Additive Manufacturing (AM), also known as 3D Printing, is changing the way products are designed, prototyped, produced and brought to market in many high-tech fields such as Aerospace, Medical Device, Transportation and Power Generation.

With the growth of AM, the need for reliable analytical testing is more important than ever. IMR Test Labs offers a wide variety of testing solutions to ensure the integrity of the raw materials and the finished products and components they produce.

For example, IMR provides comprehensive powder analysis to fully characterize the starting powder via test methods such as:

- Chemical Analysis (ICP-AES, ICP-MS)
- Percent Crystallinity Testing
- Particle Size Testing (Microtrac)
- Morphology Analysis (XRD, SEM and Optical)

Additionally, we offer density testing on samples to determine how compact the sample has become after bonding, and compression testing to determine how much force a sample can handle. A full list of analytical services offered by IMR for Additive Manufacturing is listed on the back page of this Knowledge Sheet.

Quality is a priority at IMR Test Labs and we’ve instituted strict quality control systems to ensure testing is completed with the utmost integrity. See our website for a full list of accreditations.

Our reports and analyses are clear, concise and complete. We are prepared to discuss the results at any time. If you require expedited testing, we’re willing and able to deliver high-quality test reports on a timeline.
ANALYTICAL SERVICES FOR ADDITIVE MANUFACTURING TESTING

METALLURGICAL ANALYSIS
- Alpha Case
- Aggressive Machining Evaluations
- Brazing Analysis
- Case Depth
- Certified Weld Inspections
- Coatings Analysis
- Decarburization
- Failure Analysis
- Fractography/Fracture Mechanics
- Grain Size
- Image Analysis
- Inclusion Rating
- Intergranular Attack
- Intergranular Oxidation
- Macroetch/Microetch
- Metallography/Materialography
- Microhardness (Knoop, Vickers, Macro/Vickers)
- Microstructure
- Orientation in Microstructure
- Particle Analysis (Distribution, ID, Size)

MECHANICAL TESTING
- Bend Testing (3 Point, 4 Point)
- Bond Strength Testing
- Charpy Impact Testing (-320°F to 450°F)
- Coefficient of Thermal Expansion by TMA
- Composite Testing (FRC, CMC)
- Creep & Stress Rupture
- Fatigue Testing (Axial, Low Cycle, High Cycle, Rotating Beam, Coating Shear)
- Flexural Properties (Modulus, Strength, Stress-Strain Response)
- Fracture Mechanics
- Hardness (Rockwell, Brinell)
- Heat Aging
- Indentation Toughness
- Impact Testing (Charpy, Izod)
- Lap Shear Testing
- Open Hole Tension/Compression
- Shear Properties
- Slow Strain Rate
- Taber Abrasion/Wear Resistance
- Tensile Testing - Metals (to 2000°F)
- Torsional/Axial Fatigue (200 lb)

CHEMICAL ANALYSIS
- Alloy Chemistry/Verification
- Ash Content
- C, H, O, N, S
- Chemical Resistance
- Cleanliness Testing
- Coating Weight
- Contaminant/Corrodent Analysis
- Density
- DSC Analysis (Melting Point, Glass Transition, % Crystallinity, Degree of Cure, Purity)
- Filler Content Analysis
- FTIR Analysis
- GC/MS Analysis
- Halogen Analysis (IC)
- Heavy Metal Impurities
- Hexavalent Chromium
- ICP-AES Analysis
- ICP-MS Trace Element Analysis
- Ion Chromatography (IC)
- Material Certification
- Mercury Analysis
- Metallic Material Verification/ID
- OES Analysis
- Particle Size Analysis
- Percent Crystallinity
- Phase Identification
- Positive Material ID (On-site PMI available)
- Powder Diffraction
- Precious Metal Assay
- RoHS Testing
- SEM/EDX
- Sieve Analysis
- Trace Element Analysis
- Unknown Material ID
- X-Ray Diffraction (XRD)
- XRF Chemistry

IMR Test Labs Knowledge Sheet

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