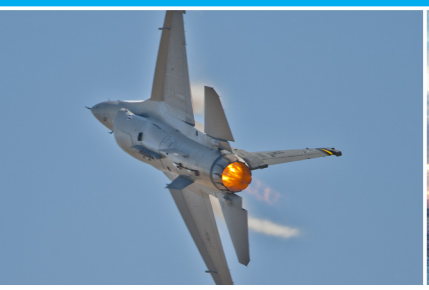
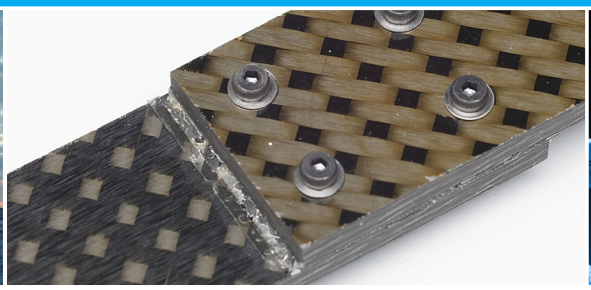
Material and failure analysis



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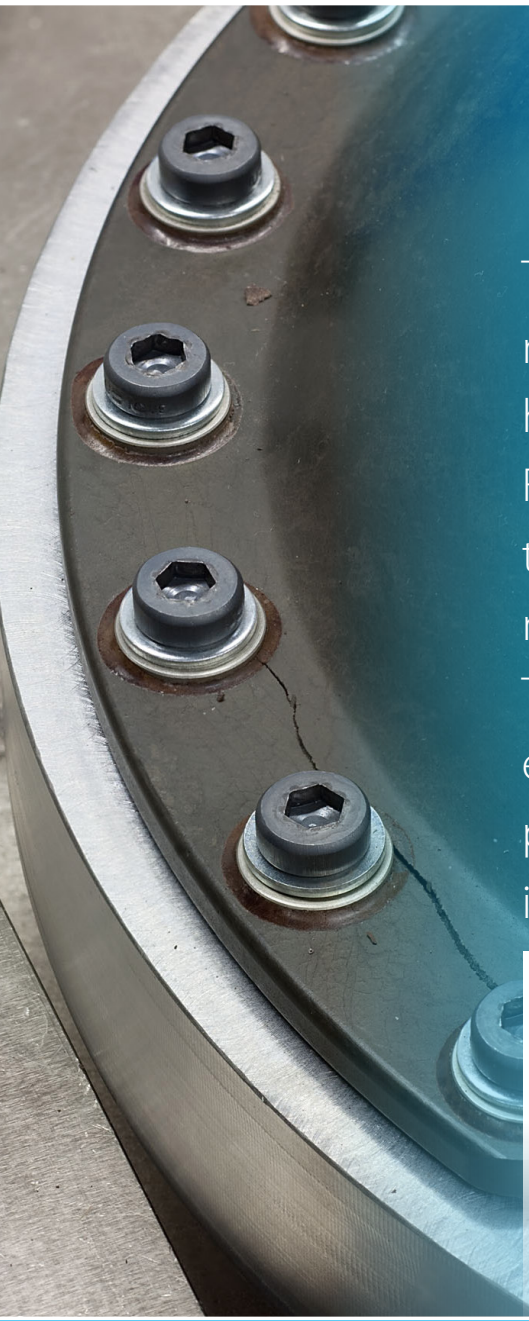


"WHERE QUESTIONS ABOUT MATERIALS ARE ANSWERED"

The National Aerospace Laboratory NLR offers material and failure analysis for the aerospace and high tech industry.

From a multi-disciplinary approach NLR delivers the essential feedback to design, manufacturing, maintenance/repair and safe operation.

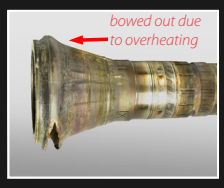
The modern material facilities and extensive experience provide NLR the capabilities to ensure proper material solutions for our national and international customers.

The facility includes:

- Fully equipped material testing and investigation laboratory
- Metallographic imaging equipment for microstructural examination and material characterization
- Scanning electron microscope with EDX/WDX and EBSD
- Portable microscope and replication kit for field investigations
- Environmental test facility
- High temperature test facility

"THE RIGHT PARTNER IN MATERIAL RESEARCH"

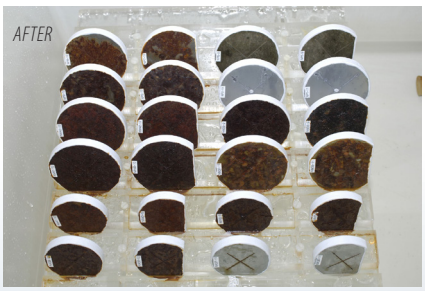
root cause analysis of F16 crash



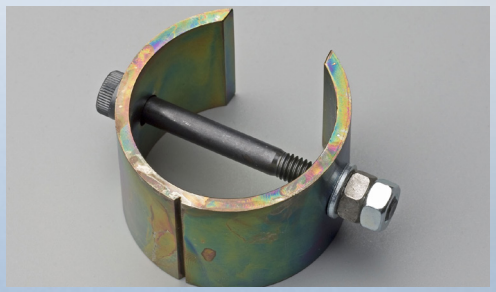
Fact: strange drive shaft geometry

Is the overheating of the drive shaft caused by an oil fire?

The replacement and/or implementation of new materials or coatings are driven by technical performance, costs or environmental requirements. For aerospace applications, these new materials or coatings must be validated on the effectiveness to the service live. NLR is fully equipped to guide you through the entire validation process. An example of this validation is the replacement of chroming plating on landing gears of airplanes.



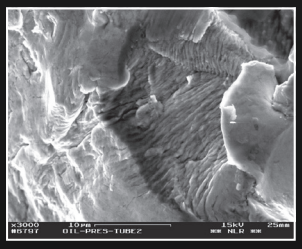
Salt spray test for the replacement of chroming plating as applied on landing gears (left side before the test, right side after 192 test hours)

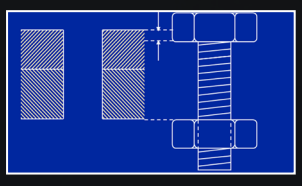


Test method for mechanical hydrogen embrittlement evaluation of plating/coating processes and service environments

Determination of the residal stress in material after an applied process

What causes the load cycles?





Different thermal expansion coefficent

Remedy: Worldwide replacement of the steel bolts by nickel bolts

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