

DIN EN ISO 12696:2022-08 (E)

Cathodic protection of steel in concrete (ISO 12696:2022)

Contents		Page
European foreword		4
Foreword		5
Introduction		6
1	Scope	7
2	Normative references	7
3	Terms and definitions	8
4	General	9
4.1	Quality management	9
4.2	Persons	9
4.3	Design	9
5	Structure assessment and repair	10
5.1	General	10
5.2	Records	10
5.3	Visual inspection and delamination survey	10
5.4	Chloride analysis	10
5.5	Carbonation depth measurement	10
5.6	Concrete cover and reinforcement location	11
5.7	Reinforcement electrical continuity	11
5.8	Steel/concrete potential	11
5.9	Concrete electrical resistivity	11
5.10	Repair	12
5.10.1	General	12
5.10.2	Concrete removal	12
5.10.3	Reinforcement preparation	12
5.10.4	Concrete reinstatement	12
5.11	Cementitious overlay	13
5.12	New structures	13
6	Cathodic protection system components	14
6.1	General	14
6.2	Anode systems	14
6.2.1	General	14
6.2.2	Conductive coating anode systems	15
6.2.3	Activated titanium anode systems	16
6.2.4	Titania ceramic anodes	17
6.2.5	Conductive cementitious anodes	17
6.2.6	Embedded galvanic anodes	17
6.2.7	Surface-mounted galvanic anodes	18
6.2.8	Buried and immersed anodes	18
6.3	Monitoring sensors	20
6.3.1	General	20
6.3.2	Portable reference electrodes	21
6.3.3	Other sensors	21
6.4	Monitoring instrumentation	22
6.4.1	General	22
6.4.2	Digital meters	22
6.4.3	Data loggers	22

6.5	Data management system	23
6.6	Direct current cables	24
6.7	Junction boxes	25
6.8	Power supplies	25
6.9	Transformer-rectifiers	25
7	Installation procedures	27
7.1	Electrical continuity	27
7.2	Performance monitoring system	27
7.3	Connections to steel in concrete	28
7.4	Concrete repairs associated with the cathodic protection components	28
7.5	Surface preparation for anode installation	28
7.6	Anode installation	29
7.7	Connections to the anode system	29
7.8	Anode overlay, surface sealant or decorative coating application	29
7.9	Electrical installation	30
7.10	Testing during installation	31
8	Commissioning	31
8.1	Visual inspection	31
8.2	Pre-energizing measurements	31
8.3	Initial energizing of impressed current systems	32
8.4	Initial adjustment of impressed current systems	32
8.5	Initial performance assessment	33
8.6	Criteria of protection: Interpretation of performance assessment data	34
9	System records and documentation	35
9.1	Quality and test records	35
9.2	Installation and commissioning report	35
9.3	Operation and maintenance manual	36
10	Operation and maintenance	36
10.1	Intervals and procedures	36
10.2	System review	37
10.3	System review report	37
	Annex A (informative) Principles of cathodic protection and its application to steel in concrete	38
	Annex B (informative) Design process	46
	Annex C (informative) Notes on anode systems	53
	Annex D (informative) Notes on reference electrodes	58
	Bibliography	62