A-T Controls, Inc.
9955 International Blvd. • Cincinnati, Ohio 45246
Phone: 513.247.5465 Fax: 513.247.5462
www.atcontrols.com

Engineer: CMB **No.:** DI00092
Date Created: 05/04/2023
Date Modified:

PMI

PMI (Positive Material Identification) is a non-destructive test that evaluates a sample's chemical composition. PMI testing ensures that the part being tested has the correct material composition and can be used to check against MTRs (Material Test Reports). The three common forms of PMI are XRF (X-ray Fluorescence), Optical Emission Spectroscopy (OES), and Laser Induced Breakdown Spectroscopy (LIBS). XRF testing analyzes the X-rays emitted from the sample being tested and compares them to a known radiation spectrum to determine elemental composition. OES uses a spark to cause a sample to emit light and converts the light into a spectral pattern that is compared to known spectral patterns. LIBS uses spectral data like OES, but it uses a laser to remove the surface of a sample and analyze the plasma's wavelengths.

Limitations of PMI Techniques

XRF analyzers cannot measure elements lighter than sodium, which includes Carbon. OES and LIBS analyzers often require more surface preparation, such as using a grinder to prepare a sample, than an XRF analyzer. OES analyzers are portable; however, they are not handheld like an XRF or LIBS analyzer. Both OES and LIBS analyzers need Argon to operate, increasing the cost for these types of PMI equipment.

A-T Controls PMI Offering

A-T Controls, Inc. uses a Vanta™ C VCW Handheld XRF analyzer to perform PMI testing. A report is produced for each part tested. This report includes the chemical composition of the sample being tested and its closest compound match, sales order, tag number (if applicable), heat number (if applicable), and part number. A sample report can be found on the next page and is provided with each component tested on the sales order. Tests are sent electronically (printed copies can be requested).

There are three different levels available for PMI testing:

Levels of PMI Testing:

Body & End Caps (appears as "PMI TESTING" on sales order): this will test the body and end caps of the valve.

Body, End Caps & Stem (appears as "PMI TESTING 2" on sales order): this test includes the body and end caps of a valve and adds a test for the stem of a valve.

All Components (appears as "PMI TESTING 3" on sales order): this test includes body, end cap, ball, stem, and metallic seats.

Notes on PMI Testing Results

1. Coated materials prevent base materials from being tested, however a PMI test can be performed on the coating or the base material in some instances. Please contact A-T Controls, Inc. on how to proceed with these types of components (example: coated butterfly discs or metal seated valve balls or seats).
2. If a component is painted, a sample will need to be prepared to be tested. Please contact A-T Controls, Inc. on how to proceed on these types of components.
3. Carbon steel valves cannot be tested using an XRF analyzer. Please contact A-T Controls, Inc. for options on PMI testing for carbon steel valves.
4. Please contact A-T Controls, Inc. for pricing and options if LIBS testing is required. LIBS testing is performed by an independent lab.

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Serial Number of PMI Analyzer

Serial Number : 820282

material grade matched

percent composition

element

Chemistry

CF8M 316

CF8M
Exact

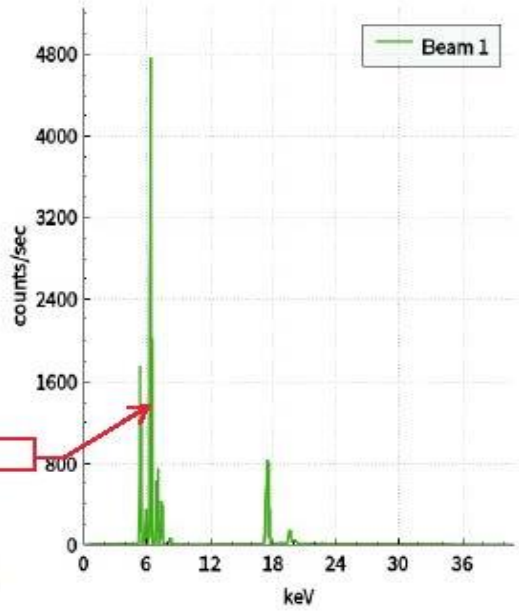
Method : AlloyPlus
Daily ID : 2

Elapsed Time : 3 s

Aiming Image

Spectrum

El	%	+/- 2σ	CF8M
V	0.098	0.029	Resid. 0.2
Cr	18.31	0.19	
Mn	0.81	0.11	
Fe	68.56	0.27	
Co	0.20	0.12	Resid. 0.6
Ni	9.34	0.18	
Cu	0.195	0.041	
Nb	ND	<0.007	
Mo	2.478	0.032	



sample/order information

spectral data

Notes

CUSTOMER:	Your CO Name
PO#:	123456
SO#:	345678
HEAT#:	EXAMPLE
PART#:	FMB-F3-0200-3XX-B
DESCRIPTION:	BODY
TAG#:	1
OPERATOR:	BRAD SHULL