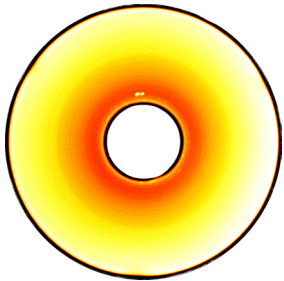
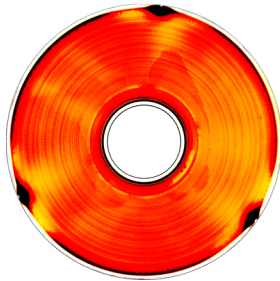


# Data Recovery from Seagate HDD

ST1000DM003 ST2000DM001 ST2000DL001 ST2000DL003 ST3000DM001

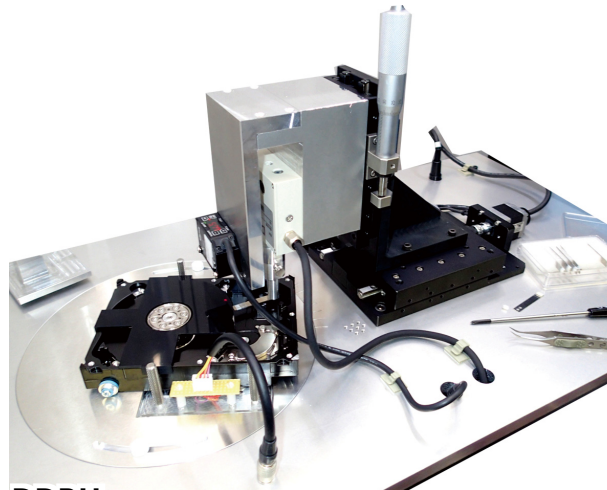


GOOD



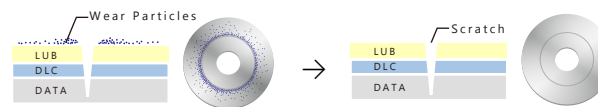
BAD

These two disks had been installed in one single HDD, ST3000DM001, which had 3 disks inside. These 2 inspection results, out of 6, are selected to see the difference of the lubricant layer state.



**DDRH** was first invented in 2014 for burnishing the surface of 3.5 inch magnetic data recording disks without taking them out of the spindle motor so that we can prevent the misalignment issue.

As shown on the left part of this brochure, we have figured out that the main cause of the recent Seagate HDD's malfunction may be the damaged surface of the internal magnetic data recording disk. This surface damage bothers the stable flying of the sliders which are located at the tip of head stack assembly.



The reason why simple HSA swap doesn't work for these products is that the data recording disk itself has the problem in many cases.

## For Critically Important Cases

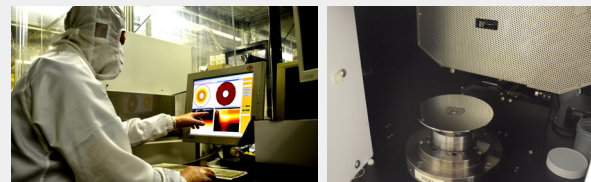
**Check Points and Visual Diagnosis** Turn off the clean bench light and carefully look at these points with flashlight. **MUST be operated by experienced data recovery engineer.**



Even if the abrasion powder is invisible but you keep receiving "FAIL servo" through the serial terminal after head swap, there is **GOOD CHANCE** for data.



In this case, perfect data recovery would be difficult ( but not always impossible). However, giving up is too early because data would be **PARTIALLY RECOVERABLE**.



Measurement of the Lubricant Layer thickness by Optical Surface Analyzer



Modified HSA for h0 & h5

Less chance for data recovery

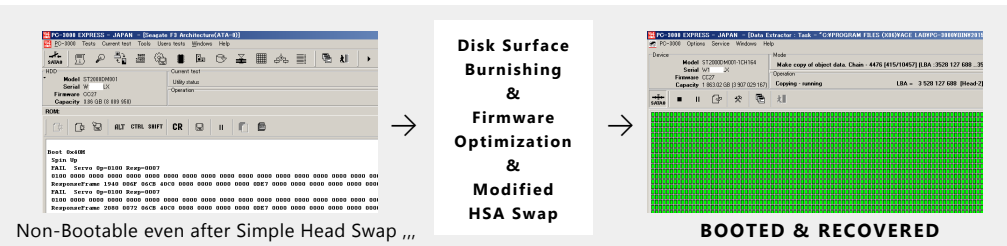
Spoken at International Conferences for Digital Forensics and Cybersecurity



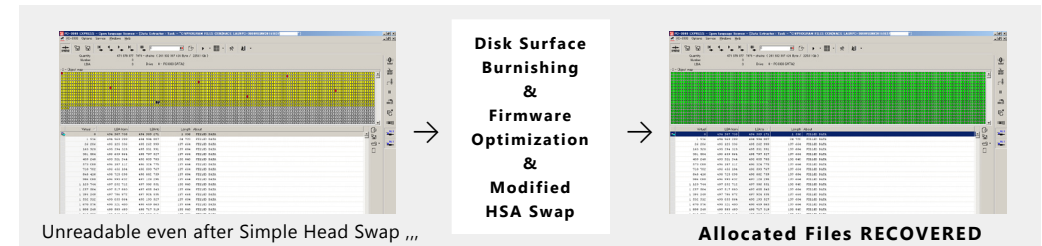
HTCIA 2016 LAS VEGAS, U.S.A.



CODE BLUE 2016 TOKYO, JAPAN



Successful Case I



Successful Case II

This High integrity Data Recovery ( HiDR ) would be useful for **critically important cases of data loss** and **digital forensics**. Please do NOT LOOSEN nor REMOVE the platter clamp before bringing the drive to us. Thank you for your cooperation.