

AISI – 4 point bend fracture samples 16MnCr5
Iteration 190 (Shallow CD)
Iteration 194 (Deep CD)
J. Brown 5/23/2017

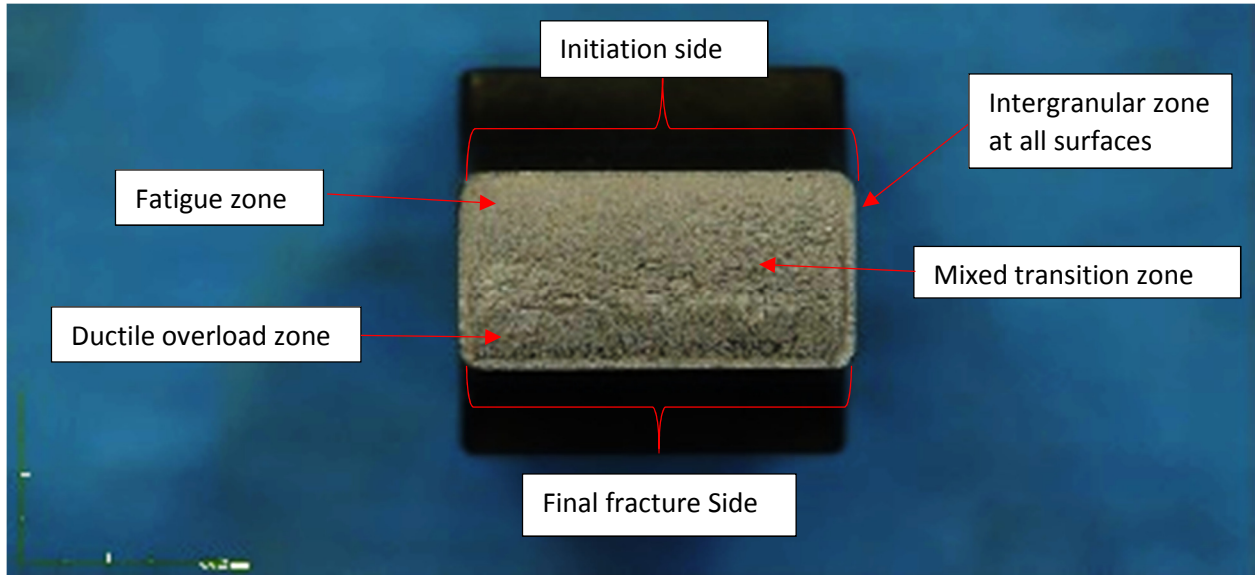


Figure 1 – Representative fracture photograph (iteration 190 – SN 3, 11, 15, 19, 20 and iteration 194 – SN 3, 34).

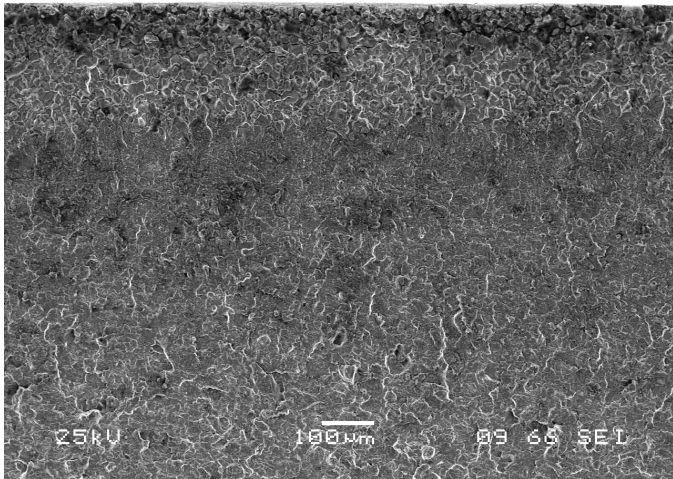


Figure 2 – Fracture surface at the initiation side.

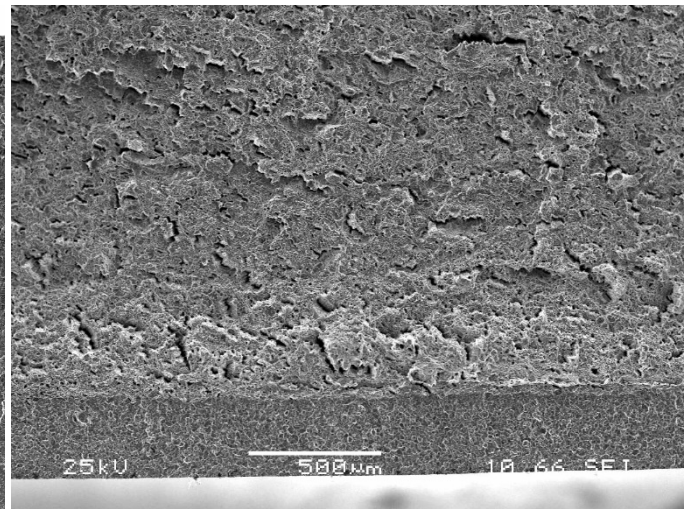


Figure 3 – Fracture surface at the final fracture side.

AISI – 4 point bend fracture samples 16MnCr5
Iteration 190 (Shallow CD)
Iteration 194 (Deep CD)
J. Brown 5/23/2017

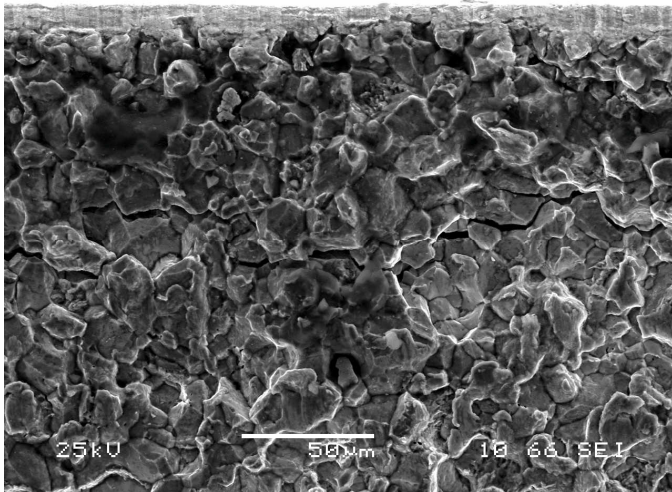


Figure 4 – Representative photograph at the surface showing intergranular fracture.

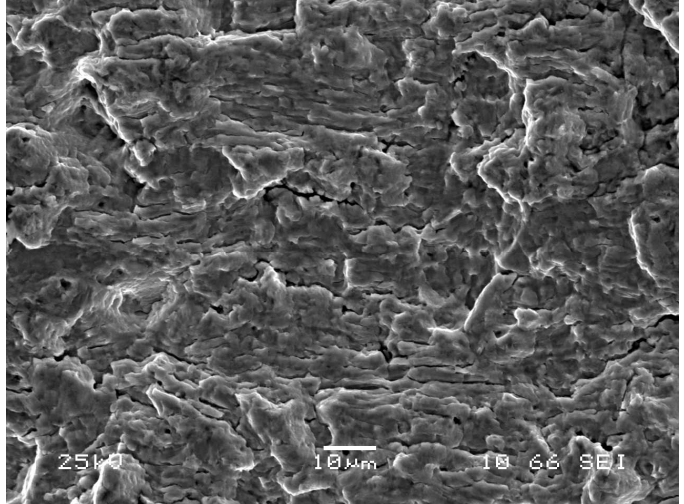


Figure 5 – Representative photograph of the fatigue zone. Showing micro-tearing and some striations.

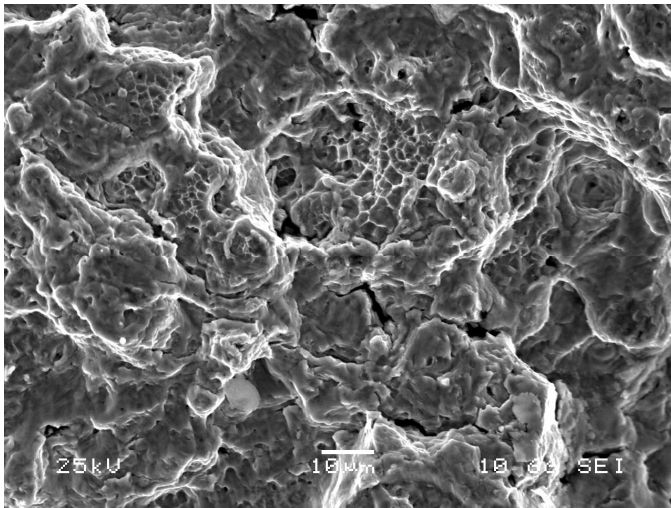


Figure 6 – Representative photograph of the transition zone (changing from fatigue to ductile overload).

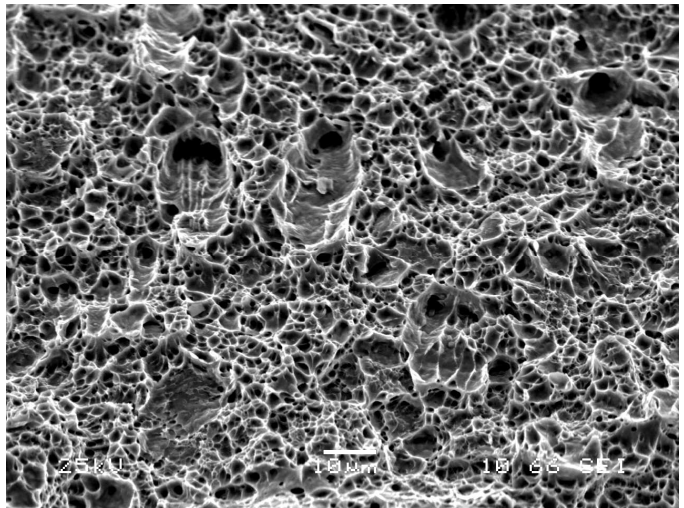


Figure 7 – Representative photograph of the ductile overload zone showing ductile dimple morphology.

AISI – 4 point bend fracture samples 16MnCr5
Iteration 190 (Shallow CD)
Iteration 194 (Deep CD)
J. Brown 5/23/2017

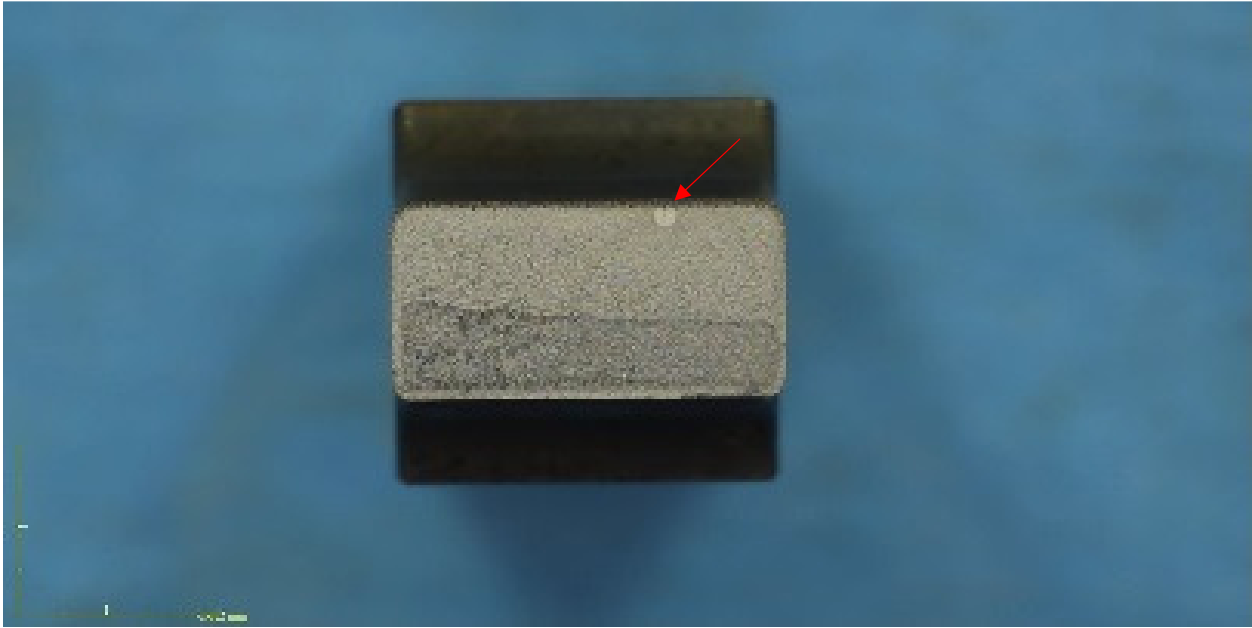
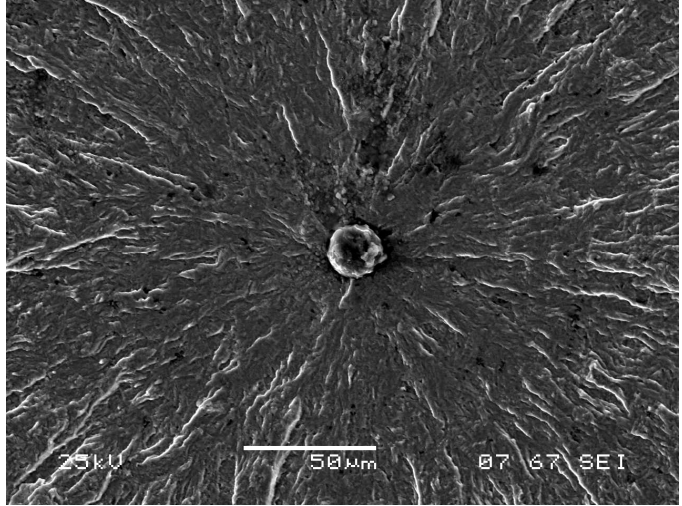
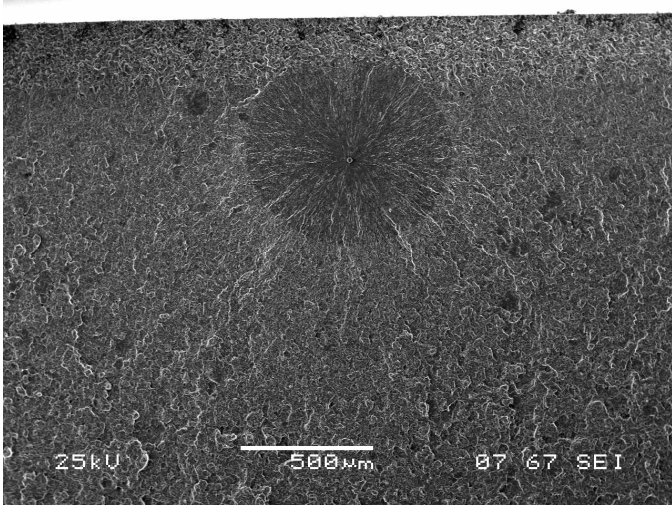


Figure 8 – Showing the fracture surface of iteration 190 SN 16.
Arrow shows location of subsurface burst as the initiation.



Figures 9 and 10 – Showing an inclusion at the initiation location.

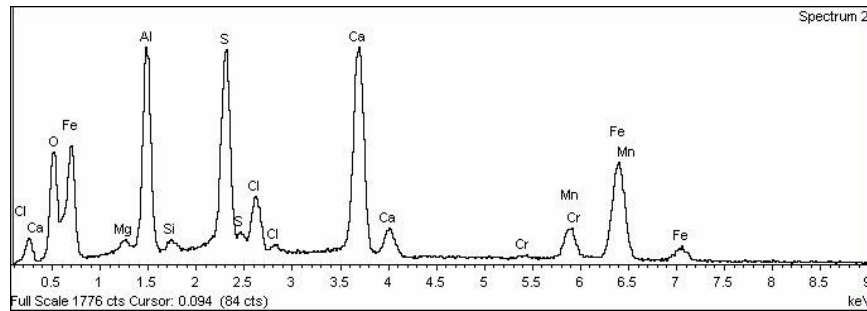


Figure 11 – EDS spectrum showing the elements present in the inclusion (iteration 190 SN 16).

AISI – 4 point bend fracture samples 16MnCr5
Iteration 190 (Shallow CD)
Iteration 194 (Deep CD)
J. Brown 5/23/2017

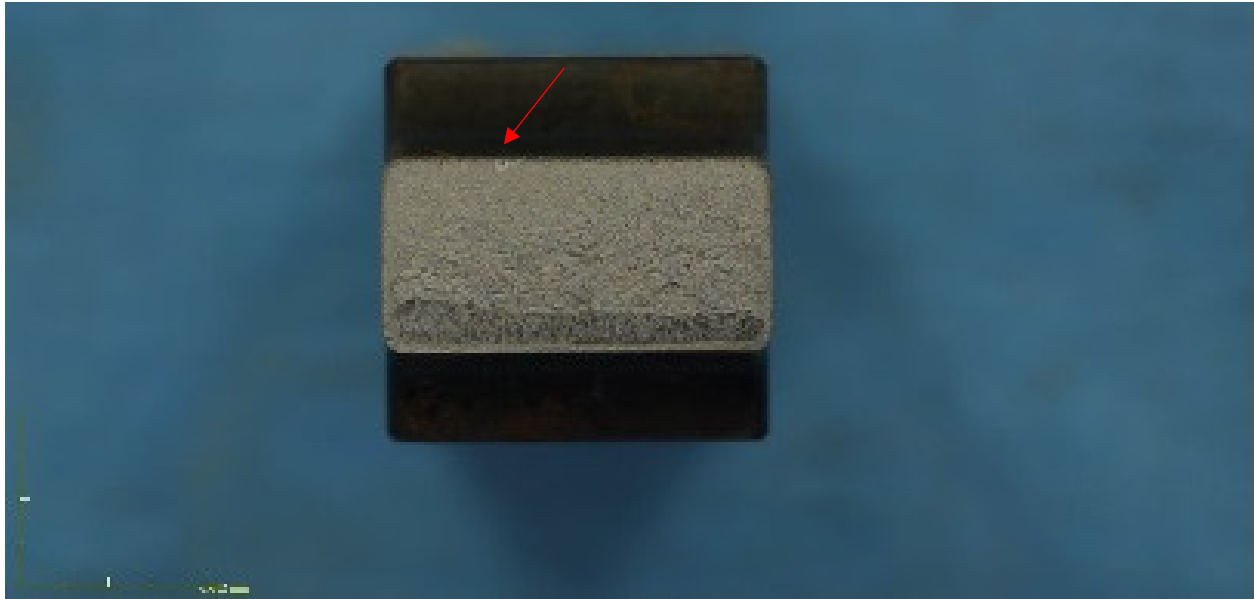
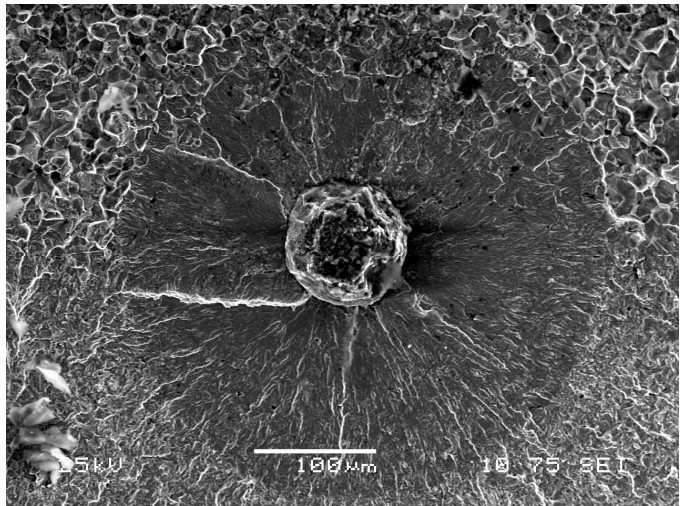
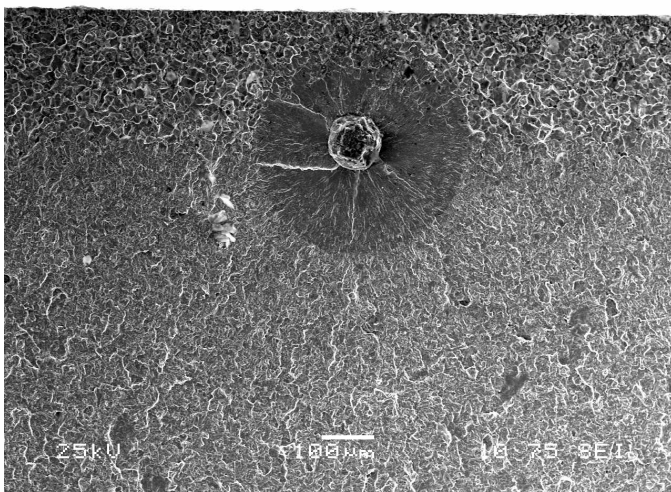


Figure 12 – Showing the fracture surface of iteration 190 SN 17.
Arrow shows location of subsurface burst as the initiation.



Figures 13 and 14 – Showing an inclusion at the initiation location.

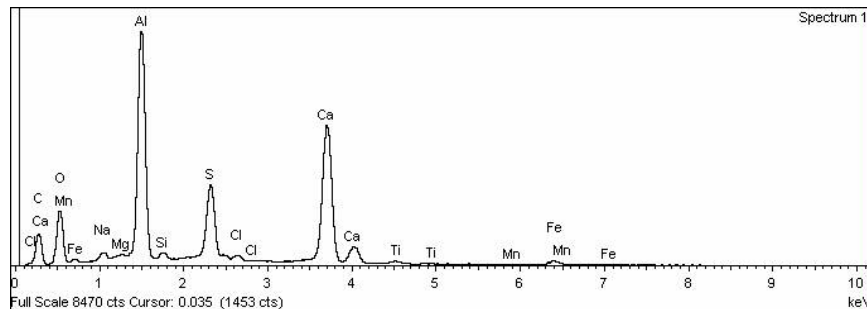


Figure 15 – EDS spectrum showing the elements present in the inclusion (iteration 190 SN 17).

AISI – 4 point bend fracture samples 16MnCr5
Iteration 190 (Shallow CD)
Iteration 194 (Deep CD)
J. Brown 5/23/2017

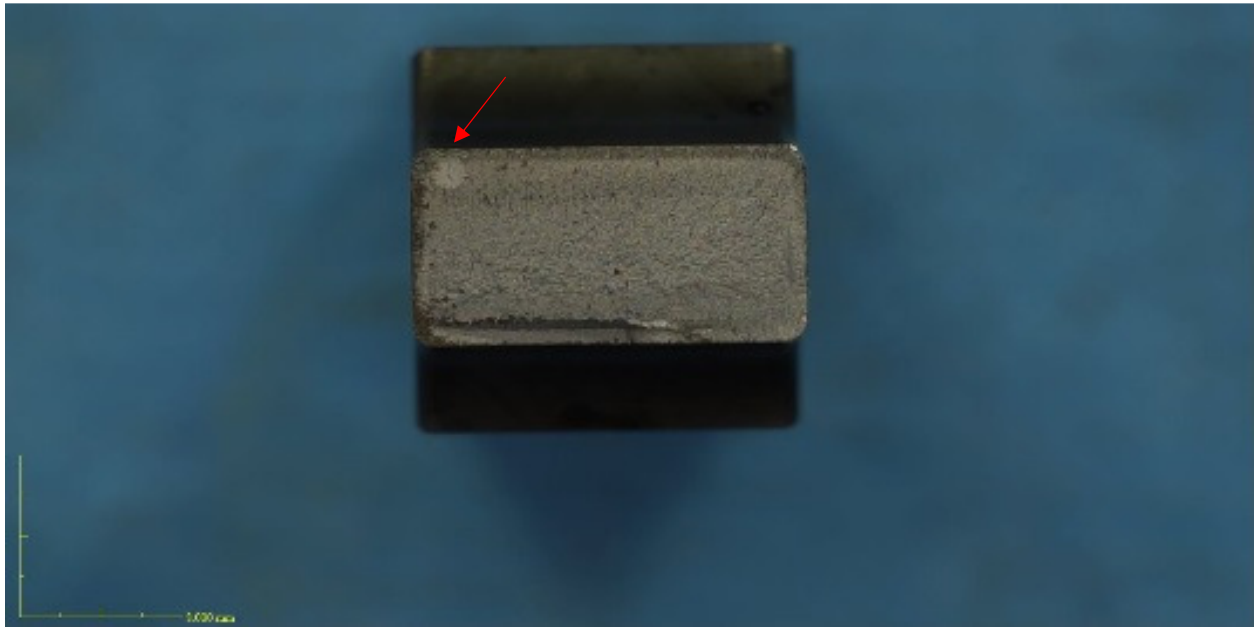
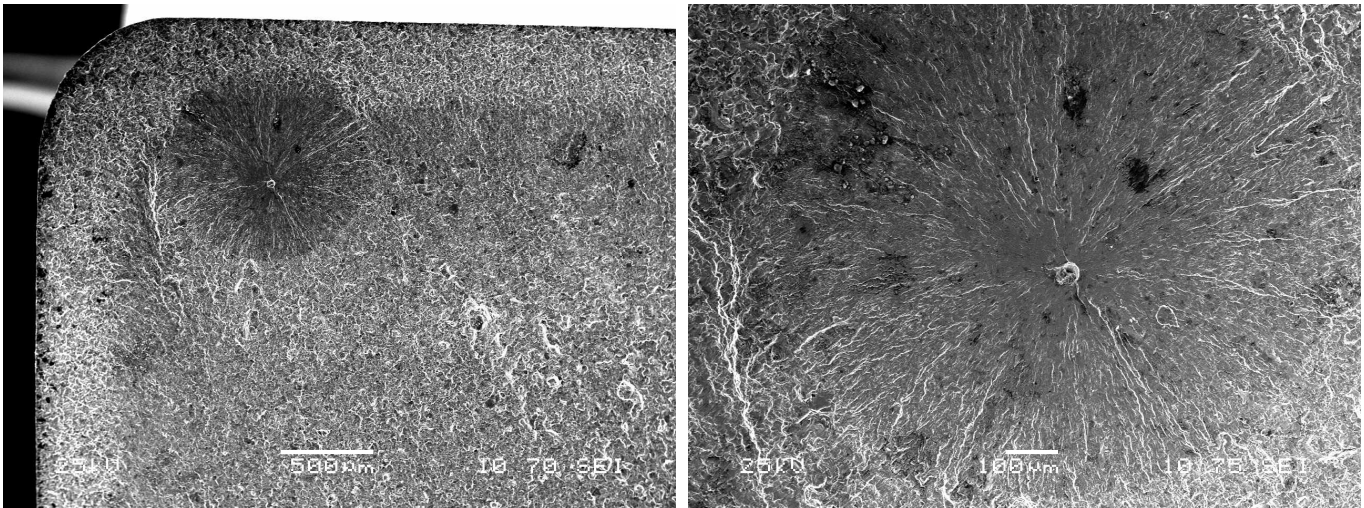


Figure 16 – Showing the fracture surface of iteration 194 SN 9.
Arrow shows location of subsurface burst as the initiation.



Figures 17 and 18 – Showing an inclusion at the initiation location.

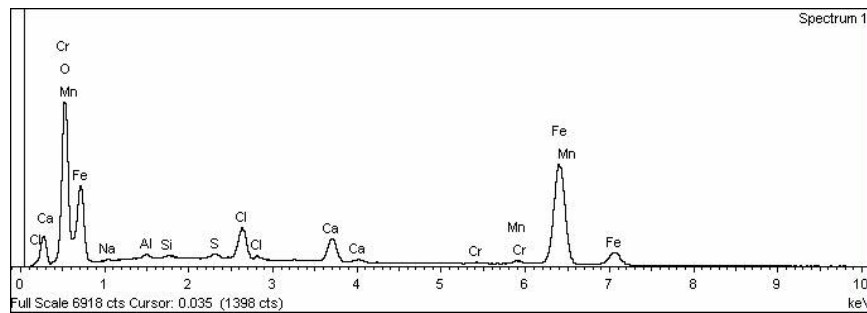


Figure 19 – EDS spectrum showing the elements present in the inclusion (iteration 194 SN 9).