

**East Carolina
Metal Treating**



**Virginia
Metal Treating**



03/23/2022

Jefferson Lab Report

Work Order No: **212171 (Samples AA, BB, CC, DD)**

East Carolina
Metal Treating,
Inc.



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Raleigh, NC 27603

919-834-2100

03/23/2022

Mike Beck
Jefferson Lab
12000 Jefferson Ave.
Newport, VA 23006
Work Order 212171

Hi Mike, we have completed testing all your sample with 500g per your request and copies attached for your review.

Sample AA: Grade 1005

Harnesses are below the measurements and they are -21 to -36, the difference is surface slightly higher hardness compare to core.

Microstructure does not have evidence of any heat treat performed, very course with large carbide and no distribution of alloy from iron etc.

Sample BB: Grade 1005

Has the same results with slightly?

Higher hardness but still in negative and Micro Structure same identical.

Sample CC: Grade 1015

Same Hardness value but Micro Structure is different, this sample appears to have Homogenize process performed very very poor process, without properly cooling. Micro Structure also reveals that there is decent amount of Iron Carbon distribution, Carbides are formatted with large Grain; subject sample does not have any evidence of proper Normalize, Temper or any other Heat-treating evidence.

Sample DD: Grade 1020

Similar pattern of hardness but Micro Structure appears to have gone through decent Homogenize, Decent Normalized but not properly tempered.

Micro Structure appears to be the best of all samples, with proper Martensetic structure, Normal Grain size and no more than normal Grain Boundaries.

Conclusion:

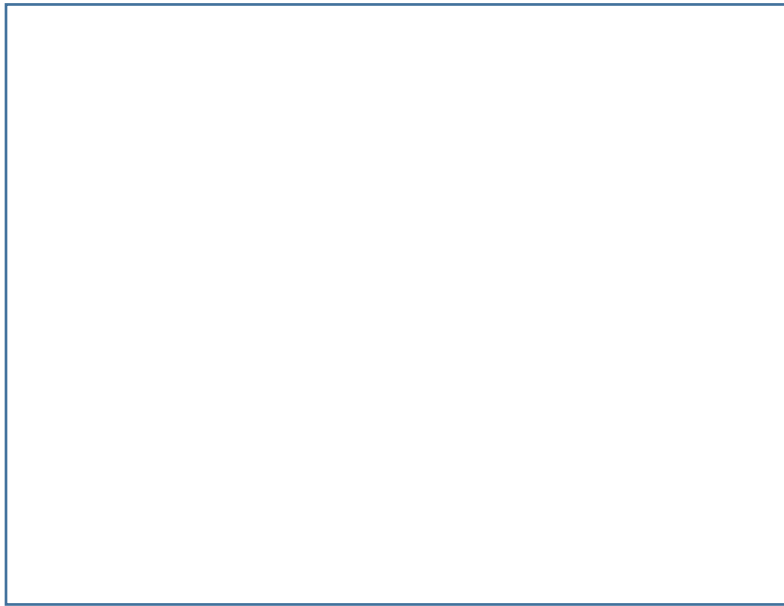
None of the samples appeared have proper heat treating, they all show in raw condition.
Abdul

212171_AA:

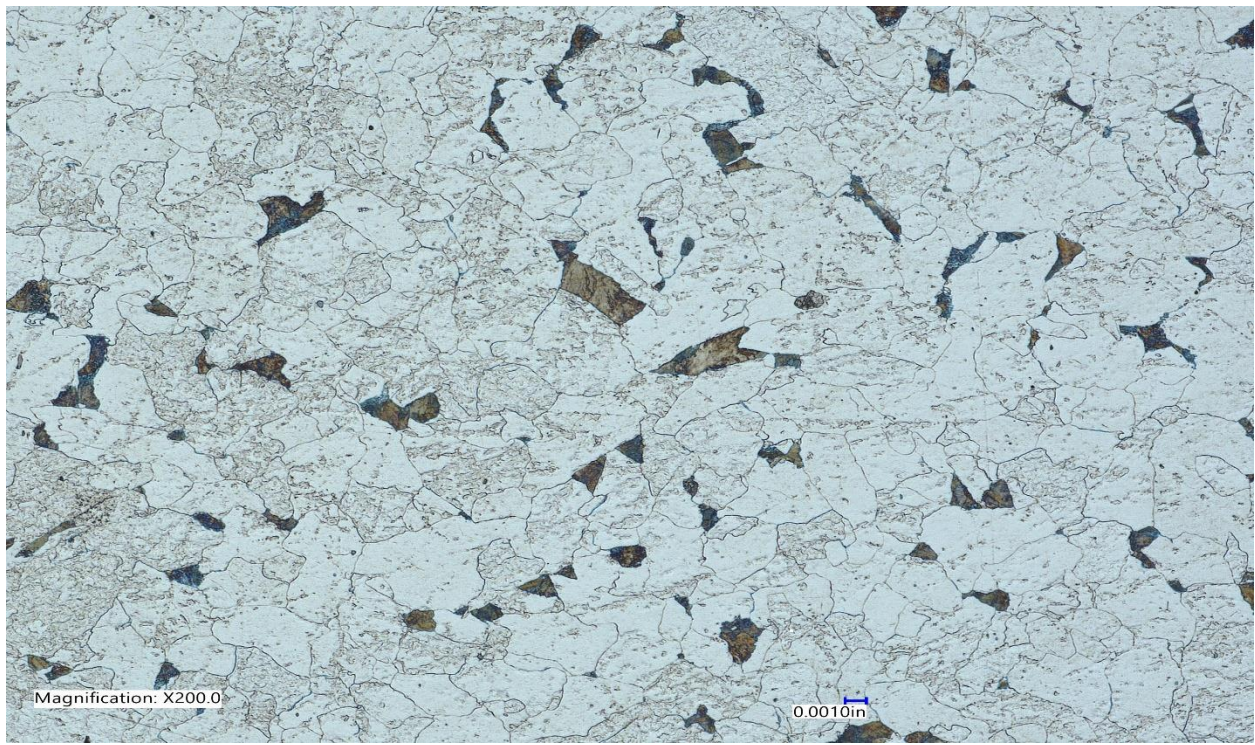
[illegible]

4/15/2015

A horizontal strip of a cracked and peeling white surface, likely a wall or ceiling, showing significant damage and discoloration. The surface is covered in a network of fine cracks and larger, irregular peeling areas, revealing a darker, brownish substrate underneath. The overall appearance is one of severe wear and tear.



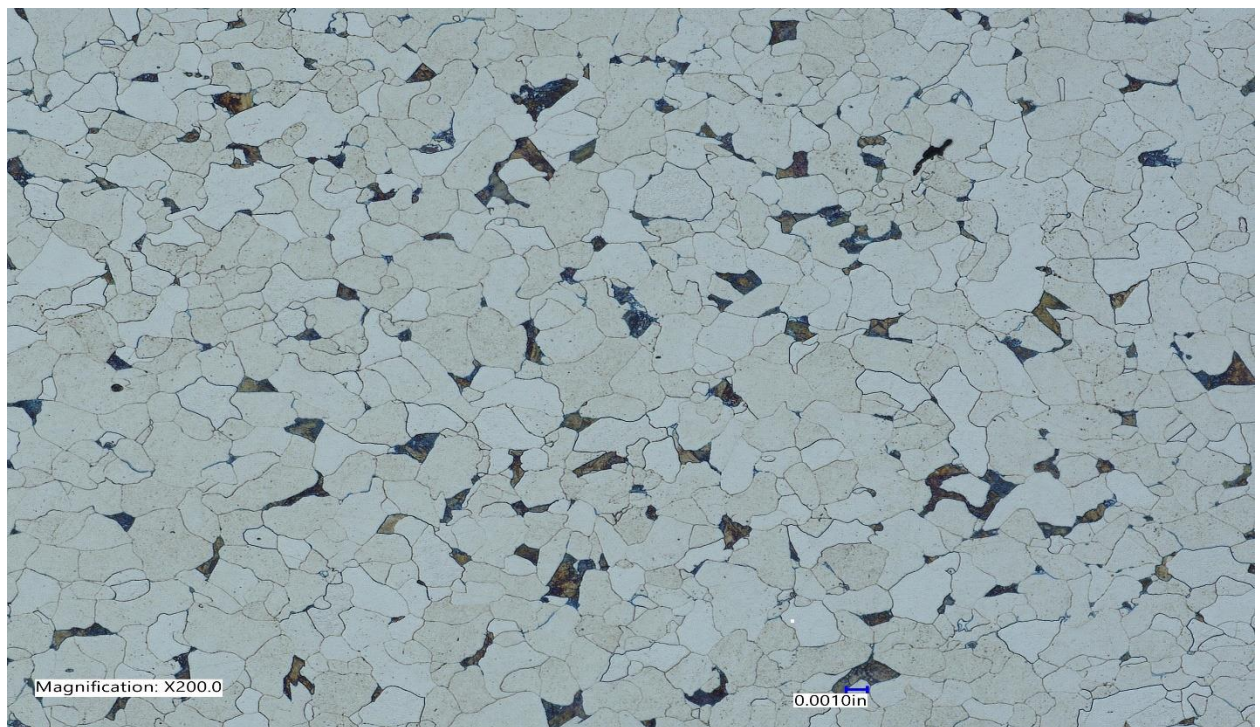
Core microstructure 200x: AA



212171_BB:



Core microstructure 200x: BB

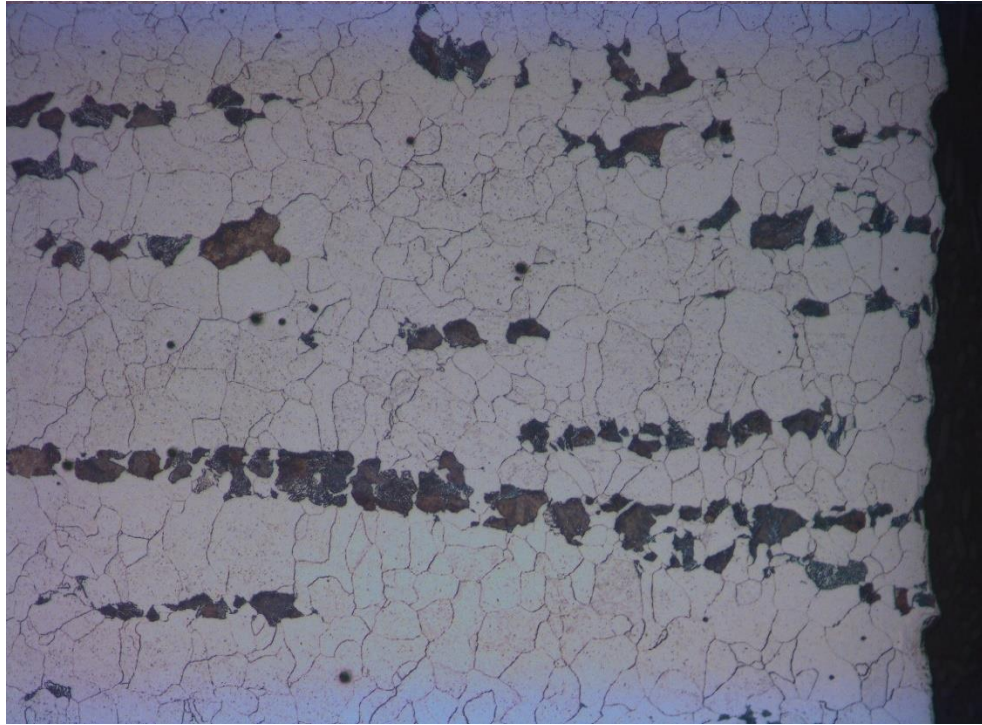


212171_CC:

[illegible]

4/15/2015

A close-up photograph of a dark, textured surface, likely the cover or endpaper of an old book. A horizontal band of lighter, cracked material runs across the middle, showing signs of wear and aging. The dark material above and below the band has a rough, fibrous texture.



Core microstructure 200x: CC



212171_DD:

EAST CAROLINA METAL TREATING, INC.		
CASE DEPTH MICROHARDNESS TEST REPORT		
Customer: Jefferson Lab	Work Order: 212171 DD	Date: 3/22/2022

Surface microstructure 200x:

Surface microstructure 200x: DD



Core microstructure 200x: DD



