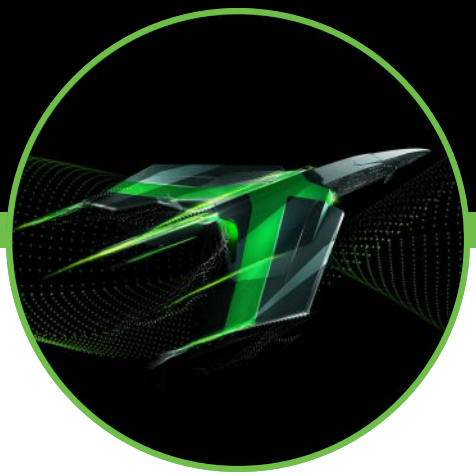
DATA SHEET

Exos X24—Powerful performance. Proven technology. Scalable design.



Powerful performance with proven technology—Seagate's ® Exos® X24 drives are built off the platform that's shipped millions globally and deployed in leading cloud service provider solutions—making them the most sought-after drives in our datasphere. Designed with the highest rack-space efficiency and protected with Seagate Secure™, Exos X24 offers extreme market-leading capacity, earning customer confidence by delivering trusted peace of mind.

Best-Fit Applications

- Scalable 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

Maximum Storage Capacity for Highest Rack Space Efficiency

Market-leading 24TB HDD offering the highest capacity available for more petabytes per rack[1]

Highly reliable performance with enhanced caching—making it the logical choice 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 per TB

Maximize total cost of ownership savings through lower power and weight with helium-sealed drive design

Proven 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—featuring Seagate Instant Secure for safe, affordable, fast, and easy drive retirement

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

1 Compared to 20TB competitive product

EXOS™

Specifications	SATA 6Gb/s			
Capacity	24TB	20TB	16TB	12TB
Standard Model - Seagate Instant Secure Erase (ISE) [1]	ST24000NM002H	ST20000NM002H	ST16000NM002H	ST12000NM002H
SED Model[2]	ST24000NM001H	ST20000NM001H	ST16000NM001H	ST12000NM001H
SED-FIPS[2]	—	—	—	—
FEATURES				
Helium Sealed-Drive Design	Yes	Yes	Yes	Yes
Conventional Magnetic Recording (CMR)	Yes	Yes	Yes	Yes
Protection Information (T10 DIF)	—	—	—	—
Super Parity	Yes	Yes	Yes	Yes
Low Halogen	Yes	Yes	Yes	Yes
PowerChoice™ Idle Power Technology	Yes	Yes	Yes	Yes
PowerBalance™ Power/Performance Technology	Yes	Yes	Yes	Yes
Hot-Plug Support[1]	Yes	Yes	Yes	Yes
Cache, Multisegmented (MB)	512	512	512	512
Organic Solderability Preservative	Yes	Yes	Yes	Yes
RSA 3072 Firmware Verification (SD&D)	Yes	Yes	Yes	Yes
RELIABILITY/DATA INTEGRITY				
Mean Time Between Failures (MTBF, hours)	2500000hr	2500000hr	2500000hr	2500000hr
Reliability Rating @ Full 24×7 Operation (AFR)	0.35%	0.35%	0.35%	0.35%
Nonrecoverable Read Errors per Bits Read	<1 in 10E15	<1 in 10E15	<1 in 10E15	<1 in 10E15
Power-On Hours per Year (24×7)	8760	8760	8760	8760
512e Sector Size (Bytes per Sector)	512	512	512	512
4Kn Sector Size (Bytes per Sector)	4096	4096	4096	4096
Limited Warranty (years)	5	5	5	5
PERFORMANCE				
Spindle Speed (RPM)	7200RPM	7200RPM	7200RPM	7200RPM
Interface Access Speed (Gb/s)	6.0, 3.0	6.0, 3.0	6.0, 3.0	6.0, 3.0
Max. Sustained Transfer Rate OD (MB/s,MiB/s)	285/272	285/272	285/272	285/272
Random Read/Write 4K QD16 WCD (IOPS)	168/550	168/550	168/550	168/550
Average Latency (ms)	4.16ms	4.16ms	4.16ms	4.16ms
Interface Ports	Single	Single	Single	Single
Rotation Vibration @ 20-1500 Hz (rad/sec^2)	12.5	12.5	12.5	12.5
POWER				
Idle A (W) Average	6.3	6.3	6.3	6.3
Max Operating, Random Read/Write 4K/16Q (W)	8.9, 7.1	8.9, 7.1	8.9, 7.1	8.9, 7.1
Power Supply Requirements	+12V and +5V	+12V and +5V	+12V and +5V	+12V and +5V
ENVIRONMENTAL				
Temperature, Operating (°C)	10°C – 60°C	10°C – 60°C	10°C – 60°C	10°C – 60°C
Vibration, Nonoperating: 2 to 500Hz (Grms)	2.27	2.27	2.27	2.27
Shock, Operating 2ms (Read/Write) (Gs)	40Gs	40Gs	40Gs	40Gs
Shock, Nonoperating 2ms (Gs)	200	200	200	200
PHYSICAL				
Height (mm/in, max) [4]	26.1mm/1.028in	26.1mm/1.028in	26.1mm/1.028in	26.1mm/1.028in
Width (mm/in, max) [4]	101.85mm/4.010in	101.85mm/4.010in	101.85mm/4.010in	101.85mm/4.010in
Depth (mm/in, max) [4]	147mm/5.787in	147mm/5.787in	147mm/5.787in	147mm/5.787in
Weight (gm/lb)	685g/1.51lb	685g/1.51lb	685g/1.51lb	685g/1.51lb
Carton Unit Quantity	20	20	20	20
Cartons per Pallet/Cartons per Layer	40 / 8	40 / 8	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 fomat
2 Self-Encrypting Drives (SED) and FIPS 140-3 Validated drives available through franchised authorized distributors. May require TCG-compliant host or controller support.
3 Supports Hotplug operation per Serial ATA Revision 3.5 specification
4 These base deck dimensions conform to the Small Form Factor Standard (SFF-8301) found at https://www.snia.org/sff. For connector-related dimensions, see SFF-8323.

EXOS™

Specifications	SAS 12Gb/s			
Capacity	24TB	20TB	16TB	12TB
Standard Model - Seagate Instant Secure Erase (ISE) [1]	ST24000NM007H	ST20000NM007H	ST16000NM007H	ST12000NM007H
SED Model[2]	ST24000NM005H	ST20000NM005H	ST16000NM005H	ST12000NM005H
SED-FIPS[2]	ST24000NM006H	ST20000NM006H	ST16000NM006H	ST12000NM009H
FEATURES				
Helium Sealed-Drive Design	Yes	Yes	Yes	Yes
Conventional Magnetic Recording (CMR)	Yes	Yes	Yes	Yes
Protection Information (T10 DIF)	Yes	Yes	Yes	Yes
Super Parity	Yes	Yes	Yes	Yes
Low Halogen	Yes	Yes	Yes	Yes
PowerChoice™ Idle Power Technology	Yes	Yes	Yes	Yes
PowerBalance™ Power/Performance Technology	Yes	Yes	Yes	Yes
Hot-Plug Support[1]	Yes	Yes	Yes	Yes
Cache, Multisegmented (MB)	512	512	512	512
Organic Solderability Preservative	Yes	Yes	Yes	Yes
RSA 3072 Firmware Verification (SD&D)	Yes	Yes	Yes	Yes
RELIABILITY/DATA INTEGRITY				
Mean Time Between Failures (MTBF, hours)	2500000hr	2500000hr	2500000hr	2500000hr
Reliability Rating @ Full 24×7 Operation (AFR)	0.35%	0.35%	0.35%	0.35%
Nonrecoverable Read Errors per Bits Read	<1 in 10E15	<1 in 10E15	<1 in 10E15	<1 in 10E15
Power-On Hours per Year (24×7)	8760	8760	8760	8760
512e Sector Size (Bytes per Sector)	512, 520, 528	512, 520, 528	512, 520, 528	512, 520, 528
4Kn Sector Size (Bytes per Sector)	4096, 4160,4224	4096, 4160,4224	4096, 4160,4224	4096, 4160,4224
Limited Warranty (years)	5	5	5	5
PERFORMANCE				
Spindle Speed (RPM)	7200RPM	7200RPM	7200RPM	7200RPM
Interface Access Speed (Gb/s)	12.0, 6.0, 3.0	12.0, 6.0, 3.0	12.0, 6.0, 3.0	12.0, 6.0, 3.0
Max. Sustained Transfer Rate OD (MB/s,MiB/s)	285/272	285/272	285/272	285/272
Random Read/Write 4K QD16 WCD (IOPS)	168/550	168/550	168/550	168/550
Average Latency (ms)	4.16ms	4.16ms	4.16ms	4.16ms
Interface Ports	Dual	Dual	Dual	Dual
Rotation Vibration @ 20-1500 Hz (rad/sec^2)	12.5	12.5	12.5	12.5
POWER				
Idle A (W) Average	6.5	6.5	6.5	6.5
Max Operating, Random Read/Write 4K/16Q (W)	9.8, 8.2	9.8, 8.2	9.8, 8.2	9.8, 8.2
Power Supply Requirements	+12V and +5V	+12V and +5V	+12V and +5V	+12V and +5V
ENVIRONMENTAL				
Temperature, Operating (°C)	10°C – 60°C	10°C – 60°C	10°C – 60°C	10°C – 60°C
Vibration, Nonoperating: 2 to 500Hz (Grms)	2.27	2.27	2.27	2.27
Shock, Operating 2ms (Read/Write) (Gs)	40Gs	40Gs	40Gs	40Gs
Shock, Nonoperating 2ms (Gs)	200	200	200	200
PHYSICAL				
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