

# DIN EN 13262:2020-12 (E)

## Railway applications - Wheelsets and bogies - Wheels - Product requirements

<b>Contents</b>		<b>Page</b>
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