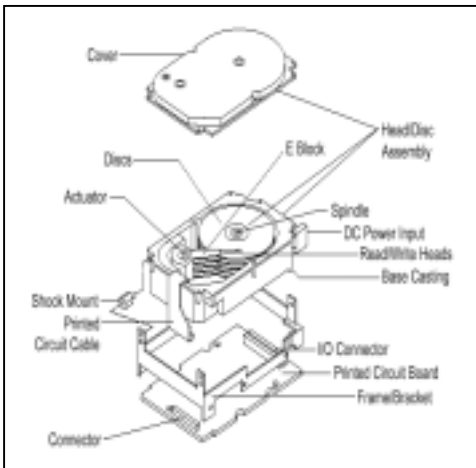
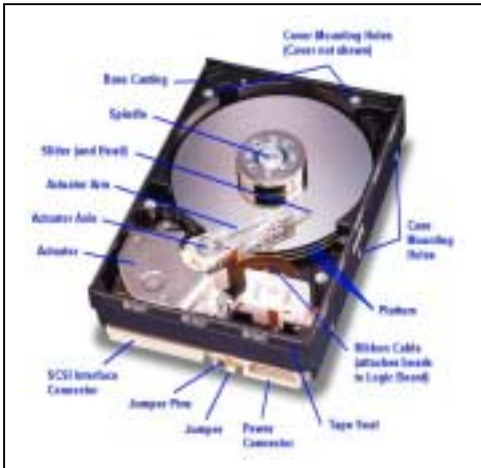




Microcontamination Testing Services

Cleanliness Test For Disk Drive Parts

DESCRIPTION OF THE PARTS THAT ARE FOUND IN HARD DISK DRIVE



Base Casting - The main component of the disk drive, to which all of the other components are directly or indirectly attached.

Crash Stops - A small plastic part, sometimes containing a magnet and/or an elastomeric bumper, used to restrain the HSA from moving beyond the I.D. and O.D. boundaries of the prescribed travel.

Filters - Typically up to four types can be found in an HDD. Recirculation filters are found in the air flow path, created by the spinning motion of the media, and are designed to filter out particles which become airborne during the operation of the drive. Breather filters are located on the cover or base casting and are designed to allow for pressure equalization in the drive, without the introduction of particulate contamination. A third type of filter is an organic adsorption filter which is used to prevent organic vapors or reactive gases from entering the drive or condensing on the media or sliders within the drive.

Gaskets - Gaskets can take the form of standard O-rings, custom elastomeric rings or other shapes as well as custom foam die cuttings. They are typically used to seal around and between components such as motors to base castings or covers to base castings.

HGA - Head Gimbal Assembly, a sub-assembly including: trace suspensions and/or metallic suspensions and sliders. **HSA** - Head Stack Assembly, a complete assembly including: a comb or suspensions or trace suspensions; pivot or bearing assembly; actuator/coil; sliders; amplifier module; flex cable and connector.

Media - Magnetic recording disks consisting of several layers, an example of which is the following: an aluminum substrate, an electroless nickel layer, a chromium isolation layer, a Co-based magnetic layer, a carbon overcoat and a lubricant layer. **Motor** - Provides the hub for attachment of the media, spacers and top clamp as well as the armature and bearings to spin the media under the sliders at high rotational speeds.

Slider - A component made of ceramic, ferrite or other proprietary materials which contains the reading and writing elements (heads) which fly over the media spaced by the slider's air bearing surface (ABS).

Spacers - Rings made of aluminum, stainless steel (SS) or ceramic used to control the disk to disk spacing of the disk stack.

Suspension - The stainless steel stamping to which the slider and wire are mounted. In addition they provide the head spacing and preload to establish the proper flying height and attitude.

Tape Seals - An adhesive strip used to wrap around the perimeter of the HDD to seal the gap between the top cover and the base casting.

Top Clamps - Stainless steel or aluminum disk installed via interference pressing or screws attachment to hold the media and disk spacer rings in place on the motor hub. **Top Cover** - A stainless steel, aluminum, plastic or combination material which is used to cover the drive so that external particulate contamination is excluded.

VCM - Voice Coil Magnets, used in combination with the actuator coils to move the sliders radially across the media

TYPES AND SOURCES OF CONTAMINATION IN DISK DRIVES

Organic: Referring to all carbon-containing compounds except elemental C, simple binary compounds such as , CN, CO, CO₂, and excluding compounds such as metal cyanides, carbonyls, and carbonates. The simplest compounds include methane, formaldehyde and formic acid. For the disk drive industry, most organic compounds of interest contain a backbone of carbon atoms linked to each other, as well as to other atoms such as N, O, P, S, or Si. Attached to this backbone may be other atoms such as Cl, F, H, and O.

Inorganic: Not organic.

Ionic: Referring to compounds in which the binding is ionic, i.e. there is electron transfer; and when these compounds dissolve in water, they dissociate into ions -- electrically charged species.

Magnetic: Referring to a substance which in a magnetic field experiences a force, or which is itself the source of a magnetic field, e.g. iron, cobalt or nickel.

Phase: Physical state, i.e. gas, liquid, or solid.

Particulates: Small solid particles.

Vapor: A substance in the gas phase, which under standard conditions of 25°C and one atm. of pressure, exists predominantly as a liquid or solid.

NVR: Non-Volatile Residue, that portion of a residue which remains after a prescribed heating procedure.

Aerosol: "Air solution", a stable suspension in air of fine particles and/or droplets.

Phases/ Types (organic, inorganic, ionic, magnetic) & Sources

Particulates: humans, dust, abrasion products, evaporated aerosols, engine exhaust, manufacturing/process by-products.

Gases/vapors (corrosive or condensable): manufacturing/processing by-products, fossil fuel combustion, atmospheric photochemical processes, outgassing of drive components.

Liquids/droplets: spray from spinning drives/motors, condensation of outgas products and aerosols,hygroscopic particulates or corrosion products.

Aerosols: spray from machinery, hygroscopic particulates, industrial exhausts, and pneumatic machinery.

Kindly call us if you have further enquiry (Biological & Chemical Technology Division)

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