galvanic anodes used for seawater and saline mud applications (i.e., cast anodes of trapezoidal, "D," or circular cross-section and bracelet-type anodes. The general requirements and recommendations of this standard may also be applied to other anode shapes (e.g., half-spherical, button, etc., which are sometimes used for seawater applications).

- NACE SP0387-2019.[13] This standard defines minimum physical quality and inspection standards for cast sacrificial anodes for offshore applications.
- NACE SP0176-2007-SG.[14] This standard lists materials, practices, and methods of corrosion control for fixed offshore structures associated with petroleum production. Three major areas are the submerged zone, the splash zone, and the atmospheric zone.
- NACE SP0169-2013.[15]
- NACE SP0492-2016-SG.[16] This standard sets minimum physical quality and inspection standards for cast sacrificial anodes for offshore pipeline applications. The standard applies to typical half-shell or segmented bracelet-type anodes and is not intended to apply to the platform, hull, tank, or extruded-type anodes. The section on physical requirements includes information on samples for chemical analysis; anode identification, weight, dimensions, and straightness; insert dimensions and position; insert material; fabrication of inserts by welding; insert surface preparation; surface irregularities on the anode casting; cracks in cast anodic materials; defects; and more.
- NACE TM0190-2017.[17] This standard determines the potential and current capacity characteristics under laboratory conditions for aluminum and zinc alloy anodes used for CP.
- NACE SP0196-2015.[18]
- NACE SP0492-2006.[19]
- DNV-RP-B401.[20]
- DNVGL-RP-B401[21]
- NORSOK M-503[22]
- ISO 15589.[23] This specifies requirements and gives recommendations for the pre-installation surveys, design, materials, equipment, fabrication, installation, commissioning, operation, inspection, and maintenance of CP systems for offshore pipelines for the petroleum, petrochemical, and natural gas industries as defined in ISO 13623. It applies to carbon steel, stainless steel, and flexible pipelines in offshore service and retrofits, modifications, and repairs made to existing pipeline systems. ISO 15589 is applicable to all types of seawater and seabed environments encountered in submerged conditions and risers up to mean water level.
- MIL-DTL-24779C (SH)[24]
- AS 2239[25]
- ASTM E1251-17a[26]

None of the above standards include information on the type of furnace that should be used to obtain the anodes with the quality and specifications indicated in each of these standards.

Conclusions

From the review that was carried out of the specifications, codes of recommended best practices, and standards within our reach: ASTM, DNV, NORSOK, ISO, NACE, AS, and NRF PEMEX, it was not possible to find any reference to the manufacturing process of Al anodes, either through the use of gas or induction furnaces. This includes the particularity of using the technology of fusion and stirring by electromagnetic induction.

The anode's quality is judged by its traditional chemical and traditional electrochemical properties: chemical composition, operating potential, electrochemical efficiency, current drainage capacity, and microstructure (which may be considered in some cases), not specifying the fusion technique used to qualify the quality of the anode. The functionality of the anode obtained is judged, not the manufacturing process applied to bring this functionality.

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