

GP 18-12-01	Positive Material Identification	December 2003
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Positive Material Identification

GP 18-12-01

Scope

- 1) [I] This Global Practice (GP) applies to metallic alloy materials purchased for use either directly by Owner or indirectly through Vendors, Fabricators, or Subcontractors. It includes the supply, fabrication, and erection of these materials.
 - 2) [I] This GP covers the procedures and methods to ensure that the nominal chemical composition of alloy materials is in accordance with purchase specifications, and that such materials are properly analyzed and marked to indicate the alloy.
 - 3) [I] Carbon steels are not within the Scope of this GP.
 - 4) [I] An asterisk (*) indicates that a decision by Owner is required, or that additional information shall be furnished by Owner.
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1. Required References

This Section lists Practices and Standards that are generically referenced and assumed to be a part of this document. Unless otherwise specified herein, use the latest edition.

1.1. Global Practices–ExxonMobil Engineering Practices

GP 05-01-01	Pressure Vessels
GP 18-07-01	Welding Procedures
GP 20-01-01	Inspection of Equipment and Materials

1.2. ExxonMobil Data Sheets

ExxonMobil Data Sheets	ExxonMobil Data Sheet Home Page
T181201C01	Positive Material Identification - Analysis Mode Data Sheet

1.3. ASME–American Society of Mechanical Engineers

ASME SEC II A	BPVC Section II A - Materials Part A - Ferrous Material Specifications
ASME SEC II B	BPVC Section II B - Materials Part B - Nonferrous Material Specifications
ASME SEC II C	BPVC Section II C - Materials Part C - Specifications for Welding Rods, Electrodes, and Filler Metals
ASME SEC V B SD-129	SD-129 Standard Test Method for Sulfur in Petroleum Products (General Bomb Method) ASTM D129-95
ASME SEC V B SD-808	SD-808 Standard Test Method for Chlorine in New and Used Petroleum Products (Bomb Method) ASTM D808-95

1.4. ASTM–American Society for Testing and Materials

ASTM A 193/A 193M	Standard Specification for Alloy-Steel and Stainless Steel Bolting Materials for High-Temperature Service
ASTM A 751	Standard Test Methods, Practices, and Terminology for Chemical Analysis of Steel Products
ASTM E 353	Standard Test Methods for Chemical Analysis of Stainless, Heat-Resisting, Maraging, and Other Similar Chromium-Nickel-Iron Alloys



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ASTM E 354	Standard Test Methods for Chemical Analysis of High-Temperature, Electrical, Magnetic, and Other Similar Iron, Nickel, and Cobalt Alloys
Other ASTM and National Standards, as applicable	

2. Definitions

Term	[I] Definition
Positive Materials Identification (PMI)	A procedure used to ensure that specified metallic alloy materials are: properly identified as to alloy type, marked according to Owner's procedures, installed as intended.
Inspection Lot	With the exception of bolting, an inspection lot is a group of components from the same heat number or heat treatment batch, from which a sample is drawn. For bolting, a lot is a group of similar components in terms of alloy type and size.
100% Positive Material Identification	Each individual component and weld is tested.
Representative Sampling	PMI testing of a sample, which consists of one or more pieces (components), selected at random from an inspection lot, which will be examined to determine acceptability of the inspection lot. The representative sample shall be 100 percent for a lot of 5 pieces or less; the greater of 5 pieces, or 5 percent for a lot of 5 to 200 pieces, and the greater of 10 pieces, or 3 percent for a lot greater than 200 pieces.
Traceable Mill Certificate	A document that permits each component to be identified according to the original heat or material from which it was produced.
Check (instrument performance)	A test carried out on a known standard alloy to verify the performance of the instrument.
PMIV (PMI Verified) AV (Alloy Verified)	Markings used to identify components which have been tested and confirmed to be acceptable.

3. Specific Applicability

- 1) * [R] The following metallic-alloy-material items require 100% Positive Material Identification (PMI):

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- a) All pressure-containing welds. For double welded joints, both weld caps, inside and outside when accessible.
 - b) All pressure containing piping components (includes thermowells, instrument manifolds, etc.).
 - c) Pressure-containing components of heat exchangers (to include the plates for plate and frame heat exchangers, except components per Section 3, Item 2) and other pressure vessels.
 - d) Plate material used as pressure containing components.
 - e) Pressure-containing machinery components (e.g., pump casings, compressors, and process expansion drivers).
 - f) Pressure-containing instrument housings in alloy piping circuits that cannot be isolated from the process environment, or housings with a design pressure above 900 psig (e.g., gauge glass housings, orifice meter tubes).
 - g) External valve components (body, flanges, bonnet, plugs and vents, and associated welds).
 - h) Expansion joints and bellows in pressure containing service.
 - i) Pressure containing tubing which cannot be isolated from the process environment (except as excluded in Section 3, Items 2 and 4).
 - j) Fired heater coils including all welds on alloy tubes and air-cooled heat exchanger tubes (air fin tubes).
 - k) Any other components or materials specifically designated for PMI on the Purchase Specification.
- 2) * [R] The following items require PMI on a representative sampling basis as a minimum, unless specifically exempted on the Purchase Specification:
- a) Tubular products used in the fabrication of equipment such as heat exchangers and boilers, provided that traceable mill certification is available.

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