

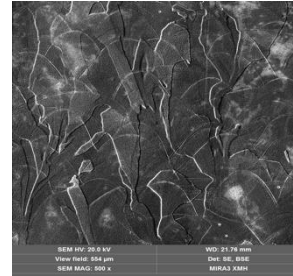


The Metallurgy Master Mind LLC - Works For Sustainable World

Naperville, IL, USA, 60565

Metallography and Microscopy (ASTM E3)

- Sample Preparation (ASTM E3 and ASTM E407)
- Phase Analysis (ASTM E562/E930)
- Grain size Analysis (ASTM 112/ASTM1181)
- Inclusion Rate (ASTM E45 and ASTM E1245)
- Digital Micrography or Macrography (ASTM E1359, E2016, E7)
- SEM/EDS (ASTM E2018, and E1508)



Coating/Surface Analysis

- Case Depth (ASTM A833)
- Coating Thickness (ASTM B487)
- Density measurement (ASTM B311/B962)
- Exfoliation Analysis (Al only ASTM G4)



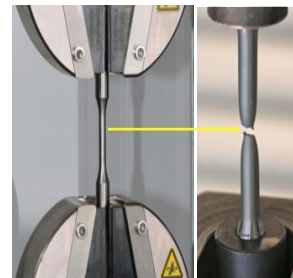
Failure Analysis and Consulting

- Failure/Root Cause Analysis (ASTM E2332)
- Fractography (ASTM E1823)
- Report Writing
- Product Approval Testing (SPAP/PPAP)



Mechanical Testing

- Tensile (ASTM E8/ASTM A370)
- Compression (ASTM E9/ASTM A370)
- Bend Test (ASTM E290/ASTM A370)
- Fatigue (ASTM E606, E466/ASTM A370))
- Microhardness (ASTM E384/ ASTM A370)
- Rockwell (ASTM E18/ASTM A370) and Brinell (ASTM E10/ASTM A370)





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Heat Treatment

- Stress Relief (SAE AMS 2759/5 and ASME Section II Part A, and ASME B31.3)
- T6, T7 (ASTM B917/B917M)
- Tempering (ASTM A255/ASTM304 and ASTM A681)
- Carburizing (SAE AMS 2759/7)



Alloy Development

- Melting/Casting
- Cold Rolling

