

# Failure Analysis

The Applus+ Materials Centre specialise in conducting materials failure analyses for our clients. We focus on the diagnostic and forensic engineering analysis of materials related failures for all types of materials, including metals and alloys, ceramics, polymers and elastomers, and various composites.



## THE Applus+ SOLUTION

A typical failure investigation may include the following steps:

- Site inspection and data gathering
- Visual and macroscopic analysis
- Non-destructive testing to determine the extent of the failure
- Chemical and compositional analysis
- Hardness testing
- Mechanical testing
- Optical microscopy including Fractography
- Scanning electron microscopy and EDS analysis of specific areas of interest

As part of each investigation, it is normally common to conduct a Root Cause Analysis (RCA) to understand the various key variables that can influence the performance and outcomes of the materials and components under investigation.

Also essential to each investigation are understanding the client applications, structures, equipment, processes and understanding and relating manufacturing processes for the materials in relation to the failure modes observed.

The key advantages Applus Materials Centre provides to our clients are the experience and expertise in advanced diagnostic and forensic engineering, along with specific

knowledge of manufacturing, mineral processing, mining, oil and gas and utilities industries.

## Target customers

Failure analysis is an essential process to develop a detailed understanding and root cause analysis of equipment and material failures, to ensure the correct causes are identified and suitable solutions developed to minimise future issues.

## Key customer benefits

A successful and detailed failure analysis can ultimately lead to reduced costs and lower risks associated with processes and manufacturing, due to:

- Establishing improved material quality
- Ensuring material conformity and suitability to the processes and applications involved
- Minimising wear and corrosion
- Manufacturing improvements
- Reducing the risk of re-occurring failures
- Reducing the associated safety risks of materials and component failures

Using a structured and systematic failure analysis process in combination with site support and participation can often lead to reduced equipment down-time and significantly improved productivity.