

**LAB ANALYSIS REPORT**

<b>Company:</b>	<b>Date:</b> March 8, 2012
<b>Submitted by:</b> [Redacted]	<b>Report No.:</b> 12-0120A
<b>Ph.</b>	<b>P. O. No.:</b>
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**IDENTIFICATION**

**Vendor:** Micron Technologies / Reballer - Corfin  
**Part Number:** 00062608F / Reballer – 049999F-00  
**Description:** VFBGA90 – SDRAM 8Mx32 7.5ms  
**Quantity Received:** 3  
**Request No.:** MILA 852

**BACKGROUND INFORMATION**

Three devices have been re-balled. Perform Sonoscan analysis for delamination or other defects. Perform ball shear testing and SEM of sheared pads to characterize the separation(s). Perform electrical test at R/T and XRF to verify ball composition.

**SUMMARY OF ANALYSIS PROCESS** (Numbered in Order Completed)

<u>    </u> Electrical Test 25°C	<u>  6  </u> Detailed Internal/External Analysis
<u>  4  </u> Curve Tracer	<u>  3  </u> Scanning Electron Microscope (SEM)
<u>    </u> Bake and Retest 2 Hours at 180°C	<u>    </u> Energy Dispersive X-Ray (EDX) Analysis
<u>  5  </u> XRF	<u>  2  </u> Ball Shear
<u>    </u> Decapsulate <u>    </u> Mechanical <u>    </u> Chemical	<u>  1  </u> Sonoscan

**PREPARED BY:**

**REVIEWED BY:**

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## ANALYSIS

Sonoscan testing found no evidence of delamination, cracking or other defects. See Figures 1 – 8.

Ball shear testing results:

Sample	Min.kg	Max. kg	Ave. kg
Red Dot 1	0.52	0.88	0.62
Red Dot 2	0.50	0.63	0.56
Red Dot 3	0.56	0.76	0.62

SEM inspection of the sheared device pads and balls finds that all appear to be ductile separations and there were no apparent differences between inner and outer rows. See Figures 9 – 29.

Curve tracer analysis finds no opens or shorts and the junction characteristics are normal. XRF analysis finds that the re-balled ball contains lead (Pb). See Figure 30.

## CONCLUSION/COMMENTS

Sonoscan testing found no issues. Curve tracer analysis found no issues. The ball shear testing found the samples to be consistent and the SEM analysis indicated that all shear separations were ductile. XRF analysis confirms that the re-balled balls contain lead.

**Figure 1**

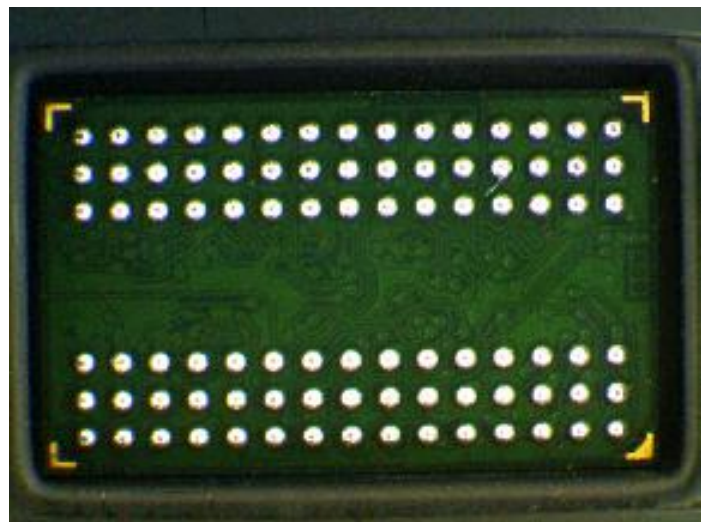
**Package Markings**

**All devices have the same markings**



**Figure 2**

**Package BGA Side**

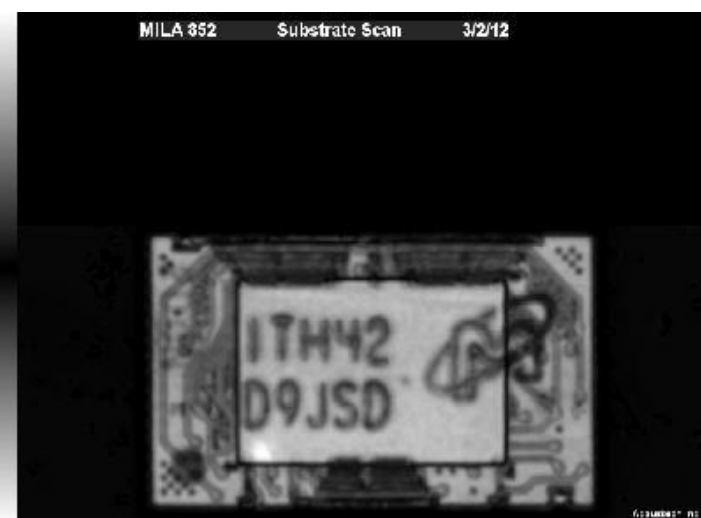


**Figure 3**

**Sonoscan**

**Red Dot 1**

**Substrate**



**Figure 4**  
**Sonoscan**  
**Red Dot 1**  
**Through Scan**



**Figure 5**  
**Sonoscan**  
**Red Dot 2**  
**Substrate**



**Figure 6**  
**Sonoscan**  
**Red Dot 2**  
**Through Scan**



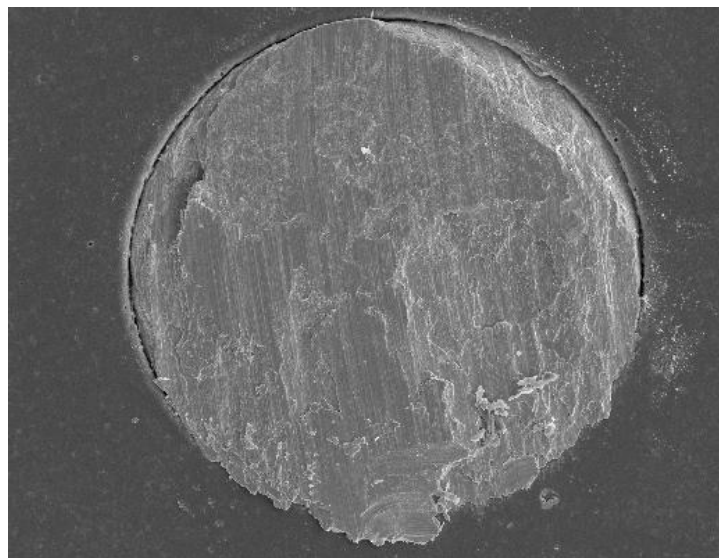
**Figure 7**  
**Sonoscan**  
**Red Dot 3**  
**Substrate**



**Figure 8**  
**Sonoscan**  
**Red Dot 3**  
**Through Scan**



**Figure 9**  
**Red Dot 1**  
**Inner Row**  
**200X**

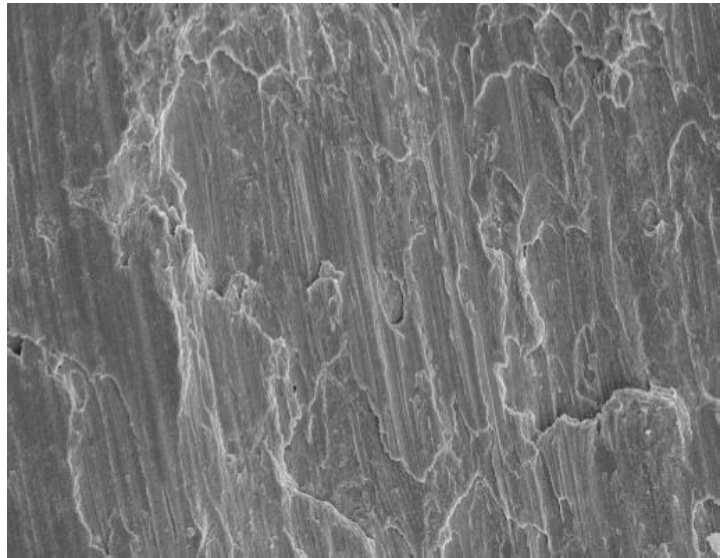


**Figure 10**

**Red Dot 1**

**Inner Row**

**1KX**

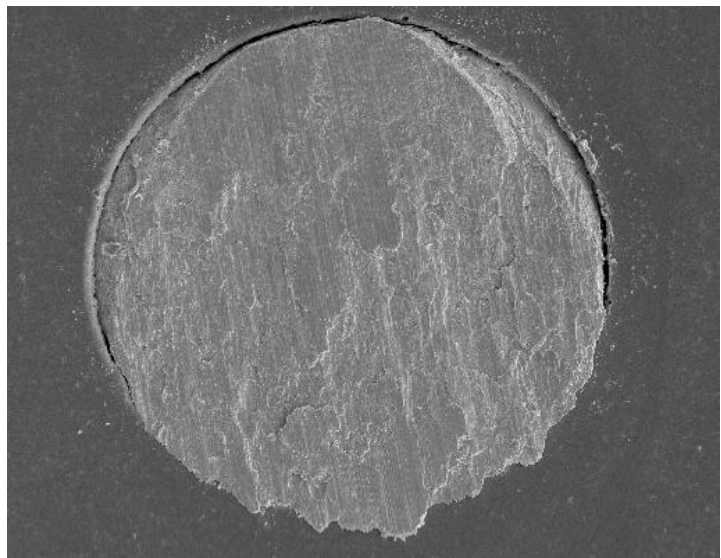


**Figure 11**

**Red Dot 1**

**Outer Row**

**200X**

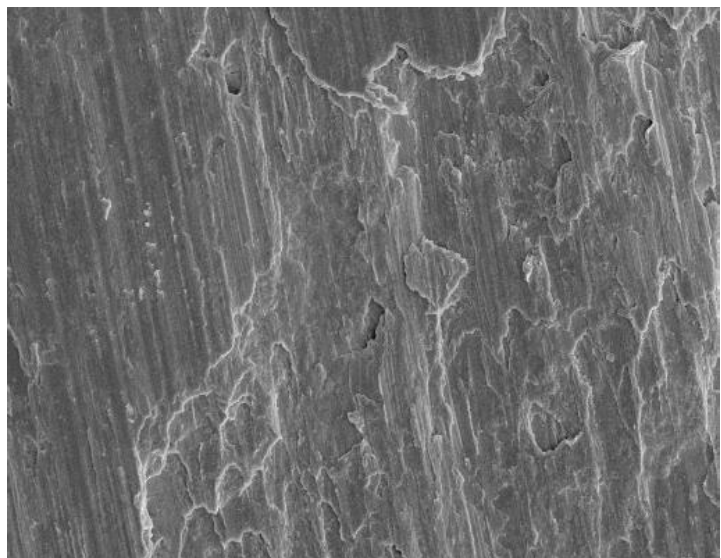


**Figure 12**

**Red Dot 1**

**Outer Row**

**1KX**

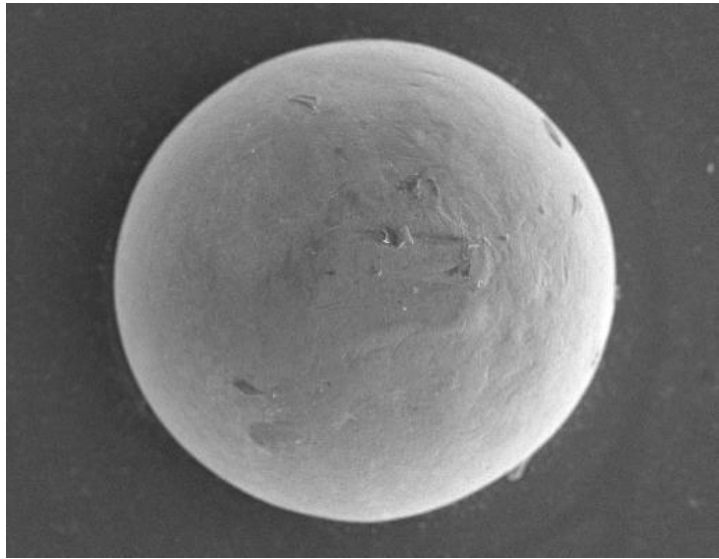


**Figure 13**

**Red Dot 1**

**Ball**

**180X**

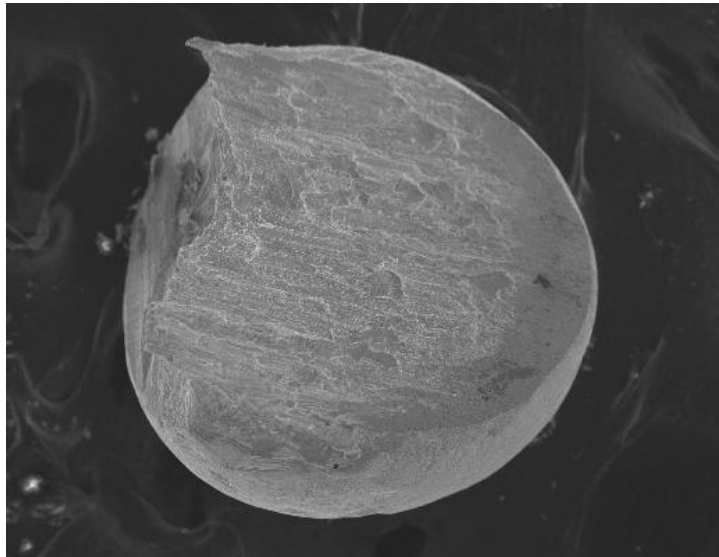


**Figure 14**

**Red Dot 1**

**Sheared Ball**

**180X**

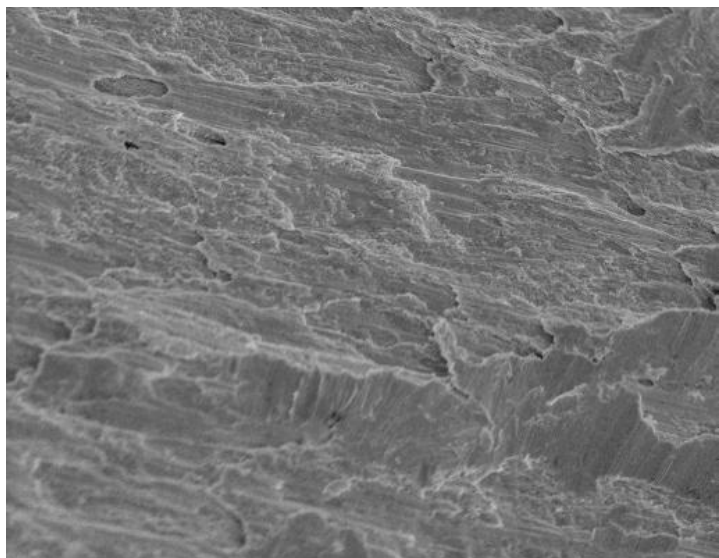


**Figure 15**

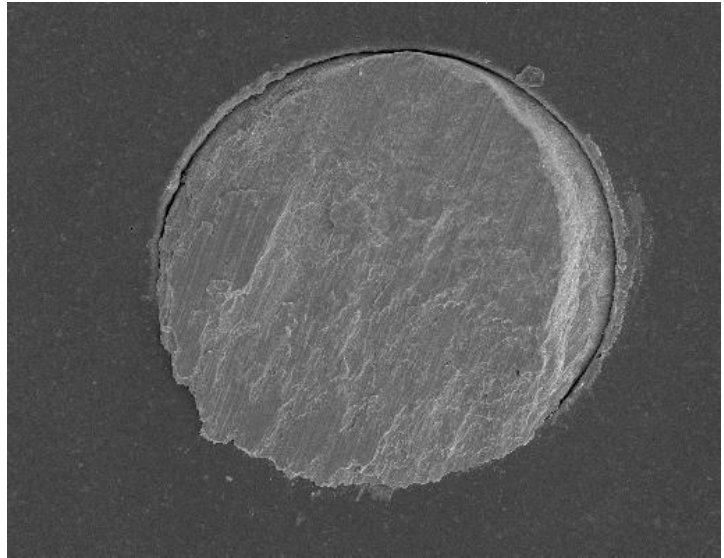
**Red Dot 1**

**Sheared Ball**

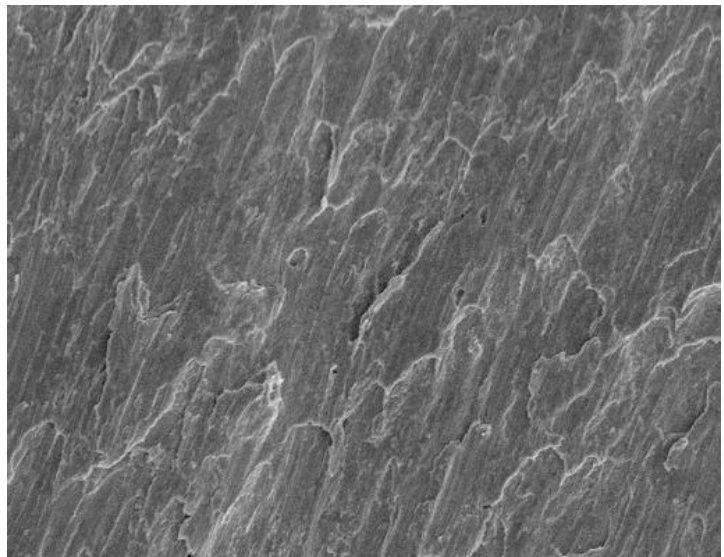
**1KX**



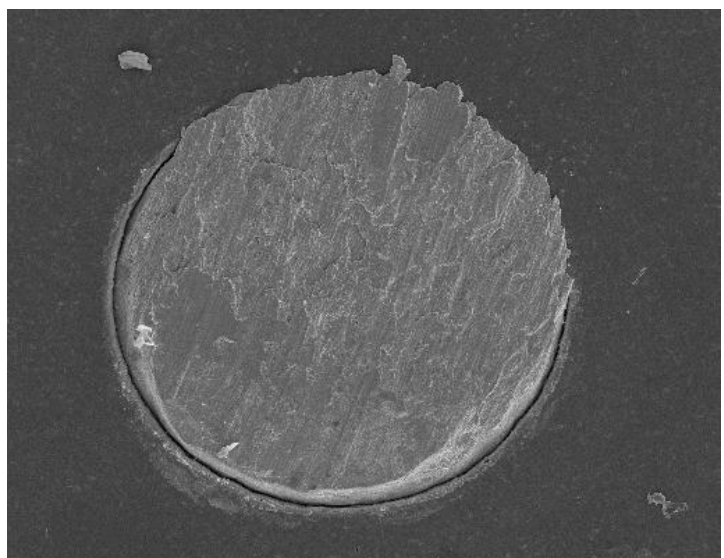
**Figure 16**  
**Red Dot 2**  
**Inner Row**  
**180X**



**Figure 17**  
**Red Dot 2**  
**Inner Row**  
**1KX**

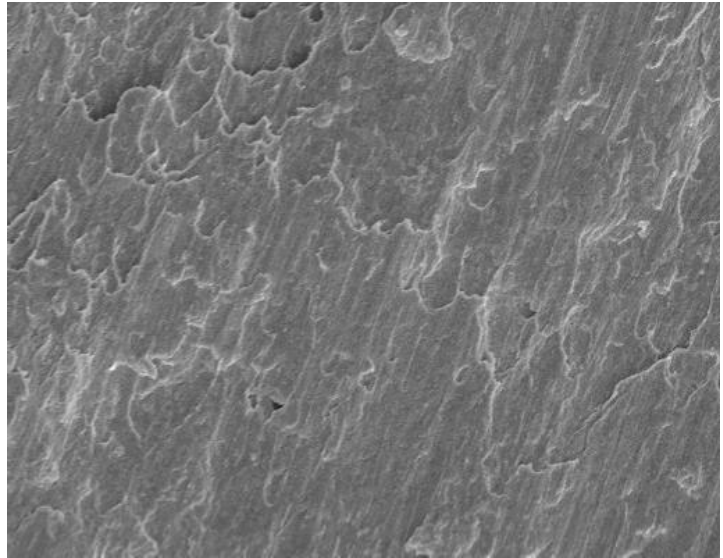


**Figure 18**  
**Red Dot 2**  
**Outer Row**  
**180X**

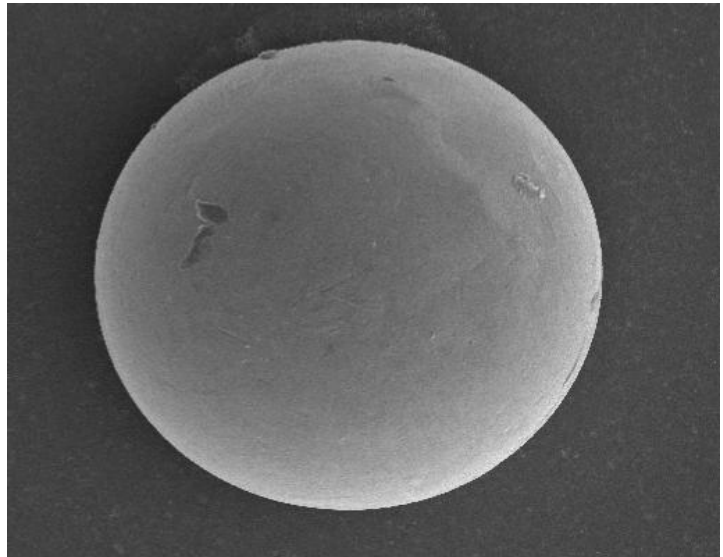




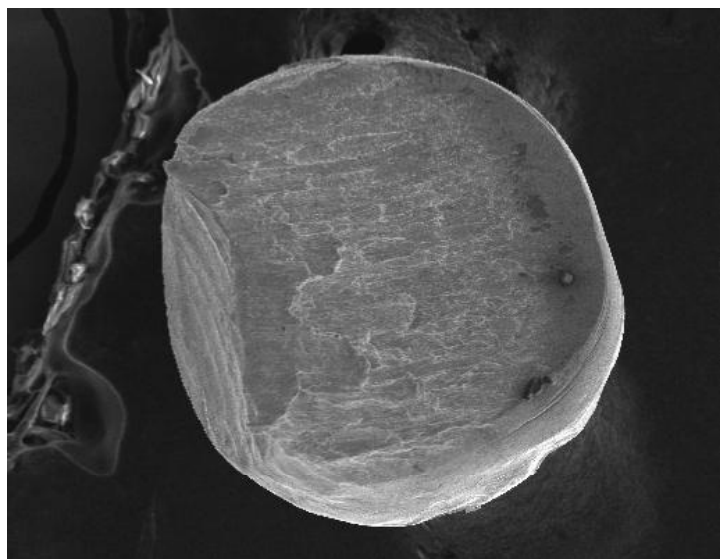
**Figure 19**  
**Red Dot 1**  
**Outer Row**  
**1KX**



**Figure 20**  
**Red Dot 2**  
**Ball**  
**180X**



**Figure 21**  
**Red Dot 2**  
**Sheared Ball**  
**180X**

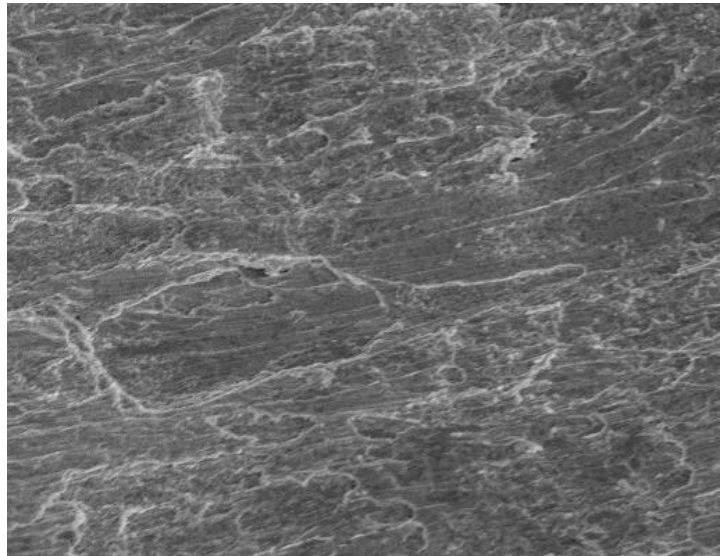


**Figure 22**

**Red Dot 2**

**Sheared Ball**

**1KX**

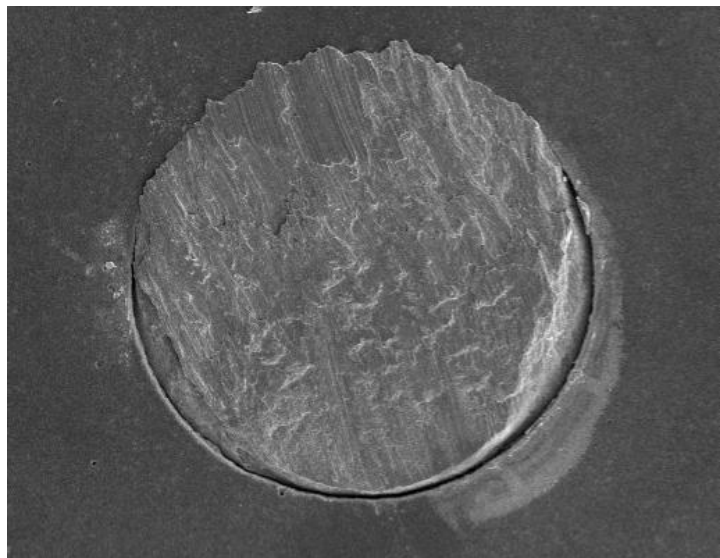


**Figure 23**

**Red Dot 3**

**Inner Row**

**180X**

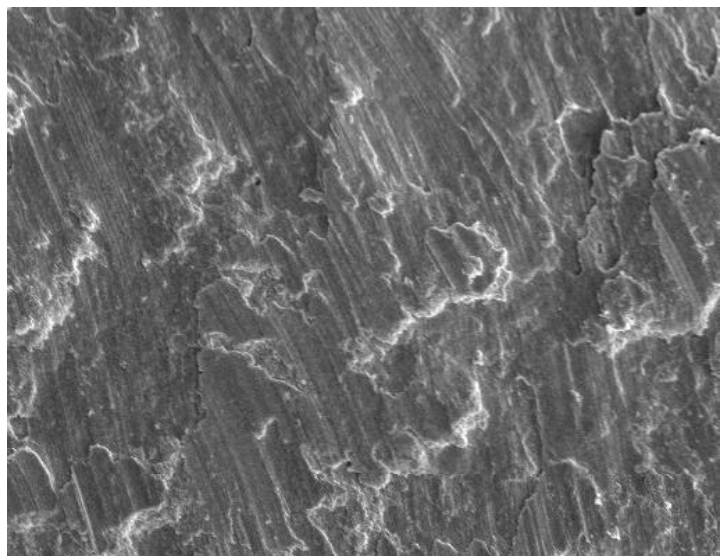


**Figure 24**

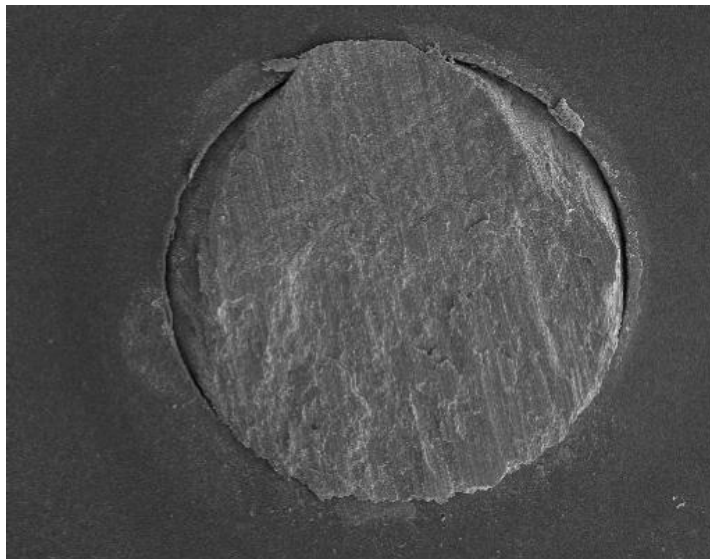
**Red Dot 3**

**Inner Row**

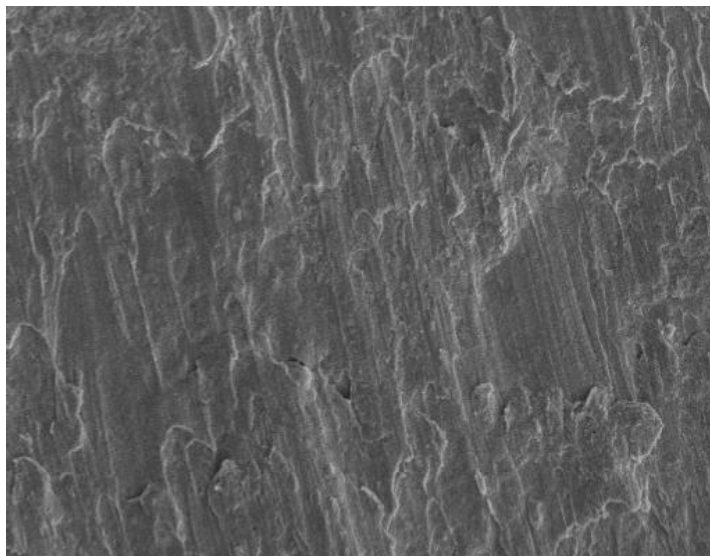
**1KX**



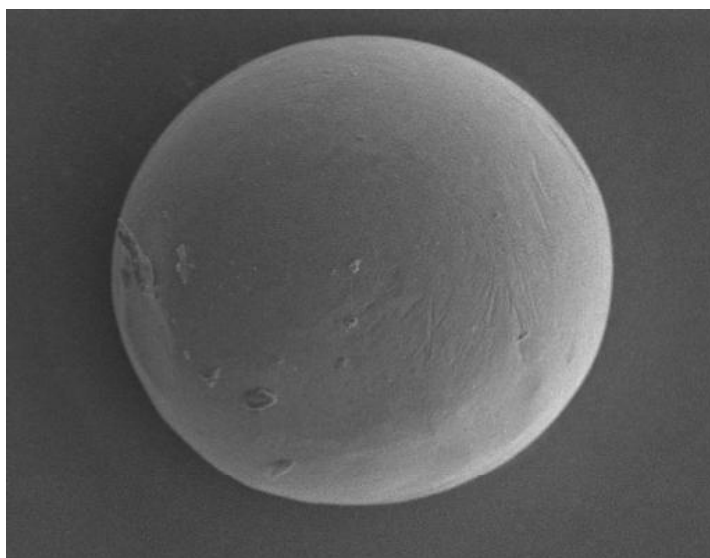
**Figure 25**  
**Red Dot 3**  
**Outer Row**  
**180X**



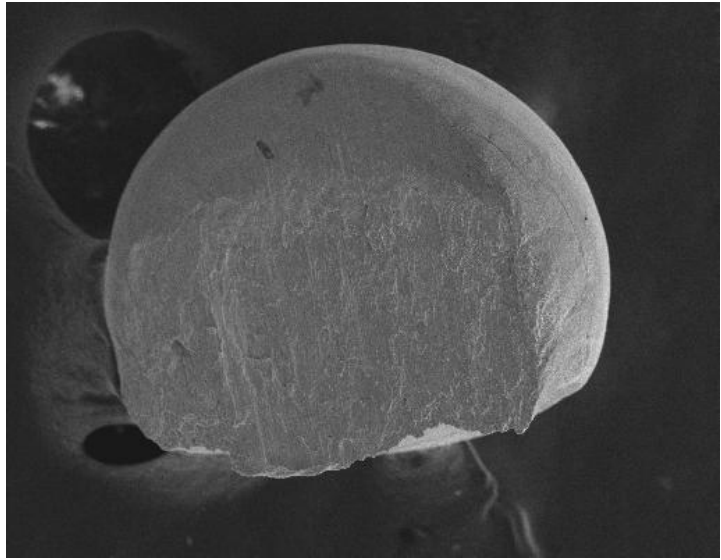
**Figure 26**  
**Red Dot 3**  
**Outer Row**  
**1KX**



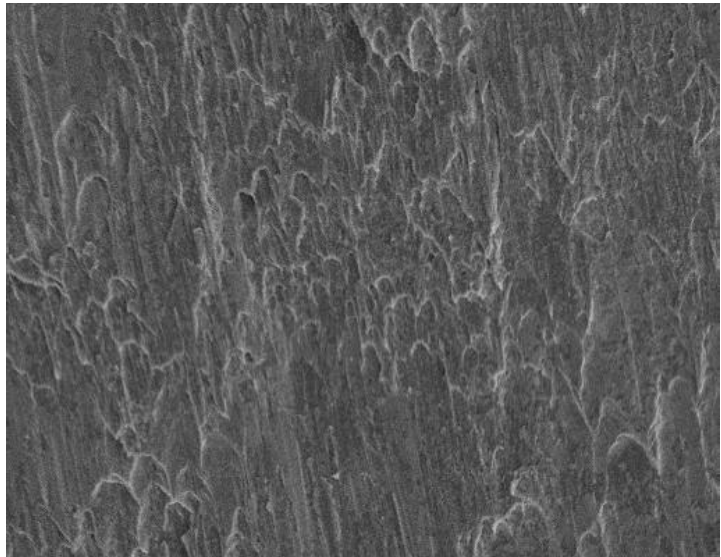
**Figure 27**  
**Red Dot 3**  
**Ball**  
**180X**



**Figure 28**  
**Red Dot 3**  
**Sheared Ball**  
**180X**



**Figure 29**  
**Red Dot 3**  
**Sheared Ball**  
**1KX**



**Figure 30**  
**XRF of Typical Ball**

