WheelAir

Cushion Cover Test Report

Table of Contents

WheelAir Cushion Cover Test Report

Temperature and Relative humidity test report for the WheelAir Cushion Cover.

Abstract

If left unmanaged, heat and moisture can cause serious health complications for wheelchair users, such as pressure sores and heat stroke. Although it is common for wheelchair users to be affected by these symptoms, there is a lack of research and available solutions to the issue of microclimate management; that is, the regulation of temperature and relative humidity in the space between the skin and wheelchair seating surface. Common current standards of care include administering antibiotics, skin creams, making chair modifications and frequent supportive care. The WheelAir Cushion Cover (WA CC) provides an innovative alternative to these solutions and helps wheelchair users manage their microclimate more effectively. Using a modified ISO 16840-11 testing standard, we tested the WA CC on 5 different popular wheelchair cushions, measuring temperature and relative humidity levels over a two-hour period. The results of the WA CC tests were compared to those when using the cushion brand's standard cover. Overall, the tests show that the WA CC is effective in reducing both relative humidity and temperature over a sustained period of two hours for four out of five cushion types tested. The only cushion for which the WA CC failed to reduce temperature and relative humidity more than the standard own-brand cover was the Varilite; a non-permeable inflatable air cell cushion. This gives an early indication of the dissipating temperature, perspiration and moisture levels that can be achieved when using the WA CC.

Introduction

There are many ways the body can maintain homeostasis when exposed to hot and humid climates. In general, people with no pre-existing medical conditions are able to sweat and regulate their temperature to avoid any serious heat and moisture related complications. However, for wheelchair users who are unable to maintain adequate airflow around the body, it is far more difficult to regulate heat and moisture, especially if their condition, degree of immobility or medication limits their heat loss capabilities. An inability to sweat or self-regulate one's temperature can lead to build-ups of heat and moisture in the most humid parts of the body, which, if left unmanaged, can seriously damage skin integrity. For instance, if the skin is heated past 33 degrees celsius, localized perspiration is increased, the skin becomes softer, and becomes more susceptible to breakdown (Lachenbruch, 2005).

Sitting in a wheelchair for long periods, especially in a custom-fitted seating system, can exacerbate these heat and moisture complications. This is particularly acute for people with conditions such as spinal cord injury (SCI) who can experience dysregulation of the autonomic nervous system, an inability to perspire in parts of the body, and limited mobility. In such cases, their microclimate - the space between the skin and seating surface - can become unstable (too hot or humid), which makes the skin particularly vulnerable to the formation of pressure ulcers, moisture lesions and heat rashes. On top of skin microclimate issues, for people with conditions such as Multiple Sclerosis (MS), Cerebral Palsy (CP) or Epilepsy, unmanaged heat can cause heat exhaustion, heat stroke, agitated symptomatology and a general discomfort when engaging in social activities.

Current standard practices of care for wheelchair users to prevent overheating and over-sweating complications include administering antibiotics, skin creams, the use of fans, custom chair designs, frequent clothing changes, and other types of self-management. These interventions are often inconvenient, cumbersome and can severely limit the autonomy and life quality of wheelchair users. The WA CC is designed specifically to help wheelchair users maintain a healthy microclimate and mitigate against heat and moisture build-up.

The aim of this test procedure is to measure the change in relative humidity, in combination with temperature, of the WA CC across five different cushion types, to give indications about dissipating perspiration and moisture compared to regular

own-brand cushion covers. If heat and moisture can be effectively managed by the easy-to-use and convenient WA CC, the burden of care and treatment for wheelchair users could be drastically decreased and result in more autonomy and confidence. The outcome of tests for all five cushions are detailed in the results section below.

Methods

Test procedure

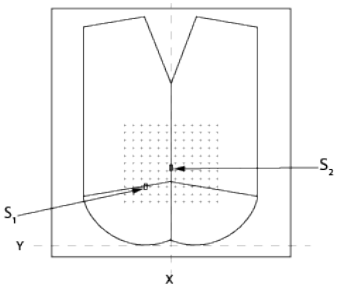
All tests were performed with one able-bodied male participant (197cm; 27-years-old; 115kg). The participant was instructed not to perform any movements during the time of the measurement that would lead to a lifting of the buttocks off the support. All testing was conducted in a small office room, isolated from the rest of the office space, where the ambient temperature and relative humidity was kept at a constant throughout all tests.

Testing was conducted in-house for WheelAir based on the ISO 16840-11 testing standards and procedures. The present test procedure deviated from the ISO 16840-11 test in that body loading on support surfaces was not simulated. Instead, a male test participant was used for all testing. The test method was applied to a range of popular wheelchair seat cushions.

The production of relative humidity and temperature in the contact area between buttocks and upholstery was observed over a two hour time span. Two measuring devices - DS1923 Temperature/Humidity logger iButtons - were stitched onto the top outer surface of the cover at two different points (marked S1 and S2 in Figure 1, taken from the ISO 16840-11 procedure). The iButtons were programmed to record temperature and relative humidity at intervals of 30 seconds for a total time of two hours.

Due to the positioning of the two iButtons, they measured different points of the contact area and so recorded slightly different readings. Therefore, the readings were averaged across the two iButtons for each test. This average value of the two sensors is what is used for the final results, detailed in the results section below.

For tests using the WA CC, a WheelAir Fanbox was attached to the cushion cover as is required by the WheelAir cover design. The Fanbox was set to the highest fan speed for the entire two hour testing period, which produces 14.4m/s airflow per fan.



Sensor Number	X_{loc} (mm)	Y_{loc} (mm)	Sensor location by rows and columns of holes (from top left corner)
S1	-55	130	Row 9, Column 3,5
S2	0	175	Row 6,5, Column 6,5

Figure 1. The two iButtons used to log temperature and relative humidity were stitched on to the top of the seat cover at marks S1 and S2 in the figure above. This configuration derives from the ISO 16840-11 procedure.

Measurement thresholds

There are no formally recommended physiological threshold values for temperature and relative humidity to prevent the development of decubitus ulcers. However, there is general agreement within the literature and among professionals that, for a sitting time of two hours without in-between airing of the contact area, 70% relative humidity and 35°C temperature in the contact are not to be exceeded. These thresholds may provide a rough guide for the interpretation of the results below but should not be taken as formal clinical limits. Clinical claims or conclusions cannot be inferred from the results using these guiding thresholds alone.

Environmental conditions

Ambient temperature and relative humidity were recorded at the start of testing and throughout the experiment using an RS Pro temperature and humidity datalogger. Values for temperature and relative humidity were measured at 30 minute intervals (.5hr, 1hr, 1.5hr, and 2hr), in line with ISO 16840-11 procedures.

According to the United States Environmental Protection Agency, ambient relative humidity above 50% is typically considered too high, while humidity below 30% is usually too low. Therefore, the ambient relative humidity in the test room was

kept within this threshold for all tests. In line with the recommendations of the American Society of Heating, Refrigerating, and Air Conditioning Engineers (ASHRAE), the ambient temperature in the test room was kept within a maximum threshold of 21°C and 26°C throughout all testing.

WheelAir Cushion Cover (WA CC) specifications
The WheelAir Cushion Cover which was used for all tests consisted of a polyester top cover with anti-slip layer at bottom, including a 25mm open cell foam pad underneath cushion, covered with a polyester mesh.

Overall Results Table

This table summarises the results from testing. The following pages provide detailed results from the five cushion tests.

	Standard cover		**WheelAir Cushion Cover**		**Peak differences***	
	Mean T (°C)	*Mean rH (%)*	*Mean T (°C)*	*Mean rH (%)*	*T (°C)*	*rH (%)*
NXT	33.5	48.1	32.1	40.6	WA CC -2.5	WA CC -21.2
Supracor	34.2	58.8	30.6	39.4	WA CC -5.7	WA CC -41
Unbranded	34.1	47.9	29.9	35.9	WA CC -5.2	WA CC -21
Varilite	34.1	54	35.1	58.5	WA CC +.3	WA CC +5.9
Vicair	34.8	63.6	31.6	41.8	WA CC -3.5	WA CC -35.4

** Maximum differences (+/-) recorded between Standard (reference point) and WheelAir Cushion Cover (WA CC).*

Eg. 'WACC -2.5' indicates that, at max. point of difference, WA CC was 2.5°C lower than Standard

Results: NXT cushion test

Cushion: NXT Nü FIT
Date: 11/3/21

Cushion specifications
The cushion used for this test was the NXT Nü FIT, a mixed-density foam cushion.

NXT cushion cover specifications
The NXT cover comprised a 3mm Spacer fabric top cover with an anti-slip bottom. The incontinence cover was removed for testing.

Environmental conditions
Relative humidity: 40% (± 4%)
Temperature: 23.55°C (± 1.75°C)

Test results:

NXT Cover

Temperature test
During a sitting time of two hours without in-between airing of the contact area, the temperature of the contact area recorded a steady increase in temperature from 26°C at the start of the test to a peak temperature reading of 35.6°C; an increase of 9.6°C. The final temperature reading at the end of the two-hour test was 35.6°C.

The mean temperature of the contact area during the test was 33.5°C.

Relative humidity test
During a sitting time of two hours without in-between airing of the contact area, the relative humidity of the contact area increased from 43.5% at the start of the test to a peak final relative humidity reading of 56.7%; an increase of 13.2%.

The mean relative humidity level of the contact area during the test was 48.1%.

Overall, the contact area of the buttocks and cushion cover saw an increase in both temperature (+9.6°C) and relative humidity (+13.2%) over the two-hour test period for the NXT Nü FIT cushion and cover.

Test results:

WheelAir Cushion Cover

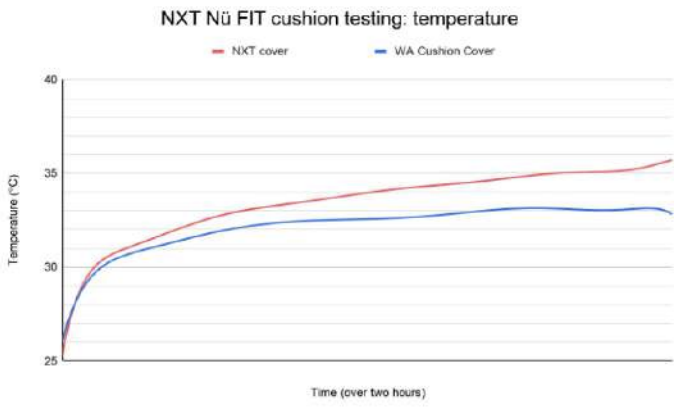
Temperature test
During a sitting time of two hours without in-between airing of the contact area, the temperature of the contact area increased from 25.6°C at the start of the test to a peak temperature reading of 33.1°C, an increase of 7.5°C. The final temperature reading at the end of the two-hour test was 33.1°C.

The mean temperature of the contact area during the test was 32.1°C.

Relative humidity test
During a sitting time of two hours without in-between airing of the contact area, the relative humidity of the contact area decreased overall during the test from 44% at the start to the lowest relative humidity reading of 35.6%, a decrease of 8.4%. The final relative humidity reading at the end of the two-hour test was 35.9%.

The mean relative humidity of the contact area during the test was 40.6%.

Overall, the contact area of the buttocks and cushion cover saw an increase in temperature (+7.5°C) but an overall decrease in relative humidity (-8.4%) over the *two-hour test period for the NXT Nü FIT cushion fitted with a WA CC.*



Graph 1. The temperature plateaued up to 2.1°C lower for the WA CC than the NXT cover.

Graph 2. The recorded relative humidity with WA CC was up to 21.2% lower than the NXT cover.

Summary

During the testing of the NXT cushion with the NXT cover, the average temperature of the contact area was 33.5°C and, at the end of the test, it rose to a peak of 35.6°C. The average relative humidity of the contact area was 48.1% but with a peak recording of 56.7%.

In comparison, during the testing of the NXT cushion with the WA cover, the average temperature of the contact area was 32.1°C with a final peak temperature of 33.1°C, - 2.5°C less than the peak value recorded with the NXT cover. The average relative humidity of the contact area was recorded at 40.6% with a low-point of 35.6%, which is 21.2% lower than the peak recording of the NXT cover.

Overall, the temperature recorded in the contact area plateaued up to 2.5°C lower for the WA cover than the NXT cover, as shown in Graph 1. The results for the relative humidity levels show a similar trend: relative humidity decreased over time with the WA CC, while it increased with the NXT cover. The difference in relative humidity between the covers was as much as 21.2% (rH), as seen in Graph 2.
These results suggest that, when using an NXT Nü FIT cushion, the WA CC allows for an overall reduction in temperature and relative humidity over a two hour period compared to a standard NXT cushion cover.

Results: Supracor cushion test

Cushion: Stimulite Classic
Date: 16/3/21

Cushion specifications
The cushion used for this test was the Supracor Stimulite Classic, which is made of a lattice 'honeycomb' material.

Supracor cushion cover specifications
Double layer top cover consisting of a polyester top cover and cotton lining, mesh fabric on the side and a perforated anti-slip at bottom.

Environmental conditions
Relative humidity: 36.5% (± 2.5%)
Temperature: 24°C (± 0.75°C)

Test results:

Supracor Cover

Temperature test
During a sitting time of two hours without in-between airing of the contact area, the temperature of the contact area recorded a steady increase in temperature from 27°C at the start of the test to a final peak temperature reading of 35.8°C, an increase of 8.8°C.

The mean temperature of the contact area during the test was 34.2°C.

Relative humidity test
During a sitting time of two hours without in-between airing of the contact area, the relative humidity of the contact area increased from 45.8% at the start of the test to a peak relative humidity reading of 77.3%, an increase of 31.5%. The final relative humidity reading at the end of the two-hour test was 77.1%.

The mean relative humidity level of the contact area during the test was 58.8%.

Overall, the contact area of the buttocks and cushion cover saw an increase in both temperature (+8.8°C) and, to a much greater extent, relative humidity (+31.5%) over the two-hour test period for the Supracor Stimulite Classic cushion and cover.

Test results:

WheelAir Cushion Cover

Temperature test
During a sitting time of two hours without in-between airing of the contact area, the temperature of the contact area increased from 26.1°C at the start of the test to a peak temperature reading of 31.3°C; an increase of 5.2°C, before decreasing to a final temperature reading of 30.1°C.

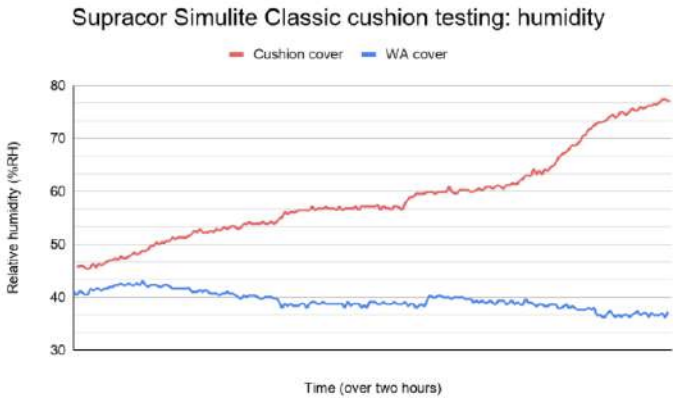
The mean temperature of the contact area during the test was 30.6°C.

Relative humidity test
During a sitting time of two hours without in-between airing of the contact area, the relative humidity of the contact area decreased overall during the test from 40.5% at the start to a low-point of 36.3%; a decrease of 4.2%. The final relative humidity reading at the end of the two-hour test was 37.2%.

The mean relative humidity of the contact area during the test was 39.4%.

Overall, the contact area of the buttocks and cushion cover saw an increase in temperature (+5.2°C) but an overall decrease in relative humidity (-4.2%) over the two-hour test period for the Supracor Stimulite Classic cushion fitted with a WA CC.

Graph 1. The temperature plateaued up to 5.7°C lower for the WA CC than the Supracor cover



Graph 2. The relative humidity with WA CC was up to 41% lower than the Supracor cover

Summary

During the testing of the Supracor Stimulite Classic cushion with the Supracor cover, the average temperature of the contact area was 34.2°C and at the end of the test it rose to a peak of 35.8°C. The average relative humidity of the contact area was 58.8% but with a peak recording of 77.3%, which was the highest recording of all tests.

In comparison, during the testing of the Supracor Stimulite Classic cushion with the WA cover, the average temperature of the contact area was 30.58°C with a final peak temperature of 30.1°C - 5.7°C less than the peak value recorded with the Supracor cover. The average relative humidity of the contact area was recorded at 39.4% with a low-point of 36.3%, which is 41% lower than the peak recording of the Supracor cover.

Overall, the temperature recorded in the contact area plateaued up to 5.7°C lower for the WA cover than the Supracor cover, as shown in Graph 1. The results for the relative humidity levels show a similar trend: relative humidity decreased over time with the WA CC, while it increased with the Supracor cover. The difference in relative humidity between the covers was as much as 41% (rH), as seen in Graph 2.

These results suggest that, when using a Supracor Stimulite Classic cushion, the WA CC allows for an overall reduction in temperature and an even greater reduction in relative humidity over a two hour period compared to when using a standard Supracor cushion cover.

Results: Unbranded cushion test

Cushion: A standard unbranded foam cushion
Date: 25/3/21

Cushion specifications
The cushion used for this test was unbranded and made of single-density foam.

Unbranded cushion cover specifications
3mm Spacer fabric cover.

Environmental conditions
Relative humidity: 35.65% (± 1.65%)
Temperature: 23.7°C (± 0.5°C)

Test results:

Unbranded Cover

Temperature test
During a sitting time of two hours without in-between airing of the contact area, the temperature of the contact area recorded a steady increase in temperature from 26.3°C at the start of the test to a final peak temperature reading of 36.3°C; an increase of 10°C.

The mean temperature of the contact area during the test was 34.1°C.

Relative humidity test
During a sitting time of two hours without in-between airing of the contact area, the relative humidity of the contact area increased from 41.7% at the start of the test to a final peak relative humidity reading of 54.6%; an increase of 12.9%.

The mean relative humidity level of the contact area during the test was 47.9%

Overall, the contact area of the buttocks and cushion cover saw an increase in both temperature (+10°C) and relative humidity (+12.9%) over the two-hour test period for the unbranded single-density foam cushion and cover.

Test results:

WheelAir Cushion Cover

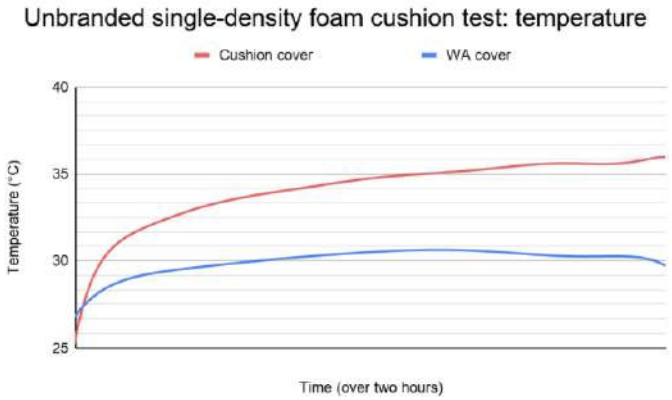
Temperature test
During a sitting time of two hours without in-between airing of the contact area, the temperature of the contact area increased from 26.3°C at the start of the test to a peak temperature reading of 30.8°C; an increase of 4.5°C, before decreasing to a final temperature reading of 30.1°C.

The mean temperature of the contact area during the test was 29.9°C.

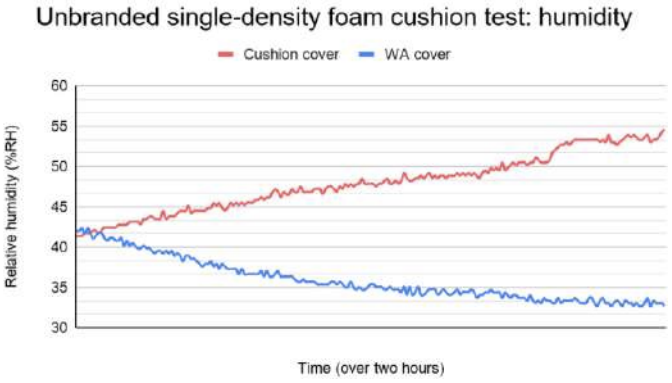
Relative humidity test
During a sitting time of two hours without in-between airing of the contact area, the relative humidity of the contact area decreased overall during the test from 41.7% at the start to the lowest final relative humidity reading of 32.6%; a decrease of 9.1%.

The mean relative humidity of the contact area during the test was 35.9%.

Overall, the contact area of the buttocks and cushion cover saw an increase in temperature (+4.5°C) but an overall decrease in relative humidity (-9.1%) over the two-hour test period for the unbranded cushion fitted with a WA CC.



Graph 1. The temperature plateaued up to 5.2°C lower for the WA CC than the unbranded cover



Graph 2. The relative humidity with WA CC was up to 22% lower than the unbranded cover

Summary

During the testing of the unbranded single-density foam cushion with the unbranded cover, the average temperature of the contact area was 34.1°C and at the end of the test it rose to a peak of 36.3°C. The average relative humidity of the contact area was 47.9% but with a peak recording of 54.6%.

In comparison, during the testing of the unbranded single-density foam cushion with the WA cover, the average temperature of the contact area was 29.9°C with a final peak temperature of 30.1°C - 6.2°C less than the peak value recorded for the unbranded cover. The average relative humidity of the contact area was recorded at 35.9% with a low-point of 32.6%, which is 22% lower than the peak recording of the unbranded cover.

Overall, the temperature recorded in the contact area plateaued up to 5.2°C lower for the WA cover than the unbranded cover, as shown in Graph 1. The results for the relative humidity levels show a similar trend: relative humidity decreased over time with the WA CC, while it increased with the unbranded cover. The difference in relative humidity between the covers was as much as 21% (rH), as seen in Graph 2.

These results suggest that, when using a standard single-density foam cushion, the WA CC allows for an overall reduction in temperature and relative humidity over a two hour period compared to when using a standard unbranded 3mm spacer fabric cushion cover.

Results: Varilite cushion test

Cushion: Varilite Evolution
Date: 24/3/21

Cushion specifications
The cushion used for this test was the Varilite Evolution, a non-permeable inflatable air cell cushion.

Varilite cushion cover specifications
Perforated polyester top cover on 1cm filter foam, nylon sides and anti-slip urethane at bottom.

Environmental conditions
Relative humidity: 34.5% (± 4.5%)
Temperature: 24°C (± 1.5°C)

Test results:

Varilite Cover

Temperature test
During a sitting time of two hours without in-between airing of the contact area, the temperature of the contact area recorded a steady increase in temperature from 27.6°C at the start of the test to a final peak temperature reading of 35.8°C, an increase of 8.2°C.

The mean temperature of the contact area during the test was 34.1°C.

Relative humidity test
During a sitting time of two hours without in-between airing of the contact area, the relative humidity of the contact area increased from 43.7% at the start of the test to a peak relative humidity reading of 62.3%, an increase of 18.6%.

The mean relative humidity level of the contact area during the test was 54%.

Overall, the contact area of the buttocks and cushion cover saw an increase in both temperature (+8.2°C) and relative humidity (+18.6%) over the two-hour test period for the Varilite cushion and cover.

Test results:

WheelAir Cushion Cover

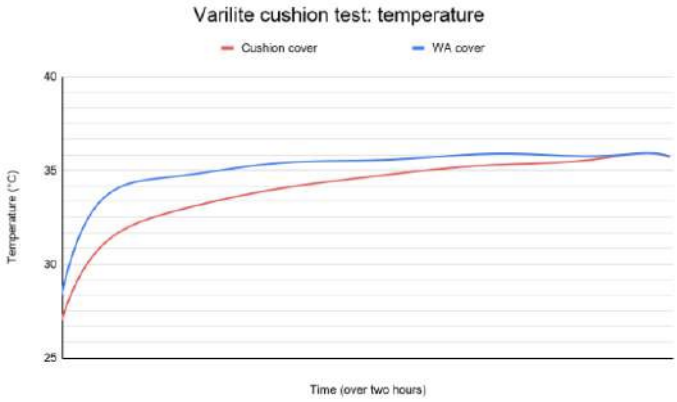
Temperature test
During a sitting time of two hours without in-between airing of the contact area, the temperature of the contact area increased from 27.6°C at the start of the test to a final peak temperature reading of 36.1°C, an increase of 8.5°C.

The mean temperature of the contact area during the test was 35.1°C.

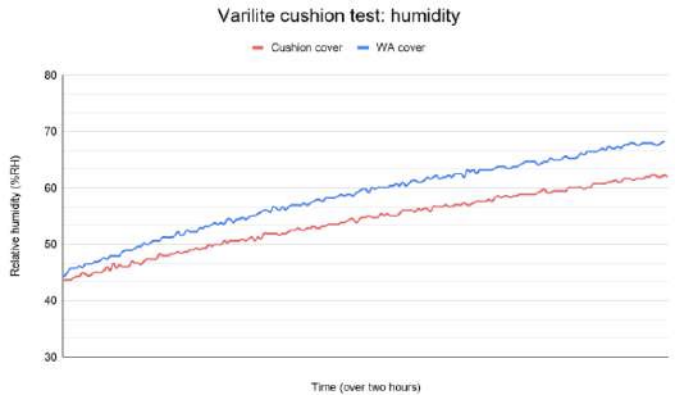
Relative humidity test
During a sitting time of two hours without in-between airing of the contact area, the relative humidity of the contact area increased overall during the test from 44.3% at the start to a final peak relative humidity reading of 68.2%, an increase of 23.9%.

The mean relative humidity of the contact area during the test was 58.5%.

Overall, the contact area of the buttocks and cushion cover saw an increase in temperature (+8.5°C) and an overall increase in relative humidity (+23.9%) over the two-hour test period for the Varilite cushion fitted with a WA CC.



Graph 1. The temperature plateaued up to 0.3°C higher for the WA CC than the Varilite cover



Graph 2. The relative humidity with WA CC was up to 5.9% higher than the Varilite cover

Summary

During the testing of the Varilite cushion with the Varilite cover, the average temperature of the contact area was 34.1°C and at the end of the test it rose to a peak of 35.8°C. The average relative humidity of the contact area was 54% but with a peak recording of 62.3%.

In comparison, during the testing of the Varilite cushion with the WA cover, the average temperature of the contact area was 35.1°C with a final peak temperature of 36.1°C - 0.3°C higher than the peak temperature using the Varilite cover. The average relative humidity of the contact area was recorded at 58.5% with a peak of 68.2%, which is 5.9% higher than the peak recording of the Varilite cover.

Overall, the temperature recorded in the contact area plateaued up to 0.3°C higher for the WA cover than the Varilite cover, as shown in Graph 1. The results for the relative humidity levels show a similar trend: relative humidity increased over time with both the WA CC and Varilite cover but the the WA CC was as much as 5.9% (rH) higher than the Varilite cover, as seen in Graph 2.

These results suggest that, when using a non-permeable inflatable air filled cell cushion, the WA CC does not allow for an overall reduction in temperature and relative humidity. In fact, temperature and relative humidity recordings were slightly higher with the WA CC than the Varilite cover over a two hour period.

Results: Vicair cushion test

Cushion: Vicair O2 Vector 6
Date: 18/3/21

Cushion specifications
The cushion used for this test was the Vicair O2 Vector 6, an air and moisture permeable compartmented air cell based cushion.

Vicair cushion cover specifications
Polyester top cover with anti-slip layer at bottom.

Environmental conditions
Relative humidity: 32.4% (± 5.4%)
Temperature: 23.95°C (± 0.45°C)

Test results:

Vicair Cover

Temperature test
During a sitting time of two hours without in-between airing of the contact area, the temperature of the contact area recorded a steady increase in temperature from 25.3°C at the start of the test to a peak temperature reading of 35.8°C, an increase of 10.5°C. The final temperature reading at the end of the two-hour test was 35.6°C.

The mean temperature of the contact area during the test was 34.8°C.

Relative humidity test
During a sitting time of two hours without in-between airing of the contact area, the relative humidity of the contact area increased from 43.3% at the start of the test to a peak relative humidity reading of 74%, an increase of 30.7%. The final relative humidity reading at the end of the two-hour test was 73.1%.

The mean relative humidity level of the contact area during the test was 63.6%.

Overall, the contact area of the buttocks and cushion cover saw an increase in both temperature (+10.5°C) and relative humidity (+30.7%) over the two-hour test period for the Vicair cushion and cover.

Test results:

WheelAir Cushion Cover

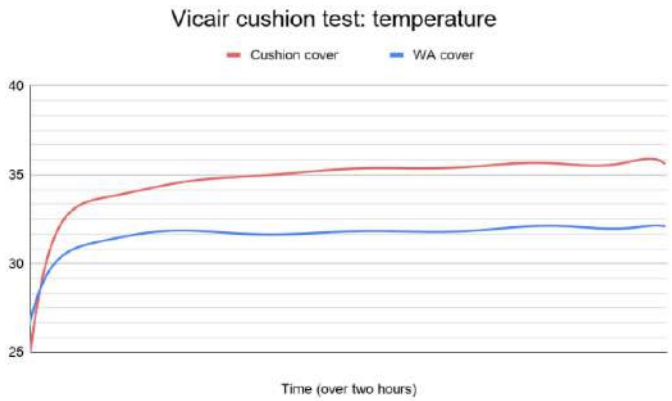
Temperature test
During a sitting time of two hours without in-between airing of the contact area, the temperature of the contact area increased from 26.3°C at the start of the test to a peak temperature reading of 32.3°C; an increase of 6°C. The final temperature reading at the end of the two-hour test was 31.8°C.

The mean temperature of the contact area during the test was 31.6°C.

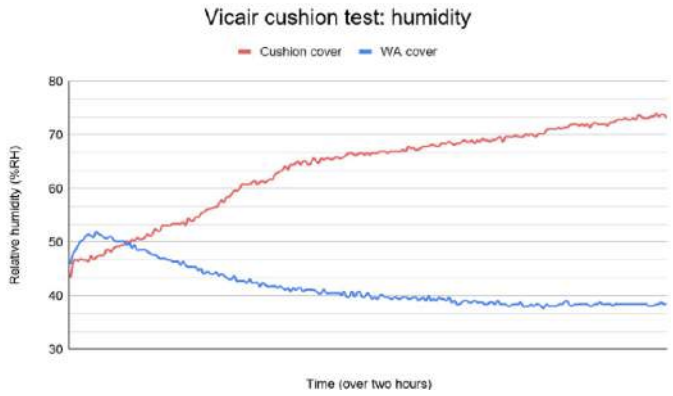
Relative humidity test
During a sitting time of two hours without in-between airing of the contact area, the relative humidity of the contact area decreased overall during the test from 45.9% at the start to the lowest relative humidity reading of 37.7%; a decrease of 8.2%. The final relative humidity reading at the end of the two-hour test was 38.5%.

The mean relative humidity of the contact area during the test was 41.8%.

Overall, the contact area of the buttocks and cushion cover saw an increase in temperature (+6°C) but an overall decrease in relative humidity (-8.8%) over the two-hour test period for the Vicair cushion fitted with a WA CC.



Graph 1. The temperature plateaued up to 3.5°C lower for the WA CC than the Vicair cover



Graph 2. The recorded relative humidity with WA CC was up to 35.4% lower than the Vicair cover

Summary

During the testing of the Vicair cushion with the Vicair cover, the average temperature of the contact area was 34.8°C and, at the end of the test, it rose to a peak of 35.8°C. The average relative humidity of the contact area was 63.6% but with a peak recording of 73.1%.

In comparison, during the testing of the Vicair cushion with the WA cover, the average temperature of the contact area was 31.6°C with a peak temperature of 32.3°C - 3.5°C less than the peak temperature recorded on the Vicair cover. The average relative humidity of the contact area was recorded at 41.8% with a low-point of 37.7%, which is 35.4% lower than the peak recording of the Vicair cover.

Overall, the temperature recorded in the contact area plateaued up to 3.5°C lower for the WA cover than the Vicair cover, as shown in Graph 1. The results for the relative humidity levels show a similar trend: relative humidity decreased over time with the WA CC, while it increased with the Vicair cover. The difference in relative humidity between the covers was up to 35.4% (rH), as seen in Graph 2.

These results suggest that, when using a Vicair O2 Vector 6 cushion, the WA CC allows for an overall reduction in temperature and relative humidity over a two hour period compared to a standard Vicair cushion cover.

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