Additively Manufactured Polymer-Based Components for Use in the Petroleum and Natural Gas Industries

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1 Scope

1.1 Purpose

This standard specifies requirements for qualification of the manufacturing process, production, marking, and documentation of additively manufactured polymer-based components used in the petroleum and natural gas industries when referenced by an applicable API equipment standard or otherwise specified as a requirement for conformance. The qualification process flowchart is shown in Figure 1.

1.2 Applicability

This standard applies to additively manufactured polymer-based components (including composites) produced by material extrusion [also referred to as fused filament fabrication (FFF) or fused deposition modeling (FDM) and fused granulate fabrication (FGF)] and powder bed fusion [also referred to as selective laser sintering (SLS) or multi jet fusion (MJF)].

1.3 Additive Manufacturing Specification Levels (AMSL)

This standard establishes requirements for three additive manufacturing specification levels (AMSL). These three designations—AMSL 1, AMSL 2, and AMSL 3—define increasing levels of additive manufacturing (AM) technical, quality and qualification requirements.

NOTE An AMSL can be assigned to a component by a product specification or standard, the purchaser, or the additive manufacturer.