

## POSITIVE MATERIAL IDENTIFICATION

### What is a Positive Material Identification?

PMI testing is a non-destructive means of identifying the precise chemical composition of a metal or alloy and matching it to a material grade (i.e. 316SS).

### How does PMI work?

The most common method of material identification is X-ray Fluorescence (XRF), which is able to accurately identify the chemical composition of an alloy by exciting the atoms with a burst of energy and analyzing their unique reactions. This method of testing can accurately determine atomic make-up of an alloy up to 0.05% of composition.

### How is PMI testing different from a Mill Test Report (MTR)?

A Mill Test Report (or Mill Test Certificate) is a quality assurance document generated by the steel mill that documents material grade, country of origin, chemical composition, and various mechanical test properties. As that material passes through the supply chain the Heat Number of the material is expected to remain on the material and its subcomponents in order to maintain traceability back to the original MTR.

A PMI Report provides the precise chemical composition of the material and the steel grade. It cannot determine hardness, tensile strength, or other mechanical test properties, nor can it verify country of origin.

### So why do I need a PMI if an MTR provides more information?

An MTR is a valuable quality assurance document, but the validity of an MTR or material identification on the part should always be viewed skeptically. Rarely is there malicious intent, however stamping the wrong material grade, losing paperwork, and mixing of material are scenarios that happen all too often in the global metals industry. Installation of the improper material grade into process piping could pose a grave risk to worker safety and process integrity.

Following a number of material corrosion related incidents, many industry groups and regulators established guidelines and recommendations for processing plants to adopt PMI testing plans. PMI testing requirements are included in the following:

- OSHA Process Safety Management (PSM) 1910-119 Highly Hazardous Chemicals (HHC)
- OSHA Chemical National Emphasis Program (NEP) CPL 03-00-014
- OSHA Refinery National Emphasis Program (NEP) CPL 03-00-004
- API RP 587 Material Verification Program (MVP/PMI)

## Does PMI testing only apply to pipes, hoses, and fittings?

No. There are many valves and instruments that are also part of the piping system and require equal, if not greater scrutiny than pipes, hoses, and fittings. Within REOTEMP's product offering the following should be considered part of the piping system:

- Pressure Gauges
- Diaphragm Seals
- Instrument Valves and Manifolds
- Thermowells
- Pressure Switches
- Pressure Transmitters

## Does REOTEMP offer PMI reports on their products?

Yes. A PMI report can be provided with any of the instruments listed above using the option code "PM". REOTEMP performs the service in house for a reasonable charge with little or no effect on overall lead time.

## Does a PMI report from REOTEMP have the same verification and traceability issue that an MTR has?

No. Much like a calibration or hydrostatic test certificate, REOTEMP is performing the PMI on certified equipment and affixing a permanent test # onto the instrument in the form of a tag, stamp, or dial marking on a gauge. In the case of an MTR, REOTEMP is providing a copy of the certificate furnished to us by our material supplier.

## Can both an MTR and PMI be ordered together?

Yes. Congratulations, you are the King of Safety!

## Does REOTEMP offer PMI report on items that are not manufactured by them?

Yes. Please contact customer service with a description of your product.

## LEVELS OF MATERIAL CERTIFICATION FOR PARTS FURNISHED BY REOTEMP

Name	Confidence	Description
<b>General Material Conformance</b>	Good	A statement from REOTEMP expressing the material of the component parts furnished on a given order. This is issued on a per order basis.
<b>Mill Test Report</b>	Better	A statement from REOTEMP expressing the wetted material of the parts furnished on a given order along with their Heat # and the Mill Test Report referencing those Heat #'s. This is ordered on a per line item basis.
<b>PMI Report</b>	Best	A chemical analysis of a part's wetted material and a unique test number permanently affixed to the part. This is ordered on a per item basis.