



# WD Caviar® Black™

## Desktop Hard Drives

WD Caviar Black drives combine a high performance electronics architecture with a rock solid mechanical architecture to deliver the perfect storage solution for your fully-loaded PC or maxed out gaming machine. Cool drive operation, no-touch head technology, leading-edge vibration protection ensure enhanced reliability.



### INTERFACE

SATA 6 Gb/s  
SATA 3 Gb/s

### WIDTH/HEIGHT

3.5-inch/1-inch

### ROTATIONAL SPEED

7200 RPM

### CAPACITIES

500 GB to 2 TB

### MODEL NUMBERS

WD2002FAEX	WD1002FAEX	WD6402AAEX
WD2001FASS	WD1001FALS	WD6401AALS
WD1502FAEX	WD7502AAEX	WD5002AALX
WD1501FASS	WD7501AALS	WD5001AALS

Note: Not all products may be available in all regions of the world.

## Product Features

### Rock Solid Mechanical Architecture

#### • Dual actuator technology

A head positioning system with two actuators that improves positional accuracy over the data track(s). The primary actuator provides coarse displacement using conventional electromagnetic actuator principles. The secondary actuator uses a piezoelectric motor to fine tune the head positioning to a higher degree of accuracy. (2 TB and 1.5 TB models only)

• **StableTrac™** — The motor shaft is secured at both ends to reduce system-induced vibration and stabilize platters for accurate tracking, during read and write operations. (2 TB and 1.5 TB models only)

#### • NoTouch™ ramp load technology

The recording head never touches the disk media ensuring significantly less wear to the recording head and media, as well as better drive protection in transit.

### High Performance Electronics Architecture

• **Dual processor** — Twice the processing power to maximize performance.  
• **Colossal cache** — Bigger, faster cache of up to 64 MB means faster performance.

### Massive Capacity

WD Caviar Black SATA drives are available in capacities up to 2 TB.

### Compatible

We perform tests on hundreds of systems and a multitude of platforms in our FIT Lab™ and Mobile Compatibility Lab to give our customers confidence that our drives will work in their systems.

### 5-year limited warranty

## Applications

- Power computing applications such as multimedia, video and photo editing, and maxed out gaming computers.
- Desktop / Consumer RAID Environments - WD Caviar Black Hard Drives are tested and recommended for use in consumer-type RAID applications (RAID-0 / RAID-1).
  - Business Critical RAID Environments – WD Caviar Black Hard Drives are not recommended for and are not warranted for use in RAID environments utilizing Enterprise HBAs and/or expanders and in multi-bay chassis, as they are not designed for, nor tested in, these specific types of RAID applications. For all Business Critical RAID applications, please consider WD's Enterprise Hard Drives that are specifically designed with RAID-specific, time-limited error recovery (TLER), are tested extensively in 24x7 RAID applications, and include features like enhanced RAFF technology and thermal extended burn-in testing.

PUT YOUR LIFE ON IT®



# WD Caviar Black

Specifications <sup>1</sup>	2 TB	2 TB	1.5 TB	1.5 TB	1 TB	1 TB
Model number	WD2002FAEX	WD2001FASS	WD1502FAEX	WD1501FASS	WD1002FAEX	WD1001FALS
Interface	SATA 6 Gb/s	SATA 3 Gb/s	SATA 6 Gb/s	SATA 3 Gb/s	SATA 6 Gb/s	SATA 3 Gb/s
Formatted capacity	2,000,398 MB	2,000,398 MB	1,500,301 MB	1,500,301 MB	1,000,204 MB	1,000,204 MB
User sectors per drive	3,907,029,168	3,907,029,168	2,930,277,168	2,930,277,168	1,953,525,169	1,953,525,169
SATA latching connector	Yes	Yes	Yes	Yes	Yes	Yes
Form factor	3.5-inch	3.5-inch	3.5-inch	3.5-inch	3.5-inch	3.5-inch
RoHS compliant <sup>2</sup>	Yes	Yes	Yes	Yes	Yes	Yes
<b>Performance</b>						
Data transfer rate (max)						
Buffer to host	6 Gb/s	3 Gb/s	6 Gb/s	3 Gb/s	6 Gb/s	3 Gb/s
Host to/from drive (sustained)	138 MB/s	138 MB/s	138 MB/s	138 MB/s	126 MB/s	126 MB/s
Cache (MB)	64	64	64	64	64	32
Average latency (ms)	4.2	4.2	4.2	4.2	4.2	4.2
Rotational speed (RPM)	7200	7200	7200	7200	7200	7200
Average drive ready time (sec)	21	21	21	21	11	11
<b>Reliability/Data Integrity</b>						
Load/unload cycles <sup>3</sup>	300,000	300,000	300,000	300,000	300,000	300,000
Non-recoverable read errors per bits read	<1 in 10 <sup>14</sup>	<1 in 10 <sup>14</sup>	<1 in 10 <sup>14</sup>	<1 in 10 <sup>14</sup>	<1 in 10 <sup>14</sup>	<1 in 10 <sup>14</sup>
Limited warranty (years) <sup>4</sup>	5	5	5	5	5	5
<b>Power Management</b>						
Average power requirements (W)						
Read/Write	10.7	10.7	10.7	10.7	6.8	6.8
Idle	8.2	8.2	8.2	8.2	6.1	6.1
Standby	1.3	1.3	1.3	1.3	0.7	0.7
Sleep	1.3	1.3	1.3	1.3	0.7	0.7
<b>Environmental Specifications<sup>5</sup></b>						
Temperature (°C)						
Operating	0 to 60	0 to 60	0 to 60	0 to 60	0 to 60	0 to 60
Non-operating	-40 to 70	-40 to 70	-40 to 70	-40 to 70	-40 to 70	-40 to 70
Shock (Gs)						
Operating (2 ms, read)	30	30	30	30	30	30
Operating (2 ms, read/write)	65	65	65	65	65	65
Non-operating (2 ms)	300	300	300	300	300	300
Average acoustics (dBA) <sup>6</sup>						
Idle mode	29	29	29	29	28	28
Performance seek mode	34	34	34	34	33	33
Quiet seek mode	30	30	30	30	29	29
<b>Physical Dimensions</b>						
Height (in./mm, max)	1.028/25.4	1.028/25.4	1.028/25.4	1.028/25.4	1.028/25.4	1.028/25.4
Length (in./mm, max)	5.787/147	5.787/147	5.787/147	5.787/147	5.787/147	5.787/147
Width (in./mm, ± .01 in.)	4/101.6	4/101.6	4/101.6	4/101.6	4/101.6	4/101.6
Weight (lb./kg, ± 10%)	1.66/0.75	1.66/0.75	1.66/0.75	1.66/0.75	1.52/0.69	1.52/0.69

<sup>1</sup>As used for storage capacity, one megabyte (MB) = one million bytes, one gigabyte (GB) = one billion bytes, and one terabyte (TB) = one trillion bytes. Total accessible capacity varies depending on operating environment. As used for buffer or cache, one megabyte (MB) = 1,048,576 bytes. As used for transfer rate or interface, megabyte per second (MB/s) = one million bytes per second, and gigabit per second (Gb/s) = one billion bits per second. Effective maximum SATA 3 Gb/s and SATA 6 Gb/s transfer rates calculated according to the Serial ATA specification published by the SATA-IO organization as of the date of this specification sheet. Visit [www.sata-io.org](http://www.sata-io.org) for details.

<sup>2</sup>WD hard drive products manufactured and sold worldwide after June 1, 2006, meet or exceed Restriction of Hazardous Substances (RoHS) compliance requirements as mandated by the European Union for electrical and electronic products. The RoHS Directive 2002/95/EC of the European Parliament, which is effective in the EU beginning July 1, 2006, aims to protect human health and the environment by restricting the use of certain hazardous substances in new equipment, and consists of restrictions on lead, mercury, cadmium, and other substances.

<sup>3</sup>Controlled unload at ambient condition

<sup>4</sup>The term of the limited warranty may vary by region. Visit <http://support.wdc.com/warranty> for details.

<sup>5</sup>No non-recoverable errors during operating tests or after non-operating tests.

<sup>6</sup>Sound power level.



# WD Caviar Black

Specifications <sup>1</sup>	750 GB	750 GB	640 GB	640 GB	500 GB	500 GB
Model number	WD7502AAEX	WD7501AALS	WD6402AAEX	WD6401AALS	WD5002AALX	WD5001AALS
Interface	SATA 6 Gb/s	SATA 3 Gb/s	SATA 6 Gb/s	SATA 3 Gb/s	SATA 6 Gb/s	SATA 3 Gb/s
Formatted capacity	750,156 MB	750,156 MB	640,135 MB	640,135 MB	500,107 MB	500,107 MB
User sectors per drive	1,465,149,168	1,465,149,168	1,250,263,728	1,250,263,728	976,773,168	976,773,168
SATA latching connector	Yes	Yes	Yes	Yes	Yes	Yes
Form factor	3.5-inch	3.5-inch	3.5-inch	3.5-inch	3.5-inch	3.5-inch
RoHS compliant <sup>2</sup>	Yes	Yes	Yes	Yes	Yes	Yes
<b>Performance</b>						
Data transfer rate (max)						
Buffer to host	6 Gb/s	3 Gb/s	6 Gb/s	3 Gb/s	6 Gb/s	3 Gb/s
Host to/from drive (sustained)	126 MB/s	126 MB/s	126 MB/s	126 MB/s	126 MB/s	126 MB/s
Cache (MB)	64	32	64	32	32	32
Average latency (ms)	4.2	4.2	4.2	4.2	4.2	4.2
Rotational speed (RPM)	7200	7200	7200	7200	7200	7200
Average drive ready time (sec)	11	11	11	11	8.5	8.5
<b>Reliability/Data Integrity</b>						
Load/unload cycles <sup>3</sup>	300,000	300,000	300,000	300,000	300,000	300,000
Non-recoverable read errors per bits read	<1 in 10 <sup>14</sup>	<1 in 10 <sup>14</sup>	<1 in 10 <sup>14</sup>	<1 in 10 <sup>14</sup>	<1 in 10 <sup>14</sup>	<1 in 10 <sup>14</sup>
Limited warranty (years) <sup>4</sup>	5	5	5	5	5	5
<b>Power Management</b>						
Average power requirements (W)						
Read/Write	6.8	6.8	6.8	6.8	6.0	6.0
Idle	6.1	6.1	6.1	6.1	5.6	5.6
Standby	0.7	0.7	0.7	0.7	0.9	0.9
Sleep	0.7	0.7	0.7	0.7	0.9	0.9
<b>Environmental Specifications<sup>5</sup></b>						
Temperature (°C)						
Operating	0 to 60	0 to 60	0 to 60	0 to 60	0 to 60	0 to 60
Non-operating	-40 to 70	-40 to 70	-40 to 70	-40 to 70	-40 to 70	-40 to 70
Shock (Gs)						
Operating (2 ms, read)	30	30	30	30	30	30
Operating (2 ms, read/write)	65	65	65	65	65	65
Non-operating (2 ms)	300	300	300	300	350	350
Average acoustics (dBA) <sup>6</sup>						
Idle mode	28	28	28	28	29	29
Performance seek mode	33	33	33	33	30	30
Quiet seek mode	29	29	29	29	26	26
<b>Physical Dimensions</b>						
Height (in./mm, max)	1.028/25.4	1.028/25.4	1.028/25.4	1.028/25.4	1.028/25.4	1.028/25.4
Length (in./mm, max)	5.787/147	5.787/147	5.787/147	5.787/147	5.787/147	5.787/147
Width (in./mm, ± .01 in.)	4/101.6	4/101.6	4/101.6	4/101.6	4/101.6	4/101.6
Weight (lb./kg, ± 10%)	1.52/0.69	1.52/0.69	1.52/0.69	1.52/0.69	0.97/0.44	0.97/0.44

<sup>1</sup>As used for storage capacity, one megabyte (MB) = one million bytes, one gigabyte (GB) = one billion bytes, and one terabyte (TB) = one trillion bytes. Total accessible capacity varies depending on operating environment. As used for buffer or cache, one megabyte (MB) = 1,048,576 bytes. As used for transfer rate or interface, megabyte per second (MB/s) = one million bytes per second, and gigabit per second (Gb/s) = one billion bits per second. Effective maximum SATA 3 Gb/s and SATA 6 Gb/s transfer rates calculated according to the Serial ATA specification published by the SATA-IO organization as of the date of this specification sheet. Visit [www.sata-io.org](http://www.sata-io.org) for details.

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<sup>6</sup>Sound power level.

WD Caviar Black is part of WD's complete lineup of desktop hard drives.



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