

# Enterprise Capacity 3.5 HDD (Helium)

VERSION 7

Channel Data Sheet

## Maximum Storage Capacity for Highest Rack Space Efficiency

- 12TB per drive<sup>1</sup> for 50% more petabytes per rack<sup>2</sup>
- Industry's lowest power and weight for optimum data center TCO
- Highest 12TB HDD performance with enhanced caching, making it perfect for Big Data applications
- Hyperscale SATA model tuned for large data transfers
- PowerBalance™ feature optimizes IOPS/Watt
- Advanced Write Caching feature for 20% boost in random write performance<sup>2</sup>
- Forged, wrought-aluminum base and a helium sealed-drive design with no porosity and uniform density
- Superior material and weld-width design for a more robust, hermetically sealed-drive enclosure that protects from helium leaks
- Digital environmental sensors for measuring internal pressure, helping to ensure high reliability, performance and quality
- Latest hermetic interconnect technology supporting higher data rate heads and higher pin counts for extreme thermal conditions
- Proven enterprise-class reliability backed by 2.5M-hr MTBF



## Best-Fit Applications

- Hyperscale applications/cloud data centers
- Massive scale-out data centers
- Big Data applications
- High-capacity density RAID storage
- Mainstream enterprise external storage arrays
- Distributed file systems, including Hadoop and Ceph
- Enterprise backup and restore—D2D, virtual tape
- Centralized surveillance

<sup>1</sup> Seagate recommends validating your configuration with your HBA/RAID controller manufacturer to ensure full capacity capabilities.

<sup>2</sup> Compared to 8TB competitive product.



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Specifications	SATA 6Gb/s	12Gb/s SAS
Capacity	12TB	12TB
Standard Model (512e)	ST12000NM0007	ST12000NM0027
Standard Model (4Kn)	ST12000NM0047	ST12000NM0067
SED Model (4Kn) <sup>1</sup>	ST12000NM0057	ST12000NM0077
SED Model (512e) <sup>1</sup>	ST12000NM0017	ST12000NM0037
SED-FIPS Model (4Kn) <sup>1, 2</sup>	ST12000NM0157	ST12000NM0167
SED-FIPS Model (512e) <sup>1, 2</sup>	ST12000NM0137	ST12000NM0147
<b>Features</b>		
Superior Helium Sealed-Drive Design With Wide Weld	Yes	Yes
Digital Sensors for Helium Pressure	Yes	Yes
Protection Information (T10 DIF)	—	Yes
SuperParity	Yes	Yes
PowerChoice™/PowerBalance™ Technology	Yes	Yes
Low Halogen/Hot-Plug Support <sup>3</sup>	Yes	Yes
Cache, Multisegmented (MB)	256	256
Organic Solderability Preservative	Yes	Yes
Secure Download and Diagnostics (SD&D) RSA 2048 signed firmware	Yes	Yes
<b>Reliability/Data Integrity</b>		
Mean Time Between Failures (MTBF, hours)	2.5 Million	2.5 Million
Reliability Rating @ Full 24x7 Operation (AFR)	0.35%	0.35%
Nonrecoverable Read Errors per Bits Read	1 sector per 10E15	1 sector per 10E15
Power-On Hours per Year (24x7)	8760	8760
512e Sector Size (Bytes per Sector)	512	512, 520, 528
4Kn Sector Size (Bytes per Sector)	4096	4096, 4160, 4224
Limited Warranty (years)	5	5
<b>Performance</b>		
Spindle Speed (RPM)	7200	7200
Interface Access Speed (Gb/s)	6.0, 3.0	12.0, 6.0, 3.0
Max. Sustained Transfer Rate OD (MB/s, MiB/s)	Up to 261, 249	Up to 261, 249
Random Read/Write 4K QD16 WCD (IOPS)	170/400	170/400
Interface Ports	Single	Dual
Rotational Vibration @ 1500Hz (rad/s <sup>2</sup> )	12.5	12.5
<b>Power Consumption</b>		
Idle A (W) Average	5.0W	5.5W
Average Latency (ms)	4.16	4.16
Operating Power <sup>4</sup>	7.8	9.3
Power Supply Requirements	+12 V and +5 V	+12 V and +5 V
<b>Environmental</b>		
Temperature, Operating (°C)	5°C – 60°C	5°C – 60°C
Vibration, Nonoperating: 10Hz to 500Hz (Gms)	2.27	2.27
<b>Physical</b>		
Height (mm/in, max) <sup>5</sup>	26.11mm/1.028in	26.11mm/1.028in
Width (mm/in, max) <sup>5</sup>	101.60mm/4.0in	101.60mm/4.0in
Depth (mm/in, max) <sup>5</sup>	147.0mm/5.787in	147.0mm/5.787in
Weight (g/lb)	650g/1.433lb	650g/1.433lb
Carton Unit Quantity	20	20
Cartons per Pallet / Cartons per Layer	40 / 8	40 / 8

<sup>1</sup> Self-Encrypting Drives (SED) and FIPS 140-2 Validated drives are not available in all models or countries. May require TCG-compliant host or controller support.

<sup>2</sup> See FIPS 140-2 Level 2 Certificate at: <http://csrc.nist.gov/groups/STM/cmvp/documents/140-1/1401val2011.htm#1635>

<sup>3</sup> Supports Hotplug operation per Serial ATA Revision 2.6 specification.

<sup>4</sup> SATA Random 8K1Q 50% Write/50% Read WCD @ 40 IO/s, SAS Random 4K4Q 50% Write/50% Read WCD @ 165 IO/s

<sup>5</sup> These base deck dimensions conform to the Small Form Factor Standard (SFF-8301) found at [www.sffcommittee.org](http://www.sffcommittee.org). For connector-related dimensions, see SFF-8323.

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