

# **Bio Mat Skin Temperature Test Protocol**

Date of protocol: November 22, 2007

Test facility: Teletherm Infrared Systems / Research  
Test Director: GJ Rockley Director of Operation

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Address: 130 Red Fox Lane Littleton  
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Equipment: 1. Infrared camera  
2. Bio Mat Professional

## **A. Test Protocol – Maximum setting (158°F/70°C), 60 minutes:**

1. Person to be imaged (subject) dresses in normal undergarments and light cotton pajamas or nightgown.
2. Turn on Bio Mat to maximum setting and wait 5 minutes for temperature of Bio Mat to stabilize.
3. Subject lies on subject's side, next to the Bio Mat, but not yet on it. Single full-length thermal image is taken of subject from top of head to bottom of feet from the back of the subject (image).

NOTE: Timing is important from the moment that the first image is taken, since subject's skin temperature measurements are grafted over a timescale.

4. Subject lies on back against mat after initial image is taken. (Time = 0 seconds)

5. Subject rolls onto subject's side and image is taken at 30 seconds. Subject lies on back against mat immediately after image is taken.
6. Steps 5 and 6 are repeated at 60, 90, 120, 180, 240, 300, 600, 900, 1200, 1800, 2400, 3000 and 3600 seconds.
7. After image is taken at 3600 seconds, subject stands up and Bio Mat is turned off.
8. Full-length images are repeated at 3630, 3660, 3690 and 3720 seconds.
9. Grafts will be produced showing temperatures at each time interval for the center of the back of the head, upper-middle back, lower-middle back, buttocks, middle back of thigh and middle back of calf.
10. All images will be retained as supporting data for the final report.

GJ Rockley Director of Operation  
Teletherm Infrared Systems / Research

**Bio Mat Skin Temperature Maximum setting (158°F/70°C) Test Data**

**(1). Back of Head**  
**Maximum setting (158°F/70°C)**

<u>Time</u>	<u>Temperature</u>
0 sec.	<u>26.6°C</u>
30 sec.	<u>28.3°C</u>
60 sec.	<u>28.3°C</u>
90 sec.	<u>28.4°C</u>
120 sec.	<u>29.2°C</u>
180 sec.	<u>28.8°C</u>
240 sec.	<u>27.7°C</u>
300 sec.	<u>27.1°C</u>
600 sec.	<u>29.6°C</u>
900 sec.	<u>28.1°C</u>
1200 sec.	<u>29.4°C</u>
1800 sec.	<u>28.1°C</u>
2400 sec.	<u>27.9°C</u>
3000 sec.	<u>28.7°C</u>
3600 sec.	<u>29.0°C</u>

**(2). Upper Middle Back**  
**Maximum setting (158°F/70°C)**

<u>Time</u>	<u>Temperature</u>
0 sec.	<u>27.3°C</u>
30 sec.	<u>29.0°C</u>
60 sec.	<u>29.1°C</u>
90 sec.	<u>29.4°C</u>
120 sec.	<u>29.9°C</u>
180 sec.	<u>30.0°C</u>
240 sec.	<u>30.1°C</u>
300 sec.	<u>31.0°C</u>
600 sec.	<u>32.3°C</u>
900 sec.	<u>33.1°C</u>
1200 sec.	<u>34.7°C</u>
1800 sec.	<u>34.6°C</u>
2400 sec.	<u>34.3°C</u>
3000 sec.	<u>35.0°C</u>
3600 sec.	<u>34.9°C</u>

**After Turn off the Biomat**

3630 sec.	<u>34.6°C</u>
3660 sec.	<u>34.1°C</u>
3690 sec.	<u>33.7°C</u>
3720 sec.	<u>33.0°C</u>

**(3). Lower Middle Back**  
Maximum setting (158°F/70°C)

<u>Time</u>	<u>Temperature</u>
0 sec.	<u>28.4°C</u>
30 sec.	<u>29.2°C</u>
60 sec.	<u>29.2°C</u>
90 sec.	<u>29.8°C</u>
120 sec.	<u>30.1°C</u>
180 sec.	<u>30.3°C</u>
240 sec.	<u>30.2°C</u>
300 sec.	<u>30.4°C</u>
600 sec.	<u>32.6°C</u>
900 sec.	<u>34.0°C</u>
1200 sec.	<u>35.2°C</u>
1800 sec.	<u>35.1°C</u>
2400 sec.	<u>36.4°C</u>
3000 sec.	<u>36.1°C</u>
3600 sec.	<u>36.4°C</u>

**After Turn off the Biomat**

3630 sec.	<u>33.1°C</u>
3660 sec.	<u>33.5°C</u>
3690 sec.	<u>34.0°C</u>
3720 sec.	<u>33.9°C</u>

**(4). Buttocks**  
Maximum setting (158°F/70°C)

<u>Time</u>	<u>Temperature</u>
0 sec.	<u>26.4°C</u>
30 sec.	<u>28.0°C</u>
60 sec.	<u>28.9°C</u>
90 sec.	<u>28.7°C</u>
120 sec.	<u>27.9°C</u>
180 sec.	<u>28.4°C</u>
240 sec.	<u>27.9°C</u>
300 sec.	<u>28.5°C</u>
600 sec.	<u>31.6°C</u>
900 sec.	<u>31.6°C</u>
1200 sec.	<u>33.5°C</u>
1800 sec.	<u>34.5°C</u>
2400 sec.	<u>29.9°C</u>
3000 sec.	<u>32.9°C</u>
3600 sec.	<u>34.3°C</u>

**After Turn off the Biomat**

3630 sec.	<u>30.5°C</u>
3660 sec.	<u>29.7°C</u>
3690 sec.	<u>30.8°C</u>
3720 sec.	<u>30.9°C</u>

**(5). Middle Back of Thigh**  
**Maximum setting (158°F/70°C)**

<u>Time</u>	<u>Temperature</u>
0 sec.	<u>28.8°C</u>
30 sec.	<u>30.6°C</u>
60 sec.	<u>31.6°C</u>
90 sec.	<u>32.4°C</u>
120 sec.	<u>32.9°C</u>
180 sec.	<u>33.2°C</u>
240 sec.	<u>32.9°C</u>
300 sec.	<u>33.8°C</u>
600 sec.	<u>35.2°C</u>
900 sec.	<u>35.1°C</u>
1200 sec.	<u>35.1°C</u>
1800 sec.	<u>35.4°C</u>
2400 sec.	<u>34.6°C</u>
3000 sec.	<u>35.9°C</u>
3600 sec.	<u>35.1°C</u>

**After Turn off the Biomat**

3630 sec.	<u>33.6°C</u>
3660 sec.	<u>33.5°C</u>
3690 sec.	<u>33.3°C</u>
3720 sec.	<u>33.4°C</u>

**(6). Middle Back of Calf**  
**Maximum setting (158°F/70°C)**

<u>Time</u>	<u>Temperature</u>
0 sec.	<u>28.8°C</u>
30 sec.	<u>31.1°C</u>
60 sec.	<u>32.3°C</u>
90 sec.	<u>33.0°C</u>
120 sec.	<u>32.6°C</u>
180 sec.	<u>32.9°C</u>
240 sec.	<u>33.1°C</u>
300 sec.	<u>33.7°C</u>
600 sec.	<u>35.3°C</u>
900 sec.	<u>35.6°C</u>
1200 sec.	<u>36.0°C</u>
1800 sec.	<u>35.4°C</u>
2400 sec.	<u>35.2°C</u>
3000 sec.	<u>35.8°C</u>
3600 sec.	<u>35.4°C</u>

**After Turn off the Biomat**

3630 sec.	<u>33.0°C</u>
3660 sec.	<u>32.1°C</u>
3690 sec.	<u>29.7°C</u>
3720 sec.	<u>29.8°C</u>

## **B. Test Protocol – Low setting (113°F /45°C), 8 hours:**

1. Person to be imaged (subject) dresses in normal undergarments and light cotton pajamas or nightgown.
2. Turn on Bio Mat to low setting (113°F/45°C) and wait 5 minutes for temperature of Bio Mat to stabilize.
3. Subject lies on subject's side, next to the Bio Mat, but not yet on it. Single full-length thermal image is taken of subject from top of head to bottom of feet from the back of the subject (image).

NOTE: Timing is important from the moment that the first image is taken, since subject's skin temperature measurements are grafted over a timescale.

4. Subject lies on back against mat after initial image is taken. (Time = 0 seconds)
5. Subject rolls onto subject's side and image are taken at 30 seconds.
6. Subject lies on back against mat immediately after image is taken.
7. Steps 5 and 6 are repeated at 60, 90, 120, 180, 240, 300, 600, 900, 1800 seconds, 1 hr, 2 hr, 4 hr, 6 hr and 8 hr.
8. After image is taken at 3600 seconds, subject stands up and Bio Mat is turned off.
9. Grafts will be produced showing temperatures at each time interval for the center of the back of the head, upper-middle back, lower-middle back, buttocks, middle back of thigh and middle back of calf.
10. All images will be retained as supporting data for the final report.

**Bio Mat Skin Temperature Low Setting (113°F /45°C), Test Data**

**(1). Back of Head**  
**Low Setting (113°F /45°C)**

<u>Time</u>	<u>Temperature</u>
0 sec.	<u>24.4°C</u>
30 sec.	<u>26.6°C</u>
60 sec.	<u>24.5°C</u>
90 sec.	<u>26.6°C</u>
120 sec.	<u>25.6°C</u>
180 sec.	<u>27.0°C</u>
240 sec.	<u>25.8°C</u>
300 sec.	<u>27.2°C</u>
600 sec.	<u>27.4°C</u>
900 sec.	<u>26.4°C</u>
1800 sec.	<u>28.4°C</u>
1 hr.	<u>27.6°C</u>

**After Turn off the Biomat**

2 hr.	<u>26.1°C</u>
4 hr.	<u>26.7°C</u>
6 hr.	<u>27.9°C</u>
8 hr.	<u>27.3°C</u>

**(2). Upper Middle Back**  
**Low Setting (113°F /45°C)**

<u>Time</u>	<u>Temperature</u>
0 sec.	<u>27.0°C</u>
30 sec.	<u>28.0°C</u>
60 sec.	<u>28.2°C</u>
90 sec.	<u>28.9°C</u>
120 sec.	<u>28.4°C</u>
180 sec.	<u>28.8°C</u>
240 sec.	<u>27.8°C</u>
300 sec.	<u>28.6°C</u>
600 sec.	<u>30.9°C</u>
900 sec.	<u>32.3°C</u>
1800 sec.	<u>33.8°C</u>
1 hr.	<u>34.0°C</u>

**After Turn off the Biomat**

2 hr.	<u>33.9°C</u>
4 hr.	<u>33.8°C</u>
6 hr.	<u>34.5°C</u>
8 hr.	<u>34.7°C</u>

**(3). Lower Middle Back**  
Low Setting (113°F /45°C)

<u>Time</u>	<u>Temperature</u>
0 sec.	<u>28.4°C</u>
30 sec.	<u>28.8°C</u>
60 sec.	<u>28.5°C</u>
90 sec.	<u>28.7°C</u>
120 sec.	<u>28.7°C</u>
180 sec.	<u>28.9°C</u>
240 sec.	<u>28.7°C</u>
300 sec.	<u>29.1°C</u>
600 sec.	<u>30.5°C</u>
900 sec.	<u>32.1°C</u>
1800 sec.	<u>34.3°C</u>
1 hr.	<u>35.2°C</u>

**After Turn off the Biomat**

2 hr.	<u>34.4°C</u>
4 hr.	<u>34.8°C</u>
6 hr.	<u>35.3°C</u>
8 hr.	<u>36.1°C</u>

**(4). Buttocks**  
Low Setting (113°F /45°C)

<u>Time</u>	<u>Temperature</u>
0 sec.	<u>24.5°C</u>
30 sec.	<u>26.5°C</u>
60 sec.	<u>26.5°C</u>
90 sec.	<u>27.9°C</u>
120 sec.	<u>27.0°C</u>
180 sec.	<u>27.1°C</u>
240 sec.	<u>27.3°C</u>
300 sec.	<u>27.7°C</u>
600 sec.	<u>29.5°C</u>
900 sec.	<u>30.8°C</u>
1800 sec.	<u>32.8°C</u>
1 hr.	<u>32.6°C</u>

**After Turn off the Biomat**

2 hr.	<u>32.0°C</u>
4 hr.	<u>32.0°C</u>
6 hr.	<u>33.2°C</u>
8 hr.	<u>34.1°C</u>



**(5). Middle Back of Thigh**  
Low Setting (113°F /45°C)

<u>Time</u>	<u>Temperature</u>
0 sec.	<u>27.7°C</u>
30 sec.	<u>30.2°C</u>
60 sec.	<u>29.8°C</u>
90 sec.	<u>30.7°C</u>
120 sec.	<u>30.1°C</u>
180 sec.	<u>30.2°C</u>
240 sec.	<u>30.1°C</u>
300 sec.	<u>31.2°C</u>
600 sec.	<u>32.2°C</u>
900 sec.	<u>32.1°C</u>
1800 sec.	<u>34.1°C</u>
1 hr.	<u>34.5°C</u>

**After Turn off the Biomat**

2 hr.	<u>33.6°C</u>
4 hr.	<u>34.4°C</u>
6 hr.	<u>35.7°C</u>
8 hr.	<u>35.3°C</u>

**(6). Middle Back of Calf**  
Low Setting (113°F /45°C)

<u>Time</u>	<u>Temperature</u>
0 sec.	<u>27.3°C</u>
30 sec.	<u>30.6°C</u>
60 sec.	<u>29.2°C</u>
90 sec.	<u>30.6°C</u>
120 sec.	<u>29.7°C</u>
180 sec.	<u>29.5°C</u>
240 sec.	<u>29.4°C</u>
300 sec.	<u>30.7°C</u>
600 sec.	<u>32.5°C</u>
900 sec.	<u>32.6°C</u>
1800 sec.	<u>34.3°C</u>
1 hr.	<u>34.2°C</u>

**After Turn off the Biomat**

2 hr.	<u>33.9°C</u>
4 hr.	<u>34.0°C</u>
6 hr.	<u>34.8°C</u>
8 hr.	<u>34.9°C</u>