

# DIN EN 12496:2014-02 (E)

## Galvanic anodes for cathodic protection in seawater and saline mud

---

<b>Contents</b>		<b>Page</b>
Foreword .....		3
Introduction .....		4
1	Scope .....	5
2	Normative references .....	5
3	Terms and definitions .....	5
4	Galvanic anode materials and their properties .....	8
4.1	General .....	8
4.2	Anode alloy composition .....	8
4.3	Electrochemical properties .....	9
4.3.1	General .....	9
4.3.2	Potential .....	9
4.3.3	Current capacity .....	9
4.3.4	Anode consumption rate .....	10
5	Anode design and acceptance criteria .....	10
5.1	General .....	10
5.2	Chemical composition .....	11
5.3	Physical properties .....	11
5.4	Electrochemical testing .....	11
5.5	Anode core materials .....	12
5.6	Cable connections .....	13
Annex A (normative) Physical tolerances for galvanic anodes .....		14
A.1	Anode mass .....	14
A.2	Anode dimensions and straightness .....	14
A.3	Steel core .....	15
A.4	Anode surface irregularities .....	15
A.5	Cracks in cast anodic material .....	15
A.5.1	General .....	15
A.5.2	Stand-off and flush mounting anodes .....	16
A.5.3	Bracelet anodes .....	16
A.6	Internal defects and destructive testing .....	16
Annex B (informative) Composition and performance properties for galvanic anodes .....		18
B.1	Aluminium alloys .....	18
B.1.1	Anode material .....	18
B.1.2	Electrochemical properties .....	19
B.2	Magnesium alloy .....	20
B.2.1	Anode material .....	20
B.2.2	Electrochemical properties .....	21
B.3	Zinc alloy .....	22
B.3.1	Anode material .....	22
B.3.2	Electrochemical properties .....	23
Annex C (informative) Description of various electrochemical tests .....		24

C.1	Free running test .....	24
C.2	Galvanostatic test .....	24
C.3	Potentiostatic test .....	24
C.4	Quality control testing .....	25
Bibliography .....		26