



## THE MOST COMPREHENSIVE ADDITIVE MANUFACTURING TESTING

## OVERVIEW

As the use of additive manufacturing grows across industries, the right testing partner is crucial to more efficient product development. That partner is Element. With almost 200 years of experience and a global network of world-class laboratories, we make certain that the materials and products we test, inspect and certify for our customers are safe, quality, compliant and fit for purpose.

## WHY CHOOSE ELEMENT?

## THE MOST COMPREHENSIVE OFFERING

We support our clients in aerospace, medical devices, transportation, and energy sectors with the most comprehensive level of additive manufacturing testing services in the industry. From metals to polymers, we offer a variety of test methods to suit your material DNA product qualification needs.

## FASTER TIME TO MARKET

Our leadership in the development of additive manufacturing testing standards allows us to qualify early in highly-regulated industries characterized by rigorous validation. That is key to ensuring that our clients' products can go to market quickly and safely. Understanding your needs in the installation, operation, and procedure validations when qualifying a new printer or adding new products, Element delivers fast turnarounds to meet your production schedules for both production and R&D purposes.

## A PARTNER ON THE LEADING EDGE

Our team's deep expertise puts us on the forefront of additive manufacturing testing. To ensure the success of these new manufacturing resources, our experts collaborate with industry leaders, higher education

and public sector organizations ranging from the ASTM International Committee F42 on Additive Manufacturing Testing Technology and the National Additive Manufacturing Innovation Institute to America Makes. We are leading developments in testing methods and accelerating the creation of stringent international testing standards.



## A CLIENT-CENTRIC APPROACH

As a trusted testing partner, we can help:

- Identify and define test requirements
- Create reliable programs for quality assurance
- Determine material properties that may be vulnerable in additive manufacturing applications
- Detect critical flaws with a higher level of accuracy and detail
- Analyze failures

With these capabilities, we help our clients face the new challenges presented by additive manufacturing head-on by leveraging our experience in all industries.

## OUR TESTING SERVICES

## MATERIALS

- Aluminum – Al
- Asphalt & Bitumen
- Ceramics
- Cobalt Chrome
- Composites
- Concrete, Stone & Masonry
- Copper - Cu
- Glass & Glass Fibers
- Iron – Fe
- Magnesium – Mg
- Metals and Alloys
- Nickel – Ni
- Nonmetals
- Polymers
- Steel
- Superalloys
- Textiles
- Titanium - Ti

## MECHANICAL

- Bend
- Charpy Impact
- Compression
- Experimental Stress Analysis
- Hardness / Microhardness
- Powder Characterization
- Shear
- Surface Roughness
- Structural Testing
- Tensile
- Torque

## FATIGUE

- Creep
- Pressure Cycling
- Rotating Beam
- Strain Controlled Axial
- Stress Controlled Axial
- Structure Life Cycling/Durability
- Stress Rupture

## CORROSION TESTING

- Ferric Chloride
- Ferric Sulfate
- Hydrogen Induced Cracking (H<sub>2</sub>) (Sour)
- Hydrogen Induced Cracking (HIC) (Sour)
- Intergranular
- Pitting and Crevice
- Salt Spray
- Sulfide-Stress Cracking (Sour)

## FRACTURE MECHANICS

- Crack Propagation (da/dN)
- CTOD
- Fracture Toughness
- JIC
- JR
- KIC

## NDT

- Eddy Current
- Liquid Penetrant
- Mag Particle
- Radiography (X-Ray)
- Ultra Sonic

## METALLOGRAPHY

- Fractography (SEM)
- Microstructure Evaluation

## COMPONENT AND SUB-COMPONENT

- Custom Fixture / Tooling / Set Up
- Custom Testing
- Fluid Use / Exp
- Multi Actuator
- Strain-Stress
- Pressure / Temperature / Flow

## CHEMICAL ANALYSIS

## FAILURE ANALYSIS



## GLOBAL LEADERS IN TESTING, INSPECTION &amp; CERTIFICATION

The Element Materials Technology Group is one of the world's leading global providers of testing, inspection and certification services for a diverse range of materials, products and technologies in advanced industrial supply chains where failure is not an option. Headquartered in London, UK, Element's team of more than 6,000 expert scientists, engineers and technicians operate from 200 locations across five continents, delivering an extensive range of solutions to customers in critical industries including Aerospace, Connected Technologies, Construction, Defense, Energy, Environmental, Life Sciences and Transportation. Everything we do is designed to help our customers to develop better products, get them to market on time, save time and money, and to minimize the risk to their business from their materials and product development and production activities.