



ADVANCED
MATERIAL
SOLUTIONS

Q&A eBook with
Advanced Material Solutions:
The Importance of Non-destructive
Testing in Manufacturing



Testing
before
there's
a problem,

to protect
your company's
tomorrow.



Future-Proofing Manufacturing through Non-destructive Testing

Competitive forces are driving unheard-of levels of innovation in product design, materials and lean manufacturing processes. A rigorous and proactive approach to risk containment is essential to protect your brand and bottom line.

Think ahead,



stay ahead.

Q1

What high volume inspection solutions should manufacturers be aware of, and how do these solutions protect manufacturers?

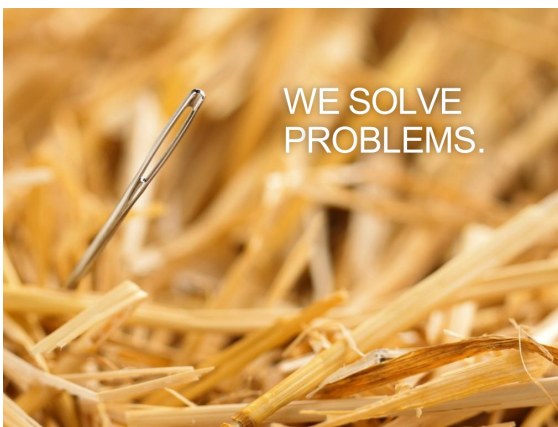
Today's non-destructive testing field is comprised of several commonly utilized techniques and several others that aren't as commonly employed. Each technique has its advantages and limitations. No single method is superior, however, AMS' expertise lies in our team's ability to identify and deploy the ideal inspection method for each project at the best overall value.

The **most mass production friendly NDT methods** (depending on project specifics):

- Ultrasonic Inspection (UT)
- Acoustic Resonance Inspection (AT)
- Eddy Current Inspection (ET)
- A combination of the above



A well-constructed non-destructive testing system can be exceedingly beneficial in proactively evaluating components to ensure 100% containment of potential defects. With such a system, crises can be averted, along with unnecessary distractions and unwanted costs.



An AMS Customer Experience

For more than twenty years, AMS has been working with a very large, tier one automotive supplier. This company had been inspecting their pressure vessel chambers with Ultrasonic examination to detect sub surface cracks and other material issues. Like many companies, they had only been

testing where exceptions had occurred. Over time, these test exceptions affected more and more product families, part numbers, and a wider range of locations on the parts. Ultimately, this client found itself faced with investigations, and containment and damage mitigation involving multiple customers. The company was suffering financially and important customer relationships were being harmed. AMS was able to help them implement proactive non-destructive testing, which positively affected the company's crisis management issues, thereby helping to safeguard the brand's reputation.

The client has since made the decision to have AMS inspect multiple products in an ongoing basis, and is now managing risk and focusing on mitigating financial penalties by sustaining a 100% proactive commitment to test each and every part. Today, AMS continues to help test their product families, part numbers, and the entire part, regardless of whether any test exceptions have occurred.

Q2

Where can NDT be applied and what types of non-conformances can be detected?

Non-destructive testing is an essential part of any industrial toolbox. Proactive materials evaluation provides confidence by increasing the certainty that a part will perform as intended. High-tech inspection - in the context of quality management - leaves no doubt about the value of proactive NDT. Getting it right the first time is fundamental to quality assurance.



Non-destructive testing can be used to detect **flaw types** such as:

- raw material issues
- residual stress
- surface or subsurface cracks
- delaminations
- porosity
- missed processes
- others



Inspections can be carried out on **parts** made by:

- metal stamping
- draw forming
- casting
- forging
- MIM/sintered metal
- tubing
- composites

- machining
- extrusion
- secondary processes



Ideal applications for non-destructive testing can be found in safety critical **automotive systems** such as:

- airbags
- seatbelts
- steering
- suspension
- powertrain
- drive line
- braking
- fuel system
- exhaust system components

NDT can also be applied in **consumer products** such as:

- power tools
- white goods
- HVAC systems
- other

Q3

What future-proofing best practices do you recommend manufacturers employ in their approach to non-destructive testing?

The importance of non-destructive testing and the bottom line value to manufacturing companies may remain in question for some executives. Companies should evaluate their own possible risks from not investing in proactive NDT. For example, how will they address the following issues?

- media criticism
- damaged reputation
- client loss
- undesirable outcomes with plant facilities, staff, etc.
- accidents and loss of life
- investigations, penalties, fines, legal fees, compliance

These realities are issues for companies large and small, right now, every day. Priority one at AMS is to ensure that every customer avoids these risks.



Best case scenarios when companies invest in NDT:

- exceeding goals and expectations
- achieving favorable outcomes
- processes that run smoothly and safely
- ensuring product integrity and reliability
- attaining customer satisfaction
- maintaining quality level throughout process
- making a profit

Companies that understand the value and impact of these benefits derive success and sustainability within the industry.

AMS recommends a 4-step approach:

1. Recognize inherent risks

We begin by conducting a review of all safety-critical or critical-to-quality components:

- How is the raw material produced?
- How is the raw material modified during primary and/or secondary processing?
- Could flaws in the raw material - even benign flaws - be reshaped or repositioned in the finished part, resulting in undesirable conditions?

If the answer is yes to any of these questions, talk with us.

2. Create a custom blueprint

Crafting a blueprint to proactively evaluate safety critical materials before issues arise is essential. At AMS we develop customized inspection solutions comprised of one or more non-destructive testing disciplines that are relevant to the needs of each of our customer's specific projects.

Identifying and eliminating root causes is the priority goal of our collaborative partnerships with our customers.



3. Ensure impartiality and transparency

Operating as a third-party inspection partner with our customers enables AMS to provide transparent findings and communicate every aspect of discovery with them. This collaboration imparts valuable knowledge about our customer's products, reducing the likelihood of recurring issues.

Our team of experienced technicians is certified across a range of NDT disciplines. When companies troubleshoot in-house, they may discover glaring issues, but may not unearth issues that aren't obvious. Unaccounted for, these issues can go undetected and impact their customers. Our certified NDT technicians are trained to do one thing: implement the highest level of impartial NDT services. That's all they do.

4. Invest where safety critical and high volume intersect

Two objectives are essential:

1. Ensuring that no defective parts can escape detection and get into the marketplace
2. Flawed parts that are not considered dangerous are also stopped from going into service because of their potential impact on production and schedules, resulting in losses



Proactive testing is not simply putting out fires, it is driven by a perpetual demand for integrity, reliability, safety, quality and compliance.

Q4

What are the benefits you've seen when companies take advantage of non-destructive testing and redirect their testing focus from a reactive to proactive approach?

Financial justification is central to building the case for proactive NDT. Substantiating costs with upper management is required, along with a thorough understanding of the technical principles involved. One missed defect can result in a failure that can erase savings accrued from years of testing.



Think ahead. Stay ahead. This is the very foundation of how AMS approaches NDT to help our customers succeed.

Waiting to test for issues after they've been uncovered in production is "reactive testing." This approach can be costly and is built around a failure mentality.

The AMS course is to proactively provide materials evaluation to address problems before they become problems. By leveraging this best practice, companies can realize improved efficiencies, boosted profits, and enhanced brand protection.



Here's how AMS proactive NDT provides significant benefits to companies:

- Improved product quality
- Reduction in PPM scores

- Improved plant productivity
- Reduced cost of quality
- Reduced scrap and warranty costs
- Less frequent incident investigation and reporting
- Lowered containment costs
- Limited missed deliveries
- Improved customer satisfaction
- Limited third party defect investigation
- Lowered product recall costs

Today's executives recognize that a proactive approach to materials evaluation:

- provides best practices for crisis avoidance
- maximizes plant output
- minimizes costs



Protecting a company's brand and reputation by ensuring the safe and efficient operation of products and parts is the cornerstone of AMS's approach to NDT. Our mission is to save our customers time and money by avoiding unnecessary costs and revenue loss due to product or equipment failures, with minimal disruption to production.

Peter Miller, AMS



Peter Miller, President of Advanced Materials Solutions (AMS) is an active business leader in articulating why non-destructing testing demands a proactive approach to problem solving. This past November, Peter spoke at the American Automotive Summit (produced by Generis Group) about Future Proofing Manufacturing with NDT -- a high priority topic for automotive companies that continually deal with risk containment. In December 2016, he spoke on the same topic at the Mexico Auto Industry Summit in Leon, Guanajuato Mexico.

Peter works with highly diverse, tier-one businesses and has considerable experience and hands-on expertise in solving NDT problems. His commitment in avoiding catastrophic events and protecting the bottom line of AMS' customers continues to be his singular focus.

Peter will also be speaking at Generis' American Manufacturing Summit on March 28-29, 2017 in Chicago, IL.



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