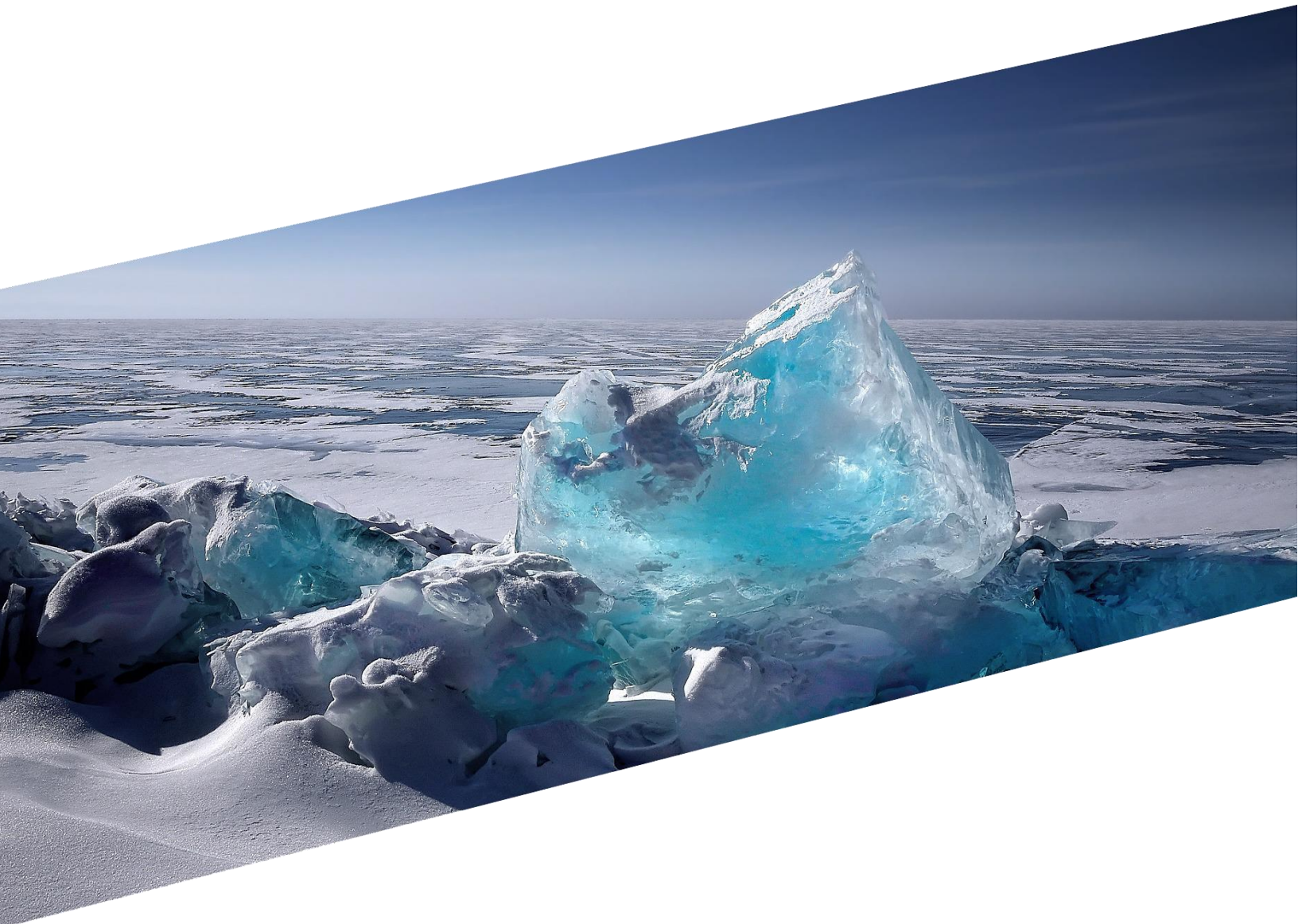




LABORATORY RESULTS – KODIAKCOOLER® WHITE PAPER

48-Hour Heat Stress Test Outline KODIAKOTTON®



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OPERATIONAL THERMAL QUALIFICATION REPORT

KODIAKOTTON® Natural Fiber Insulation

48 Hour Heat Stress Test to Maintain Temperature Between 2C and 8C

ISTA 7D Domestic Freight Summer Ramp Profile

Report Number: Biosystems Atlanta, 847-11385 (2)

Report Date: 1/23/2017

Credentials: Independent laboratory with American Council of Independent Laboratories (ACIL)

Licensed as a clinical laboratory with Georgia Department of Human Resources (License 044-026)

Registered with US Department of Health (License 11-8059)

Facility: Biosystems, Inc

PO Box 3222, Cumming, GA 30028-6517

1535-H Oak Industrial Lane, Cumming, GA 30041-6404



Scope and Test Summary

Scope: Test pass/fail insulation capability of packaging (including packaging components) per ISTA 7D.

Objective: Ability to maintain temperature above 2C and below 8C, without freezing, in simulated summer/heat stress conditions for a 48-hour distribution cycle.

Conclusion: Passed



Pack-Out and Bill of Materials

KODIAKOTTON® KSP9X9X9BL IN SBW12X12X12XBOX 1 ½" THICK
(+2°C to +8°C, Summer Temp Pack-Out)

Place Items in Order as Follows:

1. Two (2) frozen gel ice packs.
2. One (1) refrigerated gel pack.
3. One (1) layer of bubble wrap, ½".
4. Six (6) 500ml IV bags, conditioned to 3 C.
5. One (1) layer of bubble wrap, ½".
6. One (1) refrigerated gel pack.
7. Two (2) frozen gel ice packs.
8. Fill any void space with paper/newsprint.

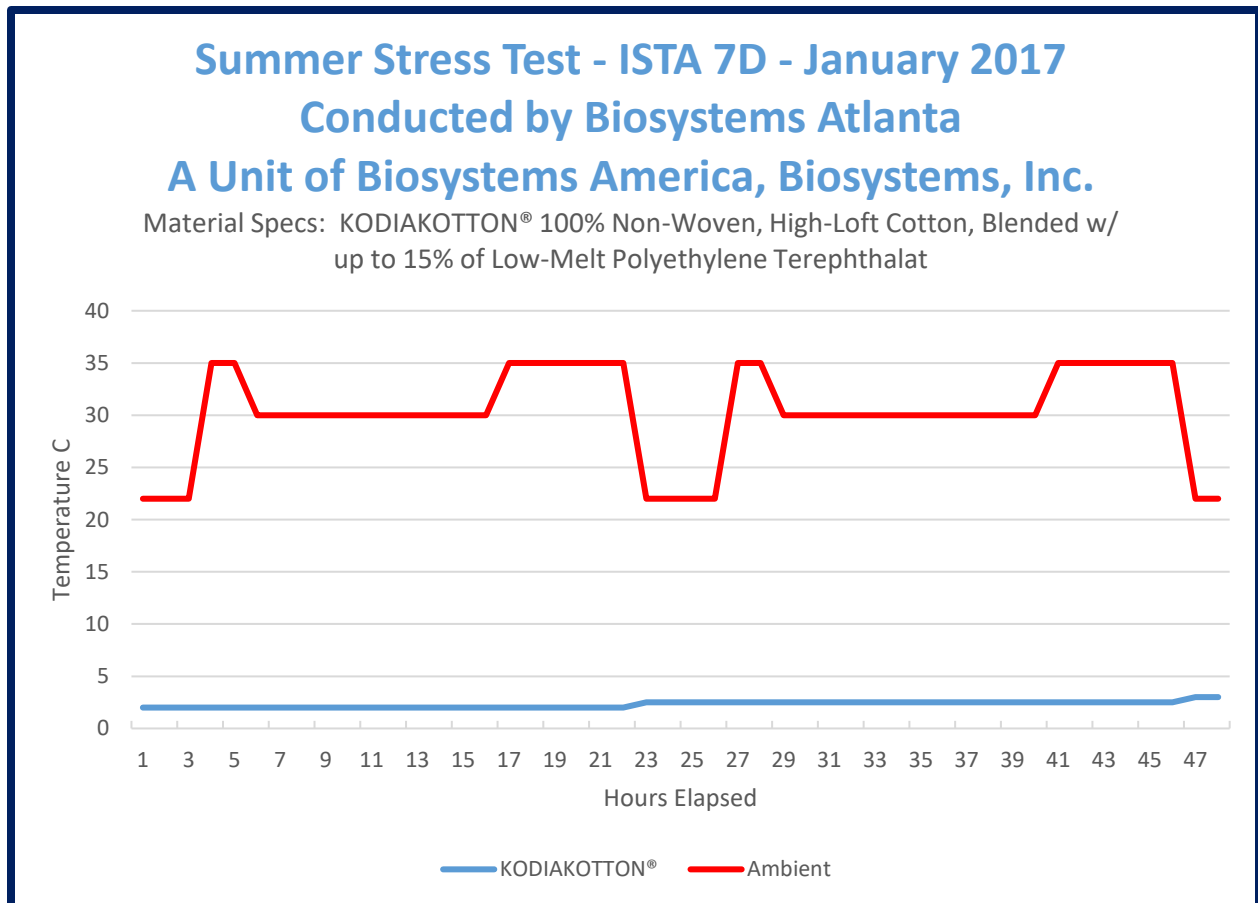
Bill of Materials	
Item #	Quantity
KSP9X9X9BL	1
SBW12X12X12KBOX	1
GEL24	6
Payload	Six (6) 500 ml IV Bags (Lactated Ringers' Solution USP)
Note: Removing of frozen gel pack from a typical -15°C freezer and staging in a room temperature (~+22° C) environment for 30 minutes prior to pack-out will bring the frozen gel pack to the desired -5°C to 0°C pack-out start range.	



Results

Hours Elapsed	KODIAKOTTON Internal Temperature	Ambient Temperature Summer Stress
1	2	22
2	2	22
3	2	22
4	2	35
5	2	35
6	2	30
7	2	30
8	2	30
9	2	30
10	2	30
11	2	30
12	2	30
13	2	30
14	2	30
15	2	30
16	2	30
17	2	35
18	2	35
19	2	35
20	2	35
21	2	35
22	2	35
23	2.5	22
24	2.5	22
25	2.5	22
26	2.5	22
27	2.5	35
28	2.5	35
29	2.5	30
30	2.5	30
31	2.5	30
32	2.5	30
33	2.5	30
34	2.5	30
35	2.5	30
36	2.5	30
37	2.5	30
38	2.5	30
39	2.5	30
40	2.5	30
41	2.5	35
42	2.5	35
43	2.5	35
44	2.5	35
45	2.5	35
46	2.5	35
47	3	22
48	3	22

Graph



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