1297 | 1294 | 1297 | 1306 | 1311 | 1305 | 1295 | 1289 | 1281 | 1289 | 1295 | 1305 | 1311 | 1306 | 1297 | 1294 | 1297 |
| 20 | 1285 | 1279 | 1288 | 1296 | 1299 | 1292 | 1281 | 1276 | 1267 | 1276 | 1281 | 1292 | 1299 | 1296 | 1288 | 1279 | 1285 |
| 25 | 1204 | 1201 | 1211 | 1222 | 1227 | 1220 | 1203 | 1195 | 1186 | 1195 | 1203 | 1220 | 1227 | 1222 | 1211 | 1201 | 1204 |
| 30 | 1111 | 1107 | 1121 | 1132 | 1138 | 1130 | 1112 | 1101 | 1088 | 1101 | 1112 | 1130 | 1138 | 1132 | 1121 | 1107 | 1111 |
| 35 | 1002 | 1000 | 1011 | 1026 | 1033 | 1023 | 1003 | 991 | 978 | 991 | 1003 | 1023 | 1033 | 1026 | 1011 | 1000 | 1002 |
| 40 | 886 | 884 | 896 | 906 | 915 | 902 | 884 | 880 | 860 | 880 | 884 | 902 | 915 | 906 | 896 | 884 | 886 |
| 45 | 762 | 758 | 769 | 781 | 789 | 776 | 760 | 747 | 736 | 747 | 760 | 776 | 789 | 781 | 769 | 758 | 762 |
| 50 | 638 | 635 | 644 | 650 | 658 | 650 | 637 | 626 | 617 | 626 | 637 | 650 | 658 | 650 | 644 | 635 | 638 |
| 55 | 522 | 516 | 521 | 525 | 529 | 525 | 516 | 508 | 501 | 508 | 516 | 525 | 529 | 525 | 521 | 516 | 522 |
| 60 | 411 | 405 | 409 | 410 | 416 | 411 | 406 | 400 | 394 | 400 | 406 | 411 | 416 | 410 | 409 | 405 | 411 |
| 65 | 316 | 310 | 309 | 312 | 314 | 312 | 307 | 305 | 302 | 305 | 307 | 312 | 314 | 312 | 309 | 310 | 316 |
| 70 | 236 | 231 | 226 | 231 | 232 | 231 | 225 | 226 | 224 | 226 | 225 | 231 | 232 | 231 | 226 | 231 | 236 |
| 75 | 174 | 167 | 162 | 166 | 170 | 165 | 159 | 161 | 163 | 161 | 159 | 165 | 170 | 166 | 162 | 167 | 174 |
| 80 | 119 | 113 | 111 | 111 | 114 | 109 | 107 | 106 | 112 | 106 | 107 | 109 | 114 | 111 | 111 | 113 | 119 |
| 85 | 66 | 62 | 57 | 59 | 60 | 56 | 51 | 54 | 54 | 54 | 51 | 56 | 60 | 59 | 57 | 62 | 66 |
| 90 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 95 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 100 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 105 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 110 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 115 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 120 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 125 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 130 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 135 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 140 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 145 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 150 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 155 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 160 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 165 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 170 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 175 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 180 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |



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