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October 26, 2026

William Haley
Sr. Project Engineer
Chiquita Canyon Landfill
29201 Henry Mayo Drive
Castaic, CA 91384

Subject: 2026 Carbon Media Vessel Evaluation Report – Supplemental Report, Chiquita Canyon Landfill

Dear Mr. Haley:

This supplemental report is submitted pursuant to Condition No. 3(b) of the Modified Stipulated Order for Abatement (SOFA) with the South Coast Air Quality Management District (SCAQMD) (Case No. 6177-4) and supplements SCS Engineers' (SCS) previously submitted report, dated July 17, 2026. The July 17 report documented SCS's broader investigation into the potential causes of the recent thermal events involving carbon media vessels used for treatment of hydrogen sulfide (H₂S) at Chiquita Canyon Landfill (Landfill/Site).

As part of the continued investigation, SCS reviewed the enclosed forensic engineering report prepared by 4X Forensic Engineering Laboratories, Inc. (4X), dated September 23, 2026, regarding the failure of the carbon media vessel number two within the vessel farm at the Landfill. The 4X evaluation included visual inspections, scanning electron microscopy (SEM), energy dispersive spectroscopy (EDS), Fourier Transform Infrared Spectroscopy (FTIR), and Oxidative Induction Time (OIT) testing of material samples collected from non-failed sections of the failed vessel (vessel number two) and sections of an adjacent vessel (vessel number three).

The purpose of the 4X evaluation was to assess whether carbon media vessel material degradation, manufacturing deficiencies, or other conditions contributed to the vessel number two failure previously identified at a repaired section of the vessel. The 4X forensic evaluation findings in the enclosed report constitute one component of the broader investigation and should be considered in conjunction with the observations, data, and conclusions documented in the July 17 report and prior investigations regarding the thermal event and carbon media vessel number two failure.

Summary of Findings

The forensic evaluation confirmed that the evaluated samples from vessel numbers two and three were constructed of glass-fiber reinforced epoxy, consistent with the design specifications and standard industry practice for carbon media systems. Material examination indicated good adhesion between fiberglass laminates and the epoxy matrix, with no evidence of significant manufacturing defects or material deficiencies.

Microscopic examination revealed oxidation of the epoxy material on the interior surfaces of both vessels, as evidenced by brown discoloration and visible oxidation layers. The oxidation in the failed vessel, vessel number two, extended substantially deeper than the adjacent vessel number three, indicating exposure to higher temperatures, to elevated temperatures over a longer period, or to a combination of both.

OIT testing further supported the presence of thermal degradation, with the failed vessel, vessel number two, exhibiting significantly lower oxidation resistance than the comparison vessel, vessel number three. However, FTIR analysis did not identify evidence of chemical degradation to the epoxy material. The sulfur-rich deposits observed on the interior surfaces of the vessels were determined to be consistent with expected operating conditions within a carbon media treatment system.

The report notes that the vessel number two failure was reported to have occurred at a previously repaired section of the vessel. While the evaluation confirmed increased oxidation within the failed vessel, it did not identify defects in the laminate construction, poor adhesion, or other material deficiencies that would indicate a manufacturing-related failure mechanism.

Relationship to Previous Investigation Findings

The findings of the 4X forensic evaluation are generally consistent with the observations documented in the previous investigation reports, which identified evidence of elevated temperatures and thermal impacts associated with the carbon media treatment process. The 4X evaluation provides additional confirmation that the failed vessel number two experienced measurable thermal degradation and oxidation over time.

Importantly, the laboratory testing of the evaluated samples did not identify material incompatibility, chemical degradation, or construction defects as the primary cause of the failure. Rather, the evidence supports the conclusion that prolonged exposure to elevated temperatures contributed to degradation of the epoxy material, with the failed vessel, vessel number two, exhibiting substantially greater thermal oxidation than the adjacent vessel, vessel number three.

Conclusions

Based on the forensic evaluation and previous investigation findings, SCS concludes the following:

1. The carbon media treatment vessels were constructed of glass-fiber reinforced epoxy consistent with the design specifications and standard industry practice.
2. No evidence of manufacturing defects, laminate separation, poor fiber adhesion, or material incompatibility was identified within the evaluated samples.
3. The failed vessel, vessel number two, exhibited substantially greater oxidation and thermal degradation than the adjacent vessel, vessel number three, indicating exposure to higher temperatures, to elevated temperatures over a longer period, or to a combination of both.
4. The observed degradation is consistent with thermal aging of the epoxy material and is not indicative of chemical degradation.
5. Elevated operating temperatures are considered to have been a significant contributing factor in the degradation observed within the failed vessel.

Accordingly, the 4X forensic evaluation further supports the evidence of elevated thermal conditions but does not establish a single definitive cause or failure mechanism. The preliminary conclusions set forth in SCS's July 17, 2026, report therefore remain unchanged.

If you have any questions regarding information contained in this submittal, please contact Vidhya Viswanathan at 858-524-9525 or Rachelle Huber at 925-789-5710.

Sincerely,



Rachelle Huber
Project Manager
SCS ENGINEERS



Srividhya Viswanathan, P.E.
Senior Vice President
SCS ENGINEERS

Enclosure(s): 4X Forensic Carbon Media Vessel Failure Engineering Analysis



4xForensic
ENGINEERING LABORATORIES, INC.

LABORATORY NUMBER: 260190A

ENGINEERING ANALYSIS REQUESTED BY:

**Rachelle Huber
SCS Engineers
4683 Chabot Drive, Suite 200
Pleasanton, CA 94588**

Reference: Waste Connections

Subject: H2S Tank Failure



September 23, 2026

Laboratory Number: 260190A

Subject: H2S Tank Failure

ENGINEERING ANALYSIS

INTRODUCTION

An analysis was initiated on July 2, 2026, regarding the failure of an H2S tank. The loss occurred at 29201 Henry Mayo Drive, Castaic, CA 91384. The analysis was continued on August 24, 2026, when additional samples of tanks 2 and 3 were delivered.

The analysis included visual and microscopic examinations with digital and dimensional documentations, Hirox digital imaging, scanning electron microscopic (SEM) examinations and energy dispersive spectroscopy (EDS) analyses, FTIR (Fourier Transform Infrared Spectroscopy) and OIT (Oxidative Induction Time) testing of the tanks. The objective was to determine if the tanks had degradation.

INSPECTION

One section of tank 3 and two sections of tank 2 were sectioned and submitted for evaluation, as shown in Figures 1, 2 and 3. The sections were labeled ST 3, ST 2L and ST 2R, as shown in Figures 4, 5 and 6. There were black residues on the inner surface of the all the tank sections, as shown in Figure 7. Samples of the black residues were removed from each tank section for further evaluation, as shown in Figure 8.



The inner surface of the tanks were power washed. The polymer surface of the inner surface of the tank section were brown in color, as shown in Figure 9. A piece of each tank section was removed and polished for evaluation, as shown in Figures 10 through 16. The tank thicknesses varied from 0.978 to 1.035 inches as follows:

- Tank 2L: 0.988 inches
- Tank 2R: 0.978 inches
- Tank 3: 1.035 inches

Scanning electron microscopy (SEM) analysis of tank 2L revealed a layer of degradation approximately 100 um deep, as shown in Figures 17 and 18. There was good adhesion of the laminate layers to each other and of the fibers to the matrix, as shown in Figures 19 , 20 and 21.

SEM analysis of tank 2R revealed a layer of degradation approximately 70 um deep, as shown in Figures 22 and 23. There was good adhesion of the laminate layers to each other and of the fibers to the matrix, as shown in Figures 24, 25 and 26.

SEM analysis of tank 3 revealed a layer of degradation approximately 200 um deep, as shown in Figures 27 and 28. There was good adhesion of the laminate layers to each other and of the fibers to the matrix, as shown in Figures 29, 30 and 31. The glass fibers were approximately 10 -14 um in all the samples.

Energy dispersive x-ray spectroscopy (EDS) confirmed the fibers from each tank section were primarily silicon consistent with being glass fibers, as shown in Figures 32, 33 and 34. EDS analysis of the black residues from each tank sample



revealed high concentrations of carbon and sulfur, as shown in Figures 35, 36 and 37.

Both tank materials were identified as epoxy. The OIT testing revealed very short oxidation times for tank 2 and much longer OIT times for tank 3 as shown below and in the Appendix:

Sample	Inner Surface (1)	Outer Surface
2 (Failed Tank)	1.48	6.77
3 Right	3.82	8.08
3 Left	5.41	10.15

1. Time in minutes.

DISCUSSION

A review of the tank drawing revealed that the tank was to be glass-fiber reinforced. The evaluation confirmed that the tanks were made with glass-fiber reinforced epoxy which is the industry standard. The epoxy had been oxidized on the inner surface consistent with being exposed to high temperatures.

It was reported that the tanks had been misidentified. The sample identified as tank 3 was actually tank 2 (the failed tank) and the two samples identified as tank 2 were actually from tank 3. A review of SEM images revealed that tank 2 (the failed tank) had about twice the depth of oxidation as the tank 3 consistent with either being exposed to higher temperatures/longer times or both. The fiber glass layers of both tanks had good adhesion to the substrate with no obvious defects except some porosity which would be expected.



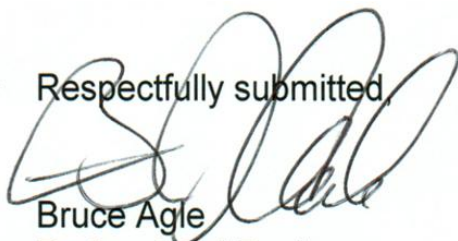
The brown coloration on the inner surface of the tank suggests oxidation from elevated temperatures. The OIT tests confirmed that. No chemical degradation was noted to the tank material.

The residues on the inner surface of the tank had carbon and sulfur concentrations, which would be expected in a H₂S tank where sulfur is being converted from H₂S to sulfur.

CONCLUSIONS

Tank 2 in the H₂S tank farm had failed. The failure was reported to be at an area of the tank that had been previously repaired. The analysis of non-failed sections of tank 2 and sections of tank 3 revealed good adhesion of the glass fibers to the epoxy matrix and oxidation of the surface of the epoxy consistent with long-term exposure to elevated temperatures. The tank 3 had significantly less oxidation than tank 2 consistent with tank 2 either being exposed to higher temperatures, similar temperature for longer times, or both.

Respectfully submitted,



Bruce Agle
Professional Engineer
California No. MT1862

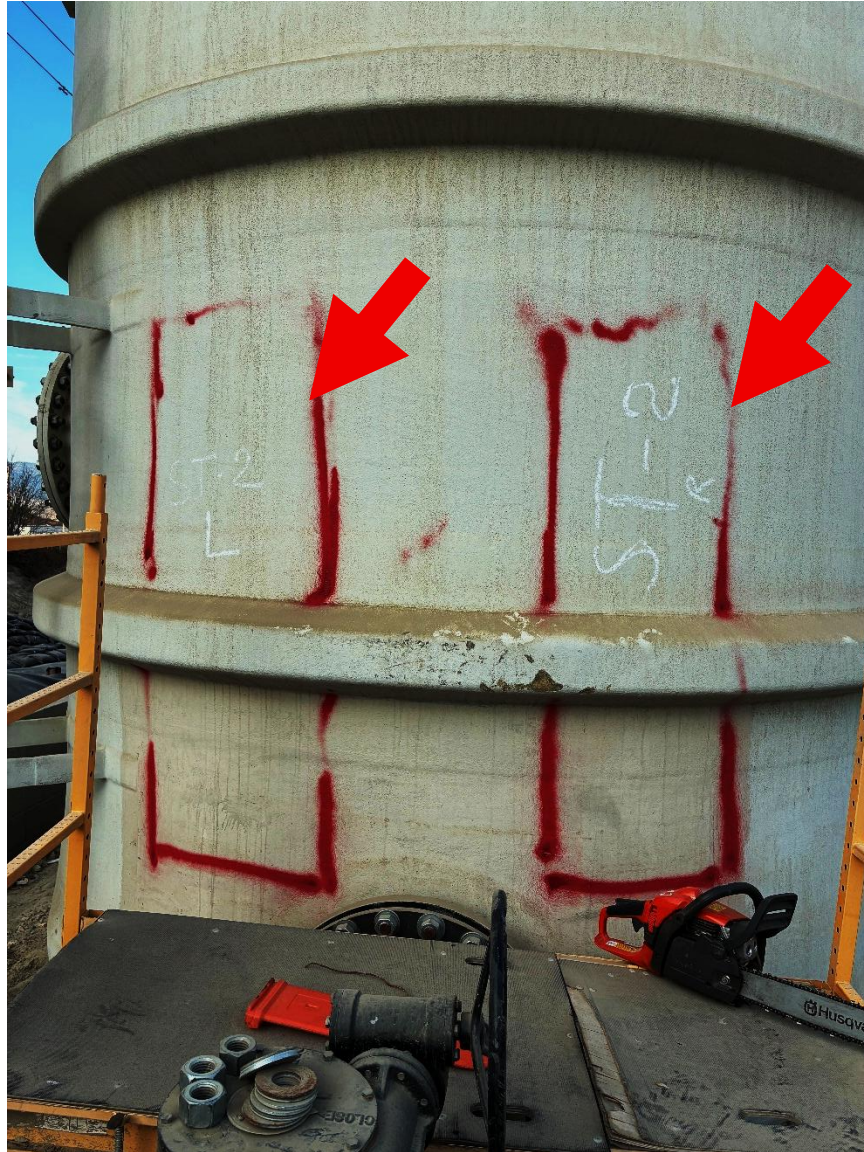


Figure 1



Figure 2



Figure 3



Figure 4

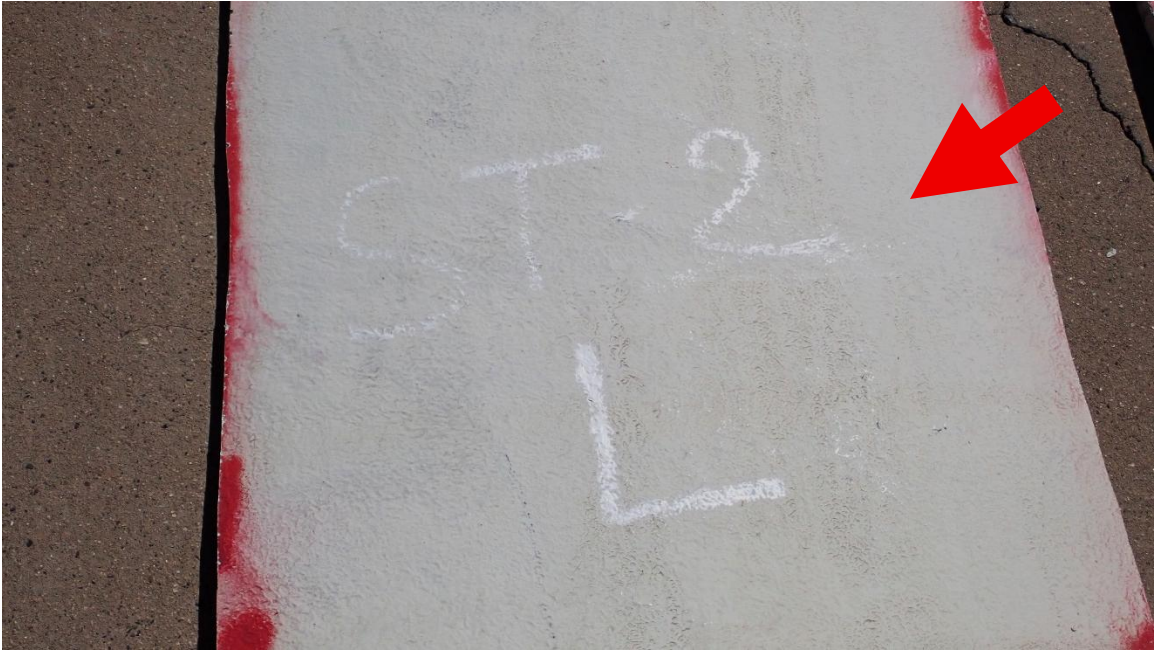


Figure 5



Figure 6



Figure 7



Figure 8



Figure 9



Figure 10

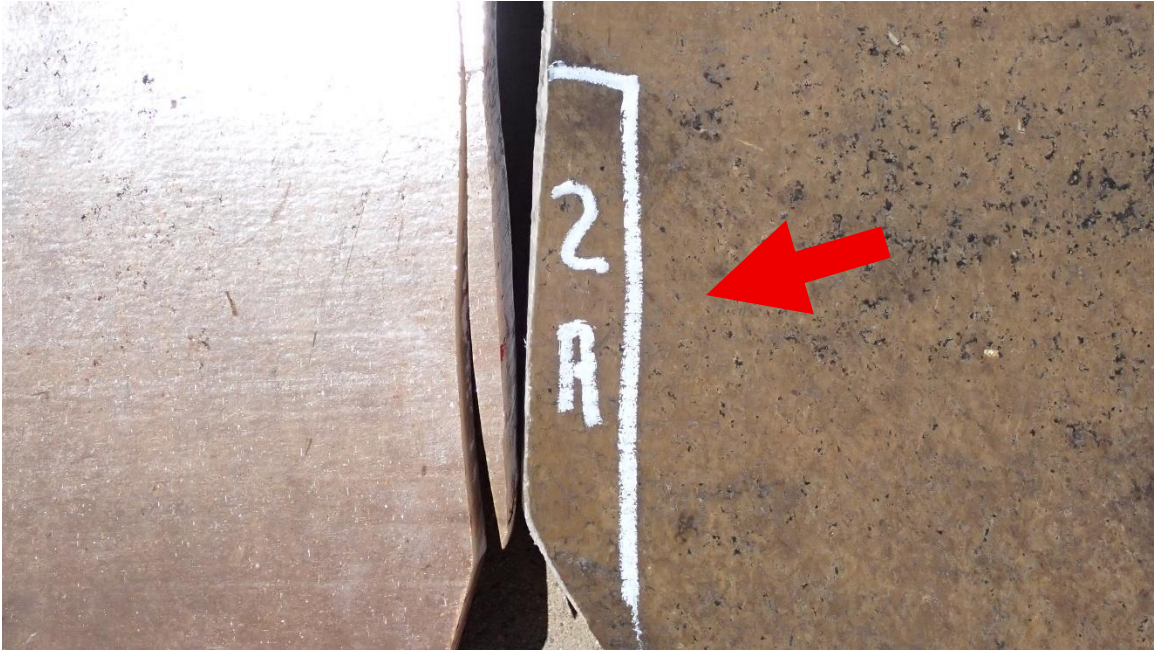


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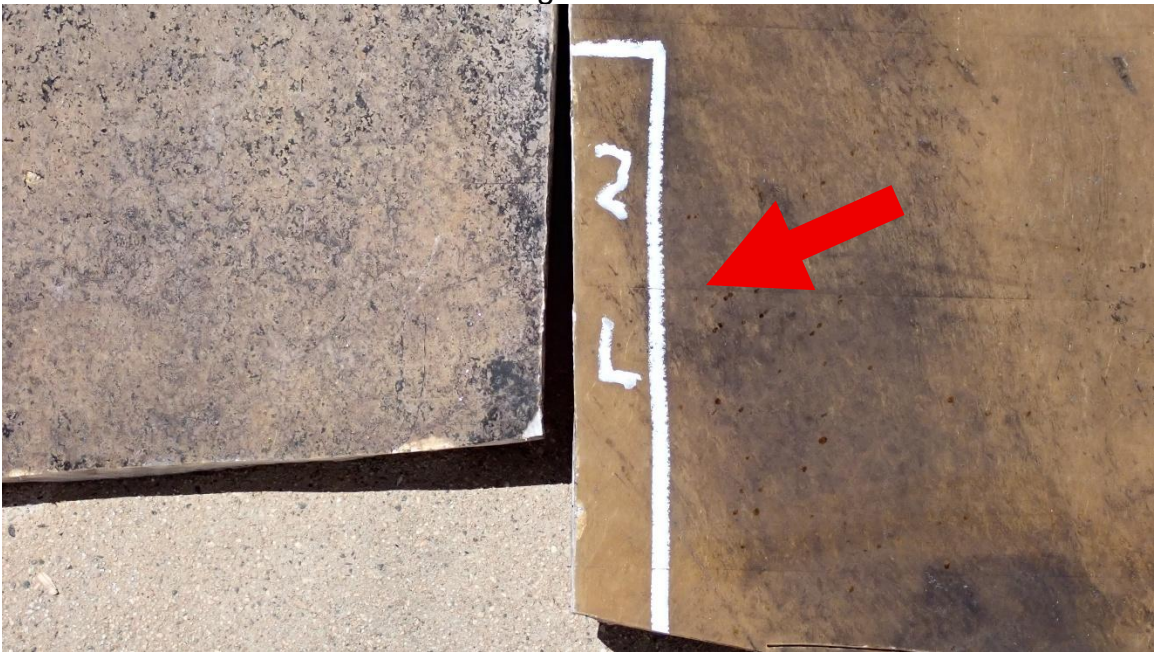


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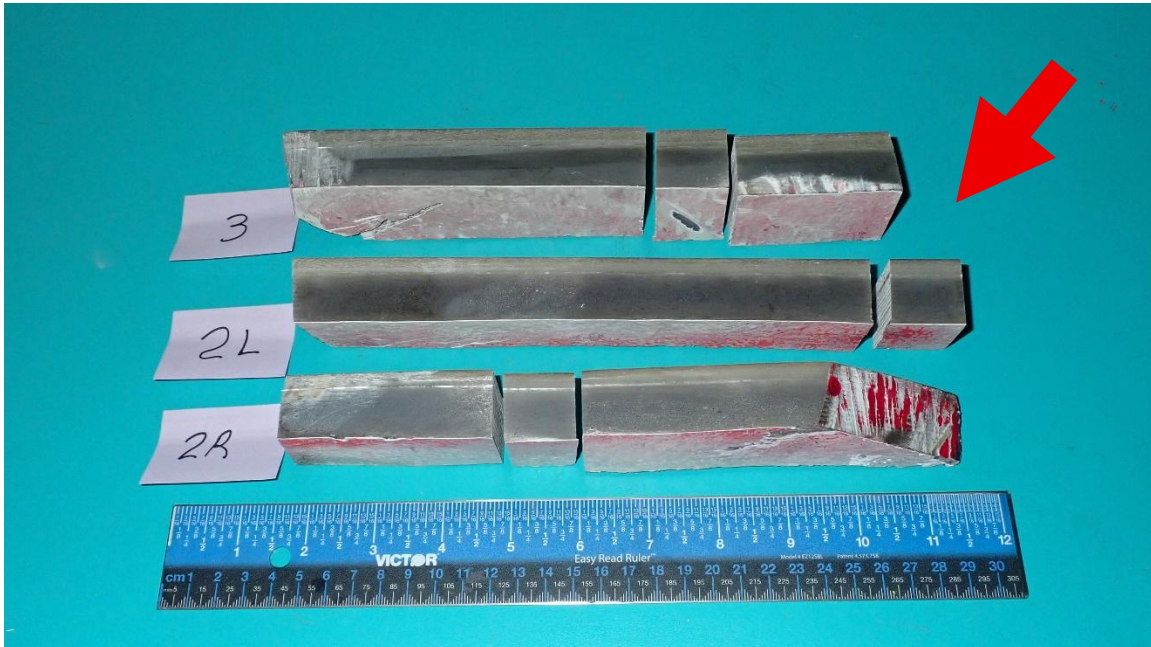


Figure 13

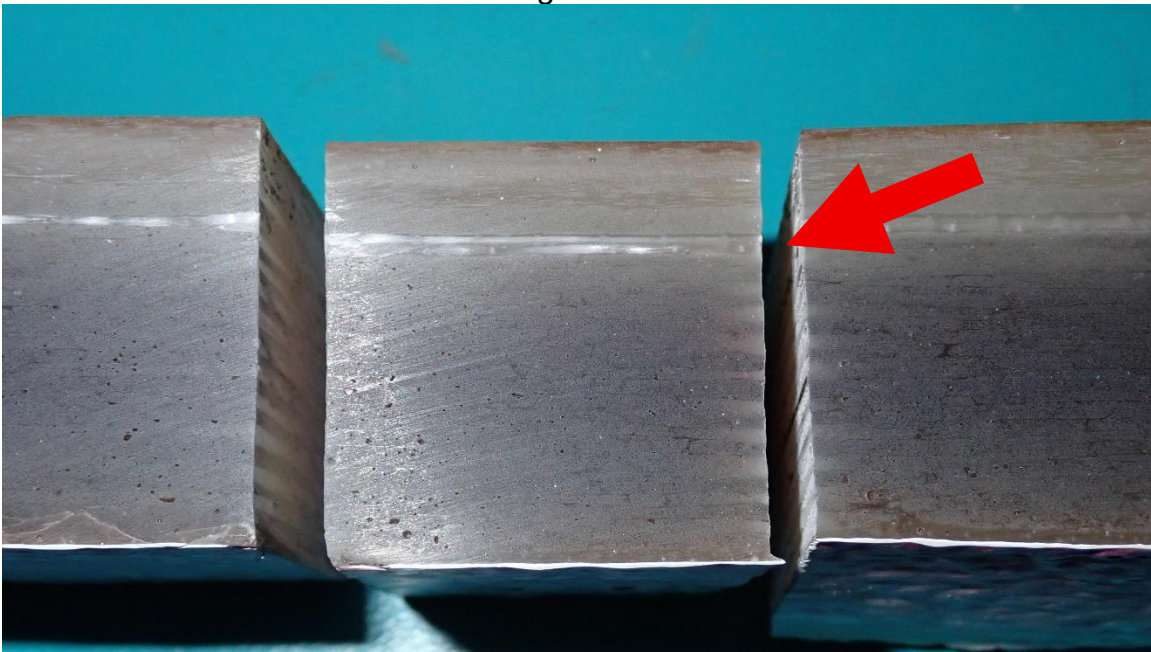


Figure 14

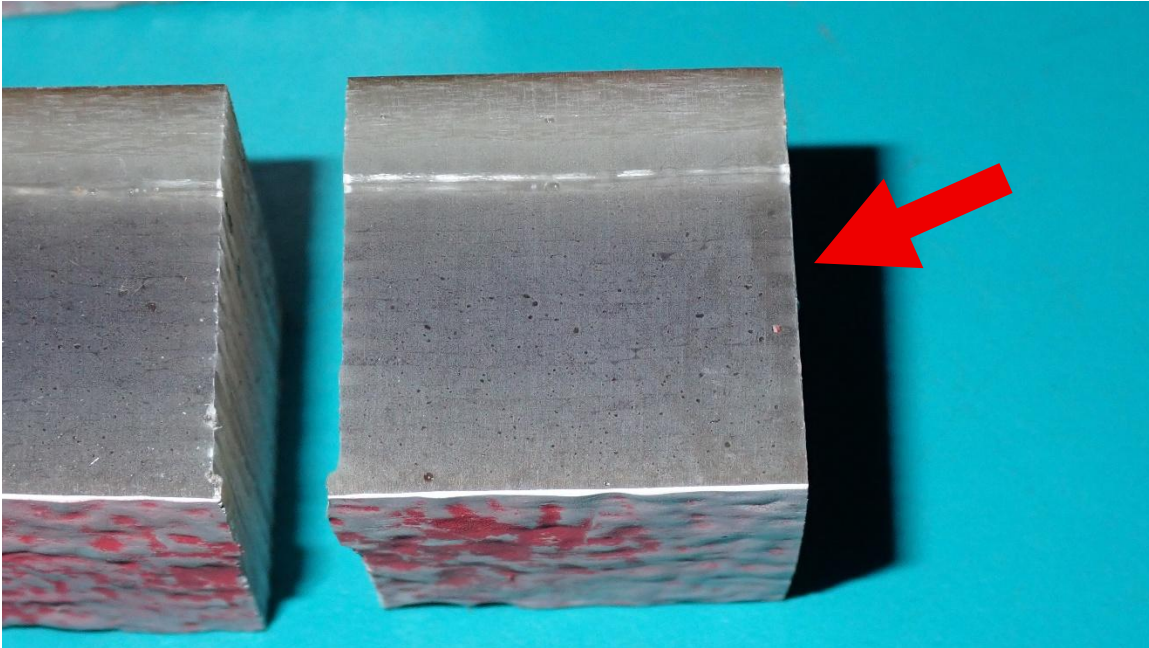


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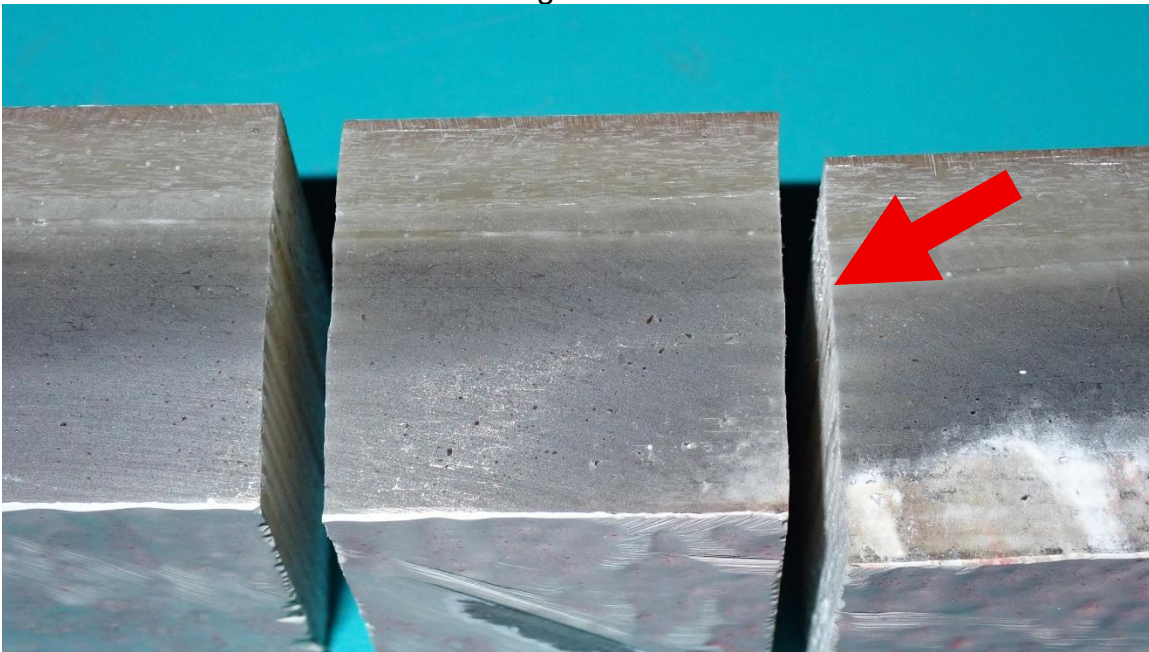


Figure 15

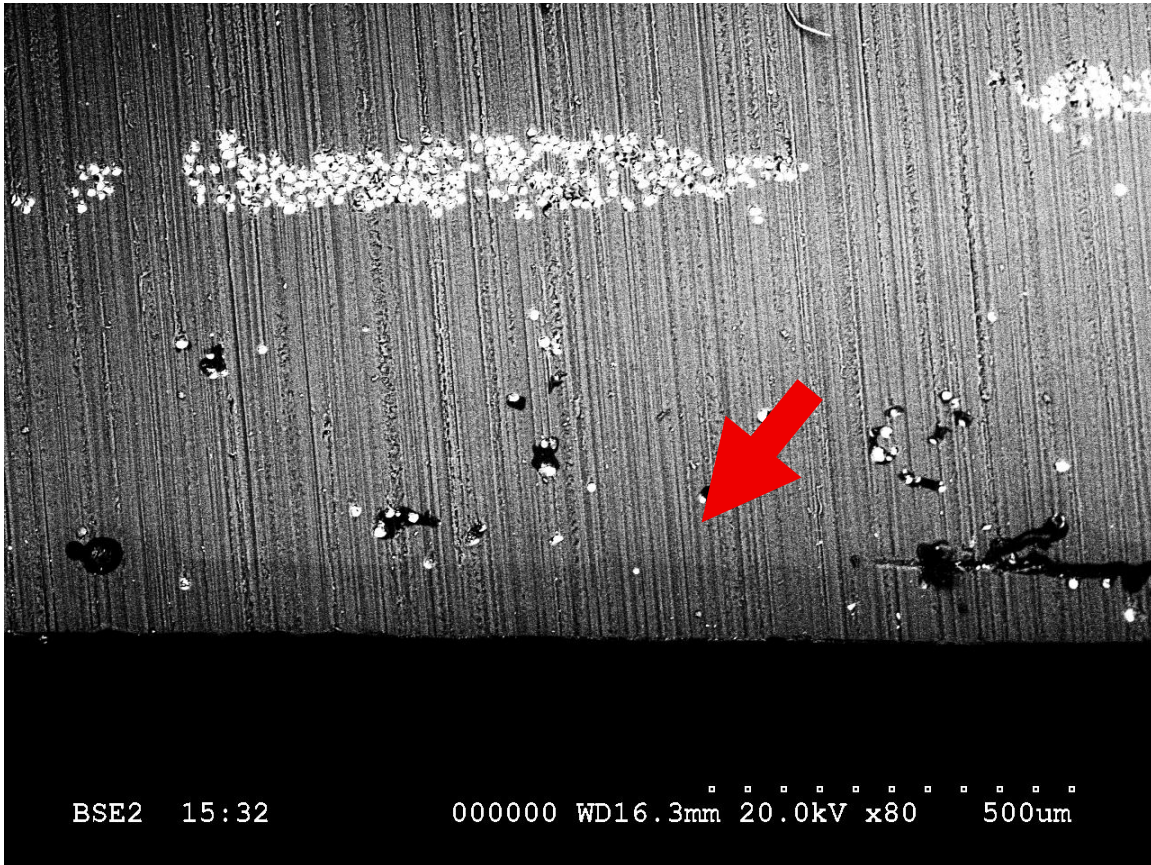


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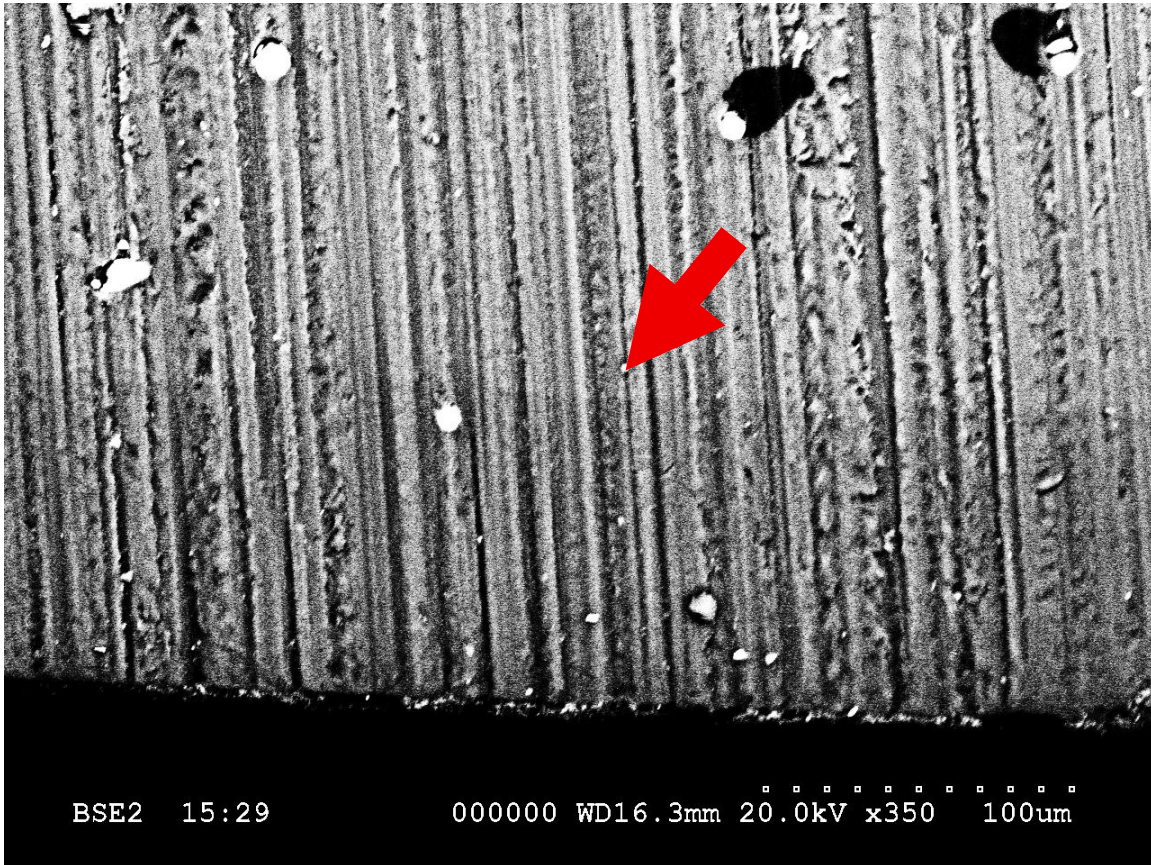


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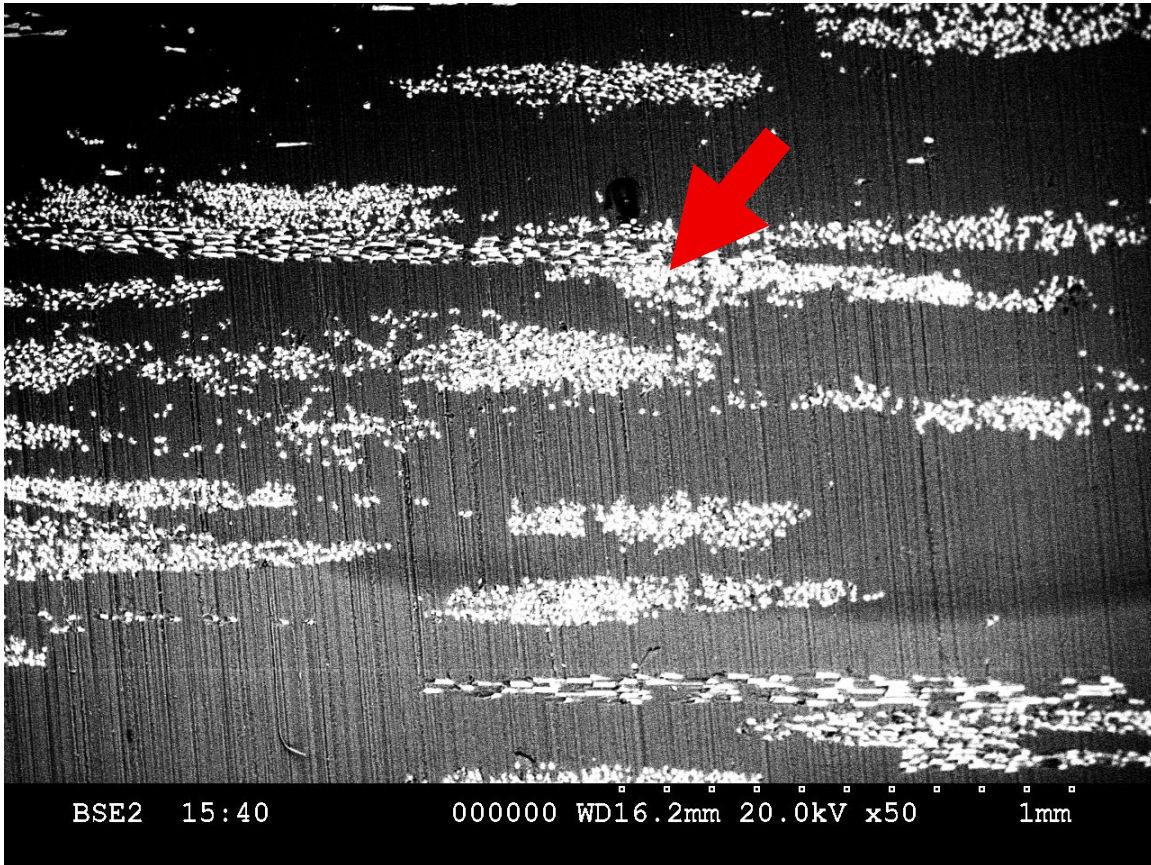


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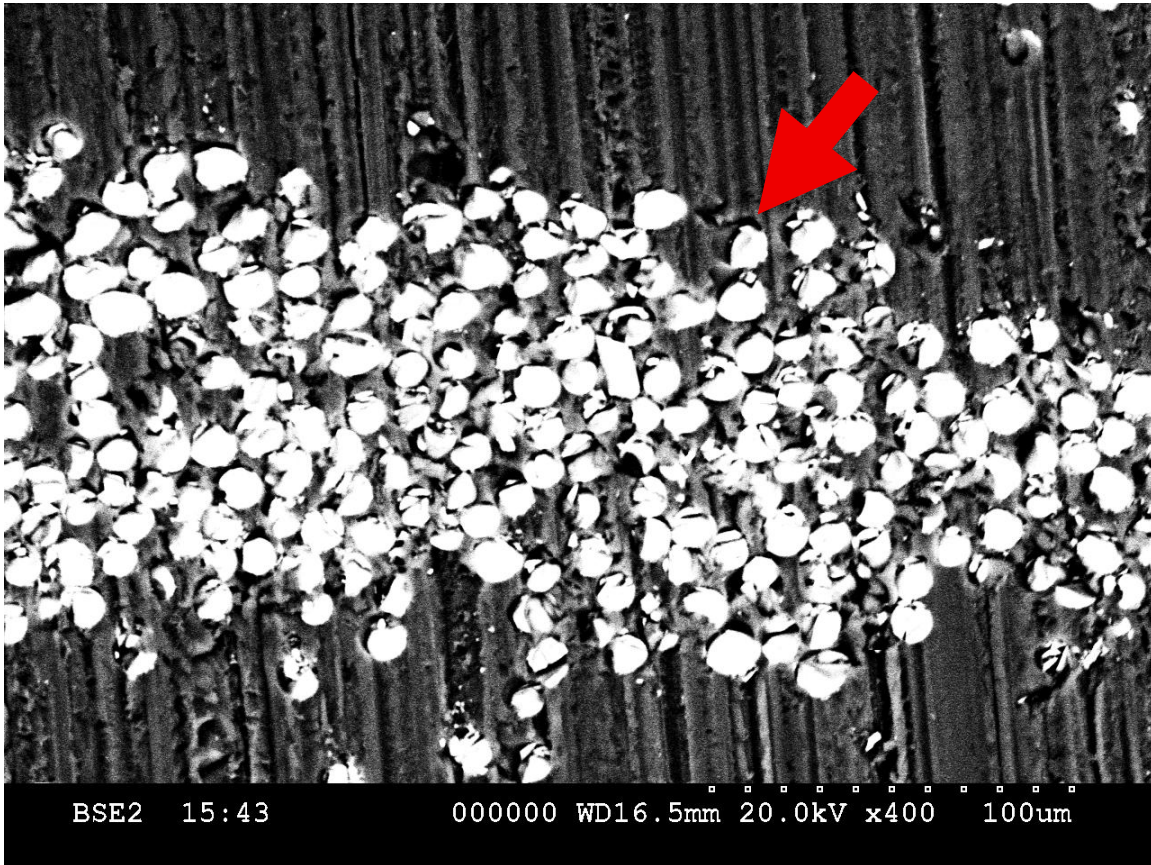


Figure 20



Figure 21

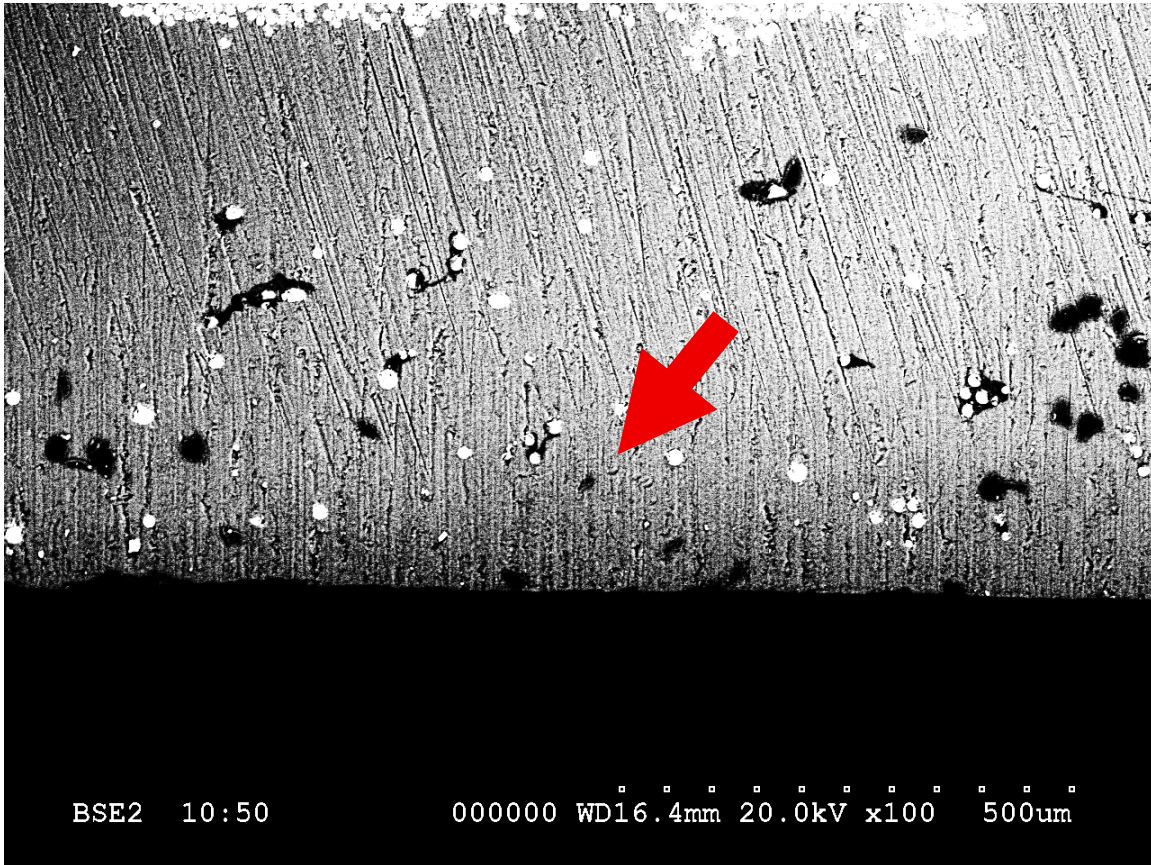


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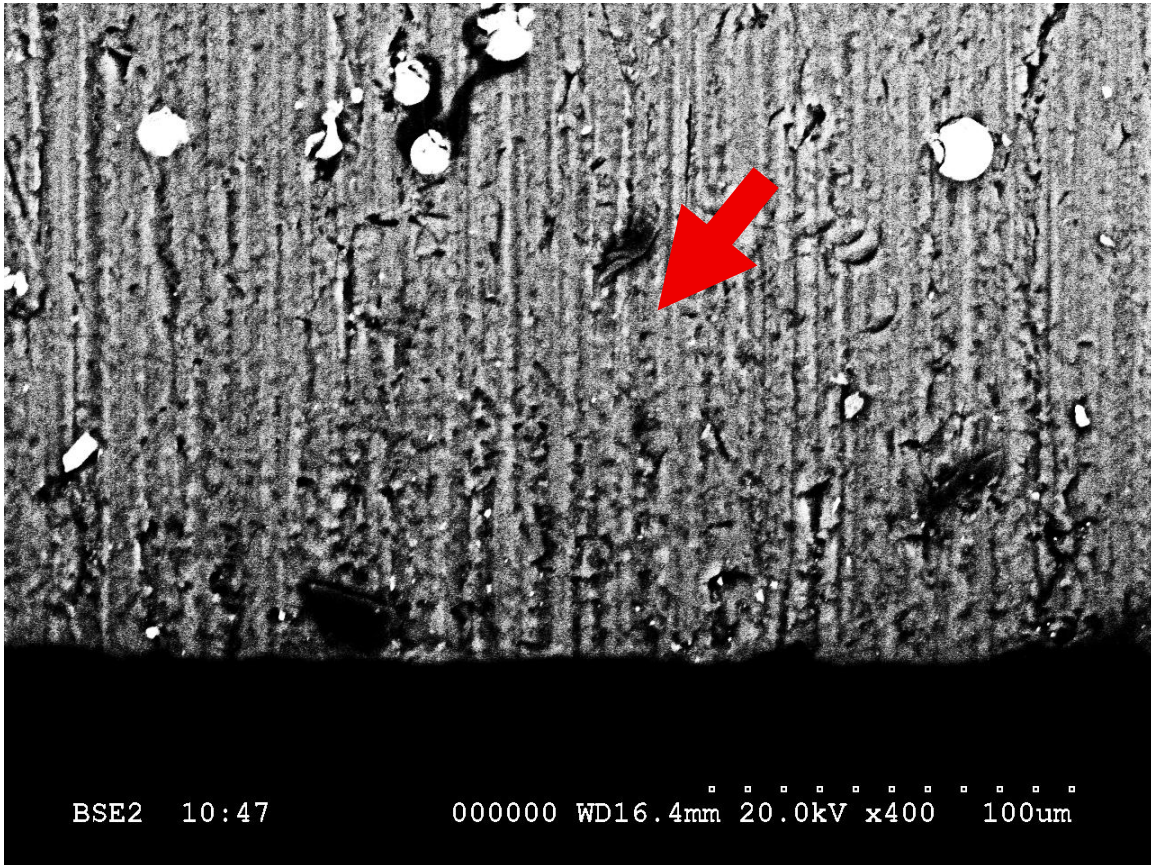


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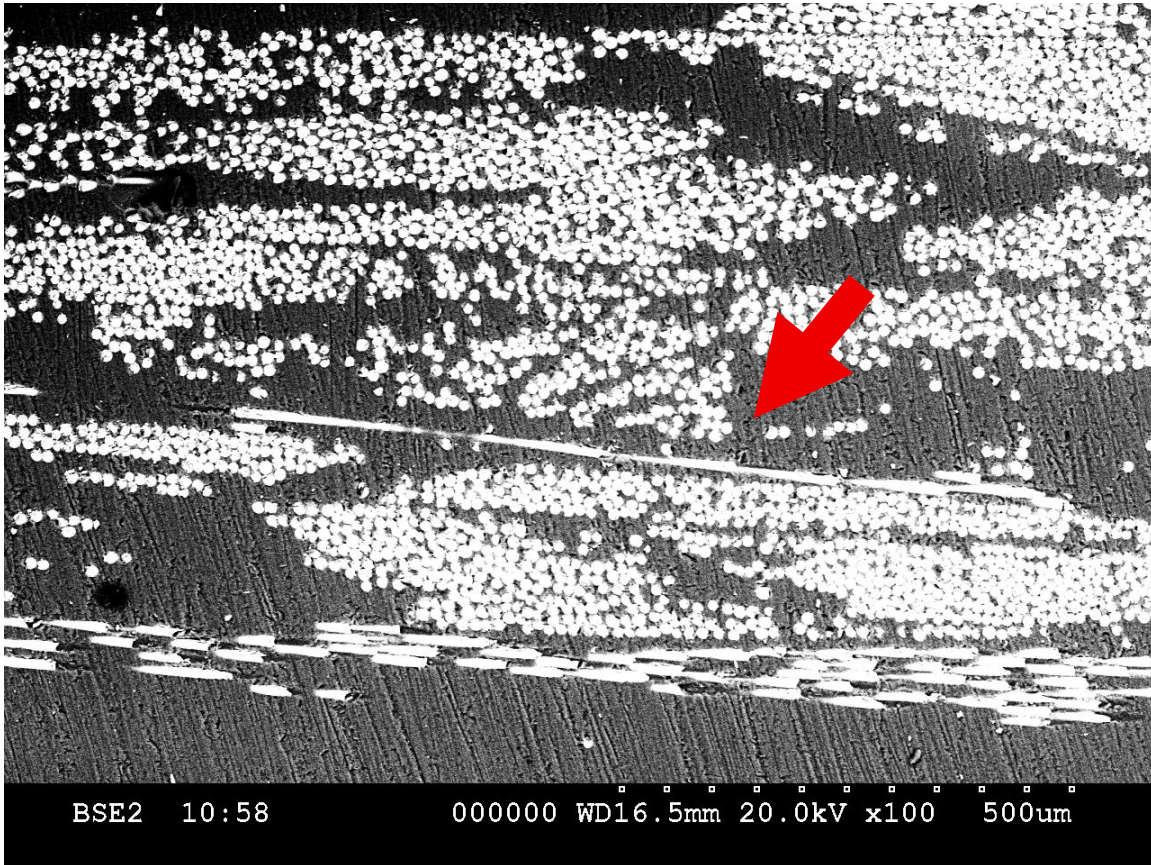


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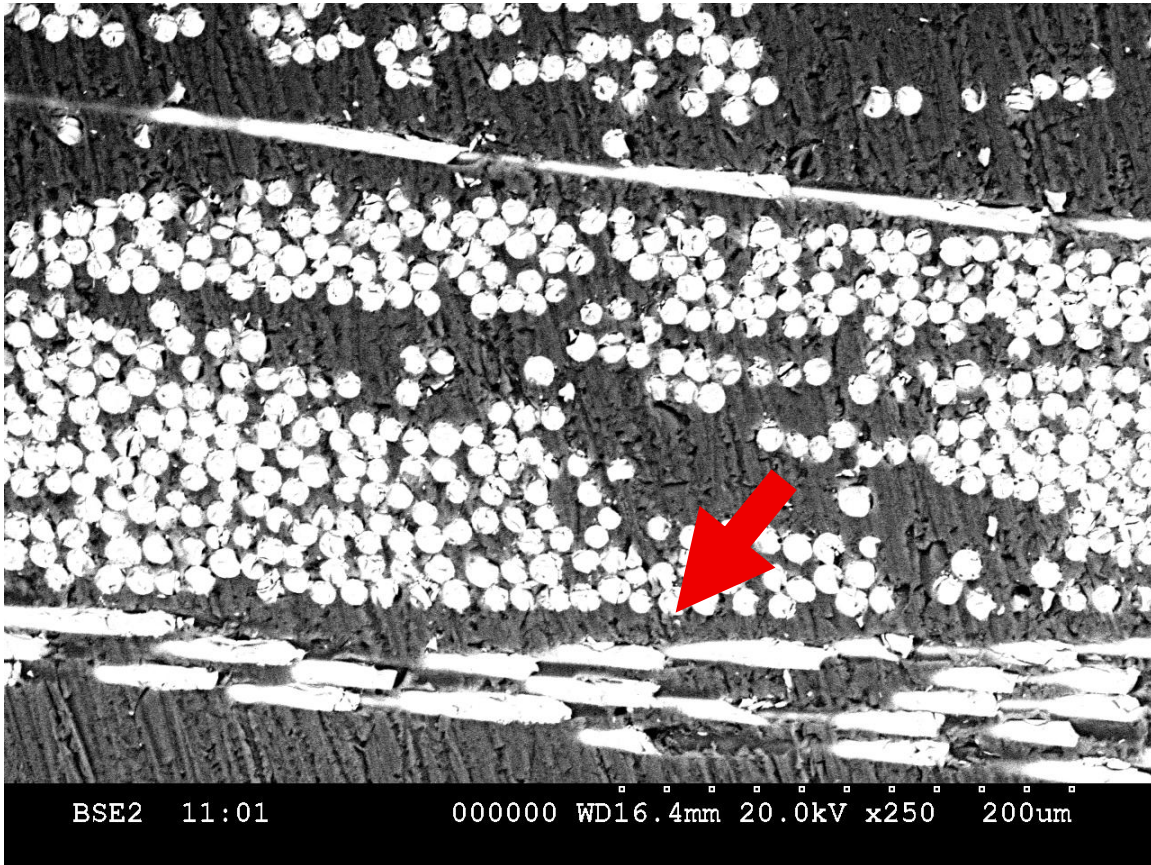


Figure 25

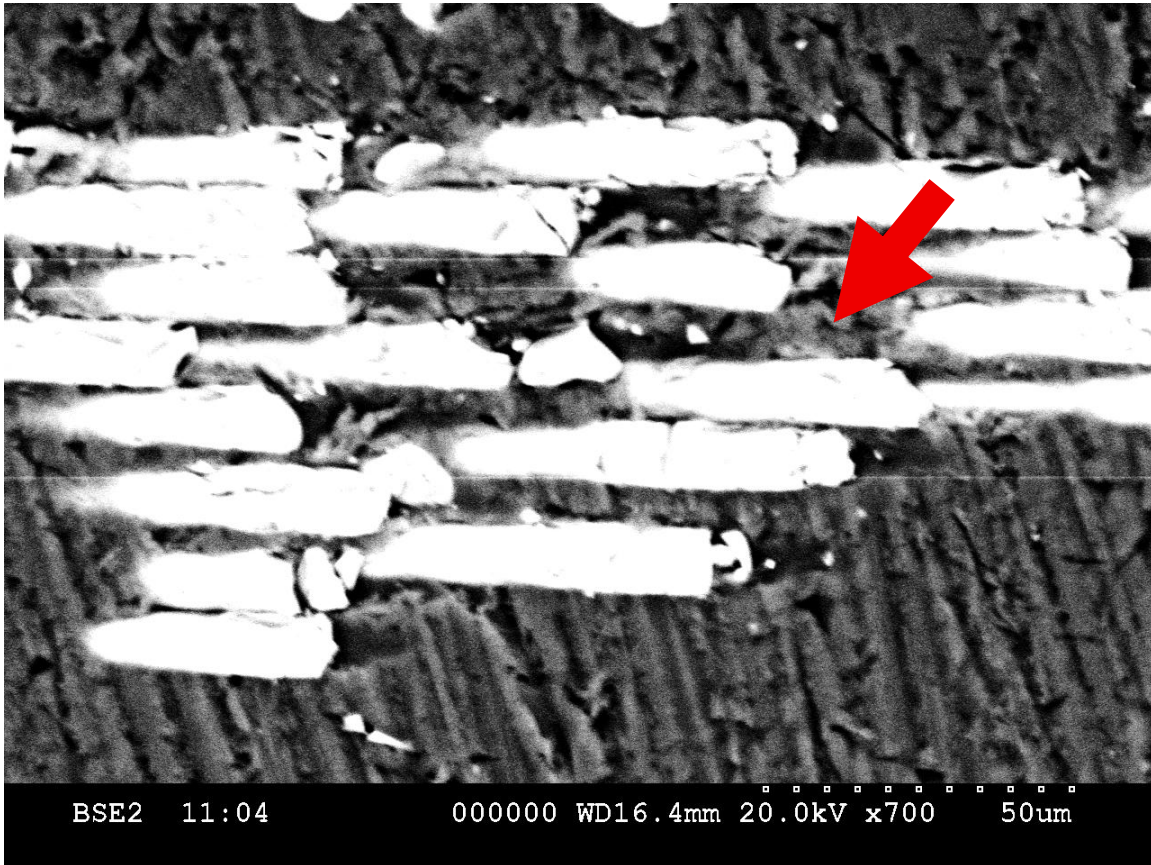


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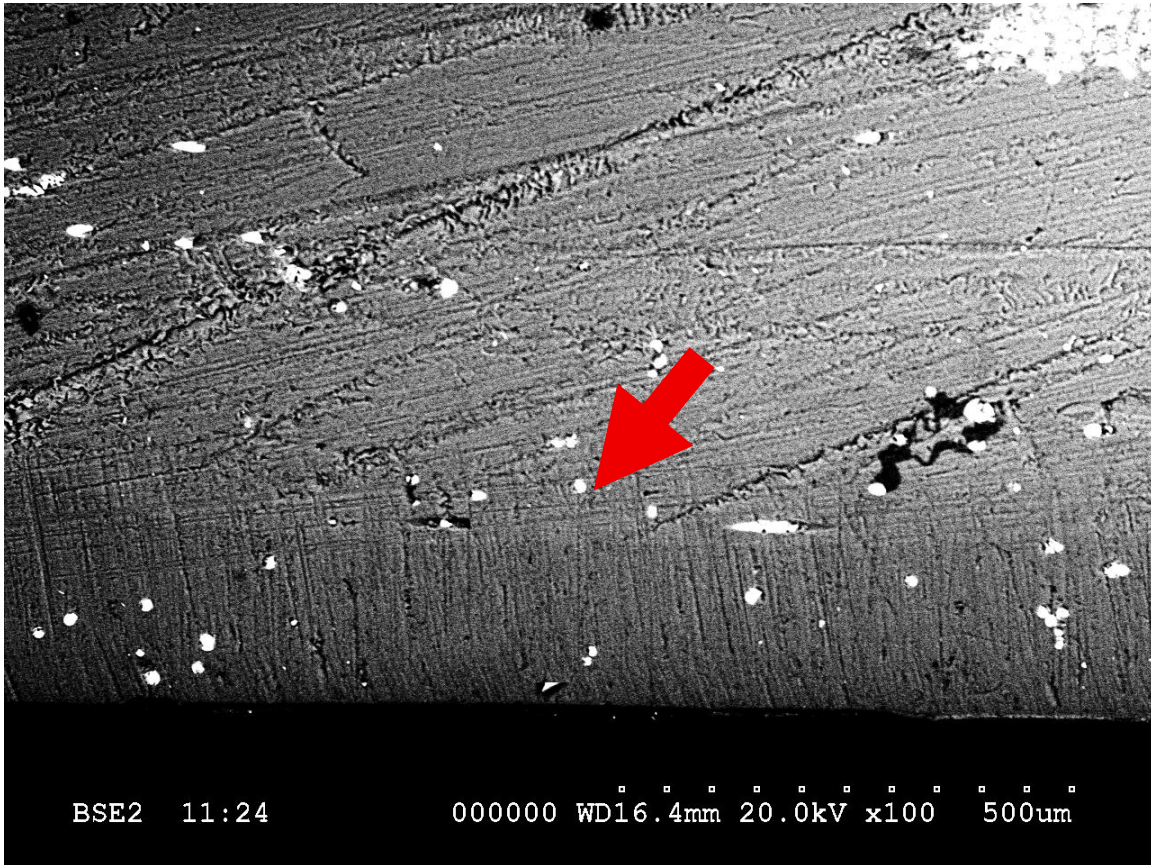


Figure 27

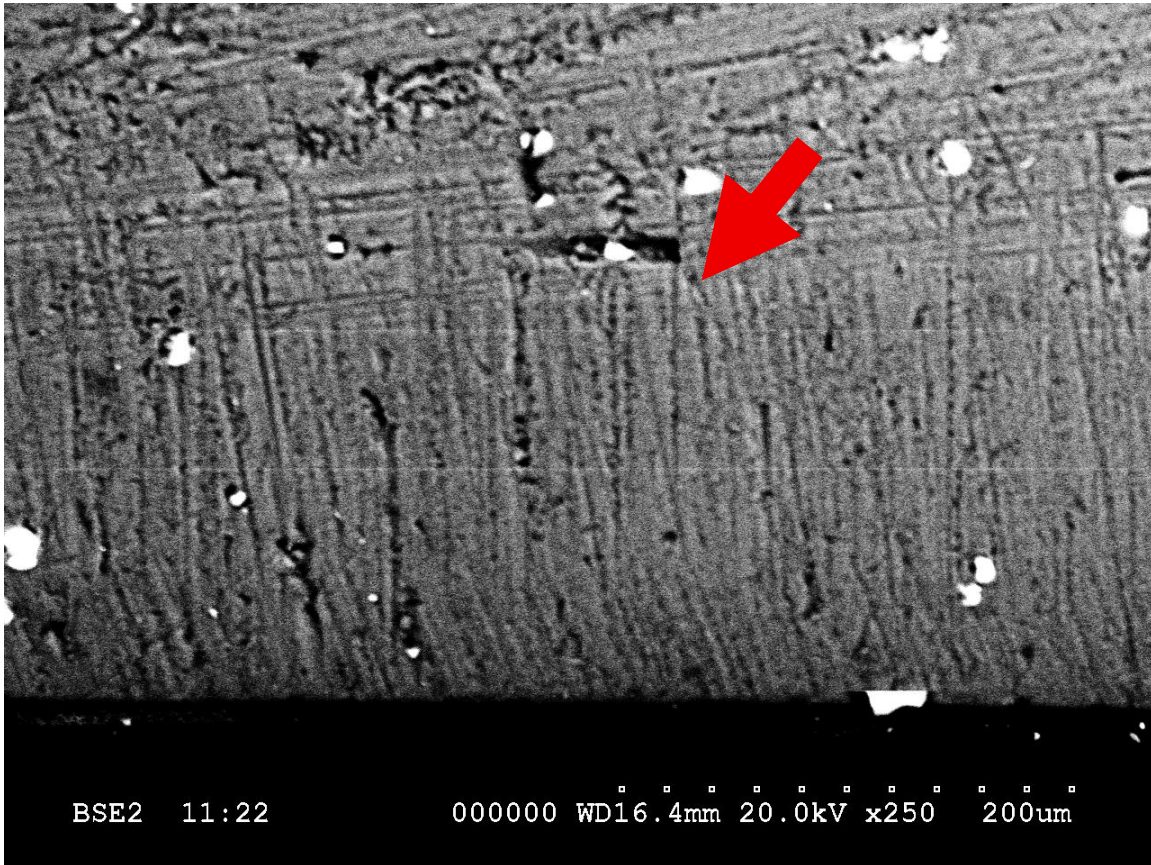


Figure 28

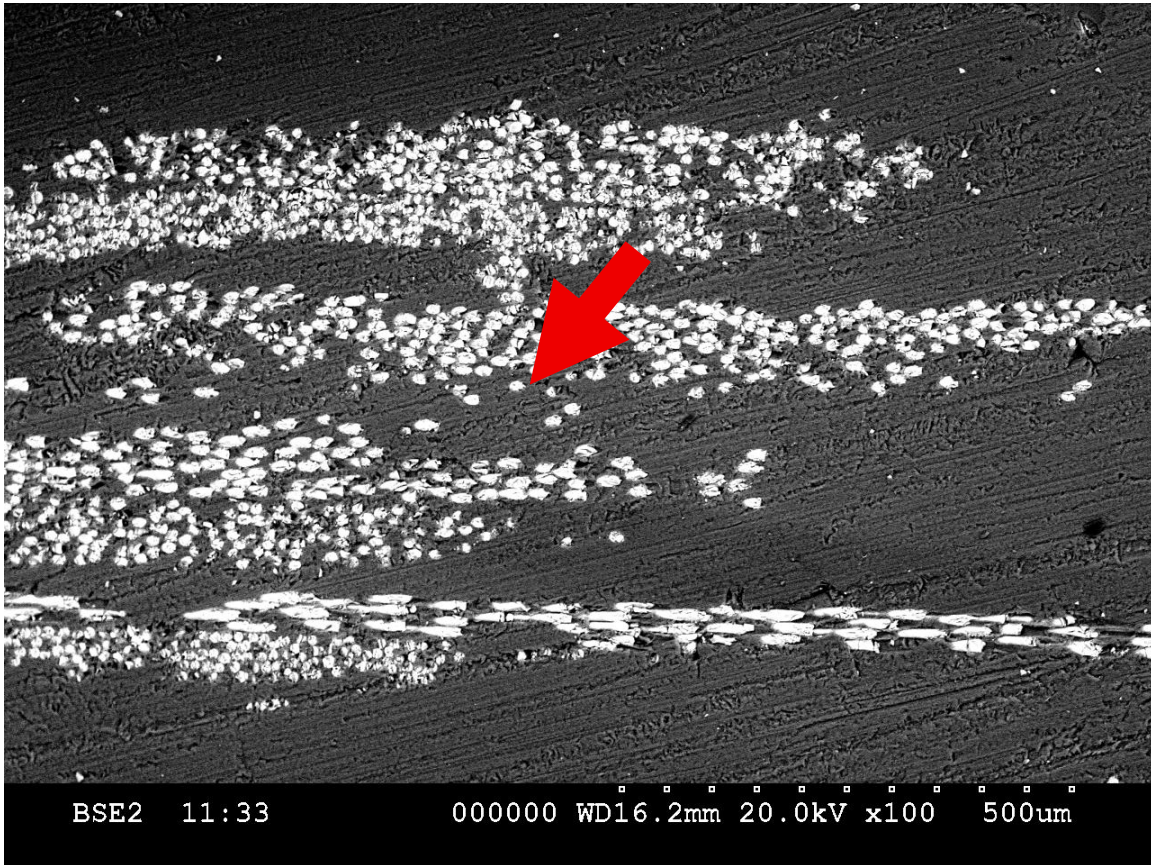


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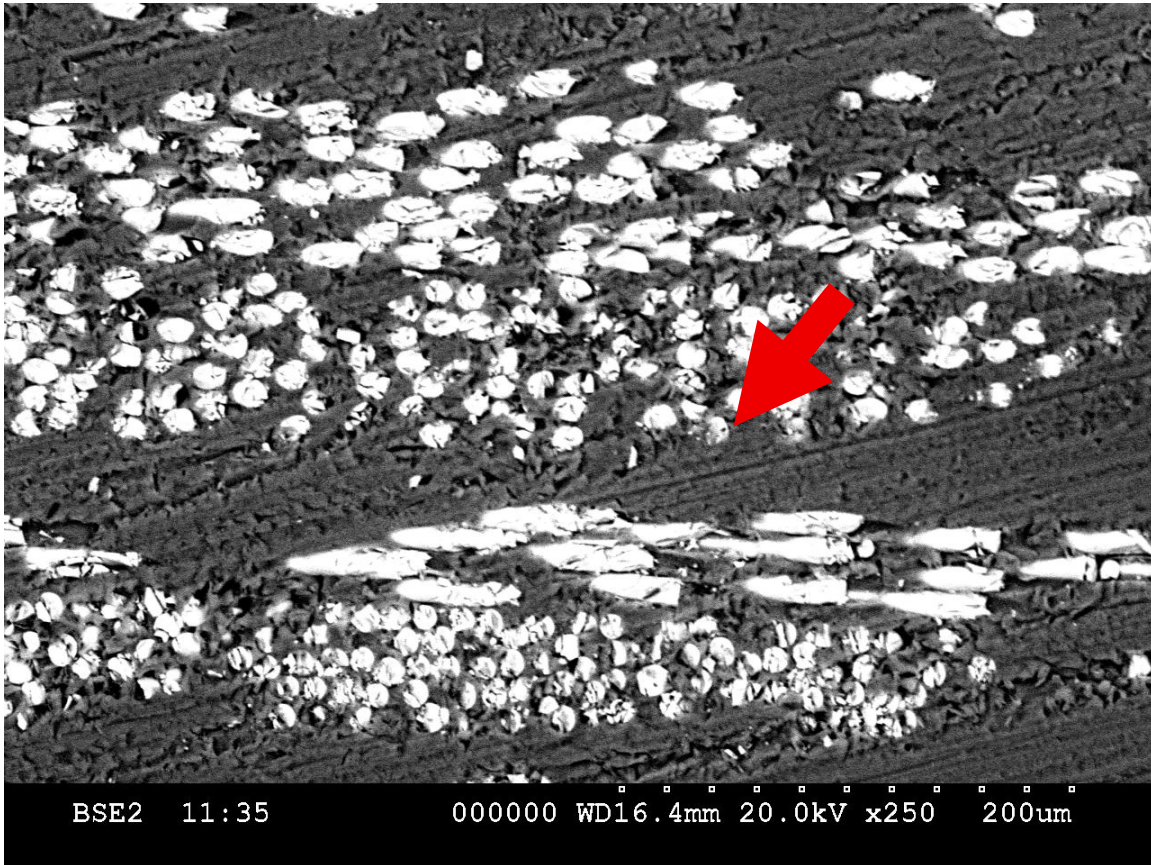


Figure 30

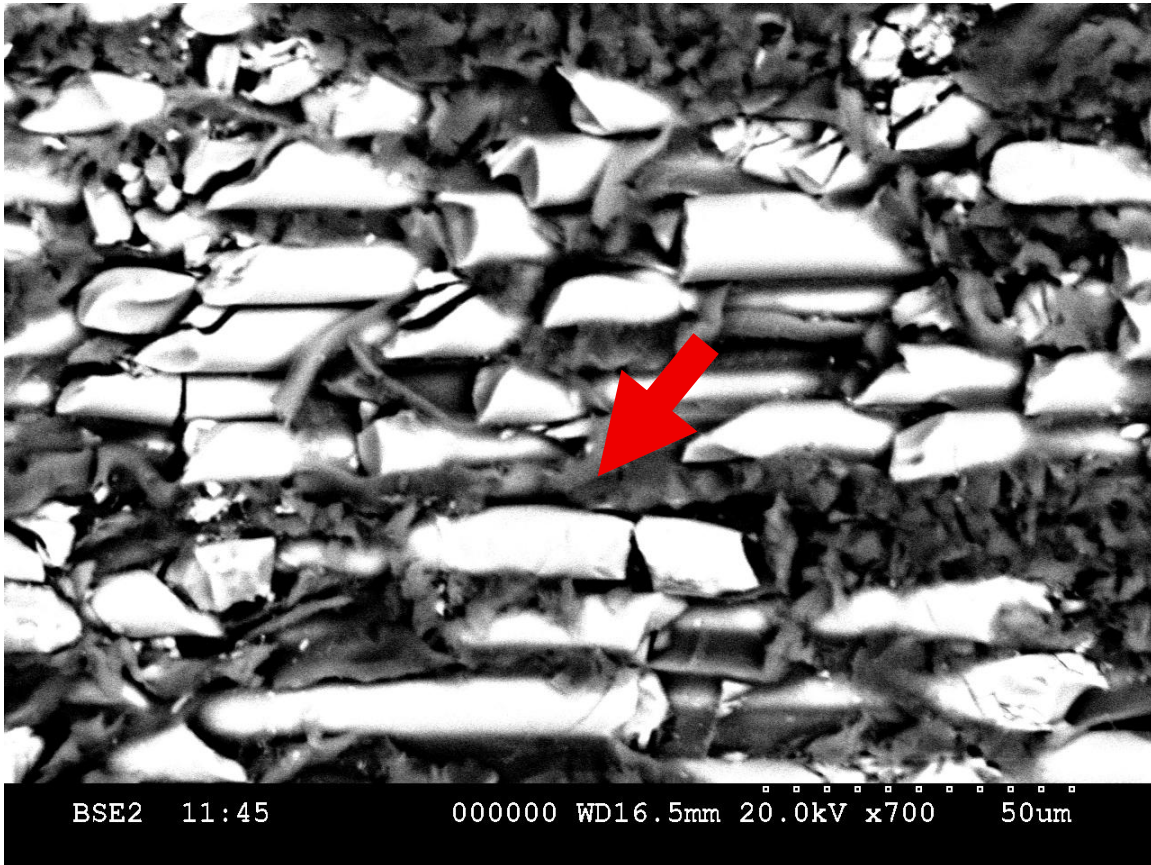
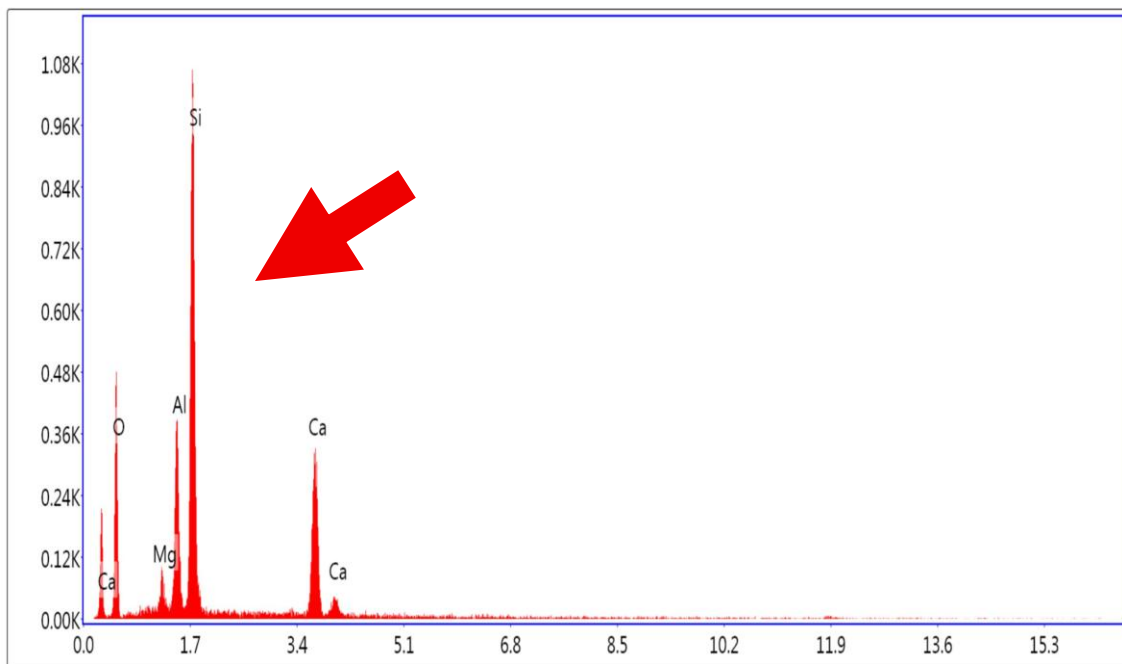
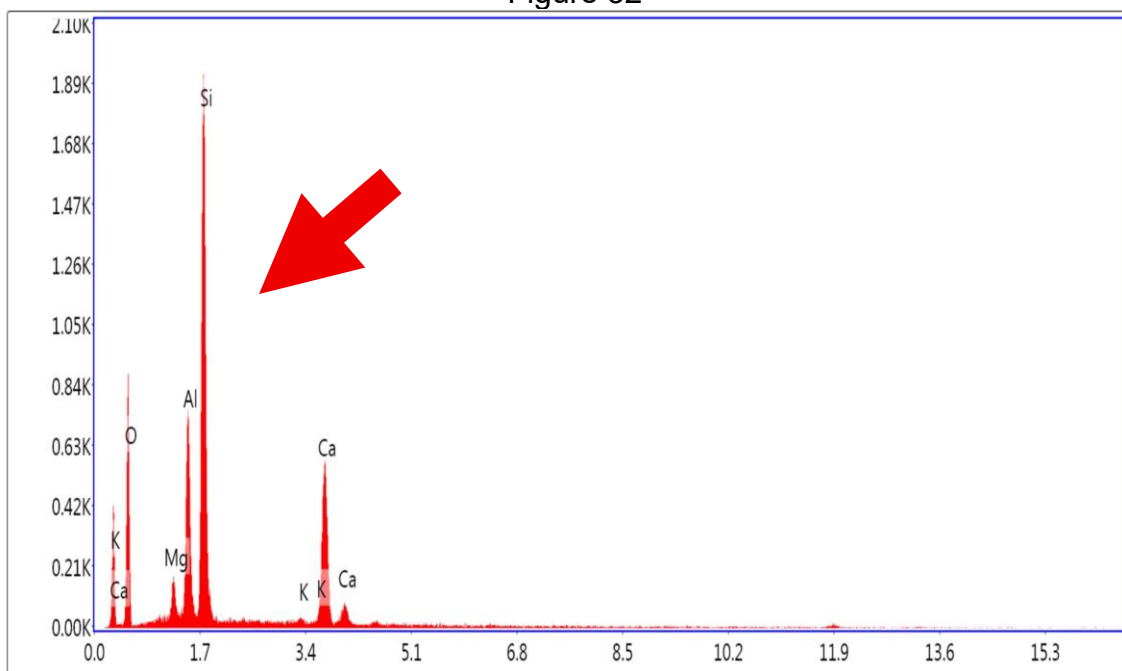


Figure 31



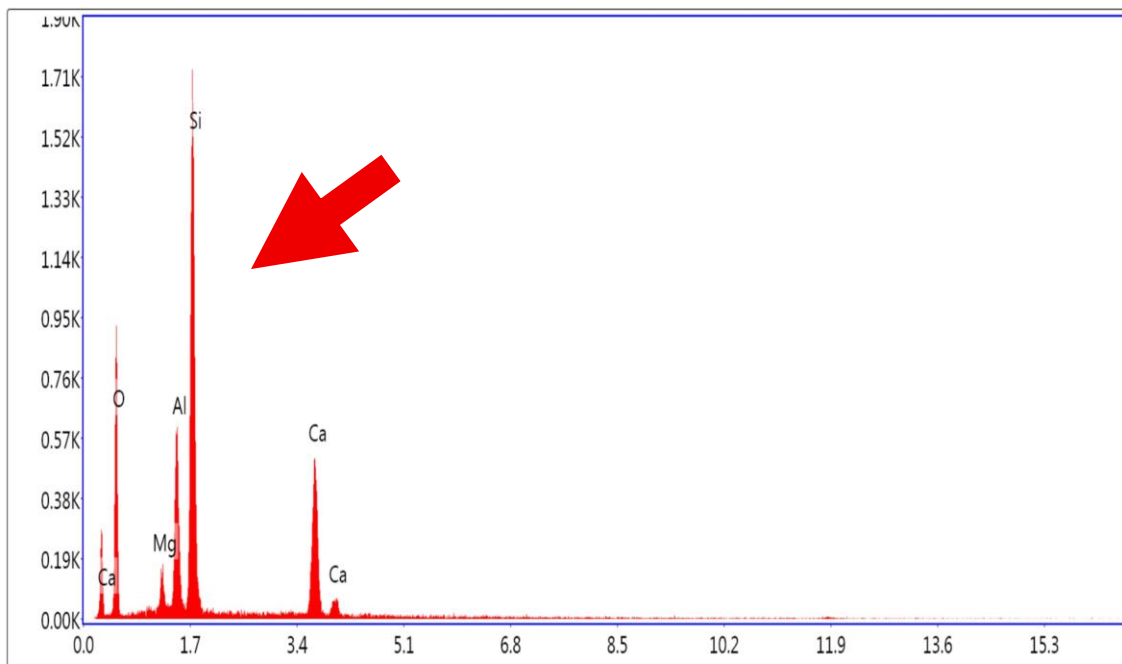
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Figure 32



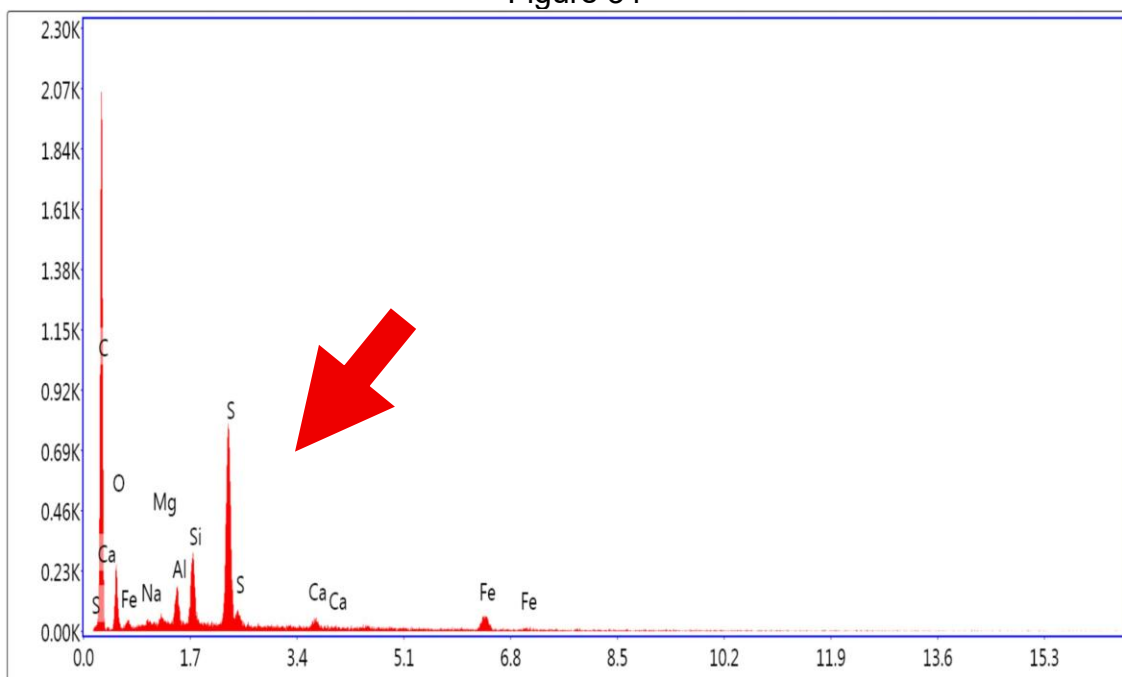
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Figure 33



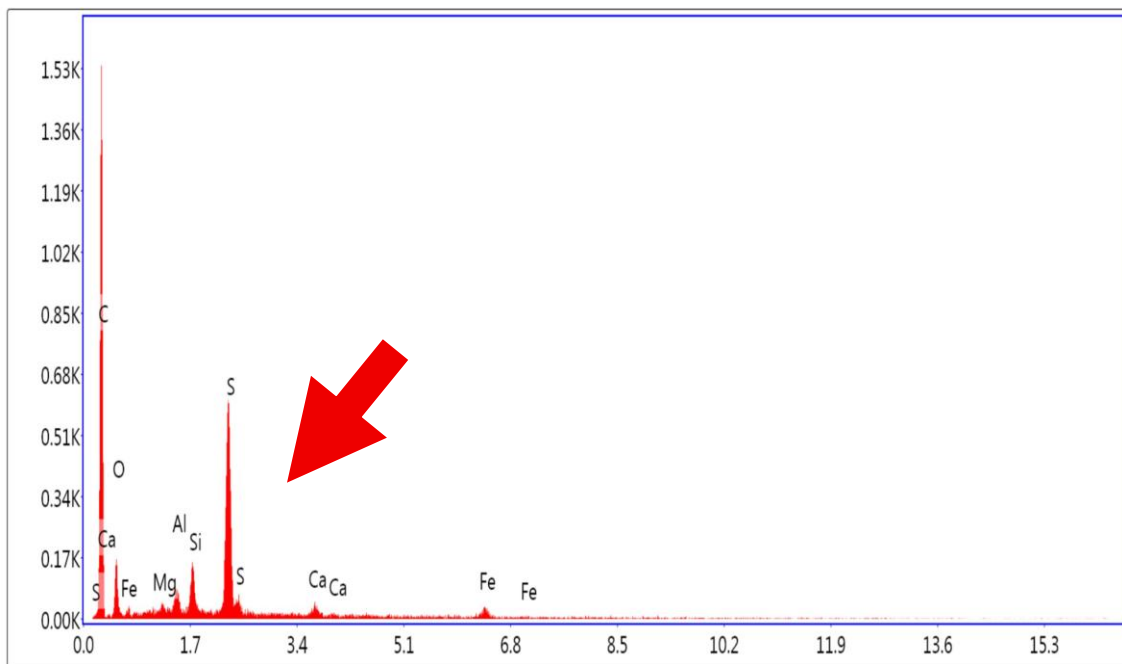
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Figure 34



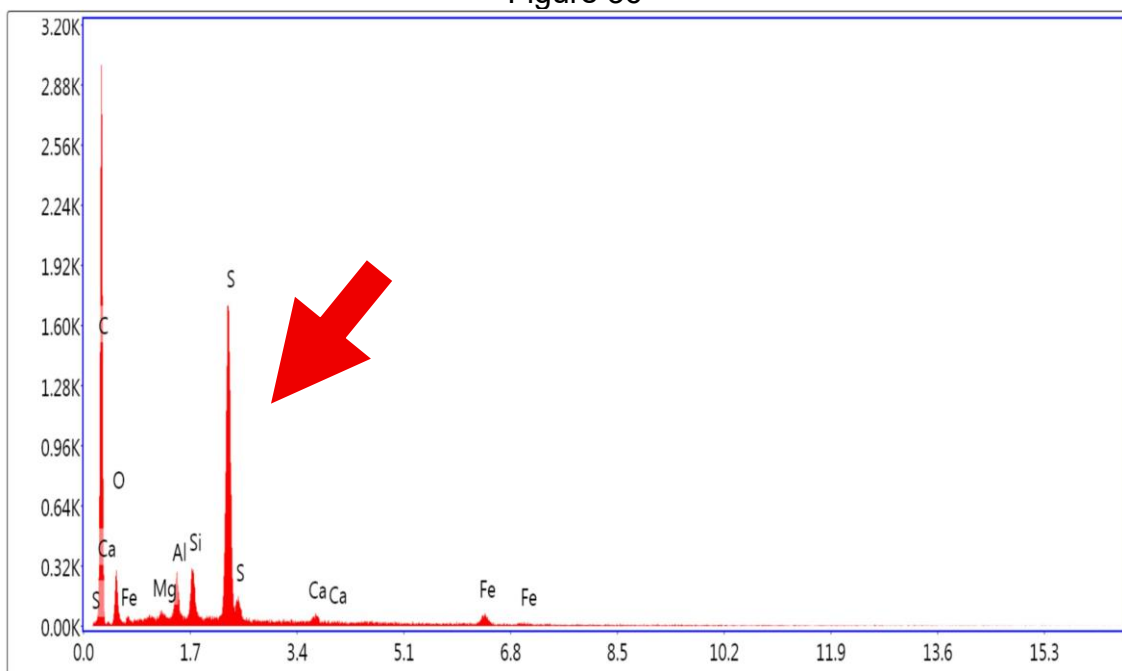
Lsec: 61.2 0 Cnts 0.000 keV Det: Octane Prime Det

Figure 35



Lsec: 54.3 0 Cnts 0.000 keV Det: Octane Prime Det

Figure 36



Lsec: 98.1 0 Cnts 0.000 keV Det: Octane Prime Det

Figure 37



APPENDIX

- FTIR (Fourier Transform Infrared Spectroscopy)
and OIT (Oxidative Induction Time)
of Tanks 2 and 3 by
Associated Polymer Lab, Inc.