



DATA SHEET—SEAGATE CONFIDENTIAL

Scalable. Responsive. Innovative.  
**Exos X16**



Seagate manufactures hard drives that specifically address the needs of the hyperscale storage market. As the flagship of the Seagate® X class, the Exos® X16 enterprise hard drives are the highest-capacity hard drives in the fleet.



## Maximum Storage Capacity for Highest Rack Space Efficiency

**Industry's first 16TB drive** for 33% more petabytes per rack<sup>1</sup>

**Highest 16TB hard drive performance** with enhanced caching, making it perfect for cloud data center and massive scale-out data center applications

**Hyperscale SATA model** tuned for large data transfers and low latency

**PowerBalance™** feature optimizes Watts/TB

**Helium sealed-drive design** delivers lower total cost of ownership through lower power and weight

**Next-generation helium side-sealing weld technology** for added handling robustness and leak protection

**Digital environmental sensors** to monitor internal drive conditions for optimal operation and performance

**Data protection and security:** Seagate Secure™ features for safe, affordable, fast, and easy drive retirement

Proven enterprise-class reliability backed by **5-year limited warranty and 2.5M-hr MTBF rating**

### 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> Compared to 12TB competitive product



Specifications	SATA 6Gb/s	12Gb/s SAS	SATA 6Gb/s	12Gb/s SAS	SATA 6Gb/s
Capacity	16TB	16TB	14TB	14TB	12TB
Standard Model 4Kn	ST16000NM008G	ST16000NM007G	ST14000NM010G	ST14000NM011G	ST12000NM007G
<b>Features</b>					
Helium Sealed-Drive Design	Yes	Yes	Yes	Yes	Yes
Protection Information (T10 DIF)	—	Yes	—	Yes	—
SuperParity	Yes	Yes	Yes	Yes	Yes
Low Halogen	Yes	Yes	Yes	Yes	Yes
PowerChoice™ Idle Power Technology	Yes	Yes	Yes	Yes	Yes
PowerBalance™ Power/Performance Technology	Yes	Yes	Yes	Yes	Yes
Hot-Plug Support <sup>1</sup>	Yes	Yes	Yes	Yes	Yes
Cache, Multisegmented (MB)	256	256	256	256	256
Organic Solderability Preservative	Yes	Yes	Yes	Yes	Yes
RSA 2048 Firmware Verification (SD&D)	Yes	Yes	Yes	Yes	Yes
<b>Reliability/Data Integrity</b>					
Mean Time Between Failures (MTBF, hours)	2,500,000	2,500,000	2,500,000	2,500,000	2,500,000
Reliability Rating @ Full 24x7 Operation (AFR)	0.35%	0.35%	0.35%	0.35%	0.35%
Nonrecoverable Read Errors per Bits Read	1 sector per 10E15	1 sector per 10E15	1 sector per 10E15	1 sector per 10E15	1 sector per 10E15
Power-On Hours per Year (24x7)	8760	8760	8760	8760	8760
4Kn Sector Size (Bytes per Sector)	4096	4096	4096	4096	4096
Limited Warranty (years)	5	5	5	5	5
<b>Performance</b>					
Spindle Speed (RPM)	7200RPM	7200RPM	7200RPM	7200RPM	7200RPM
Interface Access Speed (Gb/s)	6.0, 3.0	12.0, 6.0, 3.0	6.0, 3.0	12.0, 6.0, 3.0	6.0, 3.0
Max. Sustained Transfer Rate OD (MB/s, MiB/s)	261, 249	261, 249	261, 249	261, 249	245, 233
Random Read/Write 4K QD16 WCD (IOPS)	170/440	170/440	170/440	170/440	170/440
Average Latency (ms)	4.16	4.16	4.16	4.16	4.16
Interface Ports	Single	Dual	Single	Dual	Single
Rotation Vibration @ 20-1500 Hz (rad/sec <sup>2</sup> )	12.5	12.5	12.5	12.5	12.5
<b>Power Consumption</b>					
Idle A (W) Average	5.00W	5.00W	5.00W	5.00W	7.75W
Max Operating, Random Read/Write 4K/16Q (W)	10.0, 6.3	10.2, 6.5	10.0, 6.3	10.2, 6.5	9.5, 6.0
Power Supply Requirements	+12 V and +5 V	+12 V and +5 V	+12 V and +5 V	+12 V and +5 V	+12 V and +5 V
<b>Environmental</b>					
Temperature, Operating (°C)	5°C – 60°C	5°C – 60°C	5°C – 60°C	5°C – 60°C	5°C – 60°C
Vibration, Nonoperating: 2 to 500Hz (Grms)	2.27	2.27	2.27	2.27	2.27
Shock, Operating 2ms (Read/Write) (Gs)	50	50	50	50	50
Shock, Nonoperating 2ms (Gs)	200	200	200	200	200
<b>Physical</b>					
Height (in/mm, max) <sup>2</sup>	1.028in/26.11mm	1.028in/26.11mm	1.028in/26.11mm	1.028in/26.11mm	1.028in/26.11mm
Width (in/mm, max) <sup>2</sup>	4.010in/101.85mm	4.010in/101.85mm	4.010in/101.85mm	4.010in/101.85mm	4.010in/101.85mm
Depth (in/mm, max) <sup>2</sup>	5.787in/147.00mm	5.787in/147.00mm	5.787in/147.00mm	5.787in/147.00mm	5.787in/147.00mm
Weight (lb/gm)	670g/1.477	670g/1.477	670g/1.477	670g/1.477	670g/1.477
Carton Unit Quantity	20	20	20	20	20
Cartons per Pallet/Cartons per Layer	40/8	40/8	40/8	40/8	40/8

<sup>1</sup> Supports Hotplug operation per Serial ATA Revision 3.3 specification

<sup>2</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.



Specifications	12Gb/s SAS	SATA 6Gb/s	12Gb/s SAS
Capacity	12TB	10TB	10TB
Standard Model 4Kn	ST12000NM006G	ST10000NM009G	ST10000NM008G
<b>Features</b>			
Helium Sealed-Drive Design	Yes	Yes	Yes
Protection Information (T10 DIF)	Yes	—	Yes
SuperParity	Yes	Yes	Yes
Low Halogen	Yes	Yes	Yes
PowerChoice™ Idle Power Technology	Yes	Yes	Yes
PowerBalance™ Power/Performance Technology	Yes	Yes	Yes
Hot-Plug Support <sup>1</sup>	Yes	Yes	Yes
Cache, Multisegmented (MB)	256	256	256
Organic Solderability Preservative	Yes	Yes	Yes
RSA 2048 Firmware Verification (SD&D)	Yes	Yes	Yes
<b>Reliability/Data Integrity</b>			
Mean Time Between Failures (MTBF, hours)	2,500,000	2,500,000	2,500,000
Reliability Rating @ Full 24x7 Operation (AFR)	0.35%	0.35%	0.35%
Nonrecoverable Read Errors per Bits Read	1 sector per 10E15	1 sector per 10E15	1 sector per 10E15
Power-On Hours per Year (24x7)	8760	8760	8760
4Kn Sector Size (Bytes per Sector)	4096	4096	4096
Limited Warranty (years)	5	5	5
<b>Performance</b>			
Spindle Speed (RPM)	7200RPM	7200RPM	7200RPM
Interface Access Speed (Gb/s)	12.0, 6.0, 3.0	6.0, 3.0	12.0, 6.0, 3.0
Max. Sustained Transfer Rate OD (MB/s, MiB/s)	245, 233	245, 233	245, 233
Random Read/Write 4K QD16 WCD (IOPS)	170/440	170/440	170/440
Average Latency (ms)	4.16	4.16	4.16
Interface Ports	Dual	Single	Dual
Rotation Vibration @ 20-1500 Hz (rad/sec <sup>2</sup> )	12.5	12.5	12.5
<b>Power Consumption</b>			
Idle A (W) Average	5.0W	5.00W	5.0W
Max Operating, Random Read/Write 4K/16Q (W)	10.0, 6.2	9.5, 6.0	10.0, 6.2
Power Supply Requirements	+12 V and +5 V	+12 V and +5 V	+12 V and +5 V
<b>Environmental</b>			
Temperature, Operating (°C)	5°C – 60°C	5°C – 60°C	5°C – 60°C
Vibration, Nonoperating: 2 to 500Hz (Grms)	2.27	2.27	2.27
Shock, Operating 2ms (Read/Write) (Gs)	50	50	50
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Weight (lb/gm)	670g/1.477	670g/1.477	670g/1.477
Carton Unit Quantity	20	20	20
Cartons per Pallet/Cartons per Layer	40/8	40/8	40/8

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