

DIN EN 13262:2020-12 (E)

Railway applications - Wheelsets and bogies - Wheels - Product requirements

Contents		Page
European foreword.....		5
Introduction		6
1 European scope		7
2 Normative references		7
3 Terms and definitions		8
4 Product definition		9
4.1 Chemical composition		9
4.1.1 Values to be obtained		9
4.1.2 Sampling position		9
4.1.3 Chemical analysis		9
4.2 Mechanical characteristics		10
4.2.1 Characteristics from the tensile testing		10
4.2.2 Hardness characteristics in the rim		12
4.2.3 Impact resistance characteristics		14
4.2.4 Fatigue characteristics		14
4.2.5 Toughness characteristics of the rim		15
4.3 Heat treatment homogeneity		17
4.3.1 Values to be obtained		17
4.3.2 Test pieces		17
4.3.3 Test method		17
4.4 Material cleanliness		17
4.4.1 Micrographic cleanliness		17
4.4.2 Internal integrity		19
4.5 Residual stresses		22
4.5.1 General		22
4.5.2 Values to be obtained		22
4.5.3 Test piece		22
4.5.4 Measurement methods		22
4.6 Surface characteristics		22
4.6.1 Surface finish		22
4.6.2 Surface condition for the oil injection hole		23
4.6.3 Surface integrity		23
4.7 Geometrical tolerances		24
4.7.1 General		24
4.7.2 Wear groove		26
4.8 Static imbalance		27
4.9 Corrosion protection		28
4.10 Marking		28
5 Product qualification		29
6 Conditions of supply of the product		29
7 Tips for choosing the steel grade		29
Annexe A (normative) Evaluation process for the acceptance of new materials		30
A.1 General		30
A.2 First step: Characterisation of a new steel grade		30
A.3 Step two: Testing in service		30
A.4 Step three: Report		31

Annexe B (informative) Examples of test benches for fatigue testing	32
B.1 Test piece	32
B.2 First test method.....	32
B.2.1 Test rig	32
B.2.2 Test control	32
B.3 Second test method	33
B.3.1 Test rig	33
B.3.2 Control of the test.....	34
B.4 Third test method.....	34
B.4.1 Test rig	34
B.4.2 Control of the test.....	35
Annexe C (informative) Strain gauge method of determining the variation in circumferential residual stresses deep under the running surface (destructive method)	36
C.1 Method principle.....	36
C.2 Procedure.....	36
C.2.1 Strain gauge equipment for a section of the rim before cutting the wheel (Figure C.1).....	36
C.2.2 Making the cuts (Figure C.2).....	36
C.2.3 Operations to be performed during cutting.....	37
C.3 Calculation of the variation of the circumferential residual stress deep under the running surface	37
C.3.1 General	37
C.3.2 Calculation of the variation of the circumferential stress produced by cutting operation no. 1	37
C.3.3 Calculation of the variation of the circumferential stress produced by cutting operation no. 2.....	38
C.3.4 Calculation of the variation of the circumferential stress produced by cutting operation no. 3.....	38
C.3.5 Final diagram showing the variation of the circumferential stress deep under the running surface	38
Annexe D (normative) Product qualification	41
D.1 Introduction	41
D.2 General	41
D.3 Requirements.....	42
D.3.1 Requirements to be met by the manufacturing process	42
D.3.1.1 General	42
D.3.1.2 Quality organisation.....	42
D.3.1.3 Staff qualification.....	42
D.3.1.4 Equipment	42
D.3.2 Requirements to be met by the product.....	42
D.4 Qualification procedure	42
D.4.1 General	42
D.4.2 Documentation required.....	43
D.4.3 Evaluation of production facilities and production process.....	43
D.4.4 Laboratory tests.....	44
D.4.5 Wheel tests	44
D.4.5.1 Extended production control	44
D.4.5.2 Commissioning	45
D.4.5.3 Result of monitoring in service	45
D.5 Validity of the qualification	45

D.5.1	Condition of validity.....	45
D.5.2	Modification and extension.....	45
D.5.3	Transfer.....	45
D.5.4	Expiry.....	46
D.5.5	Withdrawal.....	46
D.6	Qualification record.....	46
Annexe E (normative)	Conditions of supply of the product.....	47
E.1	Introduction.....	47
E.2	General.....	47
E.3	Delivery states.....	48
E.4	Unit checks.....	48
E.5	Batch sampling check.....	48
E.5.1	Checks to be carried out.....	48
E.5.2	Batch homogeneity by measuring rim hardness.....	49
E.5.3	Orientation of residual stresses on treated wheels.....	50
E.5.4	Visual inspection.....	50
E.6	Quality plan.....	50
E.6.1	General.....	50
E.6.2	Objectives.....	50
E.6.3	Methods of application.....	50
E.7	Permissible repairs.....	51
E.8	Retest.....	51
Annexe F (normative)	Measurement of the hydrogen content at the time of development of steel for monobloc wheels.....	52
F.1	General.....	52
F.2	Sampling.....	52
F.3	Analysis method.....	52
F.4	Precautions.....	52
Annexe G (informative)	Common applications of steel grades.....	53
Annexe ZA (informative)	Relationship between this European Standard and the essential requirements of Directive 2016/797/EC to be met.....	54
Bibliography.....		57