1. (normative)  
   Additive Manufacturing Procedure (AMP) - DRD
   1. DRD identification
      1. Requirement identification and source document

This DRD is called from the requirement 7.2.3a.

* + 1. Purpose and objective

The purpose of the AM Procedure is to ensure that all relevant information relating to the production of each AM part, including pre-and post-processing, is documented in sufficient detail such that repeatability of the AM end to end process is given.

* 1. Expected response
     1. Scope and content

The AMP shall contain the following information:

A flow chart, detailing all performed operations and their sequence from design up to final cleaning and controls, indicating the responsible stakeholder(s)

General information

Date, issue and revision number,

Powder,

AM process,

Reference to the test report in compliance with Annex D.

Equipment and facilities

Referential axis definition in compliance with clause 5.1,

Identification of the equipment, model and serial number, used to perform all processes,

Machine management system software,

Reference to procedures of all applied processes.

Reference to powder management plan in compliance with Annex I.

Reference to AM process parameter set

Shielding gas

Shield gas identification and purity,

Shield gas flow rate and direction,

Level of oxygen during the build,

Beginning, ending and duration of the shielding gas.

Level of vacuum

In case of pre-heating is applied, the temperature, and the time at temperature

Base plate

Alloy type of base plate,

Thickness of base plate,

Base plate temperature.

Type of recoater (blade, material of blade, roller, or other)

* 1. 1 to item 3.(d): This includes e.g. preparatory processes, the AM process, surface treatment, heat treatment, non-destructive testing, marking and, cleaning.
  2. 2 to item 9.(b): The baseplate serves several purposes. One of them is to provide stiffness to counter-act bending forces due to the accumulation of residual stresses during the build process. High-strength materials and parts with high-volume cross sections may require thicker plates than materials with lower strength or filigree designs.
  3. 3 to item 10.: A cryptographic hash can be useful to unambiguously identify digital files as reference to AM process parameter set.
     1. Additional requirements for various AM processes

In addition to the requirements specified in B.2.1, the AMP for Electron Beam based Powder Bed Fusion processes shall contain as a minimum, the following information

Equipment:

Model and make,

Electron gun type.

Manufacturers’ or measured values for the beam quality parameters.

In addition to the requirements specified in B.2.1, the AMP for Laser based Powder Bed Fusion processes shall contain as a minimum, the following information:

Equipment:

Type of energy source, model and make.

* + 1. Special remarks

None.