DIN EN 15328:2020-10 (E)

Railway applications - Braking - Brake pads

Contents

Page

European foreword 5

Introduction 6

1 Scope 7

2 Normative references 7

3 Terms and definitions 8

4 Symbols and abbreviations 9

5 Characteristics and test method of the brake pads 10
5.1 Classification of brake pads 10
5.2 Coefficient of friction 10
5.3 Environmental impact, health and safety 10
5.4 Usage requirements 10
5.5 Frictional requirements for brake pads 10
5.6 Requirements and optional test programs for brake pads for coaches 12
5.7 Geometrical features of the brake pads 13
5.8 Mechanical, physical and chemical characteristics 14
5.9 Thermal and mechanical requirements 15
5.10 In-service assessment 15
5.11 Marking of brake pads 15
5.12 Dynamometer tests 15
5.13 Conditions for classification tests 16
5.14 Interchangeability of brake pads 18

Annex A(normative) Generic conditions for the execution of test programs 19

A.1 General 19
A.2 Response time 19
A.3 Weighing 19
A.4 Interruption of test sequence 19
A.5 Temperatures 19
A.6 Brake applications under wet conditions 19
A.7 Conditioning of brake discs 20
A.7.1 General 20
A.7.2 Conditioning program 21
A.7.3 Roughness measurement 21
A.8 Bedding-in of brake pads 21
A.9 Methods of temperature measurements 21
A.10 Mean friction radius 22
A.11 Rotation and ventilation conditions 22

Annex B(normative) Test programs for classes A1 to G1 23

B.1 Test program: brake pads of class A1 23
B.2 Test program: brake pads of classes B1 and C1 25
B.3 Test Program: brake pads of classes B2 and C2 30
B.4 Test program: brake pads of class C0 35
B.5 Test program: brake pads of class C3 37

B.6 Test program: brake pads of class D1 39
B.7 Test program: brake pads of class D2 43
B.8 Test program: brake pads of class E1 46
B.9 Test program: brake pads of class F1 48
B.10 Test program: brake pads of classes F2 and G1 51
B.11 Test program: brake pads of class F3 54
B.12 Assessment of static friction coefficient 57

Annex C(normative) Test programs for coaches 58

C.1 Test program S1.1 (vmax = 200 km/h - organic brake pads) 58
C.2 Test program S2.1 (wet test) 61
C.3 Instantaneous coefficient of friction for test program S1.1, S2.1, T1 and T2 61
C.4 Mean coefficient of friction for test programs S1.1, S2.1, T1 and T2 62
C.5 Test program T1 (vmax = 200 km/h - sintered brake pads) 63
C.6 Test program T2 wet test (sintered brake pads) 66

Annex D(normative) Documentation of brake tests 67

Annex E(normative) Generic test programs for locomotives, MUs and high speed trains 69

E.1 Use of the generic test programs 69
E.2 Locomotives and MUs 69
E.2.1 Test parameters 69
E.2.2 Brake steps 72
E.2.3 Masses 72
E.2.4 Continuous brake applications 73
E.3 High speed trains 73
E.3.1 Test parameters 73
E.3.2 Brake steps 75
E.3.3 Masses 76
E.3.4 Brake forces for high-speed brake applications 76
E.3.5 Power for continuous brake applications 77

Annex F(normative) Brake pads shapes and envelopes 78

F.1 General 78
F.2 Preferred space envelope for SBP 200 cm2 78
F.3 Preferred space envelope for SBP 175 cm2 79
F.4 Space envelope for SBP 200 cm2 80
F.5 Maximum Space envelope for SBP 175 cm2 80

Annex G(normative) Drawings for dove tails 81

Annex H(informative) In-service test 83

H.1 Test requirements 83
H.2 Mechanical requirements 83
H.3 Thermal requirements 84

Annex ZA (informative) Relationship between this European Standard and the Essential Requirements of EU Directive 2016/797/EU aimed to be covered 85

Bibliography 87