



Application Note

Heated Heliport
DMSO Thawing Evaluation

Heated Heliport Evaluation

- Standard Specification Heliport Unit
- 400W @12VDC PTC Heating System – 600W DC Power Supply
- All Tubes contain 99.9% DMSO
- Tubes were frozen at -19C for all tests
- Tubes were frozen 6 hours minimum between evaluations
- Freezer-to-Heliport transfer time <3min for all tests
- Ambient Temperature 73F / 23C for all tests
- Matrix and Micronic 96 tube racks were used interchangeably



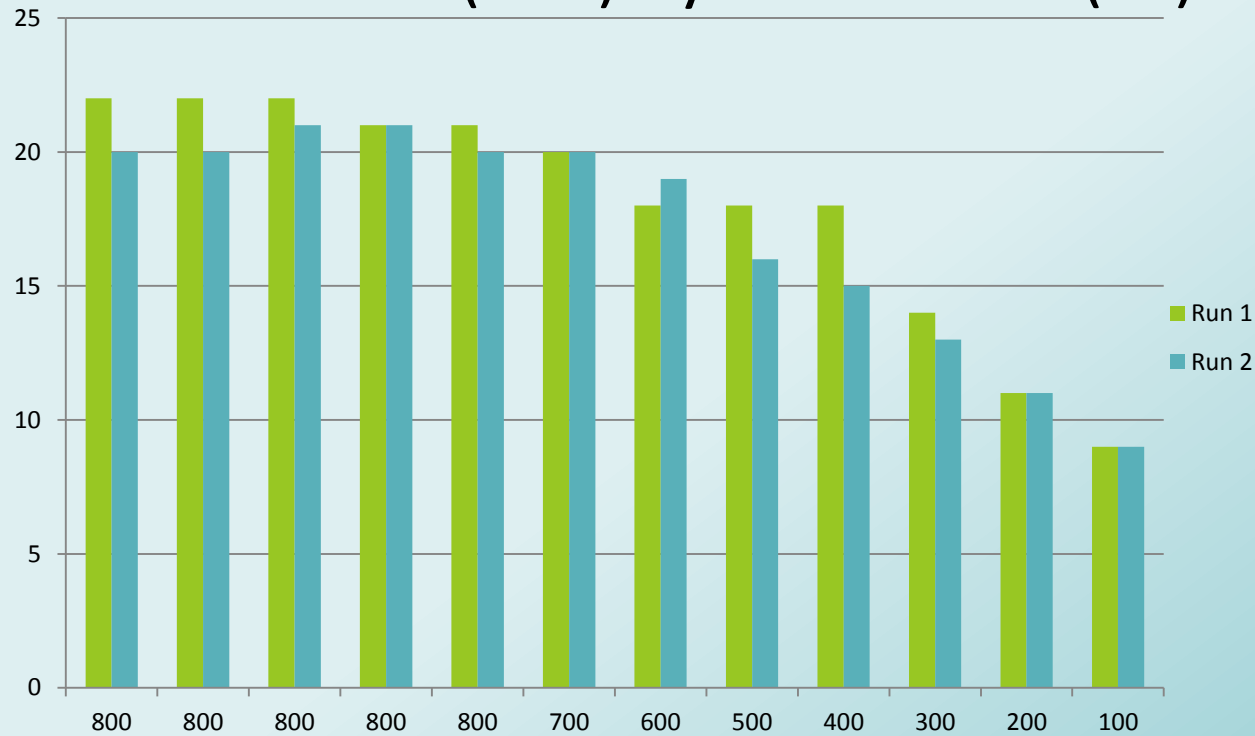
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Thaw Time (min) by Fill Volume (uL)

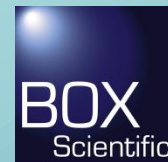


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A	800	800	800	800	800	700	600	500	400	300	200	100
B	800	800	800	800	800	700	600	500	400	300	200	100
C	800	800	800	800	800	700	600	500	400	300	200	100
D	800	800	800	800	800	700	600	500	400	300	200	100
E	800	800	800	800	800	700	600	500	400	300	200	100
F	800	800	800	800	800	700	600	500	400	300	200	100
G	800	800	800	800	800	700	600	500	400	300	200	100
H	800	800	800	800	800	700	600	500	400	300	200	100

Run 1

	1	2	3	4	5	6	7	8	9	10	11	12
A	800	800	700	500	300	100	200	400	600	800	800	800
B	800	800	700	500	300	100	200	400	600	800	800	800
C	800	800	700	500	300	100	200	400	600	800	800	800
D	800	800	700	500	300	100	200	400	600	800	800	800
E	800	800	700	500	300	100	200	400	600	800	800	800
F	800	800	700	500	300	100	200	400	600	800	800	800
G	800	800	700	500	300	100	200	400	600	800	800	800
H	800	800	700	500	300	100	200	400	600	800	800	800

Run 2



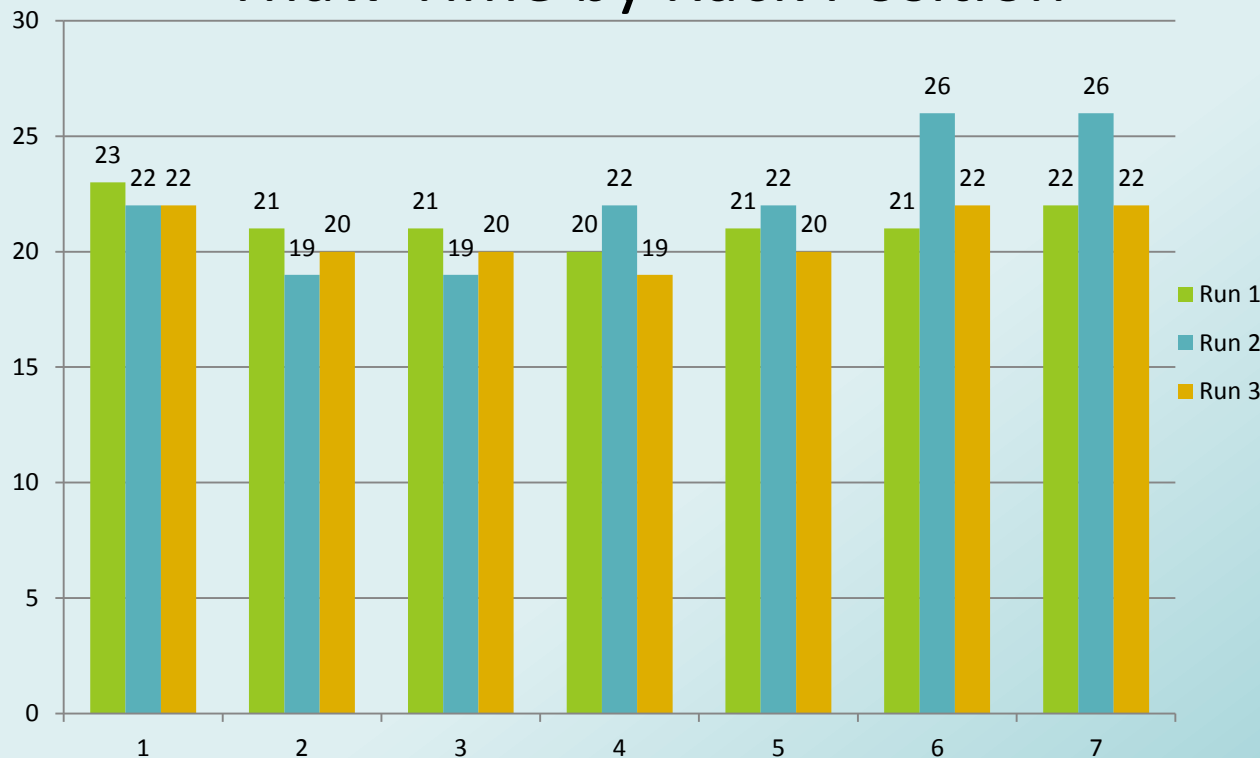
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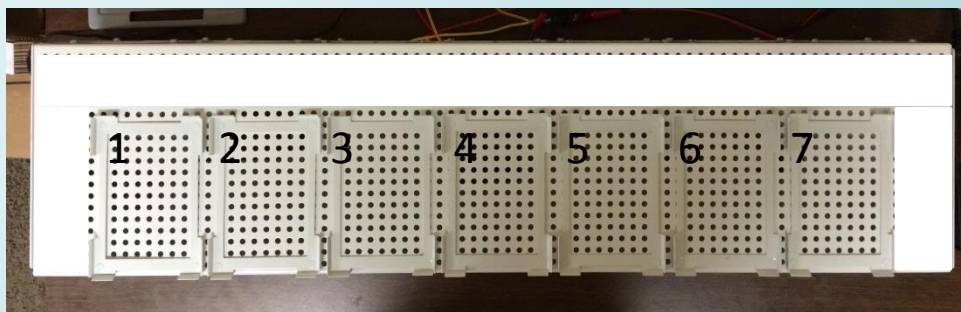
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Thaw Time by Rack Position



Micronic/Matrix 1.2ml 96
tube rack

96 Tubes / 800ul fill



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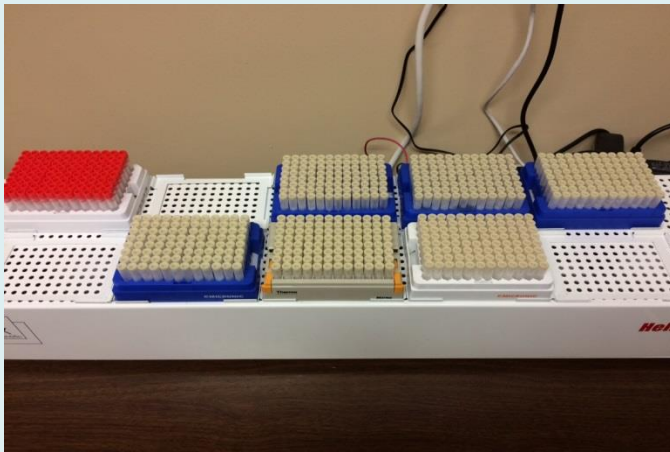
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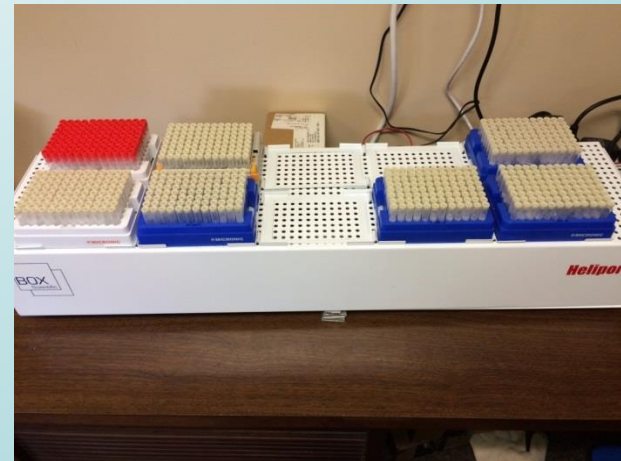
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High Fill / High Loading

Micronic/Matrix 1.2ml 96 tube rack
96 Tubes / 800ul fill



Run 1:
24 minutes to ice free



Run 2:
25 minutes to ice free



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Thaw Time by Tube Loading

Micronic/Matrix 1.2ml 96 tube rack
 96 Tubes / 800ul fill
 Position 4

1

	1	2	3	4	5	6	7	8	9	10	11	12
A	800	800	800	800								
B	800	800	800	800								
C	800	800	800	800								
D	800	800	800	800								
E	800	800	800	800								
F	800	800	800	800								
G	800	800	800	800								
H	800	800	800	800								

5

	1	2	3	4	5	6	7	8	9	10	11	12
A		800						800				
B		800						800				
C		800						800				
D		800						800				
E					800						800	
F					800						800	
G					800						800	
H					800						800	

2

	1	2	3	4	5	6	7	8	9	10	11	12
A					800	800	800	800	800	800	800	800
B					800	800	800	800	800	800	800	800
C					800	800	800	800	800	800	800	800
D					800	800	800	800	800	800	800	800
E					800	800	800	800	800	800	800	800
F					800	800	800	800	800	800	800	800
G					800	800	800	800	800	800	800	800
H					800	800	800	800	800	800	800	800

6

	1	2	3	4	5	6	7	8	9	10	11	12
A	800	800	800		800	800	800	800		800	800	800
B	800	800	800		800	800	800	800		800	800	800
C	800	800	800		800	800	800	800		800	800	800
D	800	800	800		800	800	800	800		800	800	800
E	800	800	800		800	800	800	800		800	800	800
F	800	800	800		800	800	800	800		800	800	800
G	800	800	800		800	800	800	800		800	800	800
H	800	800	800		800	800	800	800		800	800	800

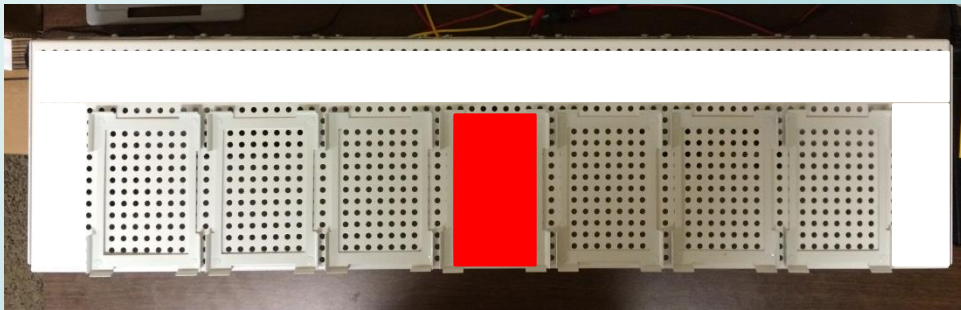
3

	1	2	3	4	5	6	7	8	9	10	11	12
A	800		800		800		800		800		800	
B	800		800		800		800		800		800	
C	800		800		800		800		800		800	
D	800		800		800		800		800		800	
E	800		800		800		800		800		800	
F	800		800		800		800		800		800	
G	800		800		800		800		800		800	
H	800		800		800		800		800		800	

4

	1	2	3	4	5	6	7	8	9	10	11	12
A					800		800					
B					800		800					
C					800		800					
D					800		800					
E					800		800					
F					800		800					
G					800		800					
H					800		800					

Run	Time (min)
1	21
2	23
3	22
4	20
5	20
6	21



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Summary

- Heated thaw times were consistently in the 20-23 minute range
- Thaw times represent a roughly a 50% reduction compared to ambient
- Thaw times show clear correlation to fill volume
- Thaw times show no clear correlation to tube count or rack position
- Thaw time variations of +/- 2 minutes were observed from location to location
- Thaw time variations of +/- 2 minutes were observed from run to run



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