element

CLEVELAND



Since the early days of the automotive industry, Element Cleveland has supported businesses in Ohio with materials testing and inspection. In 1911, metallurgists in the new laboratory tested Henry Ford's new parts destined for the Model T. Today, the laboratory's experts assist companies worldwide with Nadcap-accredited materials analyses, chemistry, mechanical testing, metallography, weld evaluation, heat treatment and more. In addition, Element Cleveland's failure analysis team provides workable solutions to companies faced with materials and product problems and failures.

ELEMENT WORLDWIDE

WHO ARE WE

Element Cleveland is part of a global network of Element laboratories and experts specializing in materials testing, product qualification testing and failure analysis.

ELEMENT MATERIALS TECHNOLOGY

We are the recognized leader in materials technology. We support our customers by utilizing our analytical expertise and knowledge. This ensures quality and integrity for advanced industrial products throughout the supply chain. With over 180 years of collective experience, we are the preferred partner for our customers' most critical testing needs.

INDUSTRIES WE SERVE

Our accredited and industry-approved laboratories provide materials testing, product qualification testing and failure analysis for companies in multiple sectors:

- Aerospace & Defense
- Oil & Gas
- Transportation

MAIN EQUIPMENT

- ATS Stress Rupture & Creep Frames
- MTS Servo-Hydraulic Fatigue Frames, 20Kip to 100K lbs. capacity
- Elevated Temperature Tensile Frame, 60K lbs. capacity
- Fracture Toughness Equipment
- Room Temperature Tensile Frames - 60 to 400k lbs. capacity
- Stress Durability Frames - 5 to 200K lbs. capacity
- Heat Treat Furnaces - Class 2 / 2100°F
- Scanning Electron Microscope with EDS
- Rockwell and Brinell Hardness testers
- Charpy Impact Testers
- Buehler Vickers & Knoop Microhardness Tester
- Metallurgical Scopes with Video Systems
- Optical Emission Spectrometer (OES)
- Atomic Absorption with Graphite Furnace (AA)
- Inductively Coupled Plasma Spectroscopy (ICP)
- Gases - Hydrogen, Oxygen, Nitrogen, Carbon/Sulphur
- Machine Shop including: CNC Lathes, CNC Mills, conventional lathes and mills, CNC Grinders, Thread grinders

INDUSTRIES WE SERVE

- Aerospace
- Airframe Structures
- Automotive
- Automotive Parts
- Components
- Building & Industrial Construction
- Castings & Forgings
- Commercial Vehicles
- Electronic Systems
- Engineering & Supply Chain
- Exploration
- Fastener Manufacturing
- Fossil Fuel Power
- Ground Support Equipment
- Heavy Equipment
- Infrastructure
- Land Based Power Generation
- Landing Gear

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OUR SERVICES

CHEMICAL ANALYSIS
- Optical emission spectroscopy (OES / Direct reader)
- Inductively coupled plasma (ICP)
- Atomic absorption (graphite furnace)
- Materials identification
- LECO direct combustion for carbon, sulfur, oxygen, nitrogen, hydrogen

MECHANICAL TESTING
- Full size yield
- Machined tensile
- Elevated temperature tensile
- Axial tensile
- Nut axial tensile
- Proof load tension and compression
- Wedge tensile
- Core hardness
- Surface hardness
- Hardness testing
- Impact testing
- Mechanical testing for Metals & Nonmetals,
- Tensile testing & stress
- Rupture/Creep Testing
- Bend testing
- Torque testing
- Recesss torque
- Locking torque
- Stress durability- torque
- Stress durability- external load
- Hydrogen embrittlement
- Stress rupture
- Creep rupture
- Rotational capacity
- Pipe flare and flattening testing

METALLURGICAL TESTING
- Microstructure evaluation
- Grain size
- Grainflow
- Microcleanliness
- Percent delta ferrite
- Microhardness
- Macro etch
- Surface discontinuities
- Decarburization
- Case depth
- Alpha case
- Plastic thickness (optical)
- Thread evaluations
- Stress corrosion
- Oxidation/ corrosion
- Intergranular attack
- Non- traditional machining evaluation (EDM, ECM, LBMR)

HEAT TREATMENT
- Heat treat response plus Jominy hardness (certified lab size furnaces)

WELDING TECHNOLOGY
- Weld process improvement
- Welding inspection
- Welding procedure qualifications
- Welding & brazing procedure development
- Welder qualifications
- Weld evaluations (verify Robotic applications)
- Brazing procedure qualifications
- Brazing qualifications
- Hydrostatic and pneumatic pressure testing

NON-DESTRUCTIVE TESTING
- Fluorescent penetrant*
- Magnetic particle*
- Magnetic permeability
- Ultrasonic*
- Visual inspection*

FULL MACHINING CAPABILITY

FASTENER TESTING

FRACTOGRAPHY SERVICES

FRACTURE TOUGHNESS

HARDWARE TESTING

EQUIPMENT & COMPONENTS TESTING

MATERIAL PROPERTIES TESTING

MATERIALS TESTING

METALLURGICAL ANALYSIS

FAILURE ANALYSIS & CONSULTING
- Materials selection
- Manufacturing and process evaluation
- Scanning electron microscope (SEM)
- SEM / EDS
- Residue analysis
- Corrosion analysis
- Fractography
- Replication/field metallography
- Reverse engineering

ACCREDITATIONS

- Nadcap
- A2LA
- ISO 17025

APPROVALS

- Bell Helicopter Textron
- GE Aircraft Engines
- Nuclear Industry Assessment Committee (NIAC)
- Nuclear Procurement Issues Committee (NUPIC)
- Westinghouse
- Airbus
- The Boeing Co.
- Beechcraft
- Cessna
- Gulfstream
- Honeywell
- Hamilton Sunstrand
- Pratt and Whitney
- Pratt and Whitney- Canada
- Safran
- Sikorsky

*Through Element Middleburg

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