Prevent Alloy Mix-ups and Take Control of Your Supply Chain:

Handheld XRF For Fast, Easy Alloy Identification and Chemistry

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Agenda

- About Olympus
- What are material mixups and what are the consequences?
- What is X-Ray Fluorescence (XRF)?
- How XRF can help avoid mixups and improve quality control
- Improve QA/QC with Vanta handheld XRF
Scientific Solutions

Medical

- Ultrasonic Flaw Detectors
- Eddy Current
- Remote Visual Inspection

Consumer

- Microscopy
- X-ray Fluorescence
- X-ray Diffraction
What are material mix-ups and consequences?

A mistake that results from taking one thing for another...

A wrong action attributed to bad judgement, ignorance or inattention...
Where Material Mixups Happen

Foundry/Mill

Decommissioning/Recycling

Procurement/Fabrication

Maintenance/Repair

Receiving/Installation

Trust, but Verify your MTRs
What are material mix-ups and consequences?

How Mixups Happen

- Improper labeling and documentation
- Materials not distinguishable or identifiable by human eye
- Improper storage or segregation of material
- Material’s country of origin may have different standards than country of use

Consequences

- Corrosion occurring at an unexpected rate leading to component failure
- Unscheduled downtime, maintenance, production halt, shipment delay
- Legal action, regulatory fines
- Market reputation, negative publicity, loss of business
- Catastrophic event leading to fatalities
What Is X-Ray Fluorescence (XRF)?

![Periodic Table Diagram][1]

- Typical alloying or residual elements in metal applications
- Other elements detected by X-ray Fluorescence

[1]: https://www.olympus-science.com/
How Does XRF Work?
How Does XRF Work?  Alloy Grade Matching

<table>
<thead>
<tr>
<th>COMPOSITION</th>
<th>(wt %)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbon</td>
<td>0.08 max.</td>
</tr>
<tr>
<td>Manganese</td>
<td>2.00 max.</td>
</tr>
<tr>
<td>Phosphorus</td>
<td>0.045 max.</td>
</tr>
<tr>
<td>Sulfur</td>
<td>0.030 max.</td>
</tr>
<tr>
<td>Silicon</td>
<td>0.75 max.</td>
</tr>
<tr>
<td>Chromium</td>
<td>17.00 – 19.00</td>
</tr>
<tr>
<td>Nickel</td>
<td>9.00 – 12.00</td>
</tr>
<tr>
<td>Titanium</td>
<td>5 x (C + N) min., 0.70 max.</td>
</tr>
<tr>
<td>Nitrogen</td>
<td>0.10 max.</td>
</tr>
<tr>
<td>Iron</td>
<td>Balance</td>
</tr>
</tbody>
</table>
How XRF Can Help Avoid Material Mix-ups

Automotive Quality Control Example

Low Alloy Steels for high-strength applications - crankshafts, gears, splines, axles
How Can XRF Help Avoid Material Mix-Ups

Automotive Quality Control - Low Alloy Steels
How XRF Can Help Avoid Material Mix-ups

Aerospace and Aviation Example
Verification of Aluminum Grades
How Can XRF Help Avoid Material Mix-Ups

Aerospace and Aviation - Verification of Aluminum Grades
How XRF Can Help Avoid Material Mix-ups

Refinery / Petrochemical Example

Positive Material Identification of Stainless Steels
How Can XRF Help Avoid Material Mix-Ups

Refinery / Petrochemical Example – Positive Material Identification of Stainless Steels
Why XRF is Beneficial & Critical to Quality Control

Make & Save More $$$ Faster

• Allows Quick Decisions for Maximum Productivity and Yield
• Reduce Waste
• Reduce Unscheduled Maintenance, Production Halts, Delayed Shipments

Quality Assurance

• Ensure Product Quality
• Ensure Product Reliability
• Verify Product Spec
• Ensure Product Safety
• Comply with regulatory and industry standards
Vanta Handheld XRF
Vanta Analyzers are Rugged

- **Drop tested** using U.S. Department of Defense methods (MIL-STD-810G)
- Reducing the risk of damage and costly repairs when a device is dropped or jostled
- A dropped instrument shouldn’t halt your productivity
Vanta Analyzers are IP Rated

**IP 64**
- Dust Tight (highest rating)
- Water splashing from any direction
- Vanta M Series
- High End
- Thinner protection window

**IP 65**
- Dust Tight (highest rating)
- Water jets from any direction
- Vanta C series
- Mid range
- Kapton mesh window
Dual Detector Protection

– Patented Eyelid Detector Shutter
– Kapton Mesh reinforced Prolene Window
Easily change windows without any tools

- Change windows without any tools
  - No screws to lose
  - No screwdriver to puncture detector

Press

Swing Out

Replace
Vanta Axon™ Technology

- Faster X-ray Counting
- Better Resolution
- Better LOD’s
- Shorter test times
- Higher throughput
- Reliable results all day
- No Daily Calibration Check
Vanta Speed
Vanta – Modern User Interface

Live View Screen
Connected for Greater Productivity

- Embedded GPS
- Data via
  - WiFi
  - BlueTooth
  - Cloud
  - USB
  - SD card
VANTA XRF

- Accuracy / Precision
- Ruggedness
- Low Cost of Ownership
- Easy to Use and Interpret
- Advanced Connectivity & Data Management Features
Thank You!

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