



KEEP IT SLEEK KEEP IT COOL

Thermal Test Report

Model: MS-1 M.2 2280 SSD Cooler

Version: **20231225**

A. Introduction

B. Test Configuration

C. Conclusion

A. Introduction

- 1. Objective**
- 2. Equipment**
- 3. Procedure**

Our objective is to find out if the MS-1 M.2 Cooler can efficiently extract the heat generated by the GEN 5 M.2 SSD while maintaining clock speed. We built a system with Intel I9-14900 CPU, ASUS MAXIMUS Z790 DARK HERO ATX Motherboard, MSI RTX™ 4090 GAMING X TRIO Graphic Card, and Crucial T700 2TB GEN5 M.2 SSD and put it to test.

Our target is to keep the GEN5 M.2 SSD at **reading/writing speed over 10K MB/s** while the graphic card is running at full load.

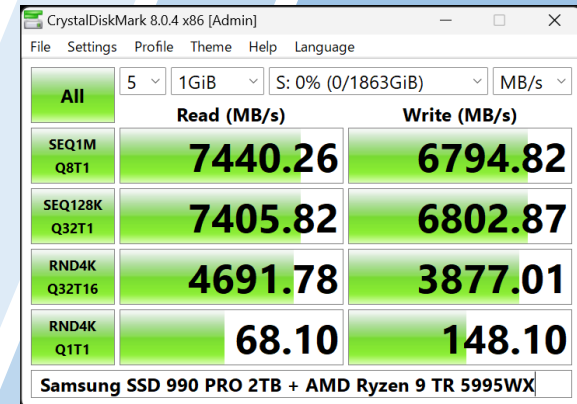


The software we used in the thermal testing includes:

1. CrystalDiskMark
2. FurMark
3. HWiFO64
4. CrystalDiskInfo

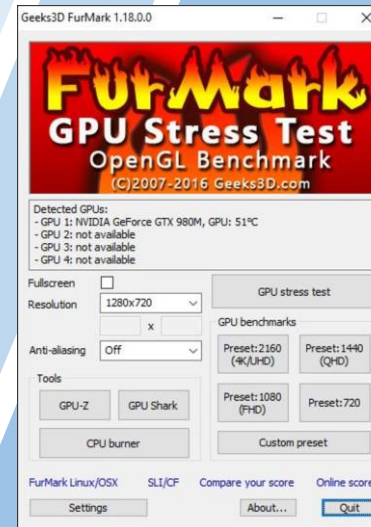
We focus on the heat generated by M.2 SSD, as a result, we will monitor the temperature change during the whole test at the extreme using scenario.

We used CrystalDiskMark and FurMark to push 100% load on the M.2 SSD and GPU, and tested for 1 GB file reading/writing/mix.



	Read (MB/s)	Write (MB/s)
All		
SEQ1M Q8T1	7440.26	6794.82
SEQ128K Q32T1	7405.82	6802.87
RND4K Q32T16	4691.78	3877.01
RND4K Q1T1	68.10	148.10

Samsung SSD 990 PRO 2TB + AMD Ryzen 9 TR 5995WX



Testing Steps:

1. Ready the system;
2. Start **HWiNFO64** and **CrystalDiskInfo**;
3. Start **FurMark**, and wait until the GPU temp. becomes stable;
4. Start **CrystalDiskMark**;
5. Recording the data acquired from the **HWiNFO64**;
6. End of test.

B. Test Configuration

- 1. List of Hardware**
- 2. M.2 Coolers Comparison**
- 3. Chassis Fans Allocation**
- 4. CrystalDiskMark & FurMark Test**

Component	Model
Chassis	Ceres 300 TG ARGB Snow
Motherboard	ASUS ROG MAXIMUS Z790 DARK HERO
CPU	Intel I9-14900
GPU	GeForce RTX™ 4090 GAMING X TRIO 24G
RAM	Crucial DDR5 4800 16g*1
SSD	Crucial T700 PCIe Gen5 NVMe 2TB SSD
SSD Cooler	<ol style="list-style-type: none"> MS-1 M.2 2280 SSD Cooler Pre-stalled Heatsink
PSU	Thermaltake GF3 1200W
CPU Cooler	TH280 V2 ARGB Sync AIO
Fans	AIO: CT140 x 2 Chassis: Standard Fan x 1 (Back x1)
Software	<ol style="list-style-type: none"> CrystalDiskMark FurMark HWiFO64 CrystalDiskInfo





	MS-1 M.2 2280 SSD Cooler	Pre-installed Passive Cooler	Ineo C2600-III
Dimensions	74 x 23 x 17.9 mm	67 x 21 x 17 mm	745x 24 x 14 mm
Fan Dimension	20 x 20 x 8 mm	-	20 x 20 x ? mm
Fan Speed	8000 RPM	-	3000~15000 RPM
Air Flow	0.44 CFM	-	-
Air Pressure	1.6 mm-H2O	-	-
Noise Level	16 dB-A	-	-
Power Connector	3-Pin	-	3-Pin



***TH280 AIO Installed in the Front.**

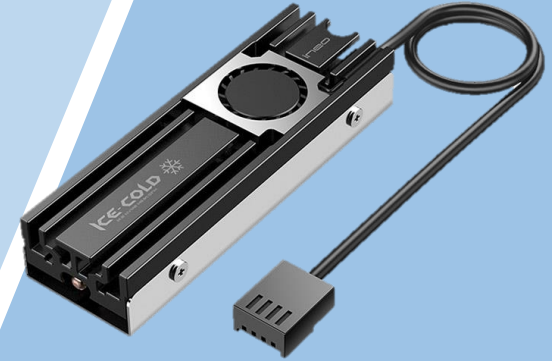
5. CrystalDiskMark & FurMark Test



MS-1 M.2 SSD Cooler



Pre-installed Heat Sink



Ineo C2600-III

	Sequential Read (MB/s)	Sequential Write (MB/s)	Random Read (IOPS)
SEQ1M QBT1	12070.68	11290.39	11042.91
SEQ1M Q1T1	8793.20	9067.15	5399.28
RND4K Q32T1	1102.13	814.70	1030.09
RND4K Q1T1	95.72	402.70	122.96

	Sequential Read (MB/s)	Sequential Write (MB/s)	Random Read (IOPS)
SEQ1M QBT1	12062.79	5135.64	1521.73
SEQ1M Q1T1	8800.36	2316.36	1149.32
RND4K Q32T1	1070.33	775.44	317.31
RND4K Q1T1	96.14	396.99	12.55

	Sequential Read (MB/s)	Sequential Write (MB/s)	Random Read (IOPS)
SEQ1M QBT1	12035.43	11307.06	5405.60
SEQ1M Q1T1	8746.36	7645.47	2966.00
RND4K Q32T1	1052.60	775.30	839.19
RND4K Q1T1	94.83	393.86	121.32

To simulate the user scenario, we use **FurMark** to stress the CPU, and simultaneously push the M.2 SSD to full load with **CrystalDiskMark**.

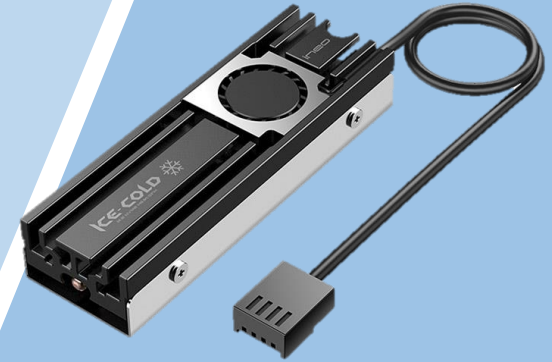
5. CrystalDiskMark & FurMark Test



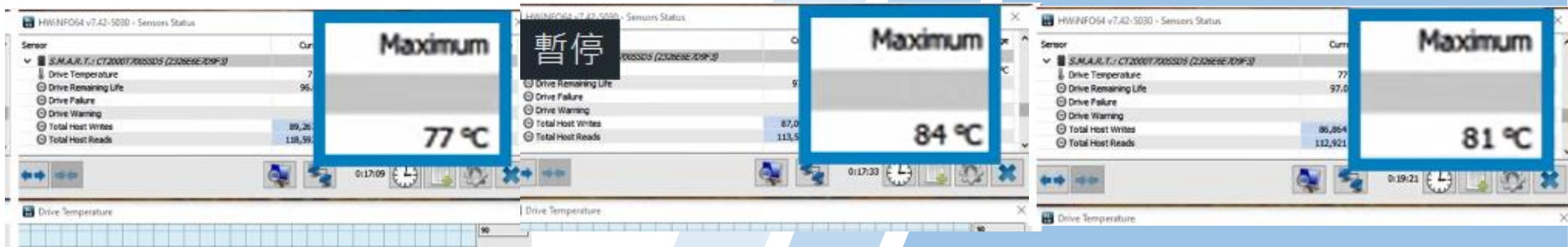
MS-1 M.2 SSD Cooler



Pre-installed Heat Sink



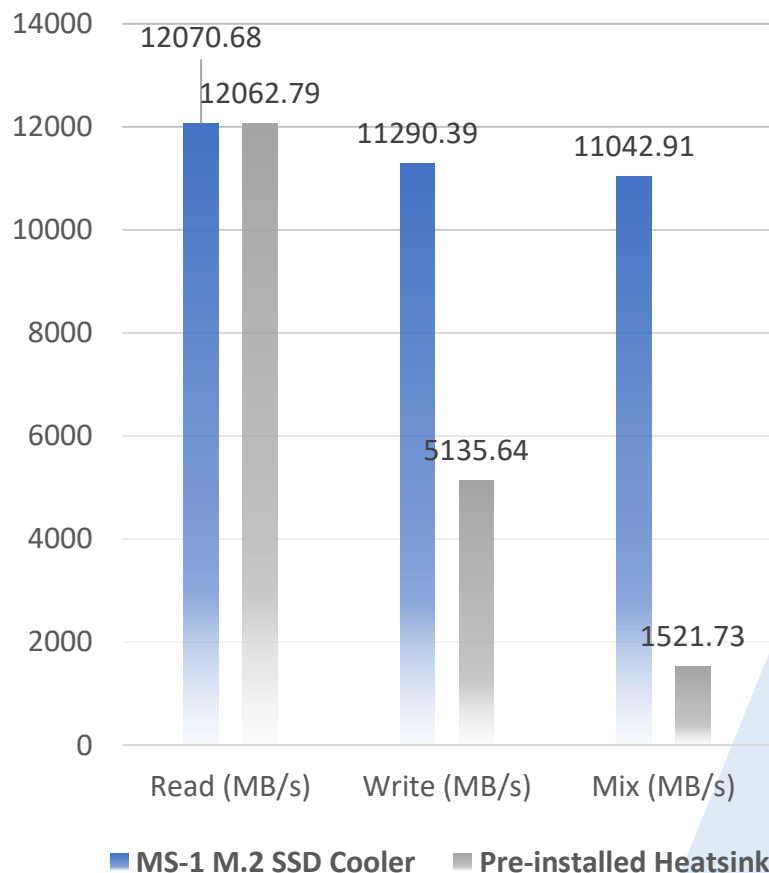
Ineo C2600-III



*The Thermal Throttle Temperature is around 84 °C

C. Conclusion

SSD CLOCK SPEED



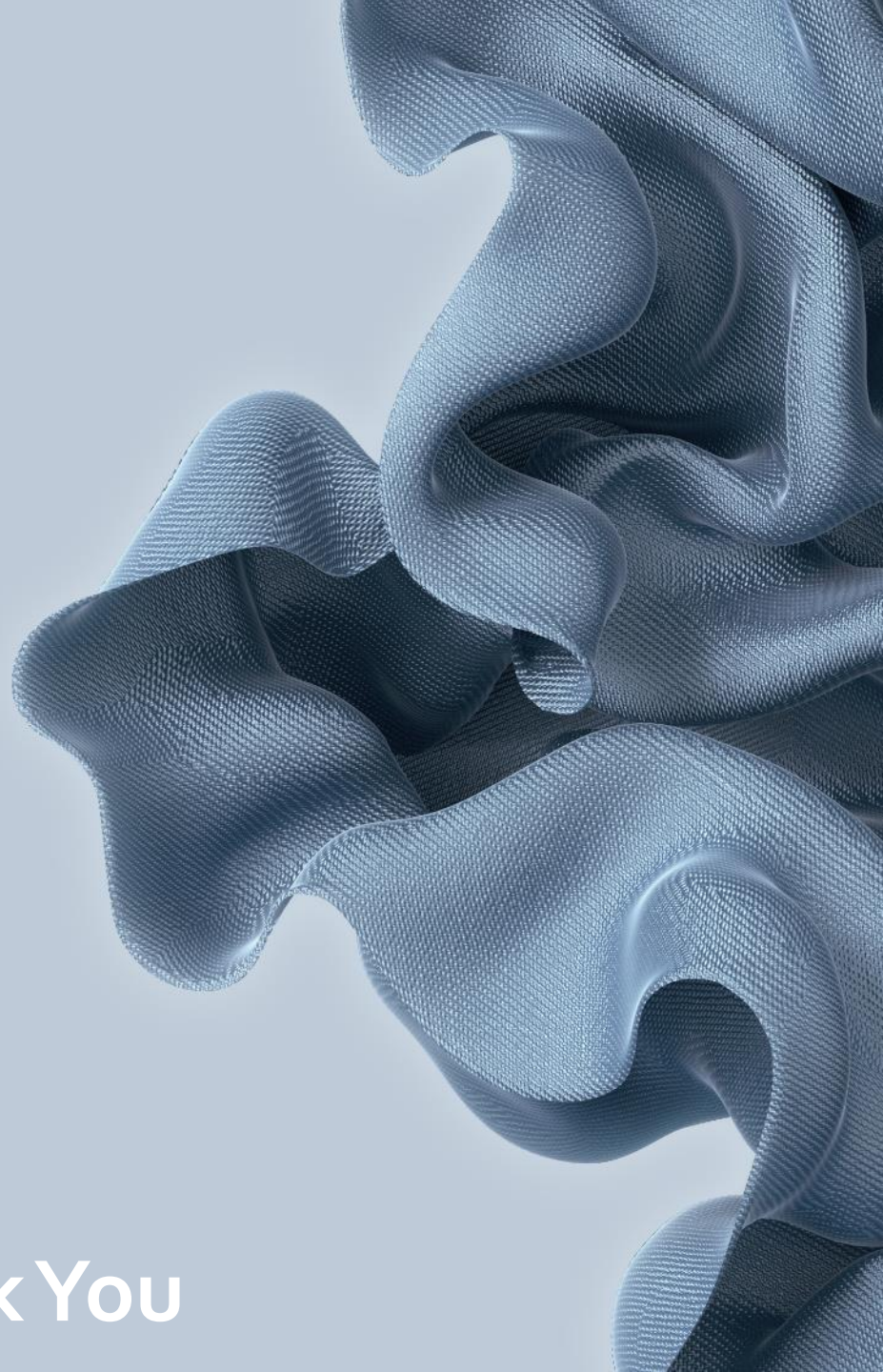
During our test, the Crucial T700 PCIe Gen5 NVMe 2TB SSD activate thermal throttling when the core temperature reaches beyond 84°C, resulting in a significant drop on performance.

On the other hand, while pairing the SSD with MS-1 M.2 SSD Cooler, the highest temperature was 81°C, and the clock speed stayed above a healthy 10K MB/s, especially in writing and mixed writing & reading respectively.

In conclusion, the MS-1 M.2 Cooler can effectively dispense the heat and keep the clock speed running above 10K MB/s, **boosting the performance by nearly 119% and 625%, write and mix writing & reading respectively.**



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KEEP IT COOL



Thank You