

Enterprise Capacity 3.5 HDD (Helium)

VERSION 7

Channel Data Sheet

Maximum Storage Capacity for Highest Rack Space Efficiency

- 12 TB per drive¹ for 50% more petabytes per rack²
- Industry's lowest power and weight for optimum data centre TCO
- Highest 12 TB HDD performance with enhanced caching, making it perfect for Big Data applications
- Hyperscale SATA model tuned for large data transfers
- FastFormatTM feature for advanced formats (4Kn and 512e) simplifies infrastructure management
- PowerBalanceTM feature optimises IOPS/Watt
- Advanced Write Caching feature for 20% boost in random write performance²
- Forged, wrought-aluminium 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 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 centres
- Massive scale-out data centres
- 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
- Centralised surveillance



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

2 Compared to 8 TB competitive product.

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Specifications	SATA 6 Gb/s	12 Gb/s SAS
Capacity	12TB	12TB
Standard Model FastFormat™ (512e/4Kn) ¹	ST12000NM0007	ST12000NM0027
SED Model FastFormat (512e/4Kn) ^{1,2,3}	ST12000NM0017	ST12000NM0037
SED-FIPS Model FastFormat (512e/4Kn) ^{1,2,3,4}	—	—
Features		
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 ⁵	Yes	Yes
Cache, Multi-segmented (MB)	256	256
Organic Solderability Preservative	Yes	Yes
Secure Download and Diagnostics (SD&D) RSA 2048 signed firmware	Yes	Yes
Reliability/Data Integrity		
Mean Time Between Failures (MTBF, hours)	2,500,000	2,500,000
Reliability Rating @ Full 24x7 Operation (AFR)	0.35%	0.35%
Non-recoverable Read Errors per Bits Read	1 sector per 10E15	1 sector per 10E15
Power-On Hours per Year (24x7)	8,760	8,760
512e Sector Size (Bytes per Sector)	512	512, 520, 528
4Kn Sector Size (Bytes per Sector)	4,096	4,096, 4,160, 4,224
Limited Warranty (years)	5	5
Performance		
Spindle Speed (RPM)	7,200	7,200
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
Rotation Vibration @ 20-1500 Hz (rad/sec ²)	12.5	12.5
Power Consumption		
Idle A (W) Average	5 W	5.4 W
Average Latency (ms)	4.16	4.16
Operating Power ⁶	7.8	9.3
Power Supply Requirements	+12 V and +5 V	+12 V and +5 V
Environmental		
Temperature, Operating (°C)	5°C – 60°C	5°C – 60°C
Vibration, Non-operating: 10 Hz to 500 Hz (Grms)	2.27	2.27
Shock, Operating 2 ms (Read/Write) (Gs)	70	70
Shock, Non-operating 2 ms (Gs)	250	250
PHYSICAL		
Height (mm/in, max) ⁷	26.11 mm/1.028 in	26.11 mm/1.028 in
Width (mm/in, max) ⁷	101.6 mm/4.01 in	101.6 mm/4.01 in
Depth (mm/in, max) ⁷	147 mm/5.787 in	147 mm/5.787 in
Weight (lb/g)	705 g/1.554 lb	705 g/1.554 lb
Carton Unit Quantity	20	20
Cartons per Pallet / Cartons per Layer	40/8	40/8

¹ FastFormat models ship in 512e format state. When switching from 512e to 4Kn by executing the FastFormat routine, all data on the drive will be deleted. Note that data must be aligned to 4K sectors to see improved performance in 4Kn format.

² 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.

³ SATA SED and SATA SED-FIPS models are only available via iSPa. Contact your sales representative to order.

⁴ See FIPS 140-2 Level 2 Certificate at: <http://csrc.nist.gov/groups/STM/cmp/documents/140-1/I-1401val2011.htm#1635>

⁵ Supports Hotplug operation per Serial ATA Revision 2.6 specification.

⁶ SATA Random 8K1Q 50% Write/50% Read WCD @ 40 IOs, SAS Random 4K4Q 50% Write/50% Read WCD @ 165 IOs.

⁷ These base deck dimensions conform to the Small Form Factor Standard (SFF-8301) found at www.sffcommittee.org. For connector-related dimensions, see SFF-8323.

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