

DIN EN 14024:2024-03 (E)

Metal profiles with thermal barrier - Mechanical performance - Requirements, proof and tests for assessment

Contents	Page
European foreword.....	4
1 Scope.....	5
2 Normative references.....	5
3 Terms and definitions	6
4 Symbols and abbreviations	12
5 Requirements	16
5.1 General.....	16
5.2 Thermal barrier with mechanical functions	17
5.3 Mechanical resistance	18
5.4 Static proof	21
6 Tests.....	21
6.1 General.....	21
6.1.1 Test specimens.....	21
6.1.2 Test temperature	21
6.1.3 Mechanical test equipment.....	21
6.1.4 Pre-test conditioning	21
6.2 Effects of different conditionings of the thermal barrier on the mechanical performances of the connection.....	22
6.2.1 Generalities.....	22
6.2.2 Performance after immersion in water	22
6.2.3 Performance after exposure to humidity.....	22
6.2.4 Testing for brittleness.....	22
6.2.5 Testing of the creep factor under constant shear load.....	23
6.2.6 Testing of the creep factor under constant transverse tensile load.....	23
6.2.7 Performance after exposure to UV radiation (if applicable).....	23
6.2.8 Testing for tensile cracks	24
6.3 Transverse tensile strength (Q).....	24
6.3.1 Test specimens.....	24
6.3.2 Test procedure.....	25
6.3.3 Evaluation	26
6.4 Shear strength and elasticity constant (T, c).....	26
6.4.1 Test specimens.....	26
6.4.2 Test procedure.....	27
6.4.3 Result types of systems with mechanical design system type A	28
6.4.4 Test flow	30
6.4.5 Special cases.....	30
6.4.6 Evaluation	33
6.5 Ageing.....	34
6.5.1 General.....	34
6.5.2 Method 1 = M1	34
6.5.3 Method 2 = M2	35
6.5.4 Method 3 = M3	37
6.6 Characteristic values.....	38
6.6.1 Transverse tensile strength	38
6.6.2 Characteristic shear strength	38
6.6.3 Elasticity constant.....	38
6.6.4 Residual deformation Δh for M1 and deformation f for M2.....	38

6.6.5	Ageing effect, creep factor $\varphi_{c,s}$ under constant shear load.....	38
6.6.6	Ageing effect, creep factor $\varphi_{c,t}$ under constant transverse tensile load	39
6.6.7	Combined shear and tensile stress, design-factor γ_{Rd}	39
6.7	Test report	39
6.7.1	General	39
6.7.2	Test report on effects of different conditionings of the thermal barrier on the mechanical performances of the connection.....	40
6.7.3	Test report on the mechanical resistance of the profile	40
Annex A	(informative) Static proof.....	42
A.1	Actions	42
A.2	Profiles without shear connection (type C).....	43
A.2.1	Flexural stress.....	43
A.2.2	Transverse tensile strength.....	45
A.2.3	Deflection.....	45
A.2.3.1	Maximum limits on frontal deflection.....	47
A.2.3.2	In plane deflection.....	47
A.3	Profiles with shear connection (types A and B).....	47
A.3.1	General	47
A.3.2	Metal profile sections.....	48
A.3.3	Shear strength of the thermal barrier.....	48
A.3.4	Transverse strength of the thermal barrier	49
A.3.5	Deflection.....	49
Annex B	(informative) Extension of characteristic data for profile design	50
B.1	General	50
B.2	Shear strength T and transverse tensile strength Q	50
B.3	Elasticity constant c , creep factor $\varphi_{c,s}$	50
Annex C	(informative) Effective momentum of inertia of metal profiles with thermal barrier.....	52
Annex D	(informative) Simple products which typically do not need a static proof by calculation.....	60
D.1	General	60
D.2	Simple product definition.....	60
D.3	Mechanical properties	61
D.3.1	General	61
D.3.2	Condition 1.....	61
D.3.3	Condition 2.....	61
D.4	Static proof.....	62
Bibliography	63