

LG ELECTRONICS INC.

TEST REPORT

SCOPE OF WORKS

HEAT PUMP CLOTHES DRYERS PERFORMANCE COMPARISON TEST FOR PROGRAMME TIME
AND DRYING EVENNESS

MODEL NUMBER

New model: RD20***, W20***
Conventional model: RH17VTS

REPORT NUMBER

211000180SEL-001

ISSUE DATE

25-NOV-2021

PAGES

18

DOCUMENT CONTROL NUMBER

GFT-OP-10b (18 April-2017)
© 2017 INTERTEK



TEST REPORT FOR LG ELECTRONICS INC.

Report No.: 211000180SEL-001

Date: 25-Nov-2021

OBJECTIVE

This test is performed to compare the operating cycle time and drying evenness between the new heat pump clothes dryer at AI course ('인공지능건조') and the conventional clothes dryer at Normal course ('표준') with different types of test loads composition designed by LG Electronics.

HYPOTHESIS

◆ Type A test loads composition:

The operating cycle time of the new heat pump clothes dryer will be at least 10 minutes and 15 % shorter than the conventional clothes dryer.

◆ Type B test loads composition:

The total FMC (%) for the new heat pump clothes dryer will be lower than 2.5 %.

The individual test load FMC (%) for the new heat pump clothes dryer will be lower than 5.0 %.

CONCLUSION

Based on the data collected the Hypothesis is **accepted**:

◆ Type A test loads composition:

The operating cycle time of the new heat pump clothes dryer was at least 10 minutes and 15 % shorter than the conventional clothes dryer.

◆ Type B test loads composition:

The total FMC (%) for the new heat pump clothes dryer was lower than 2.5 %.

The individual test load FMC (%) for the new heat pump clothes dryer was lower than 5.0 %.

James Woo

PROJECT ENGINEER

Alexander Porter

REVIEWER



Except where explicitly agreed in writing, all work and services performed by Intertek is subject to our standard Terms and Conditions which can be obtained at our website: <http://www.intertek.com/terms/>. Intertek's responsibility and liability are limited to the terms and conditions of the agreement. This report is made solely on the basis of your instructions and / or information and materials supplied by you and provide no warranty on the tested sample(s) be truly representative of the sample source. The report is not intended to be a recommendation for any particular course of action, you are responsible for acting as you see fit on the basis of the report results. Intertek is under no obligation to refer to or report upon any facts or circumstances which are outside the specific instructions received and accepts no responsibility to any parties whatsoever, following the issue of the report, for any matters arising outside the agreed scope of the works. This report does not discharge or release you from your legal obligations and duties to any other person. You are the only one authorized to permit copying or distribution of this report (and then only in its entirety). Any such third parties to whom this report may be circulated rely on the content of the report solely at their own risk. This report shall not be reproduced, except in full.

SECTION 1 INDEX

| SECTION NAMES | PAGE |
|-------------------------------------|--------|
| Objective | 4 |
| Parameters | 4 |
| Sample acquisition | 5 |
| Hypothesis | 5 |
| Equipment | 6 |
| Technical staff | 6 |
| Test procedure | 7 - 8 |
| Test results | 9 - 12 |
| Test summary | 13 |
| Conclusion | 14 |
| Appendix I. Photos | 15 -17 |
| Appendix II. Test loads composition | 18 |

SECTION 2 OBJECTIVE

This test is performed to compare the operating cycle time and drying evenness between the new heat pump clothes dryer at AI course (‘인공지능건조’) and the conventional clothes dryer at Normal course (‘표준’) with different types of test loads composition designed by LG Electronics.

Accuracy Needed 5 %

Accuracy and Repeatability should be determined from the multiple samples run as needed for the analysis conducted.

SECTION 3 PARAMETERS

The following parameters are controlled

| VALUE | DESCRIPTION | UNITS | METHOD | MU |
|-------|---|--------|--------------------|------------------------------------|
| 23 | Test room Temperature | °C | Thermo-hygrometer | 0.5 °C (Approx. 95 %, k=2) |
| 50 | Test room Humidity | % R.H. | Thermo-hygrometer | 2.4 % R.H. (Approx. 95 %, k=2) |
| 220 | Test voltage | VAC | AC Power Supply | 0.1 V (Approx. 95 %, k=2) |
| 60 | Frequency | Hz | AC Power supply | - |
| 3.0 | Weight of Type A test loads composition | kg | Electronic balance | 0.000 02 kg (Approx. 95 %, k=2) |
| 3.0 | Weight of Type B test loads composition | kg | Electronic balance | 0.000 02 kg (Approx. 95 %, k=2) |
| 29~32 | Initial moisture content (for operating cycle time) | % | Electronic balance | 0.1 % (Approx. 95 %, k=2) |
| 60 | Initial moisture content (for drying evenness) | % | Electronic balance | 0.03 % (Approx. 95 %, k=2) |

The following parameters are monitored

| VALUE | DESCRIPTION | UNITS | METHOD | MU |
|-------|---|--------|---------------------|---|
| 23 | Test room Temperature | °C | Thermo-hygrometer | 0.5 °C (Approx. 95 %, k=2) |
| 50 | Test room Humidity | % R.H. | Thermo-hygrometer | 2.4 % R.H. (Approx. 95 %, k=2) |
| 220 | Test voltage | VAC | AC Power Supply | 0.1 V (Approx. 95 %, k=2) |
| 60 | Frequency | Hz | AC Power supply | - |
| 3.0 | Weight of Type A test loads composition | kg | Electronic balance | 0.000 02 kg (Approx. 95 %, k=2) |
| 3.0 | Weight of Type B test loads composition | kg | Electronic balance | 0.000 02 kg (Approx. 95 %, k=2) |
| 29~32 | Initial moisture content (for operating cycle time) | % | Electronic balance | 0.1 % (Approx. 95 %, k=2) |
| 60 | Initial moisture content (for drying evenness) | % | Electronic balance | 0.03 % (Approx. 95 %, k=2) |
| - | Electrical energy consumption | Wh | Digital power meter | 1 W (Approx. 95 %, k=2) |
| - | Operating cycle time | min | Stopwatch | 0.000 000 18 min (Approx. 95 %, k=2) |
| - | Final moisture content | % | Electronic balance | 0.36 % (Approx. 95 %, k=2) |

SECTION 4 SAMPLE ACQUISITION

Samples were prepared by LG Electronics Inc.:

| Sample # | MODEL # | DESCRIPTION | SERIAL # | PURCHASE LOCATION | DATE | CONDITION |
|----------|---------|--|--------------|----------------------------|-------------|----------------------|
| 1 | RD20VS | New Heat pump clothes dryer (20 kg) | 110KWNM18023 | Prepared by LG Electronics | 27-Oct-2021 | Unpackaged undamaged |
| 2 | | | 110KWKS18021 | | 27-Oct-2021 | Unpackaged undamaged |
| 3 | RH17VTS | Conventional Heat pump clothes dryer (17 kg) | 007KWNM23343 | | 27-Oct-2021 | Unpackaged undamaged |

NOTE

- The models RD20VS and RH17VTS were selected as representative test models.
- The model description for the new heat pump clothes dryer is as below.
Model number: RD20*** and W20***
The asterisk * can be 0 to 9 or A to Z or blank depending on the exterior changes.
- The models RD20*** and W20*** are exactly same in all aspects of mechanical, electrical and operating algorithm only except the installation ways.
(RD20***: Series or parallel installation, W20***: Series installation only)

SECTION 5 HYPOTHESIS

♦ Type A test loads composition:

The operating cycle time of the new heat pump clothes dryer will be at least 10 minutes and 15 % shorter than the conventional clothes dryer.

♦ Type B test loads composition:

The total FMC (%) for the new heat pump clothes dryer will be lower than 2.5 %.

The individual test load FMC (%) for the new heat pump clothes dryer will be lower than 5.0 %.

SECTION 6 EQUIPMENT LIST

| # | EQUIPMENT DESCRIPTION | MANUFACTURER'S NAME / MODEL # / SERIAL # | INTERTEK ASSET # | CALIBRATION DATE | CALIBRATION DUE | RANGE USED |
|--|-------------------------|--|------------------|------------------|-----------------|-----------------------------------|
| 1 | C.V.C.F | IRAE / AFC-3010 / - | Provided by LG | N/A | N/A | (80~300) V (50~60) Hz |
| 2 | Digital power meter (1) | Hioki / 3334 / 110803181 | Provided by LG | 2021-04-21 | 2022-04-21 | (0~600) V 0.5 Hz ~ 100 kHz |
| 3 | Digital power meter (2) | Hioki / 3334 / 110803183 | Provided by LG | 2021-04-21 | 2022-04-21 | (0~600) V 0.5 Hz ~ 100 kHz |
| 4 | Digital power meter (3) | Hioki / 3334 / 110432820 | Provided by LG | 2021-04-21 | 2022-04-21 | (0~600) V 0.5 Hz ~ 100 kHz |
| 5 | Electronic balance | AND / GF-4000 / T0362890 | ES1051 | 2021-07-15 | 2021-07-15 | (0~4 000) g |
| 6 | G-TEMS system | G.SFT / Version 2016.04.22 | Provided by LG | N/A | N/A | N/A |
| 7 | Thermo-hygrometer | SEKONIC / ST-50A / HE21-001591 | ES891 | 2021-07-16 | 2022-07-16 | (-20 ~ +50) °C (0 ~ 90) % R.H. |
| 8 | Stopwatch | Casio / HS-3 / 151576 | ES890 | 2021-07-15 | 2023-07-15 | (0~86 400) s |
| NOTE: The equipment measurement uncertainty is stated in the Parameters. | | | | | | |

SECTION 7 TECHNICAL STAFF

| # | Staff Name | Area of Expertise |
|--|---------------|-----------------------------------|
| 1 | Jaekon, Jeong | Washing machine Senior Researcher |
| NOTE: Complete training records for staff are available upon request | | |

Testing was conducted at:

LG Electronics Washing Machine Division R&D center
76, Seongsan-dong, Changwon City, Gyeongnam, 641-713 Korea

Witnessed by Intertek Staff: James Woo

SECTION 8 TEST PROCEDURE**1. Test conditions**

| ITEMS | | REQUIREMENT | MEASURED |
|----------------------|-----------|---|----------------------|
| Electrical supply | Voltage | (220 ± 1) V | (220.4 ~ 221.2) V |
| | Frequency | (60 ± 1) Hz | (59.9 ~ 60.0) Hz |
| Ambient temperature | | (23 ± 2) °C | (23.6 ~ 23.9) °C |
| Humidity | | (50 ± 10) % R.H. | (51.2 ~ 51.7) % R.H. |
| Test load type | | TEST 1. Testing for operating cycle time: Type A - Test clothes composition affiliated with Poly TEST 2. Testing for drying evenness: Type B - Test clothes composition affiliated with Cotton *NOTE: Refer to the Appendix II for detailed test loads composition. | |
| Weight of test loads | | 3.0 kg (Type A / Type B) | |
| Test program | | New heat pump clothes dryer: AI course ('인공지능건조') Conventional clothes dryer: Normal course ('표준') | |

2. Test method**2-1. General**

- 1) Install the clothes dryers according to the manufacturer instruction.
- 2) Set the test conditions as described on above table.
- 3) Prepare the appropriate quantity of test loads for each type.
- 4) Before starting of test, measure the initial mass of both types of test loads at bone dry condition.
Specially for the Type B test load, measure the individual test load item.

2-2. Operating cycle time test

- 1) Dampen the test loads (Type A) by agitating it in water whose temperature is (15 ± 2) °C.
- 2) Rinse then spin to extract water from the wet test loads.
- 3) Make a final mass adjustment, such that the moisture content is set at (29 ~ 32) % by adding water uniformly distributed among all of the test loads in a very fine spray using a spray bottle.
- 4) Load the test loads by grasping them in the center, shaking them to hang loosely, and then dropping them in the dryer at random.
- 5) Set the dryers at the defined course.
- 6) Together with starting operation of dryer, record the operating cycle time and energy consumption.
- 7) The cycle shall be considered complete when the dryer indicates to the user that the cycle has finished (by means of a display, indicator light, audible signal, or other signal) and the drum/fan motor shuts off for the final time.

- 8) After the completion of the test cycle, remove and weigh the test loads to confirm the FMC (%).
- 9) Before performing next test, having a break time at least 2 hours.
Also, the water tank shall be empty and inner/outer filters need to be cleaned before starting test.

2-3. Drying evenness test

- 1) Dampen the test loads (Type B) by agitating it in water whose temperature is $(15 \pm 2) ^\circ\text{C}$.
- 2) Rinse then spin to extract water from the wet test loads.
- 3) Make a final mass adjustment, such that the moisture content of whole test loads to be set at 60 % by adding water uniformly distributed among all of the test loads in a very fine spray using a spray bottle.
- 4) Measure the mass of all test loads item separately to confirm the IMC (%) of individual test load.
- 5) Load the test loads by grasping them in the center, shaking them to hang loosely, and then dropping them in the dryer at random.
- 6) Set the dryers at the defined course.
- 7) Together with starting operation of dryer, record the operating cycle time and energy consumption.
- 8) The cycle shall be considered complete when the dryer indicates to the user that the cycle has finished (by means of a display, indicator light, audible signal, or other signal) and the drum/fan motor shuts off for the final time.
- 9) After the completion of the test cycle, measure the mass of all test loads item separately to confirm the FMC (%) of individual test load.
- 10) Record the total average FMC (%) of the test loads.
- 11) Before performing next test, having a break time at least 2 hours.
Also, the water tank shall be empty and inner/outer filters need to be cleaned before starting test.

SECTION 9 TEST RESULTS**TEST 1. Operating cycle time with Type A test loads composition**

| Model | Sample No. | Test No. | Bone-dry mass (g) | Mass of test load after wetting (kg) | Initial Moisture Content (%) | Mass of the test load after drying (kg) | Measured final moisture content (%) | Display time (min) | Measured energy consumption (kWh) | Measured program time (min) |
|---------|------------|----------|-------------------|--------------------------------------|------------------------------|---|-------------------------------------|--------------------|-----------------------------------|-----------------------------|
| RD20VS | 1 | 1 | 3.025 | 3.970 | 31.24 | 3.048 | 0.76 | 90 | 0.717 | 57 |
| | | 2 | 3.025 | 3.949 | 30.55 | 3.043 | 0.60 | 90 | 0.635 | 55 |
| RD20VS | 2 | 1 | 3.025 | 3.976 | 31.44 | 3.040 | 0.50 | 90 | 0.664 | 56 |
| | | 2 | 3.025 | 3.967 | 31.14 | 3.047 | 0.73 | 90 | 0.679 | 57 |
| RH17VTS | 3 | 1 | 3.025 | 3.960 | 30.91 | 3.056 | 1.02 | 75 | 0.846 | 70 |
| | | 2 | 3.025 | 3.947 | 30.48 | 3.044 | 0.63 | 75 | 0.790 | 69 |

Measurement uncertainty:

- Measured program time: 0.4 %
- Measured energy consumption: 0.1 %
- Initial/final moisture content: 0.4 %

TEST 2. FMC (%) with Type B test loads composition

| Model | Sample No. | Test run No. | Test load type | Qty. (EA) | Bone-dry mass (g) | Cotton (%) | Poly (%) | Cotton (g) | Poly (g) | IMC (%) | FMC (%) | Measured energy consump-tion (kWh) | Measured program time (min) |
|--------|------------|--------------|----------------|-----------|-------------------|------------|----------|------------|----------|---------|---------|------------------------------------|-----------------------------|
| RD20VS | 1 | 1 | 아동여자용남방 | 1 | 82.7 | 100 | 0 | 82.7 | 0.0 | 66.87 | 3.63 | 0.944 | 78 |
| | | | 베개 커버 | 2 | 123.4 | 50 | 50 | 61.7 | 61.7 | 50.32 | 2.92 | | |
| | | | 아동 반팔 티셔츠 | 1 | 67.4 | 100 | 0 | 67.4 | 0.0 | 78.04 | 3.12 | | |
| | | | 성인 남자 봄잠바 | 1 | 562.5 | 0 | 100 | 0.0 | 562.5 | 21.19 | 0.82 | | |
| | | | 성인 남자 흰양말(1) | 1 | 22.6 | 100 | 0 | 22.6 | 0.0 | 41.15 | 2.65 | | |
| | | | 성인 남자 흰양말(2) | 1 | 23.2 | 100 | 0 | 23.2 | 0.0 | 47.84 | 0.86 | | |
| | | | 성인 남자 반바지 | 1 | 129.9 | 0 | 100 | 0.0 | 129.9 | 14.70 | 0.08 | | |
| | | | 아동 긴팔 티셔츠 | 1 | 99.9 | 100 | 0 | 99.9 | 0.0 | 69.17 | 3.20 | | |
| | | | 브래지어 | 1 | 51.7 | 0 | 100 | 0.0 | 51.7 | 23.40 | 1.55 | | |
| | | | 스타킹 | 1 | 5.6 | 0 | 100 | 0.0 | 5.6 | 10.71 | 0.00 | | |
| | | | 청소년 반팔 티셔츠 | 2 | 123.9 | 100 | 0 | 123.9 | 0.0 | 71.83 | 3.23 | | |
| | | | 청소년 팬티 | 1 | 44.0 | 100 | 0 | 44.0 | 0.0 | 72.73 | 2.73 | | |
| | | | 아동용 여름 반바지 | 1 | 175.5 | 100 | 0 | 175.5 | 0.0 | 59.83 | 3.93 | | |
| | | | 방석 커버 | 1 | 115.1 | 50 | 50 | 57.6 | 57.6 | 63.60 | 3.04 | | |
| | | | 아동용 겨울 내의 (하) | 1 | 77.6 | 100 | 0 | 77.6 | 0.0 | 71.39 | 3.35 | | |
| | | | 세면 타월 | 6 | 92.7 | 100 | 0 | 92.7 | 0.0 | 95.79 | 3.24 | | |
| | | | 성인 여자 봄내의 (상) | 1 | 128.0 | 100 | 0 | 128.0 | 0.0 | 81.72 | 3.36 | | |
| | | | Total | 24 | 3 008.0 | - | - | - | - | 59.57 | 2.26 | | |
| | | 2 | 아동여자용남방 | 1 | 82.7 | 100 | 0 | 82.7 | 0.0 | 58.40 | 3.02 | 0.966 | 77 |
| | | | 베개 커버 | 2 | 123.4 | 50 | 50 | 61.7 | 61.7 | 49.92 | 2.51 | | |
| | | | 아동 반팔 티셔츠 | 1 | 67.4 | 100 | 0 | 67.4 | 0.0 | 76.56 | 2.23 | | |
| | | | 성인 남자 봄잠바 | 1 | 562.5 | 0 | 100 | 0.0 | 562.5 | 20.89 | 0.82 | | |
| | | | 성인 남자 흰양말(1) | 1 | 22.6 | 100 | 0 | 22.6 | 0.0 | 46.02 | 0.44 | | |
| | | | 성인 남자 흰양말(2) | 1 | 23.2 | 100 | 0 | 23.2 | 0.0 | 50.86 | 1.29 | | |
| | | | 성인 남자 반바지 | 1 | 129.9 | 0 | 100 | 0.0 | 129.9 | 15.47 | 0.92 | | |
| | | | 아동 긴팔 티셔츠 | 1 | 99.9 | 100 | 0 | 99.9 | 0.0 | 70.17 | 2.70 | | |
| | | | 브래지어 | 1 | 51.7 | 0 | 100 | 0.0 | 51.7 | 27.66 | 0.39 | | |
| | | | 스타킹 | 1 | 5.6 | 0 | 100 | 0.0 | 5.6 | 12.50 | 0.00 | | |
| | | | 청소년 반팔 티셔츠 | 2 | 123.9 | 100 | 0 | 123.9 | 0.0 | 70.30 | 2.66 | | |
| | | | 청소년 팬티 | 1 | 44.0 | 100 | 0 | 44.0 | 0.0 | 81.82 | 2.05 | | |
| | | | 아동용 여름 반바지 | 1 | 175.5 | 100 | 0 | 175.5 | 0.0 | 57.83 | 4.56 | | |
| | | | 방석 커버 | 1 | 115.1 | 50 | 50 | 57.6 | 57.6 | 68.55 | 3.21 | | |
| | | | 아동용 겨울 내의 (하) | 1 | 77.6 | 100 | 0 | 77.6 | 0.0 | 71.39 | 2.84 | | |
| | | | 세면 타월 | 6 | 92.7 | 100 | 0 | 92.7 | 0.0 | 90.94 | 2.70 | | |
| | | | 성인 여자 봄내의 (상) | 1 | 128.0 | 100 | 0 | 128.0 | 0.0 | 78.13 | 2.89 | | |
| | | | Total | 24 | 3 008.0 | - | - | - | - | 59.57 | 2.16 | | |

| Model | Sample No. | Test run No. | Test load type | Qty. (EA) | Bone-dry mass (g) | Cotton (%) | Poly (%) | Cotton (g) | Poly (g) | IMC (%) | FMC (%) | Measured energy consump-tion (kWh) | Measured program time (min) |
|--------|------------|--------------|----------------|-----------|-------------------|------------|----------|------------|----------|---------|---------|------------------------------------|-----------------------------|
| RD20VS | 2 | 1 | 아동여자용남방 | 1 | 82.7 | 100 | 0 | 82.7 | 0.0 | 59.61 | 3.51 | 0.947 | 78 |
| | | | 베개 커버 | 2 | 123.4 | 50 | 50 | 61.7 | 61.7 | 51.86 | 2.59 | | |
| | | | 아동 반팔 티셔츠 | 1 | 67.4 | 100 | 0 | 67.4 | 0.0 | 75.07 | 2.52 | | |
| | | | 성인 남자 봄잠바 | 1 | 562.5 | 0 | 100 | 0.0 | 562.5 | 21.01 | 0.91 | | |
| | | | 성인 남자 흰양말(1) | 1 | 22.6 | 100 | 0 | 22.6 | 0.0 | 42.92 | 2.21 | | |
| | | | 성인 남자 흰양말(2) | 1 | 23.2 | 100 | 0 | 23.2 | 0.0 | 50.00 | 1.29 | | |
| | | | 성인 남자 반바지 | 1 | 129.9 | 0 | 100 | 0.0 | 129.9 | 15.47 | 0.69 | | |
| | | | 아동 긴팔 티셔츠 | 1 | 99.9 | 100 | 0 | 99.9 | 0.0 | 68.27 | 3.30 | | |
| | | | 브래지어 | 1 | 51.7 | 0 | 100 | 0.0 | 51.7 | 23.60 | 0.97 | | |
| | | | 스타킹 | 1 | 5.6 | 0 | 100 | 0.0 | 5.6 | 10.71 | 0.00 | | |
| | | | 청소년 반팔 티셔츠 | 2 | 123.9 | 100 | 0 | 123.9 | 0.0 | 71.99 | 3.31 | | |
| | | | 청소년 팬티 | 1 | 44.0 | 100 | 0 | 44.0 | 0.0 | 75.23 | 2.27 | | |
| | | | 아동용 여름 반바지 | 1 | 175.5 | 100 | 0 | 175.5 | 0.0 | 58.69 | 3.99 | | |
| | | | 방석 커버 | 1 | 115.1 | 50 | 50 | 57.6 | 57.6 | 64.12 | 3.30 | | |
| | | | 아동용 겨울 내의 (하) | 1 | 77.6 | 100 | 0 | 77.6 | 0.0 | 71.52 | 2.84 | | |
| | | | 세면 타월 | 6 | 92.7 | 100 | 0 | 92.7 | 0.0 | 96.66 | 3.24 | | |
| | | | 성인 여자 봄내의 (상) | 1 | 128.0 | 100 | 0 | 128.0 | 0.0 | 81.48 | 3.36 | | |
| | | | Total | 24 | 3 008.0 | - | - | - | - | 59.57 | 2.29 | | |
| | | 2 | 아동여자용남방 | 1 | 82.7 | 100 | 0 | 82.7 | 0.0 | 59.61 | 3.02 | 1.038 | 85 |
| | | | 베개 커버 | 2 | 123.4 | 50 | 50 | 61.7 | 61.7 | 52.35 | 2.43 | | |
| | | | 아동 반팔 티셔츠 | 1 | 67.4 | 100 | 0 | 67.4 | 0.0 | 72.11 | 1.93 | | |
| | | | 성인 남자 봄잠바 | 1 | 562.5 | 0 | 100 | 0.0 | 562.5 | 20.00 | 0.36 | | |
| | | | 성인 남자 흰양말(1) | 1 | 22.6 | 100 | 0 | 22.6 | 0.0 | 41.59 | 1.77 | | |
| | | | 성인 남자 흰양말(2) | 1 | 23.2 | 100 | 0 | 23.2 | 0.0 | 55.17 | 0.86 | | |
| | | | 성인 남자 반바지 | 1 | 129.9 | 0 | 100 | 0.0 | 129.9 | 13.16 | 0.85 | | |
| | | | 아동 긴팔 티셔츠 | 1 | 99.9 | 100 | 0 | 99.9 | 0.0 | 73.17 | 2.60 | | |
| | | | 브래지어 | 1 | 51.7 | 0 | 100 | 0.0 | 51.7 | 25.73 | 0.97 | | |
| | | | 스타킹 | 1 | 5.6 | 0 | 100 | 0.0 | 5.6 | 10.71 | 0.00 | | |
| | | | 청소년 반팔 티셔츠 | 2 | 123.9 | 100 | 0 | 123.9 | 0.0 | 67.88 | 2.74 | | |
| | | | 청소년 팬티 | 1 | 44.0 | 100 | 0 | 44.0 | 0.0 | 84.09 | 1.59 | | |
| | | | 아동용 여름 반바지 | 1 | 175.5 | 100 | 0 | 175.5 | 0.0 | 57.26 | 2.85 | | |
| | | | 방석 커버 | 1 | 115.1 | 50 | 50 | 57.6 | 57.6 | 71.16 | 3.39 | | |
| | | | 아동용 겨울 내의 (하) | 1 | 77.6 | 100 | 0 | 77.6 | 0.0 | 72.68 | 3.99 | | |
| | | | 세면 타월 | 6 | 92.7 | 100 | 0 | 92.7 | 0.0 | 92.02 | 3.99 | | |
| | | | 성인 여자 봄내의 (상) | 1 | 128.0 | 100 | 0 | 128.0 | 0.0 | 79.69 | 3.36 | | |
| | | | Total | 24 | 3 008.0 | - | - | - | - | 59.57 | 2.09 | | |

| Model | Sample No. | Test run No. | Test load type | Qty. (EA) | Bone-dry mass (g) | Cotton (%) | Poly (%) | Cotton (g) | Poly (g) | IMC (%) | FMC (%) | Measured energy consumption (kWh) | Measured program time (min) |
|---------|------------|--------------|----------------|-----------|-------------------|------------|----------|------------|----------|---------|---------|-----------------------------------|-----------------------------|
| RH17VTS | 3 | 1 | 아동여자용남방 | 1 | 82.7 | 100 | 0 | 82.7 | 0.0 | 58.40 | 3.63 | 0.913 | 72 |
| | | | 베개 커버 | 2 | 123.4 | 50 | 50 | 61.7 | 61.7 | 53.97 | 2.84 | | |
| | | | 아동 반팔 티셔츠 | 1 | 67.4 | 100 | 0 | 67.4 | 0.0 | 72.11 | 3.26 | | |
| | | | 성인 남자 봄잠바 | 1 | 562.5 | 0 | 100 | 0.0 | 562.5 | 20.71 | 0.96 | | |
| | | | 성인 남자 흰양말(1) | 1 | 22.6 | 100 | 0 | 22.6 | 0.0 | 42.04 | 2.65 | | |
| | | | 성인 남자 흰양말(2) | 1 | 23.2 | 100 | 0 | 23.2 | 0.0 | 56.90 | 2.59 | | |
| | | | 성인 남자 반바지 | 1 | 129.9 | 0 | 100 | 0.0 | 129.9 | 14.63 | 1.46 | | |
| | | | 아동 긴팔 티셔츠 | 1 | 99.9 | 100 | 0 | 99.9 | 0.0 | 75.58 | 3.60 | | |
| | | | 브래지어 | 1 | 51.7 | 0 | 100 | 0.0 | 51.7 | 23.60 | 1.55 | | |
| | | | 스타킹 | 1 | 5.6 | 0 | 100 | 0.0 | 5.6 | 12.50 | 0.00 | | |
| | | | 청소년 반팔 티셔츠 | 2 | 123.9 | 100 | 0 | 123.9 | 0.0 | 69.49 | 3.71 | | |
| | | | 청소년 팬티 | 1 | 44.0 | 100 | 0 | 44.0 | 0.0 | 86.36 | 2.95 | | |
| | | | 아동용 여름 반바지 | 1 | 175.5 | 100 | 0 | 175.5 | 0.0 | 57.49 | 9.23 | | |
| | | | 방석 커버 | 1 | 115.1 | 50 | 50 | 57.6 | 57.6 | 75.59 | 3.82 | | |
| | | | 아동용 겨울 내의 (하) | 1 | 77.6 | 100 | 0 | 77.6 | 0.0 | 68.56 | 3.99 | | |
| | | | 세면 타월 | 6 | 92.7 | 100 | 0 | 92.7 | 0.0 | 89.10 | 3.99 | | |
| | | | 성인 여자 봄내의 (상) | 1 | 128.0 | 100 | 0 | 128.0 | 0.0 | 76.64 | 3.36 | | |
| | | | Total | 24 | 3 008.0 | - | - | - | - | 59.57 | 2.83 | | |
| | | 2 | 아동여자용남방 | 1 | 82.7 | 100 | 0 | 82.7 | 0.0 | 54.78 | 3.63 | 0.901 | 72 |
| | | | 베개 커버 | 2 | 123.4 | 50 | 50 | 61.7 | 61.7 | 51.54 | 2.92 | | |
| | | | 아동 반팔 티셔츠 | 1 | 67.4 | 100 | 0 | 67.4 | 0.0 | 79.53 | 3.12 | | |
| | | | 성인 남자 봄잠바 | 1 | 562.5 | 0 | 100 | 0.0 | 562.5 | 19.64 | 0.92 | | |
| | | | 성인 남자 흰양말(1) | 1 | 22.6 | 100 | 0 | 22.6 | 0.0 | 48.23 | 2.65 | | |
| | | | 성인 남자 흰양말(2) | 1 | 23.2 | 100 | 0 | 23.2 | 0.0 | 51.29 | 2.59 | | |
| | | | 성인 남자 반바지 | 1 | 129.9 | 0 | 100 | 0.0 | 129.9 | 15.47 | 1.15 | | |
| | | | 아동 긴팔 티셔츠 | 1 | 99.9 | 100 | 0 | 99.9 | 0.0 | 67.17 | 3.50 | | |
| | | | 브래지어 | 1 | 51.7 | 0 | 100 | 0.0 | 51.7 | 19.92 | 1.74 | | |
| | | | 스타킹 | 1 | 5.6 | 0 | 100 | 0.0 | 5.6 | 17.86 | 5.36 | | |
| | | | 청소년 반팔 티셔츠 | 2 | 123.9 | 100 | 0 | 123.9 | 0.0 | 71.91 | 3.63 | | |
| | | | 청소년 팬티 | 1 | 44.0 | 100 | 0 | 44.0 | 0.0 | 77.27 | 2.95 | | |
| | | | 아동용 여름 반바지 | 1 | 175.5 | 100 | 0 | 175.5 | 0.0 | 62.39 | 10.09 | | |
| | | | 방석 커버 | 1 | 115.1 | 50 | 50 | 57.6 | 57.6 | 65.07 | 3.91 | | |
| | | | 아동용 겨울 내의 (하) | 1 | 77.6 | 100 | 0 | 77.6 | 0.0 | 80.41 | 3.99 | | |
| | | | 세면 타월 | 6 | 92.7 | 100 | 0 | 92.7 | 0.0 | 87.70 | 3.99 | | |
| | | | 성인 여자 봄내의 (상) | 1 | 128.0 | 100 | 0 | 128.0 | 0.0 | 78.91 | 3.52 | | |
| | | | Total | 24 | 3 005.0 | - | - | - | - | 59.73 | 2.80 | | |

Measurement uncertainty:

- Measured program time: 0.4 %
- Measured energy consumption: 0.1 %
- Initial/final moisture content: 0.4 %

Benchmark and Non-standard Test Report: Report must be reproduced in its entirety

SECTION 10 TEST SUMMARY**For type A test loads composition**

| Model | Sample No. | Test No. | Initial Moisture Content (%) | Measured energy consumption (kWh) | Measured program time (min) | Avg. Measured program time (min) |
|---------|------------|----------|------------------------------|-----------------------------------|-----------------------------|----------------------------------|
| RD20VS | 1 | 1 | 31.24 | 0.717 | 57 | 56 |
| | | 2 | 30.55 | 0.635 | 55 | |
| | 2 | 1 | 31.44 | 0.664 | 56 | 57 |
| | | 2 | 31.14 | 0.679 | 57 | |
| RH17VTS | 3 | 1 | 30.91 | 0.846 | 70 | 70 |
| | | 2 | 30.48 | 0.790 | 69 | |

For type B test loads composition

| Model | Sample No. | Test No. | Initial Moisture Content (%) | Measured energy consumption (kWh) | Measured Program time (min) | Measured final moisture content (%) | Avg. Measured final moisture content (%) |
|---------|------------|----------|------------------------------|-----------------------------------|-----------------------------|-------------------------------------|--|
| RD20VS | 1 | 1 | 59.57 | 0.944 | 78 | 2.26 | 2.21 |
| | | 2 | 59.57 | 0.966 | 77 | 2.16 | |
| | 2 | 1 | 59.57 | 0.947 | 78 | 2.29 | 2.19 |
| | | 2 | 59.57 | 1.038 | 85 | 2.09 | |
| RH17VTS | 3 | 1 | 59.57 | 0.913 | 72 | 2.83 | 2.82 |
| | | 2 | 59.73 | 0.901 | 72 | 2.80 | |

SECTION 11 CONCLUSION

Based on the data collected the Hypothesis is **accepted**:

♦ Type A test loads composition:

The operating cycle time of the new heat pump clothes dryer was at least 10 minutes and 15 % shorter than the conventional clothes dryer.

♦ Type B test loads composition:

The total FMC (%) for the new heat pump clothes dryer was lower than 2.5 %.

The individual test load FMC (%) for the new heat pump clothes dryer was lower than 5.0 %.

The test is for information only, the data is supplied to the client without conclusion. Final evaluation to be conducted by the client.

Appendix I. Photos



Front view



Inner view



Set test program



Front view



Inner view



Set test program



Type A test loads



Type B test loads

Appendix II. Test loads composition

Type A test loads for testing operating cycle time

| No. | Test load type | Qty. (EA) |
|-----|----------------|-----------|
| 1 | 발목 양말 | 7 |
| 2 | 반팔 γ 셔츠 | 2 |
| 3 | 브래지어 (합성) | 4 |
| 4 | 성인 남자용 팬티 (합성) | 3 |
| 5 | 성인 여자용 팬티 (합성) | 4 |
| 6 | 성인남자 런닝 (에어리즘) | 2 |
| 7 | 속바지 | 4 |
| 8 | 속치마 | 4 |
| 9 | 여자 브라우스 (반팔) | 4 |
| 10 | 여자 짧은치마 (쉬폰) | 2 |
| 11 | 여자런닝 (에어리즘) | 4 |

Type B test loads for testing drying evenness

| No. | Test load type | Qty. (EA) |
|-----|----------------|-----------|
| 1 | 여아용 남방 | 1 |
| 2 | 베개 커버 | 2 |
| 3 | 아동 반팔 T-shirt | 1 |
| 4 | 성인 남자 봄잠바 | 1 |
| 5 | 성인 남자 흰양말 (1) | 1 |
| 6 | 성인 남자 흰양말 (2) | 1 |
| 7 | 성인 남자 반바지 | 1 |
| 8 | 아동 긴팔 T-Shirt | 1 |
| 9 | 브래지어 | 1 |
| 10 | 스타킹 | 1 |
| 11 | 청소년 반팔 T-shirt | 2 |
| 12 | 청소년 팬티 | 1 |
| 13 | 아동용 여름 반바지 | 1 |
| 14 | 방석 커버 | 1 |
| 15 | 아동용 거울 내의 (하) | 1 |
| 16 | 세면 타월 | 6 |
| 17 | 성인 여자 봄 내의 (상) | 1 |

NOTE

1. Type A test loads - Test clothes composition affiliated with Poly
2. Type B test loads - Test clothes composition affiliated with Cotton