

DIN EN 16994:2018-07 (E)

Clay geosynthetic barriers - Characteristics required for use in the construction of underground structures (other than tunnels and associated structures)

Contents		Page
European foreword		4
Introduction		5
1	Scope	6
2	Normative references	6
3	Terms, definitions and abbreviations	8
3.1	Terms and definitions	8
3.2	Abbreviations	10
4	Characteristics and corresponding methods of test	10
4.1	General	10
4.2	Type of application	11
4.3	Relevant characteristics	11
4.4	Characteristics relevant to specific conditions of use	13
4.5	Release of dangerous substances	14
5	Assessment and verification of constancy of performance (AVCP)	14
5.1	General	14
5.2	Type testing	15
5.3	Factory production control (FPC)	19
Annex A (normative) Durability of geosynthetic barriers		25
A.1	General	25
A.1.1	Service Life	25
A.1.2	Type testing of durability	25
A.1.3	Mechanisms of degradation	26
A.1.4	Use of rework material	26
A.1.5	Recycled materials	26
A.2	Weathering	26
A.2.1	General	26
A.2.2	Direct tests and accelerated tests	27
A.2.3	Period of exposure	27
A.3	Products used with a service life up to 5 years	28
A.4	Other applications and service life of 25 and 50 years	28
A.4.1	General	28
A.4.2	Tests for PE type of GBR-P	29
A.4.3	Tests for FPO-type of GBR-P	30
A.4.4	Tests for EPDM type of GBR-P	31
A.4.5	Tests for GBR-P made of PVC-P	31
A.4.6	Tests for clay geosynthetic barriers (GBR-C)	32
A.5	Durability tests on GBR-P	34
A.5.1	Introduction	34
A.5.2	Microbiological resistance	34
A.5.3	Resistance to environmental stress cracking	35
A.5.4	Resistance to leaching	36
A.5.5	Resistance to oxidation/thermal ageing	39

A.6	Evaluation tests on GBR-P and GBR-C	41
A.6.1	General	41
A.6.2	Evaluation by comparison of tensile properties	41
A.6.3	Evaluation by comparison of oxidative induction time (OIT) values	41
A.6.4	Evaluation by change in mass	41
A.6.5	Evaluation by change in water permeability	41
A.7	Durability tests on GBR-B	41
A.7.1	Introduction	41
A.7.2	Microbiological resistance	42
A.7.3	Resistance to environmental stress cracking	43
A.7.4	Resistance to leaching	43
A.7.5	Resistance to oxidation/thermal ageing	44
A.7.6	Weathering resistance	45
A.8	Evaluation tests on GBR-B	46
A.8.1	General	46
A.8.2	Evaluation by comparison of tensile properties	46
A.8.3	Evaluation by change in mass	46
A.8.4	Evaluation of water permeability	46
A.8.5	Evaluation of flow resistance at elevated temperature	47
A.8.6	Evaluation of flexibility at low temperature	47
A.8.7	Evaluation of ring and ball softening point temperature	47
Annex ZA (informative)	Relationship of this European Standard with Regulation (EU) No. 305/2011	48
ZA.1	Scope and relevant characteristics	48
ZA.2	System of Assessment and Verification of Constancy of Performance (AVCP)	49
ZA.3	Assignment of AVCP tasks	50
Bibliography		51